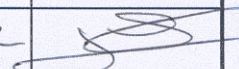
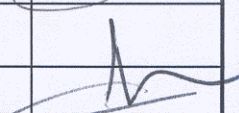
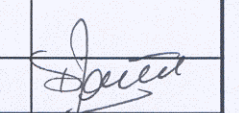
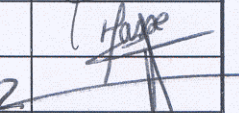
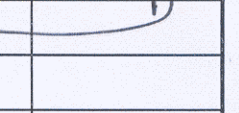


HERSCHEL / PLANCK**Satellite
AIT software management plan****H-P-1-ASP-PL-0420****Product Code : 000000**

Rédigé par/ Written by	Responsabilité-Service-Société Responsibility-Office -Company	Date	Signature
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1. INTRODUCTION

1.1 Purpose

The scope of this document is to specify the requirements for the development of the Test S/W to be used during Integration and Test activities on both HERSCHEL and PLANCK from element to model level, including subsystem level.

This Satellite AIT Software Management Plan document shall be considered as a guideline to be followed when S/W elements for the different AIV activities have to be developed.

The Software Management Plan will establish requirements for the overall S/W architecture and will contain rules for the S/W design and development of the individual elements as the TM/TC definition and use from the Herschel/Planck Satellites Database, the Test Sequences and the Synoptic Pictures.

The basis document is the AIT software management plan [AD4] written for the SVM. As the test equipments are the same at SVM and Satellite level, the AIV tests sequences used will be mainly the same. This document deals with the difference or additional tasks that will appear at instruments level, at PLM level and at satellite level.

At SVM and AVM level, some tasks have been added to [AD4] and required to be implemented (see chapters 3 and 5).

The applicability field of this document is all the H/P program activities (depend of the chapters):

- stand alone instruments tests
- P-PLM & H-EPLM
- SVM (enclosing ACMS)
- H/P satellites

For all the models: FUMO, EQM/COM, PFM

2. APPLICABLE AND REFERENCE DOCUMENTS

2.1 Applicable documents

- [AD1] H-P-4-TE-MA-0010 CCS SUM
- [AD2] H-P-1-ASPI-TN-231 Herschel / Planck System Database guide
- [AD3] H-P-1-ASPI-IS-0141 Herschel / Planck Naming Convention Specification
- [AD4] H-P-PL-AI-0012 SVM AIT software management plan
- [AD5] S2K-MCS-ICD-0001.TOS-GCI SCOS2000 data base import ICD

2.2 Reference documents

- [RD1] H-P-1-ASPI-SP-0045 EGSE Requirements Specification
- [RD2] H-P-1-ASPI-IS-0121 EGSE INTERFACE Requirements Specification
- [RD3] H-P-4-TE-DD-2020 Herschel / Planck Central Checkout System
System Design Document - Hardware

- [RD4] H-P-4-TE-DD-2010 Herschel / Planck Central Checkout System
System Design Document - Software
- [RD5]
- [RD6]
- [RD7] HSCDT-TN-017 Understanding of the interfaces between the CSS and the Herschel instrument EGSEs
in the IST

2.3 Acronyms

APID	Application Process Identifier
CCS	Central Checkout System
CDMU	Control and Data Management Unit
DFE	Data Front End
DS	Data Server
EGSE	Electrical Ground Support Equipment
HK	HouseKeeping
HPLM	Herschel PayLoad Module
HPSDB	Herschel/Planck System Data-Base
IST	Integrated System Test
LAN	Local Area Network
MTP	Master Test Processor
OBSW	On Board SoftWare
PFM	ProtoFlight Model
PLM	PayLoad Module
PPLM	Planck PayLoad Module
SCOE	Special Check-Out Equipment
S/C	SpaceCraft
S/L	SateLLite
SVM	SerVice Module
S/W	SoftWare
TC	TeleCommand
TCC	Test Conductor Consoles
TM	TeleMetry

3. GENERAL RULES (ALL LEVELS)

3.1 Parameters use

All the parameters used in the test sequences and the synoptic pictures foreseen to run in the CCS at any test level (except local parameters) shall be implemented in the HPSDB. The use of TCL/TK global variable and OL (operation language) are forbidden (TBC for OL variables)

3.2 Naming convention

3.2.1 Parameters

All the parameters used in the test sequences foreseen to run in the CCS at any test level (except local parameters) shall be implemented in the HPSDB (see 3.1). So, the name of these parameters must be compliant with [AD3].

3.2.2 Sequence name

The sequence management will not be supported by the HPSDB. In order to facilitate the sorting of these test sequences , a subsystem identifiers will be the first letter of the sequence name. The subsystem identifiers are defined in [AD3]. The fourth first characters shall be compliant with requirement NMCVT-4080-C of [AD3]. The following letters of the sequence name will comply with [AD4].

3.3 Synoptic pictures name

The tools used to create the synoptic pictures are standard tools of SCOS2000. They will be used at any test levels. In order to facilitate the sorting of these synoptics, a subsystem identifiers will be the first letter of the sequence name. The subsystem identifiers are defined in [AD3]. The fourth first characters shall be compliant with requirement NMCVT-4080-C of [AD3]. The following letters of the sequence name will comply with [AD4].

The synoptic pictures name shall respect their hierarchy. A document will be issued from ASP on this subject.

4. INSTRUMENTS STAND-ALONE TESTING

The stand-alone tests of all the Herschel & Planck instruments will be performed using specific configuration with SCOS2000 to manage the test sequence, the HK telemetry monitoring, the OBS management (partial simulation of the OBSW).

Herschel instruments and Planck instruments EGSE are different. Herschel instruments EGSE is described in [RD7], Planck instruments EGSE is described in [TBD].

4.1 Test sequences

The re-use of the test sequences developed and validated at the instruments level will not be achieved because:

- instrument stations are not allowed to send commands to the satellite
- Planck instruments EGSE's do not use a test language compatible with the CCS

So, the test sequences portability will not be 100 % possible for both Herschel and Planck. Recoding and validation of test sequences will be implemented at PLM & satellite levels.

In order to facilitate this task, the maximum possible effort shall be done to follow the rules defined in [AD3] and [AD4].

In order to increase the efficiency of the portability, instruments teams shall deliver to Alcatel/Astrium the test sequences with documentations (flow-charts, list of the parameters used...) issued from a common software management tool.

Note: the test sequences involved for the portability to the CCS are only the ones used for instruments set-up (telecommand sending) and checks (telemetry reading). According to [RD2], all the sequences used for scientific data treatment purposes will never run in the CCS. At PLM and satellite level, the scientific data will be sent directly to the instruments EGSE through the CCS.

4.2 Data base

A system database shall be used (HPSDB). According to [AD2], it will support all the model of the H/P program: AVM, SVM, satellites, all the subsystems.....& all the equipments of the models. The instruments equipments (EQM, PFM, FUMO models) will be delivered to the satellite with their own data-bases which shall be compliant with [AD5] and will be loaded inside the HPSDB.

5. GENERAL RULES (AT AVM, SVM, PLM AND SATELLITE LEVEL)

Note: SVM encloses ACSM activities with the ACMS EGSE.

5.1 Common software management tool use

All the software activities (test sequences, synoptic pictures...) will be compliant with [AD3] & [AD4]. In addition, the use of a common software management tool to manage the test sequences is mandatory. This software tool will guarantee:

- the tracability of the test sequences (history, flow-chart documentation)
- the structural organization of the test sequences (test sequences created/modified with flow-chart)
- the coherency between the test sequences and the HPSDB
- the cross reference between HPSDB objects and test sequences
- the modularity of test sequences at element, subsystem and model levels
- the validation at least of the test sequences, synoptic picture before running for test purposes

As the same test sequences will be used at different levels, at different areas, with different teams; the use of a common software management tool will increase their understanding.

Note: for ACMS activities, all the test sequences that will run in the CCS later on shall be created/modified with the use of the common software management tool. The ACMS test software used for the subsystem performances and that at any case never run in the CCS is not involved with this requirement.

5.2 AIT software configuration management

The AIT software objects involved are at least test sequences, synoptics, data files. The AIT software of each model is involved too with this configuration management (SVM, ACMS, AVM, satellites....).

The configuration management allows to manage the different issues of all the AIT software objects. At the end of master phases (integration, performances, satellite integration, environmental tests...), at model delivery (ACMS, SVM, satellites...), a status shall be issued and configured (official documents form).

The configuration management allows to manage the belonging of all the AIT software objects. One object could be common (the same for all models), could be different (for example, Herschel ACMS will be different to Planck ACMS).

6. AVM AND SVM TESTING

The reference document for the AVM and SVM is [AD4]. In addition, the different rules defined in chapter 3 and 5 of this document shall be required.

7. PLM TESTING

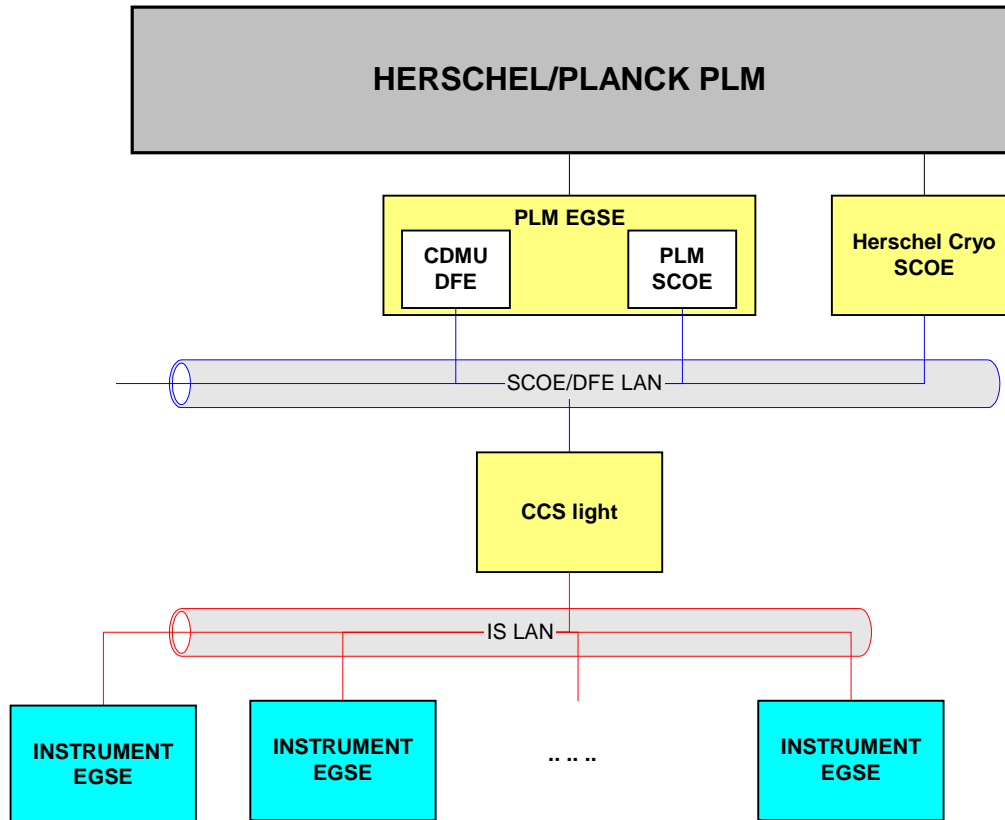


FIGURE 1: PLM EGSE CONFIGURATION

The PPLM & H-EPLM AIT activities will be performed with a SVM simulator (call PLM EGSE enclosing PLM scoe and CDMU DFE in the schematic above) connected to the WU of instruments CQM. It will be the first time that the CCS will be connected to the WU. Herschel satellite team, Planck satellite team & instruments teams will take profit of this set-up to run the test sequences. Instrument team will be in charge of the delivery of:

- the data to the HPSDB (parameters list, limit set for monitoring, curves.....) according to [AD5] & [AD3]
- the synoptic pictures used at instrument level
- the test sequences used at instrument level

Herschel / Planck AIT teams will be in charge of the recoding & validation of the test sequences delivered by instruments teams (with their help) with the use of the common software management tool.

One of the main functionality of the PLM EGSE is to simulate the CDMU software (in term of input/output). All the telecommands sent to the satellite, all the telemetries received from the satellite will be the same at PLM and satellite level. Test sequences run during PLM tests will be considered validated for satellite testing.

8. SATELLITE TESTING

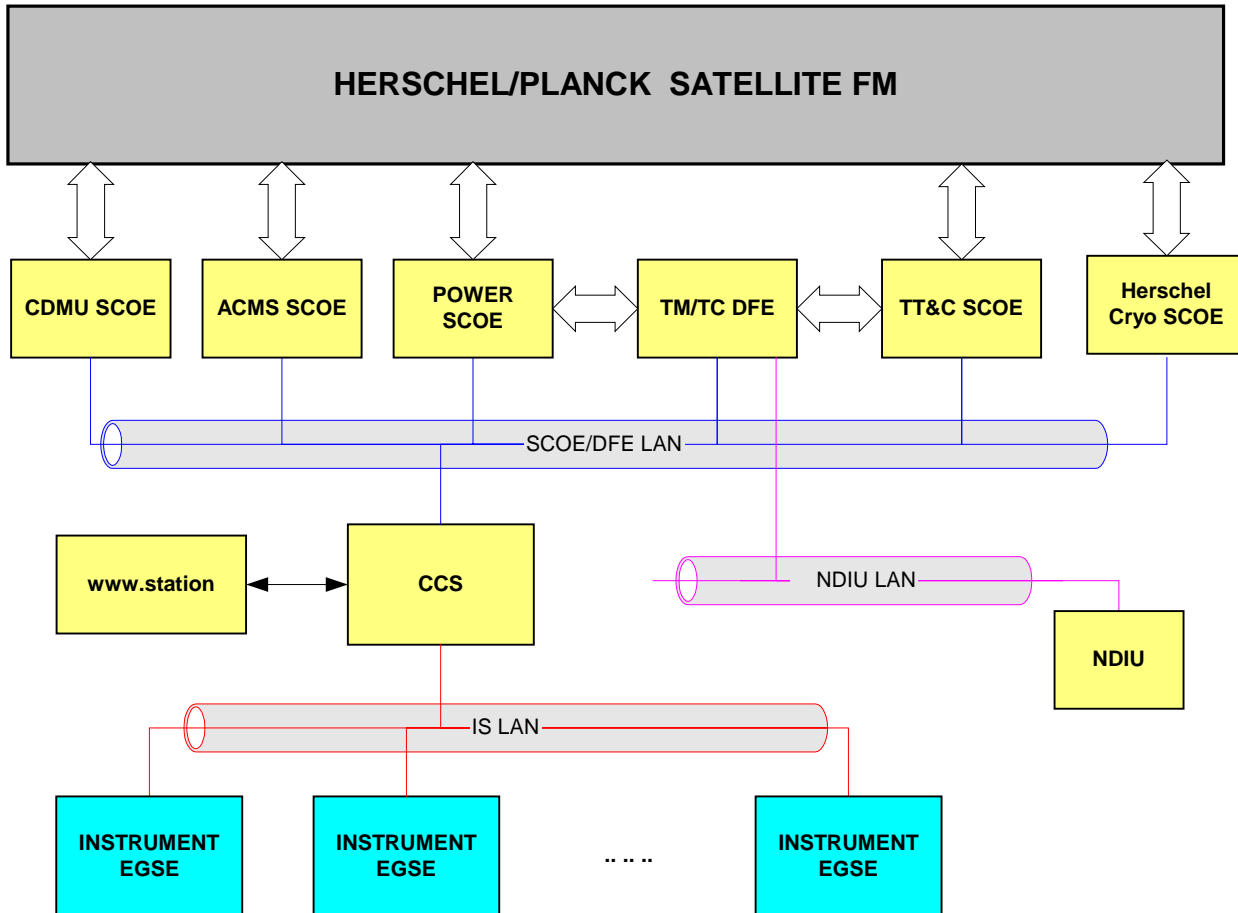


FIGURE 2: SATELLITE EGSE CONFIGURATION

The Herschel / Planck satellites will be tested using:

- SVM test sequences: they will be validated at SVM level. All the activities to manage these test sequences will be compliant with this document (also for the common software management tool purposes). The SVM test sequences will be completely compatible with the satellite level testing.
- PLM test sequences: they will be validated at PLM level. All the activities to manage these test sequences will be compliant with this document (also for the common software management tool purposes). The PLM test sequences will be completely compatible with the satellite level testing.
- Satellite test sequences: the master sequences will be created to configure the complete satellite for the system tests. Nevertheless, these master sequences will call as much as possible sequences already used for the SVM and the PLM testing. All the activities to manage these test sequences will be compliant with this document (also for common software management tool purposes).
- Synoptic pictures: they will be validated at SVM and PLM level. Some of them will be created at satellite level in order to simplify the monitoring of the satellite. All the activities to manage these synoptic

pictures will be compliant with this document (except for the common software management tool purposes).

END OF DOCUMENT