GIADA FS MODEL

REPORT ON
IN FLIGHT ACTIVE PAYLOAD CHECKOUT N. 12 (PC12)
performed on
23-04-2010 and 4-05-2010

PREPARED	APPROVED	AUTHORIZED
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REVISIONS LOG

REV	DOCUMENT CHANGE ORDER	DATE	CHANGES DESCRIPTION	PREPARED
0	-	26-10-2011	First issue	GIADA Team

1. SCOPE AND APPLICABILITY

Payload Checkout 12 (PC12) was an active checkout where a target independent opportunity to perform interactive operations and to request spacecraft pointing was given to all Rosetta payload teams. All Rosetta payload took part in this scenario
The Active Payload Checkout 12 ran for 23 consecutive days starting on the 23th April 2010 until the 14th May 2010.
During PC12 GIADA performs only a passive test (GD01) similar to the previous Passive Payload Checkouts. This passive test (GD01), which includes standard procedures and full functional verification, was executed by switching on Main and Redundant I/Fs in sequence and executing similar procedures for the two cases

This document reports the results obtained on GIADA experiment during PC12.

This report is applicable to GIADA FS model on board the Rosetta S/C. The data were retrieved from DDS by means of the PI Workstation located at Università Parthenope in Naples

GIADA IWS software configuration is GES v. 4.2.2 plus RSOC Converter v. 1.1.2. GIADA in flight software configuration is 2.3 plus three additional patches (one more patch is used to update the context file).

2. REFERENCES

2.1 APPLICABLE DOCUMENT

AD1	RO-EST-RS-3001/EID A	ROSETTA Experiment Interface Document – Part A
AD2	RO-EST-RS-3009/EIDB	ROSETTA GIADA Experiment Interface Document – Part B
AD3	RO-ESC-PL-5000 – last issue	Flight Control Procedure
AD4	GIA-GAL-MA-007 Issue 4	GIADA Flight Spare Experiment User Manual last version

2.2 REFERENCE DOCUMENT

	None.	

3. DEFINITIONS AND ABBREVIATIONS

3.1 ABBREVIATIONS

CAL	Calibration
CF	Context File
CREP	Cover REPort
CT	Configuration Table
DDS	Data Disposition System
EGSE	Electrical Ground Support Equipment
EQM	Electrical Qualification Model
ESA	European Space Agency
FCP	Flight Control Procedure
FS	Flight Spare
GDS	Grain Detection System
GES	GIADA EGSE SW
GIADA	Grain Impact Analyser and Dust Accumulator
HK	House Keeping
I/F	InterFace
INAF-OAC	INAF - Osservatorio Astronomico di Capodimonte – Napoli (I)
IRQ	Interrupt ReQuest
IS	Impact Sensor
IWS	Instrument Work-Station
MBS	Micro Balance System
ME	Main Electronics
MTL	Mission TimeLine
MON	Monitor
OBCP	On-Board Control Procedure
PC	Payload Checkout
PI	Principal Investigator
PS	GIADA Power Supply
PZT	(IS) Piezoelectric Sensor
RED	Redundant
REV	Revision
RMOC	Rosetta Mission Operation Centre
RSOC	Rosetta Science Operation Centre
S/C	(Rosetta) Spacecraft
S/S	(GIADA) Sub-system (e.g. IS or GDS or MBS)
SCI	Scientific
SSC	Source Sequence Count
SSMM	Solid State Mass Memory on-board of Rosetta Spacecraft
SW	Software
TC	TeleCommand
TM	Telemetry
UM	User Manual
UTC	Coordinated Universal Time
VC0	Virtual Channel 0 (Real Time TM packets)

VC1 Virtual Channel 1 (TM packets coming from Mass Memory)

4. DESCRIPTION OF ACTIVITIES

The Active Payload Checkout n. 12 (PC12) scenario begins on the 23rd September 2010 and ran for 23 days to the 4th May 2010, according to the timelines reported in Section 8.
About GIADA, PC12 consists only of a passive test, named GD01 in ESA document. GD01 is the passive test routinely executed in every payload checkout (6-Months status check).

PC12 is a maintenance and calibration scenario plan and therefore there are no scientific objectives.
Details of the plan of activities referred to as passive part of PC12 are in Section 8.1.
No problem appeared during PC12 open/close cover procedures.

In the next table there are some information about PC12

Scenario period	22/04/10 to 14/5/10
Scenario duration	23 days
Sun distance	2.08 AU to 2.27 AU
Earth distance	~1.65 AU
Propagation delay	~13.5 min.

The data were off-line elaborated on the PI IWS at INAF-OAC in Naples.

5. SUMMARY OF DATA ANALYSIS

The full sets of plots about Housekeeping data are reported in Sections 6 and 7 for GD01 test on the Main and Redundant I/F's respectively.

Here following the main findings are summarised.

5.1 GENERAL CONSIDERATIONS

Test started on "S4n Apr 24 2010 14:16:11.160537", when the first TM packet was received from GIADA switched on the Main interface; the last TM packet on the Main interface was received on "Sun Apr 25 2010 01:58:00.183022". Test on the Redundant interface started on "Sun Apr 25 2010 02:58:16.144037" (1st packet received) and ended on "Sun Apr 25 2010 13:56:00.186044" (last packet received).

The first expected packet **(Connection Test Report, service 17,2) was not received** in the time window of any test, because the DDS has marked it with a wrong UTC time, being an unsynchronised time tag (bad time quality) TM report..

At the 3rd IS power-on both on Main I/F (San Apr 25 2010 00:34:00) and Red I/F (San Apr 25 2010 12:32:00), the event ***"Hardware error in IS event detection circuitry. No IRQ received."*** was received (see TCTM report file residing in the log directory of GES). This is a false message produced by the ME of GIADA when the IS electronics is powered-on. This is a known problem (see relevant Remark in GIADA FS UM [**AD 4**]).

During PC12 appeared some unusual events:

1) Some events ***"EID 42310 - EDAC error during S/W start and dump"*** received on both Main and Red I/Fs : these events are generated at GIADA power ON in two cases: when GIADA is switched ON the first time or with KAL off. In this case the events are due to the temporary switch OFF of KAL line on board the S/C during the test performed February 2010 on the Lander, as reported by RMOC. As a consequence of KAL deactivation, a reset of memory occurred. Error messages are linked to the memory reset and raised at the first GIADA power ON after the KAL is deactivated. Anyhow the instrument behaviour is nominal.
2) OOLs received for parameter NGDD0097 - Current +15V - Red ; these are invalid values remained in TM since the instrument was switched ON last time on Redundant I/F. Some invalid values can appear at the following switch ON but they are immediately replaced by the new TM data.
3) Two commands ZGD19601 (Go To Safe Mode) failed: this was an expected event . The "failure" is due to the fact that the instrument received twice the TC ZGD19601: the former before the execution of dump CF and the latter at power OFF when the instrument was already in Safe mode. In agreement with RMOC we have found a solution to avoid the command ZGD19601 will fail again in the future. It will be sufficient to make a modification of procedure AGDF060A (Goto Safe Mode and Power-off) including in it also the dump CF. In this case only one command ZGD19601 is required to the instrument for working properly.

As reported in the "Cover Reports" (**CREP**) no OPEN/CLOSE problem occurred during PC12

5.2 GIADA STATUS

The **current consumption** and **power supply temperatures** are shown in **Errore. L'origine riferimento non è stata trovata.** for Main on GD01, **Errore. L'origine riferimento non è stata trovata.** for Red on GD01; Power values must be compared with soft and hard limits reported in GIADA FS UM (**AD4**) and summarised in Table 5.2-1.

As reported in GIADA FS UM (**AD4**), the Soft and Hard Alarm Limits for Power consumption in Table 5.2-1 for parameters NGDD0086, NGDD0087 and/or NGDD0088 refer to the different GIADA operating modes. The Soft Alarm Limits in Normal and Flux Modes refer to nominal conditions, i.e. with all sub-systems switched ON. This means that when GIADA is in Normal Mode, but not with all sub-systems ON (or in Flux with MBS OFF), the lower Soft Alarm Limits indicated in the Table can be overcome. In order to avoid flood of Out Of Limits (OOL) alarms, it has been decided (July 2006) to refer the Hard Alarm Limits to the extreme instrument status for each mode (e.g., in normal mode, with all subsystems off – lower – or at maximum power consumption - upper). Other configurations not related to real GIADA failure may still give OOL, related to operation in non nominal temperature conditions, although such conditions have never been experienced so far.

In general, all **functional parameters** measured during the PC10 test behave as expected, with the exception of some OOLs reported in the previous section 5.1

QUANTITY	NAME	LNAME	SOFT ALARM LIMITS		HARD ALARM LIMITS	
			Lower	Higher	Lower	Higher
+5V Power Consumption ([1])	NGDD0086	Current +5V	110 mA	150 mA	80 mA	180 mA
+15V Power Consumption ([1])	NGDD0087	Current +15V	30 mA	60 mA	20 mA	70 mA
-15V Power Consumption ([1])	NGDD0088	Current -15V	50 mA	90 mA	40 mA	100 mA
+5V Power Consumption ([2])	NGDD0086	Current +5V	110 mA	150 mA	80 mA	180 mA
+15V Power Consumption ([2])	NGDD0087	Current +15V	30 mA	600 mA	20 mA	700 mA
-15V Power Consumption ([2])	NGDD0088	Current -15V	50 mA	600 mA	40 mA	700 mA
+5V Power Consumption ([3])	NGDD0086	Current +5V	110 mA	1600 mA	80 mA	1800 mA
+15V Power Consumption ([3])	NGDD0087	Current +15V	30 mA	550 mA	20 mA	600 mA
-15V Power Consumption ([3])	NGDD0088	Current -15V	50 mA	350 mA	40 mA	400 mA
+5V Power Consumption ([4])	NGDD0086	Current +5V	110 mA	170 mA	80 mA	1500 mA
+15V Power Consumption ([4])	NGDD0087	Current +15V	30 mA	200 mA	20 mA	220 mA
-15V Power Consumption ([4])	NGDD0088	Current -15V	50 mA	135 mA	40 mA	155 mA

Table 5.2-1. Hard and Soft limits for GIADA FS power consumption

([1]) Safe mode ([2]) Cover mode ([3]) Normal mode ([4]) Flux mode

All **Temperatures** behave as expected (Main on GD01: **Errore. L'origine riferimento non è stata trovata.**3,,

Figure 6.1-4; Red on GD01: **Errore. L'origine riferimento non è stata trovata.**3, **Errore. L'origine riferimento non è stata trovata.**4. The peaks visible at the beginning and at the end of Frangibolt and IS temperature profiles are features due to the temporary increasing of power consumption at Power-on of the motor heaters (see Figure 6.1-5 and Figure 6.1-6 for Main on

GD01; **Errore. L'origine riferimento non è stata trovata.** and **Errore. L'origine riferimento non è stata trovata.** for Red on).

The trend of the IS Temperature is more noisy with the Main than with the Red I/F (Main on GD01: Figure 6.3-4; Red on GD01: **Errore. L'origine riferimento non è stata trovata.**).

The detection **Thresholds** applied on GDS are shown in

Figure 6.2-2 (Main on GD01), **Errore. L'origine riferimento non è stata trovata.** (Red on GD01, **Errore. L'origine riferimento non è stata trovata.** while those applied to PZT3 and PZT5 of IS are shown in Figure 6.3-23 and Figure 6.3-34 (Main on GD01), **Errore. L'origine riferimento non è stata trovata.**3 and **Errore. L'origine riferimento non è stata trovata.**4 (Red on GD01). Moreover, Range and Gain for IS are set as shown in Table 5.2-2.

RANGE	GAIN				
	PZTA	PZTB	PZTC	PZTD	PZTE
Low	High	High	High	High	High

Table 5.2-2. IS Range and Gain configuration

During PC12 no scientific data were occurred..

During PC12 test the **GDS CAL data** show for the **GDS Left side** an output level of about **1 V** and for the **GDS Right side** a saturation level of about **0.2 V** (depending on temperature). These are the nominal values occurring when the GDS is not saturated.

The frequency level of all MBS has not relevant changes with respect PC10.

6. PC12 DATA ANALYSIS – MAIN INTERFACE (GD01)

6.1 GIADA STATUS

Figure 6.1-1. HK Status of GIADA vs. time – Main

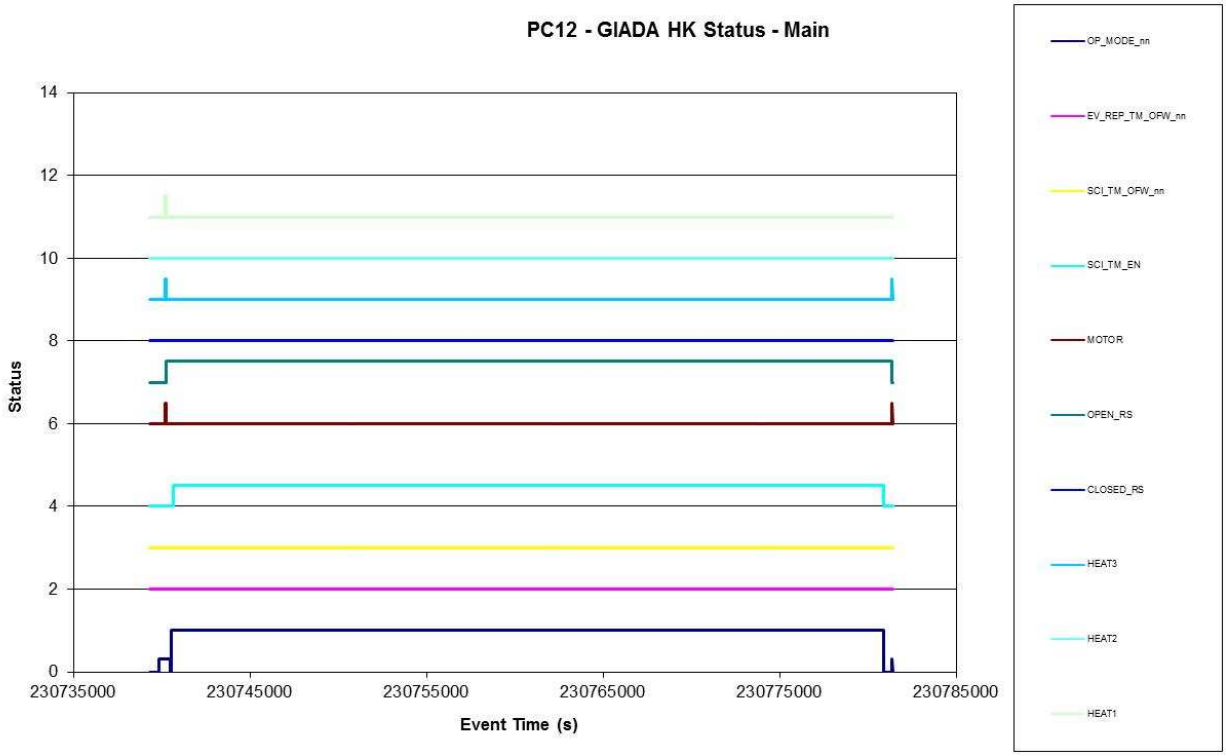


Figure 6.1-2. Power profile and Power Supply temperature vs. time - HK, Main

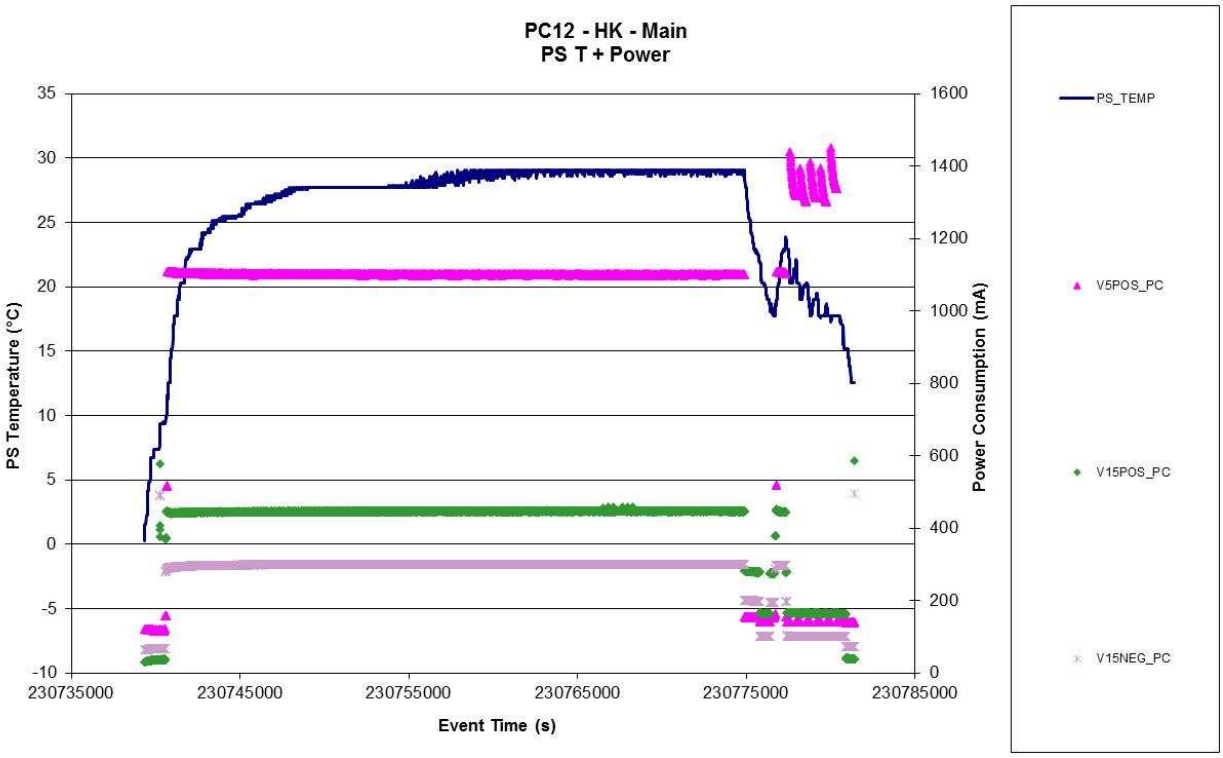


Figure 6.1-3. Evolution of temperatures of system elements vs. time - HK, Main

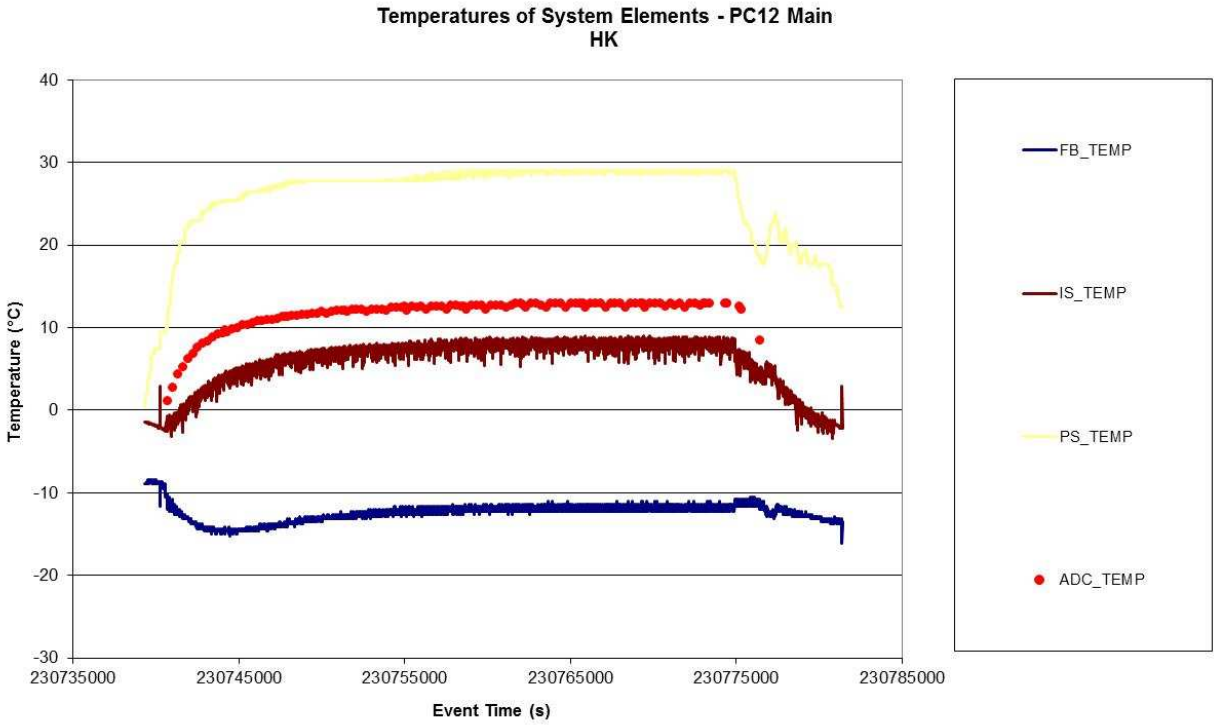


Figure 6.1-4. Evolution of temperatures of sub-systems vs. time with instrument in Normal Mode– Main

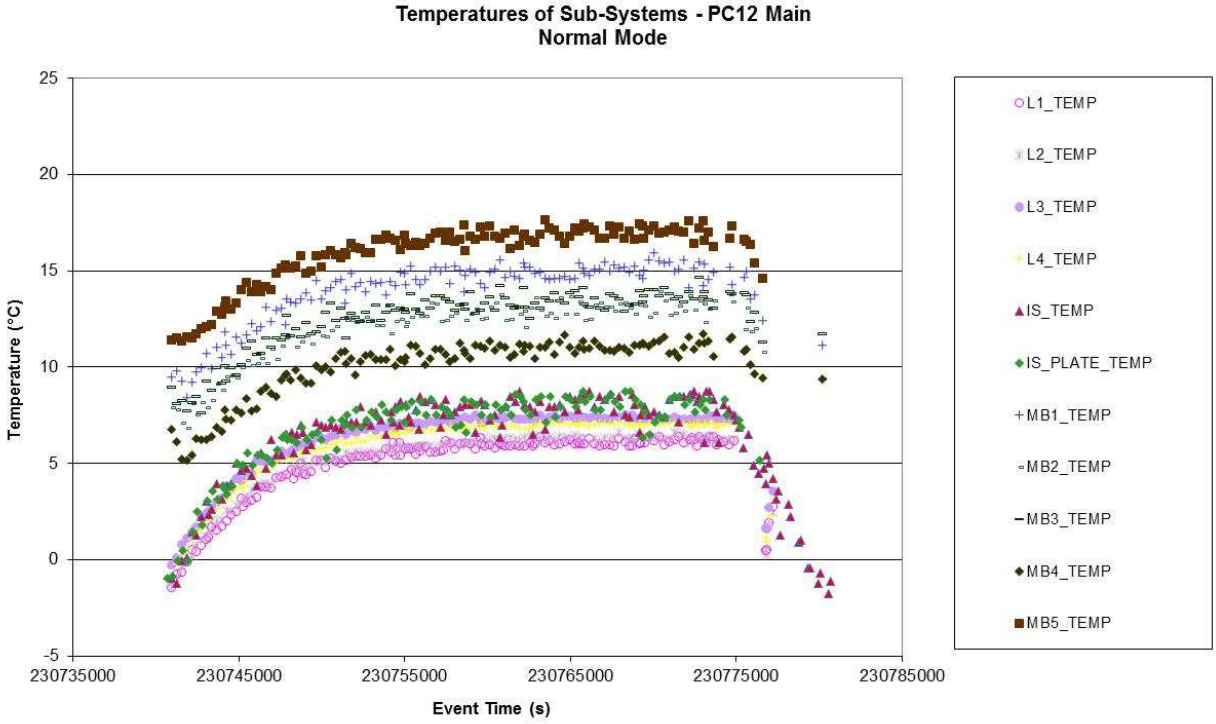


Figure 6.1-5. HK Status versus Temperatures of system elements – Main

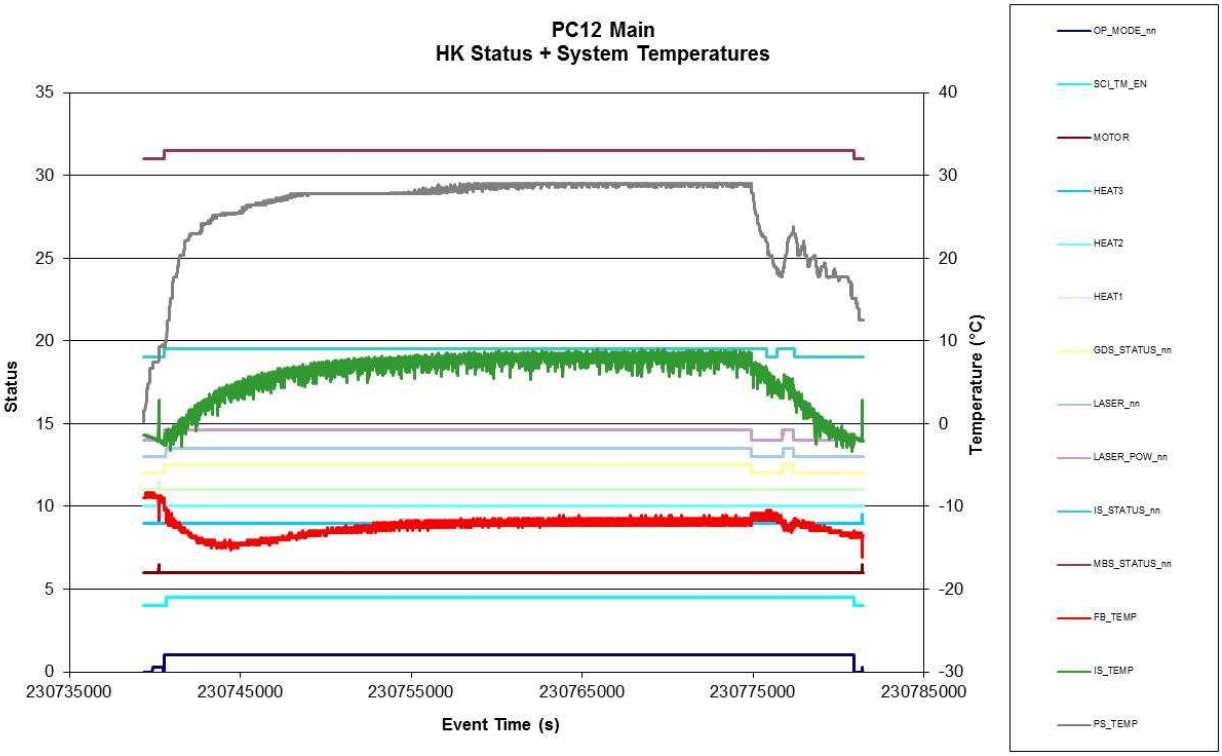
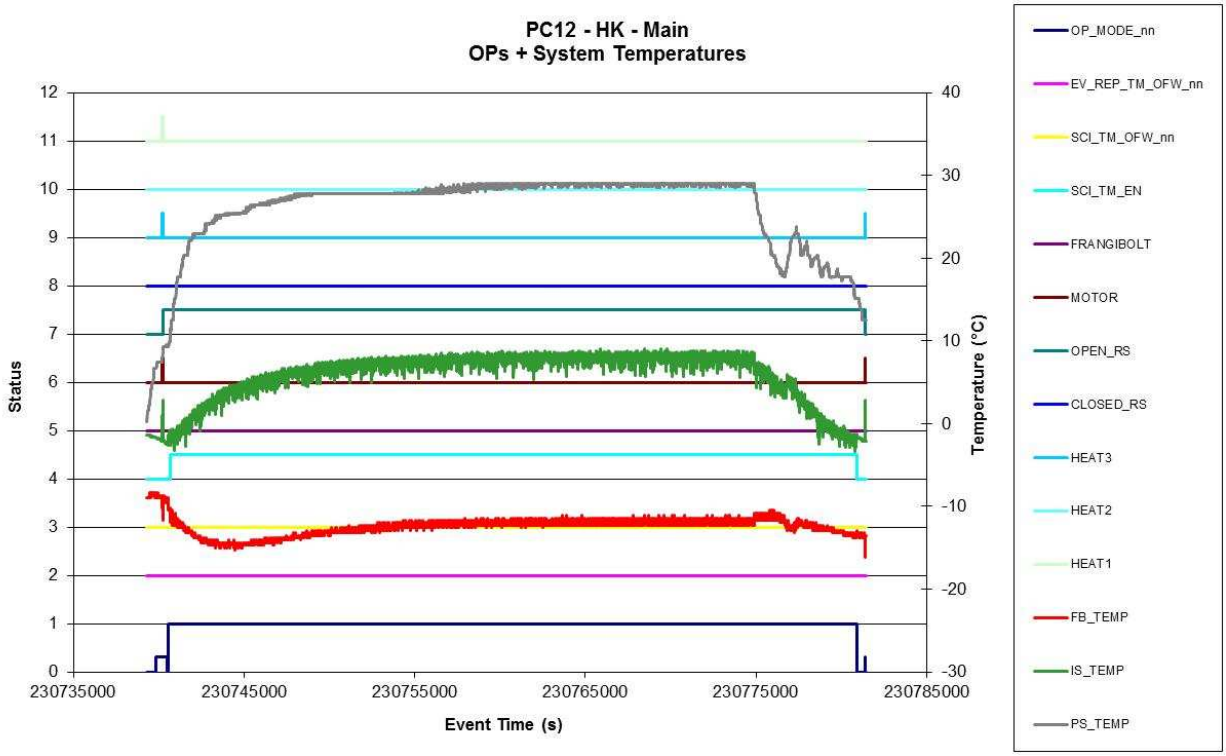


Figure 6.1-6. Operation Status versus Temperatures of system elements – Main
In the diagram are reported operative parameters with relevant variations.



6.2 GRAIN DETECTION SYSTEM (GDS)

6.2.1 GDS – Status

Figure 6.2-1. GDS Operation Status vs. time – Main

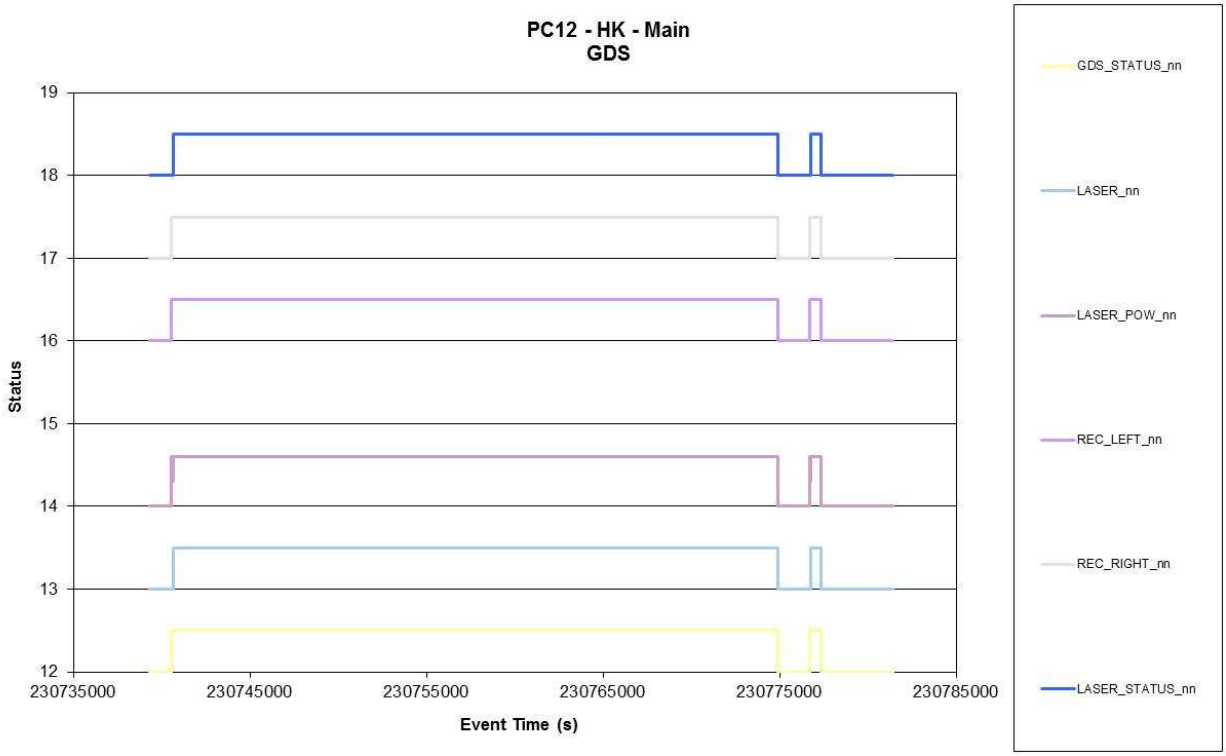


Figure 6.2-2. GDS Thresholds change vs. time – Main

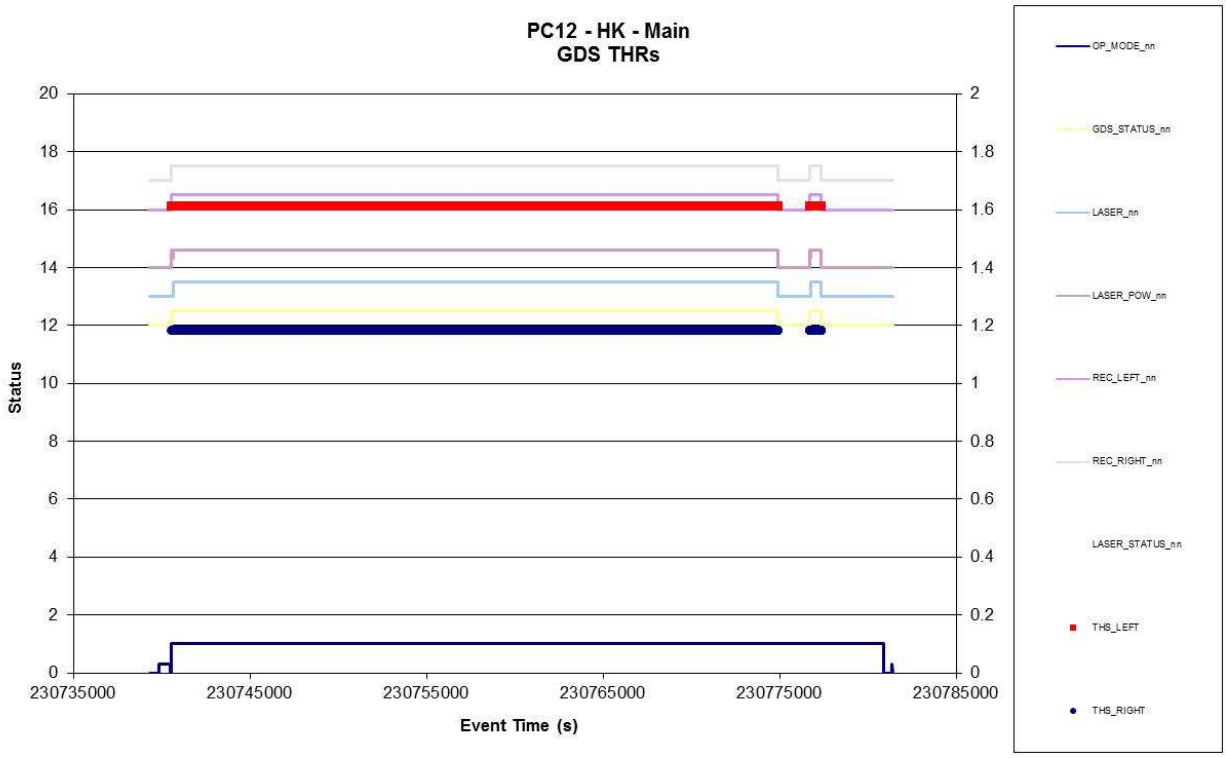


Figure 6.2-3. GDS Laser Temperatures vs. time– Main

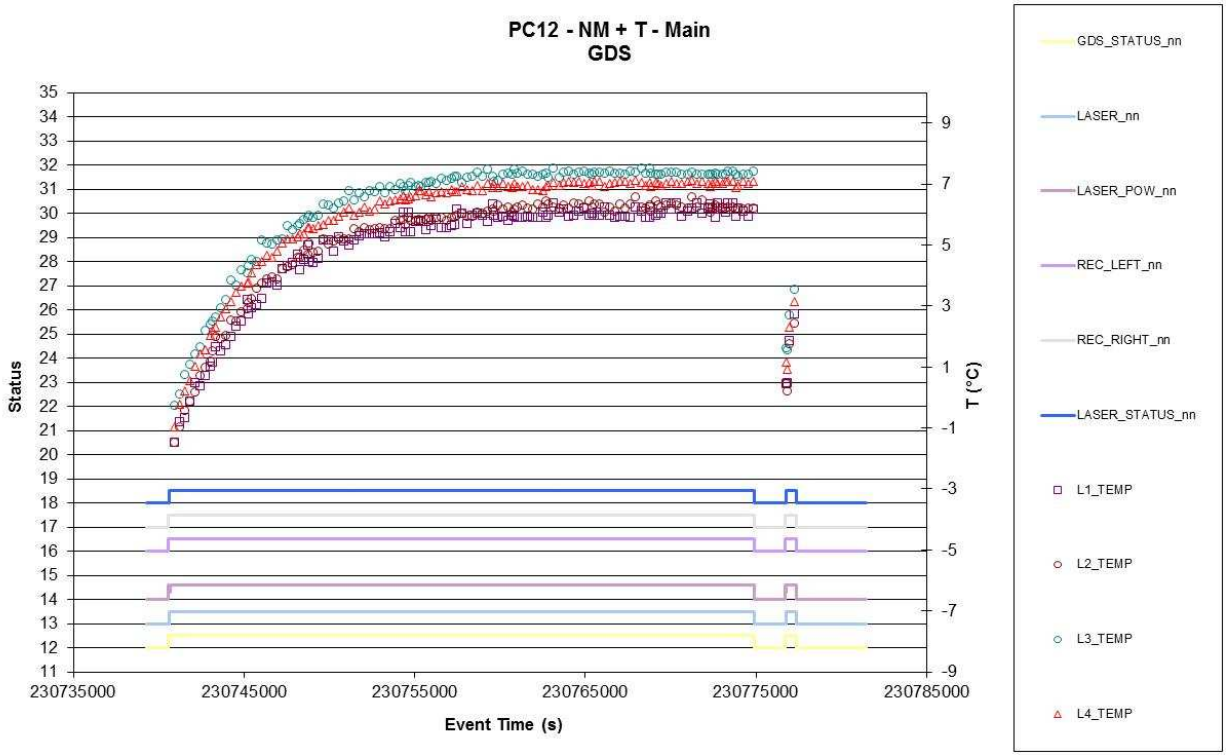


Figure 6.2-4. GDS Laser Monitor vs. time– Main

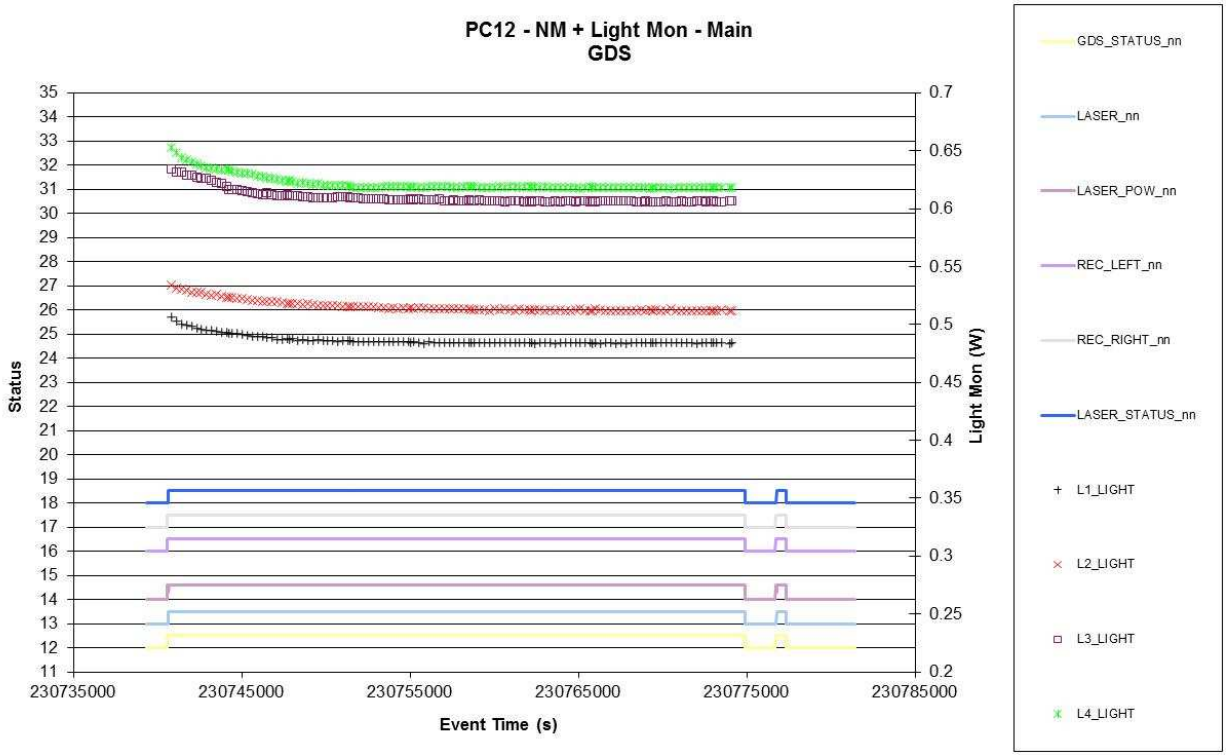


Figure 6.2-5. Lasers Light Monitor versus Temperature (HK, HK-SCI, SCI) – Main

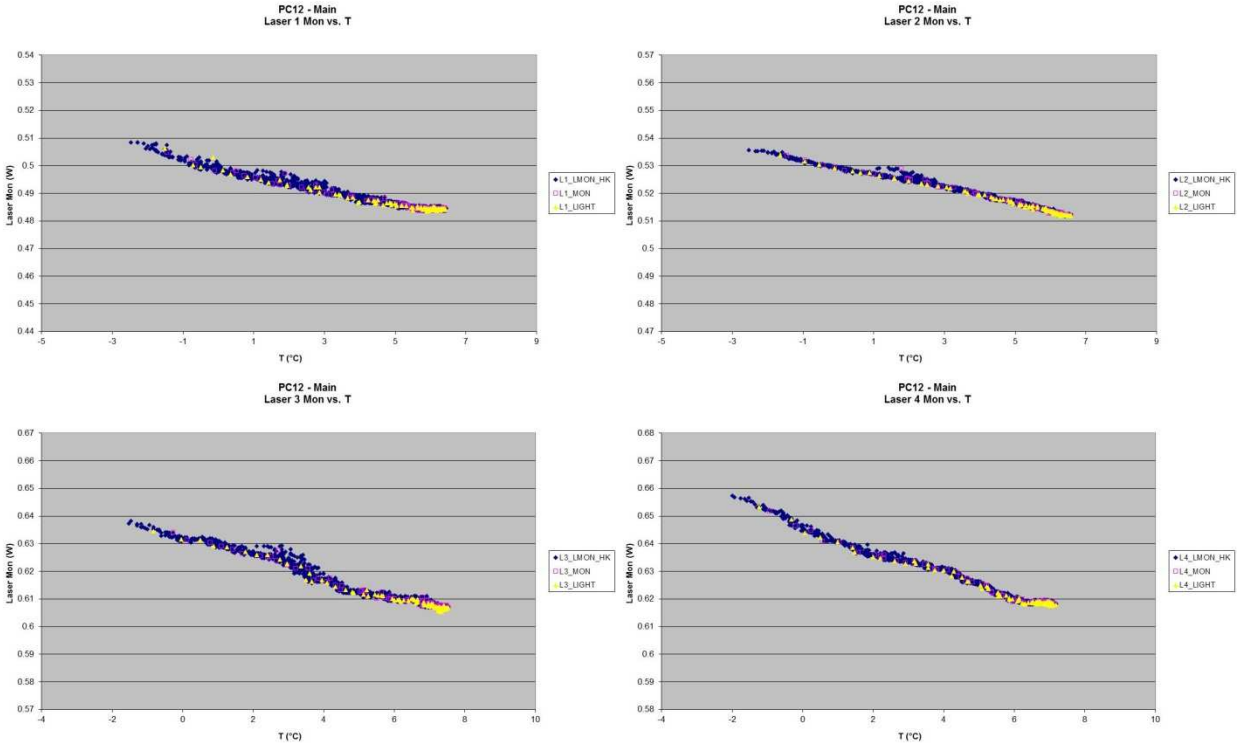
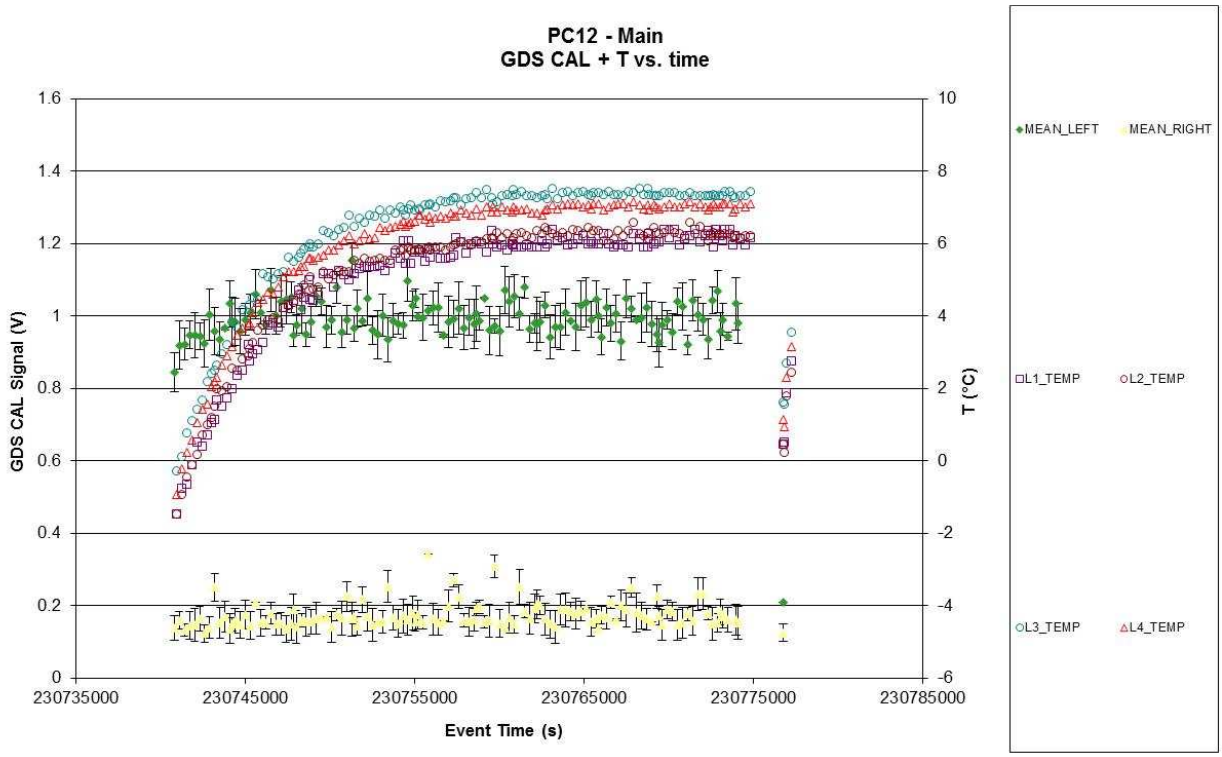


Figure 6.2-6. GDS Laser Monitor vs. time– Main



6.3 IMPACT SENSOR (IS)

6.3.1 IS – Status

Figure 6.3-1. IS Operation Status vs. time – Main

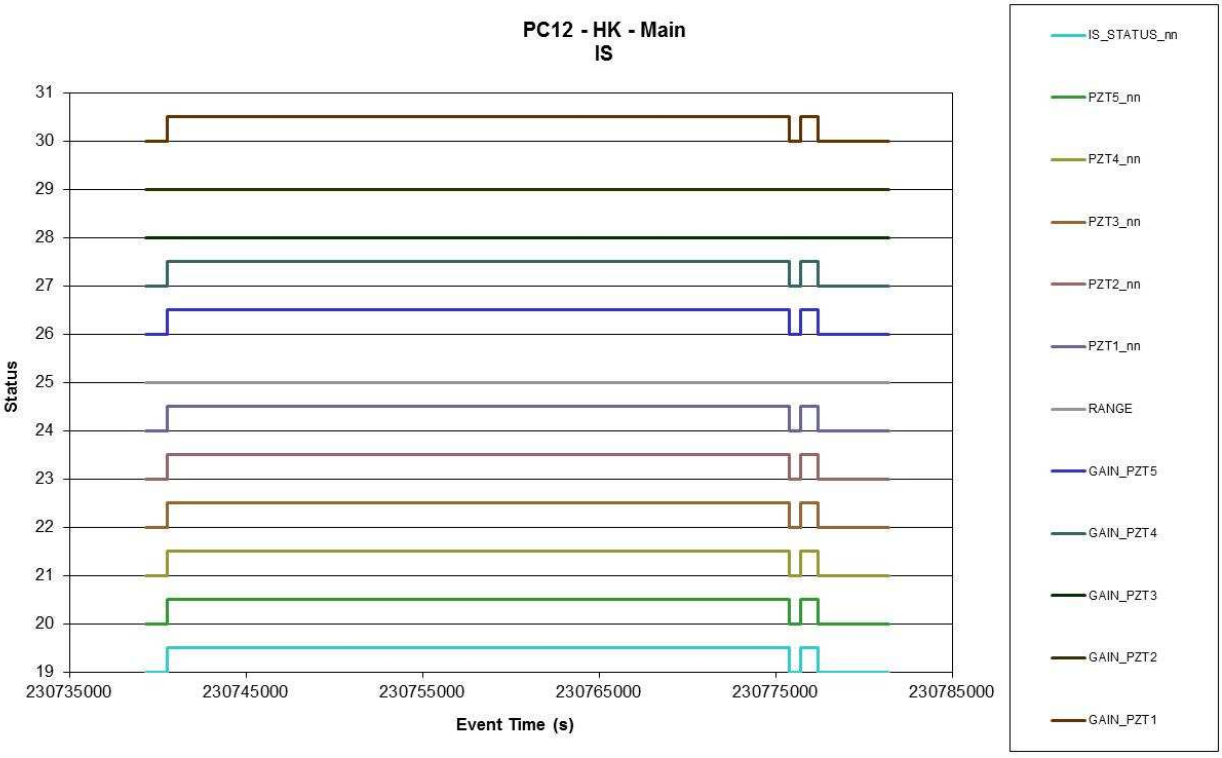


Figure 6.3-2. IS PZT 3 Thresholds change vs. time – Main

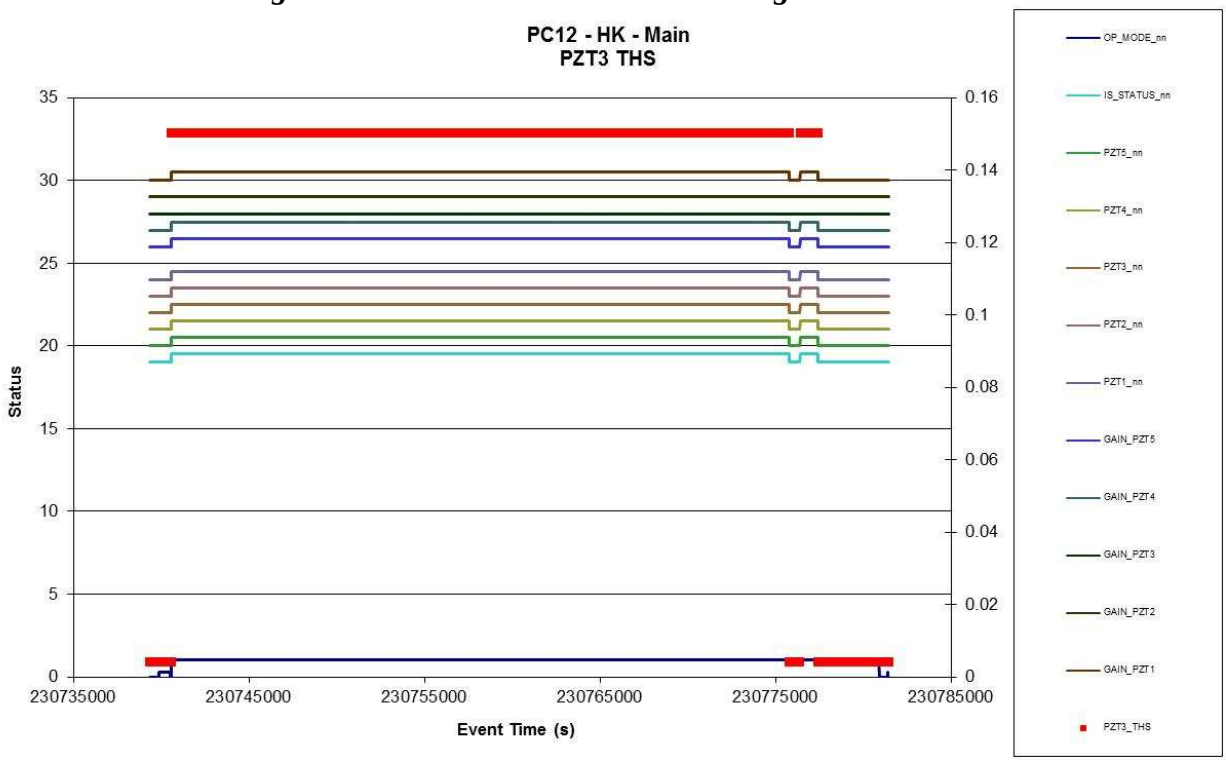


Figure 6.3-3. IS PZT 5 Thresholds change vs. time – Main

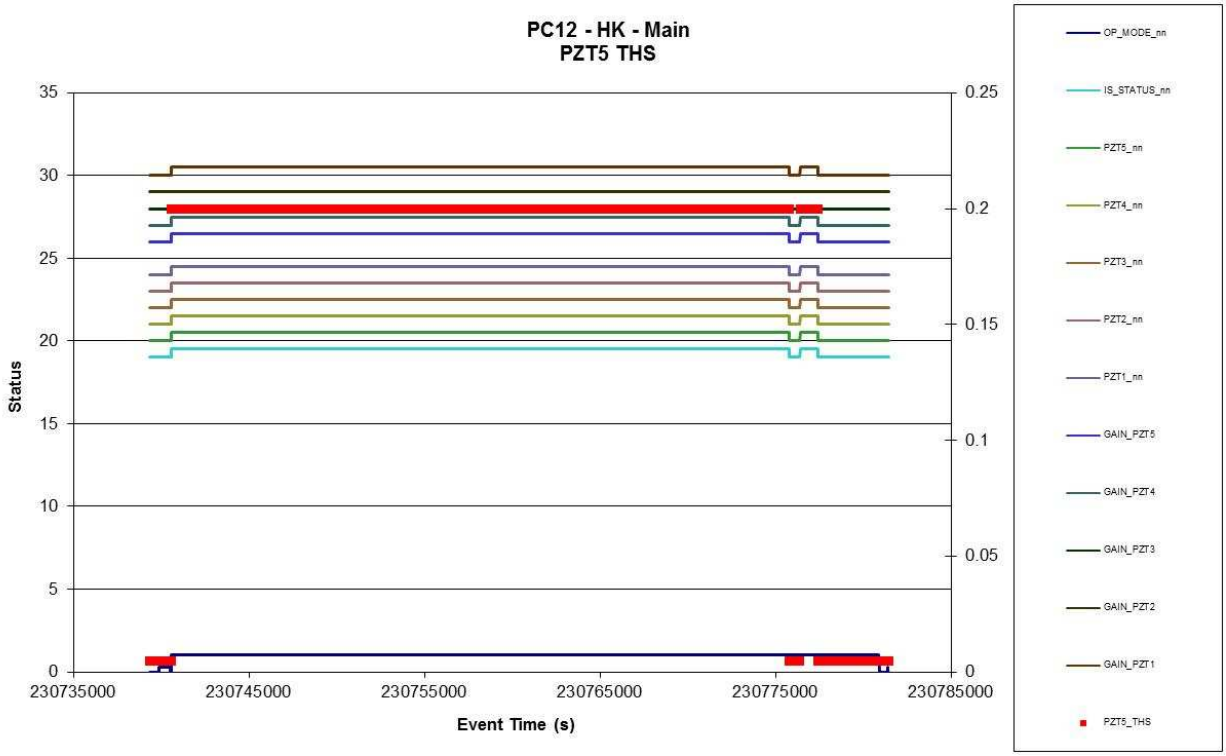
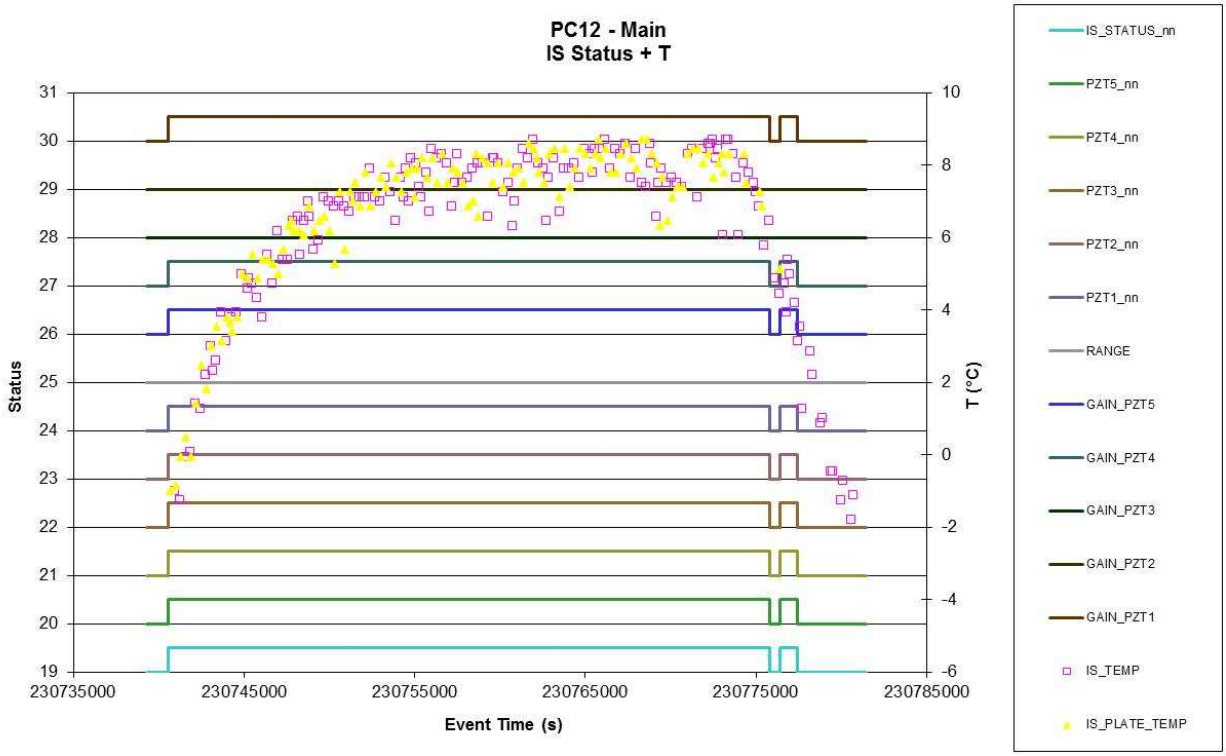
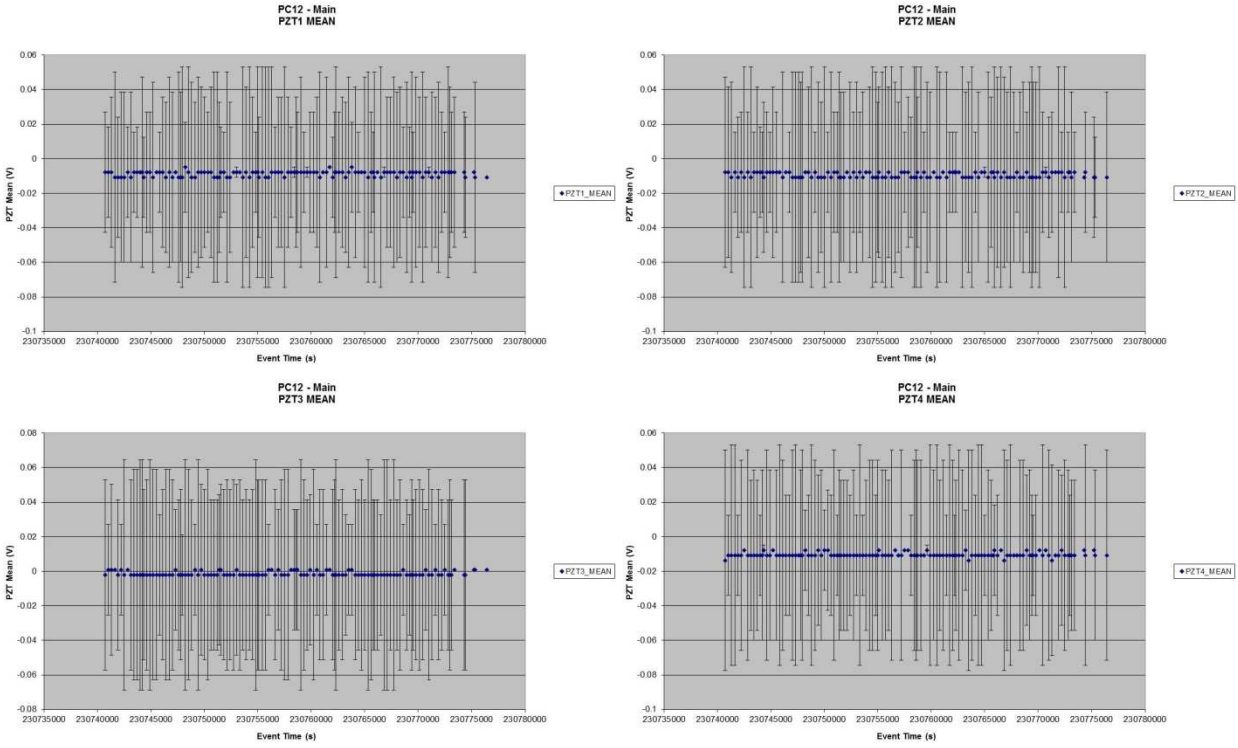


Figure 6.3-4. IS Temperature vs. time (HK, HK-SCI, SCI) – Main



6.3.1.1 CAL

Figure 6.3-5. PZTs Mean and St Dev. CAL vs. time – Main



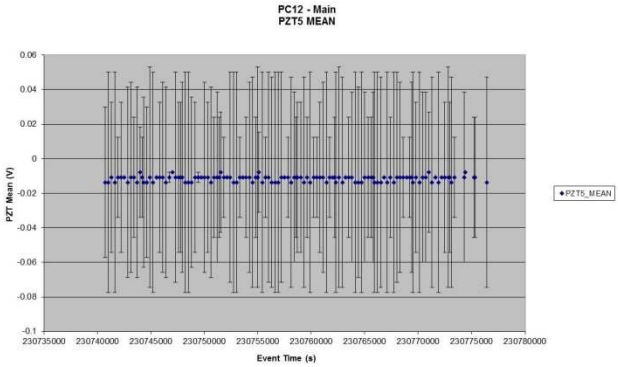


Figure 6.3-6. Reference Voltages for IS calibration vs. time – Main Voltages values for the calibrator don't show level variation

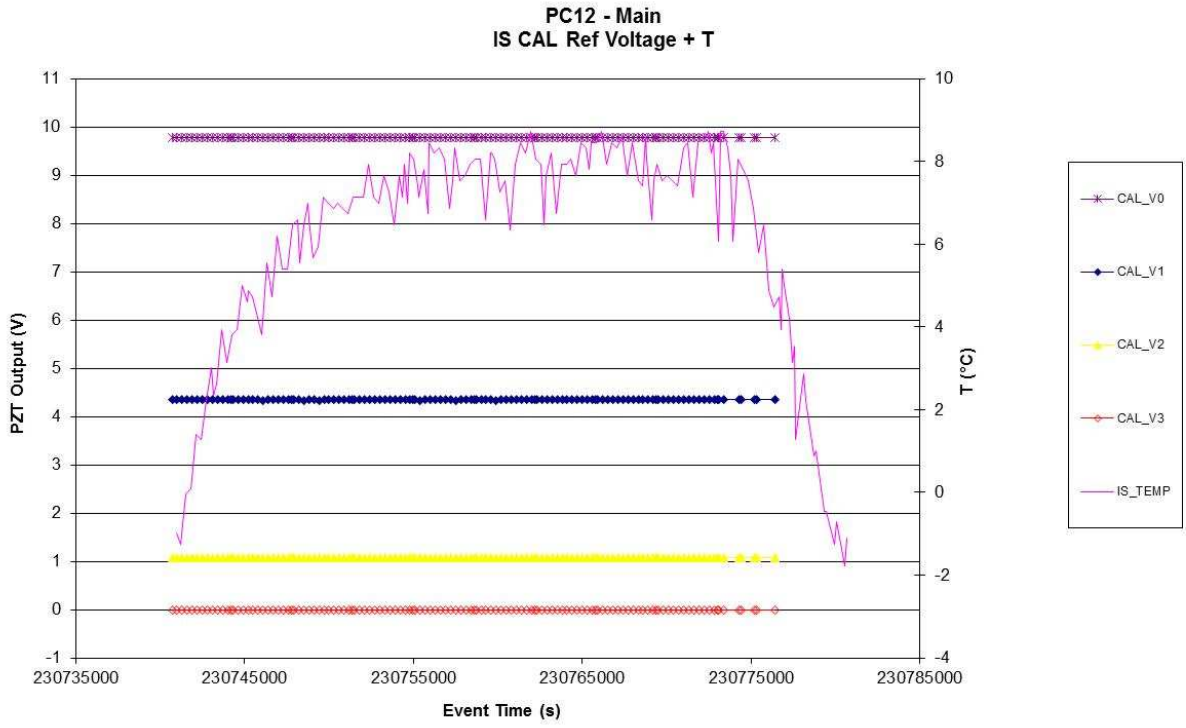
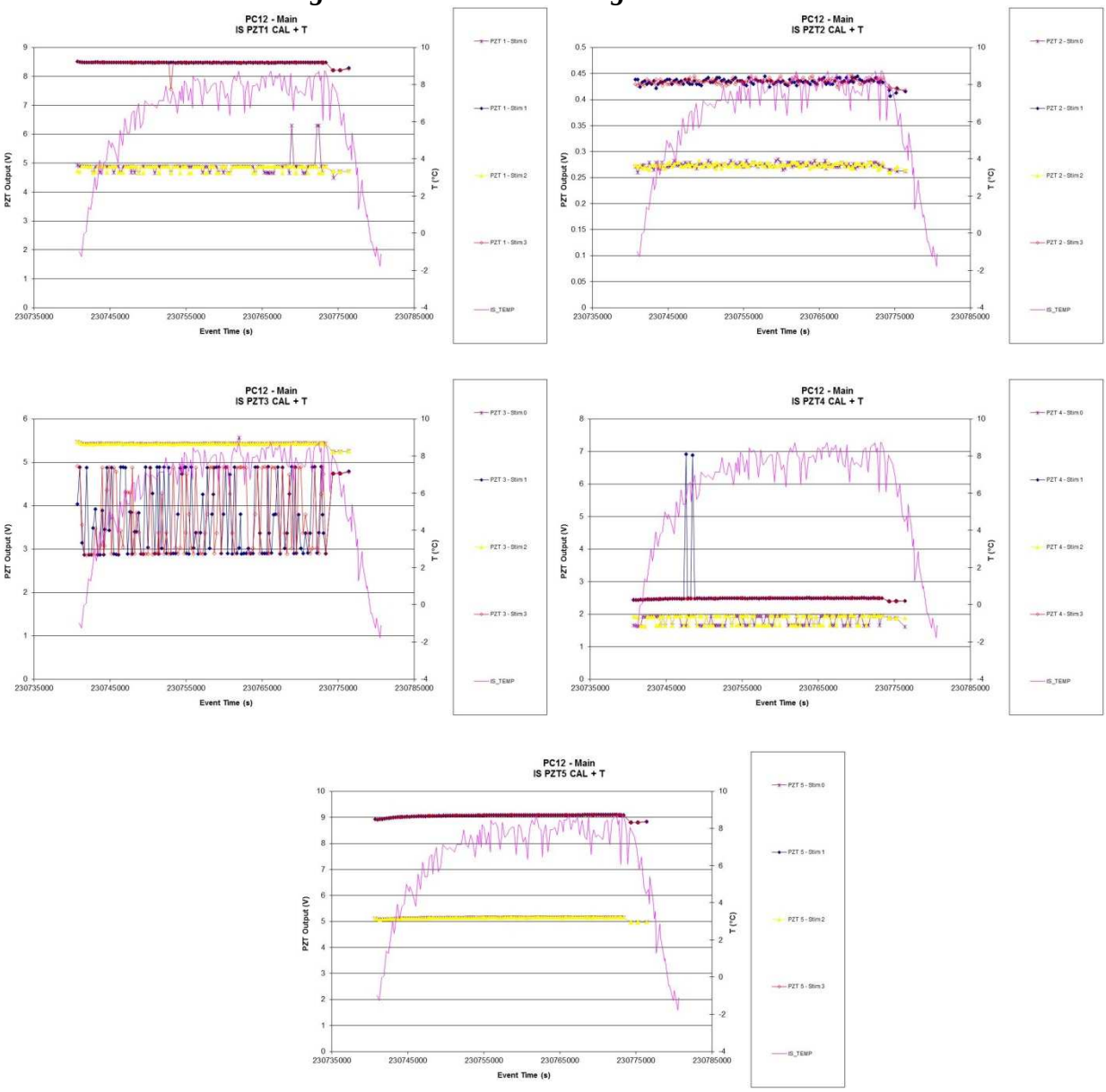


Figure 6.3-7. PZTs CAL Signal vs. time – Main



6.4 MICRO BALANCE SYSTEM (MBS)

6.4.1 MBS – Status

Figure 6.4-1. MBS Operation Status vs. time – Main

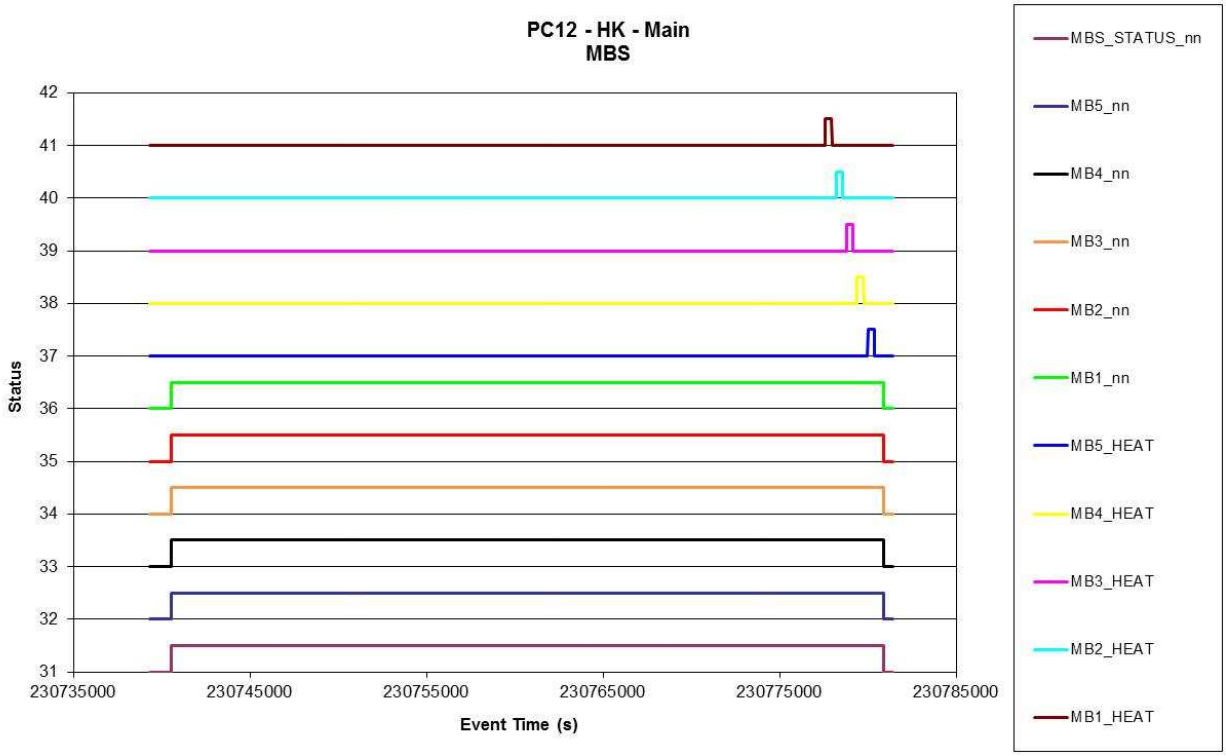
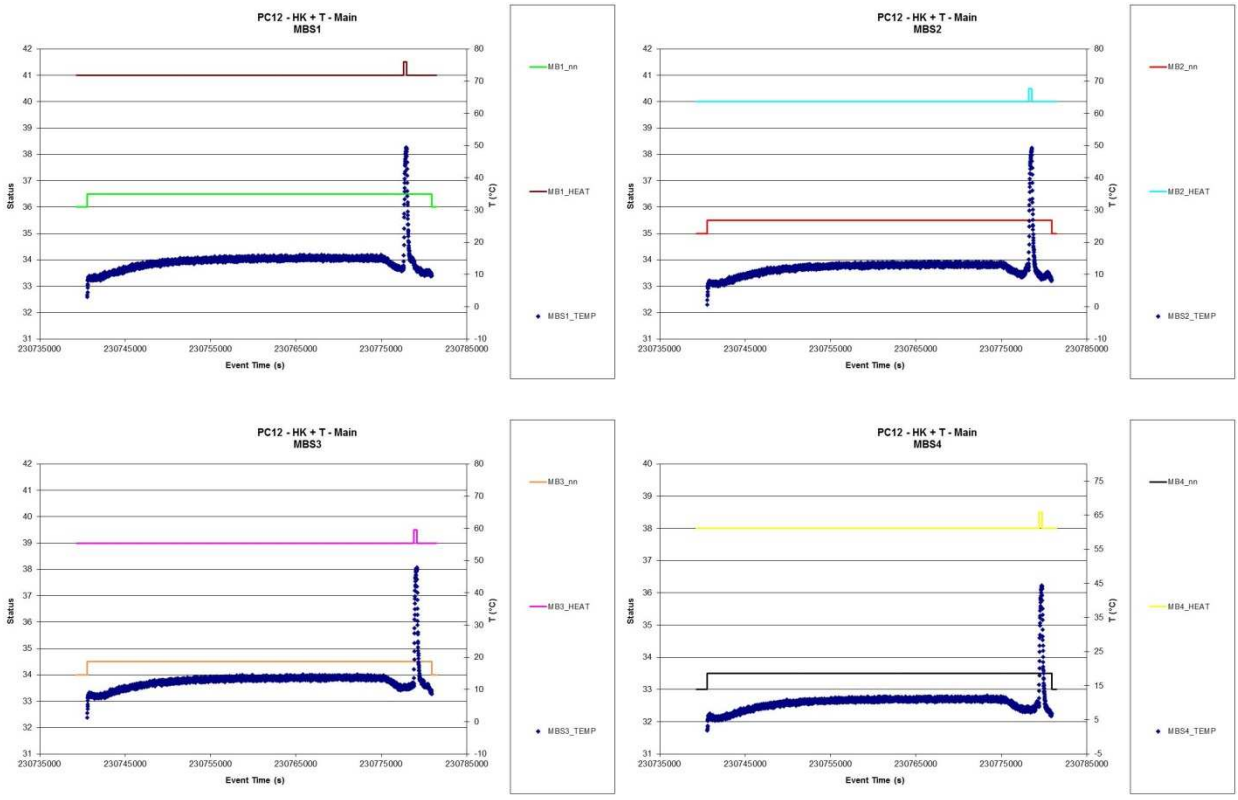


Figure 6.4-2. MBSs Temperature vs. time (SCI) – Main



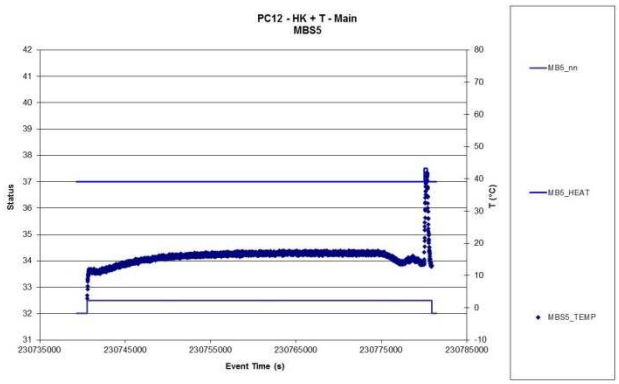
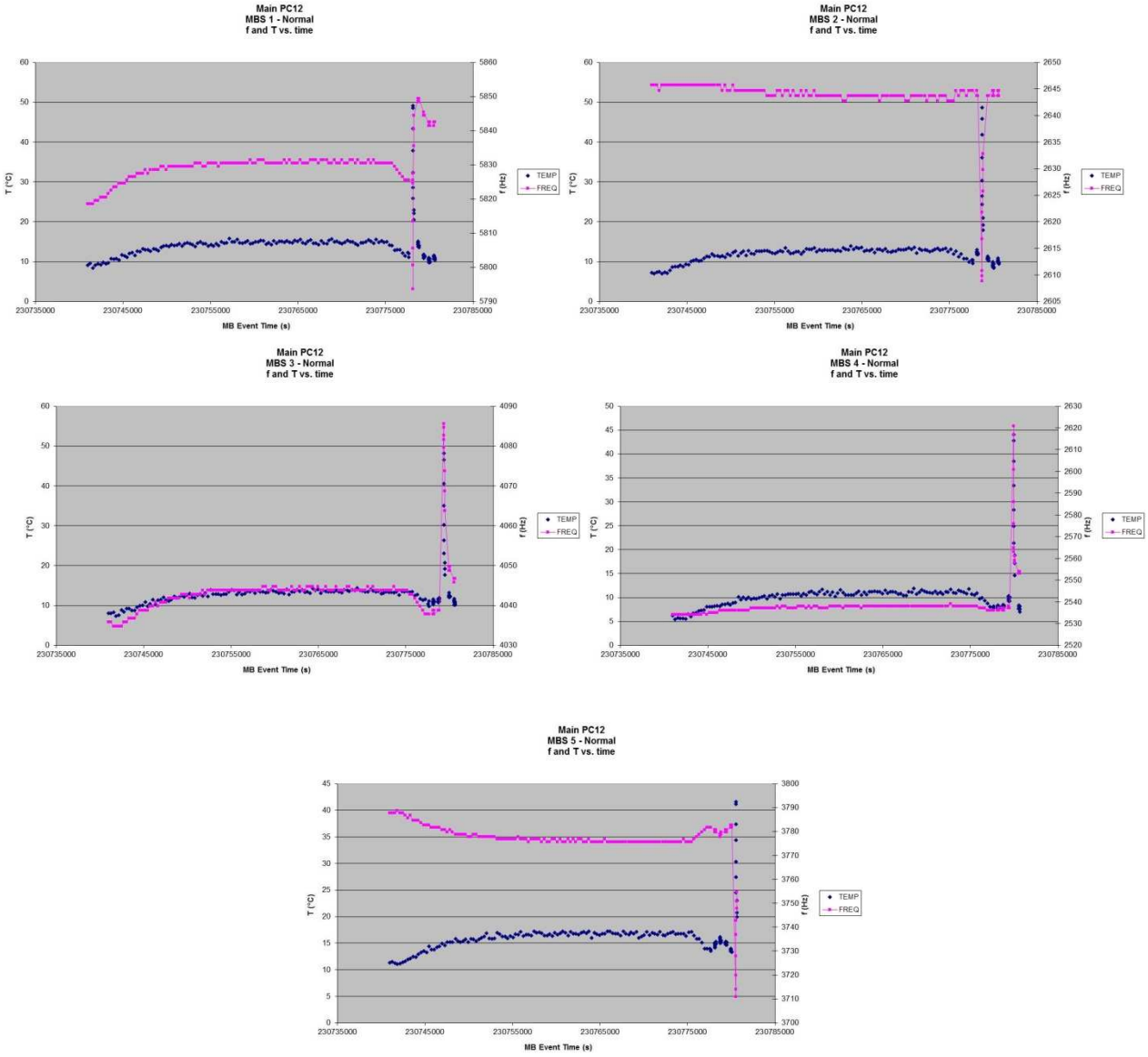


Figure 6.4-3. MBSs Frequency and Temperature vs. time– Main



7. PC12 DATA ANALYSIS – RED INTERFACE (GD01)

7.1 GIADA STATUS

Figure 7.1-1. HK Status of GIADA vs. time – Red

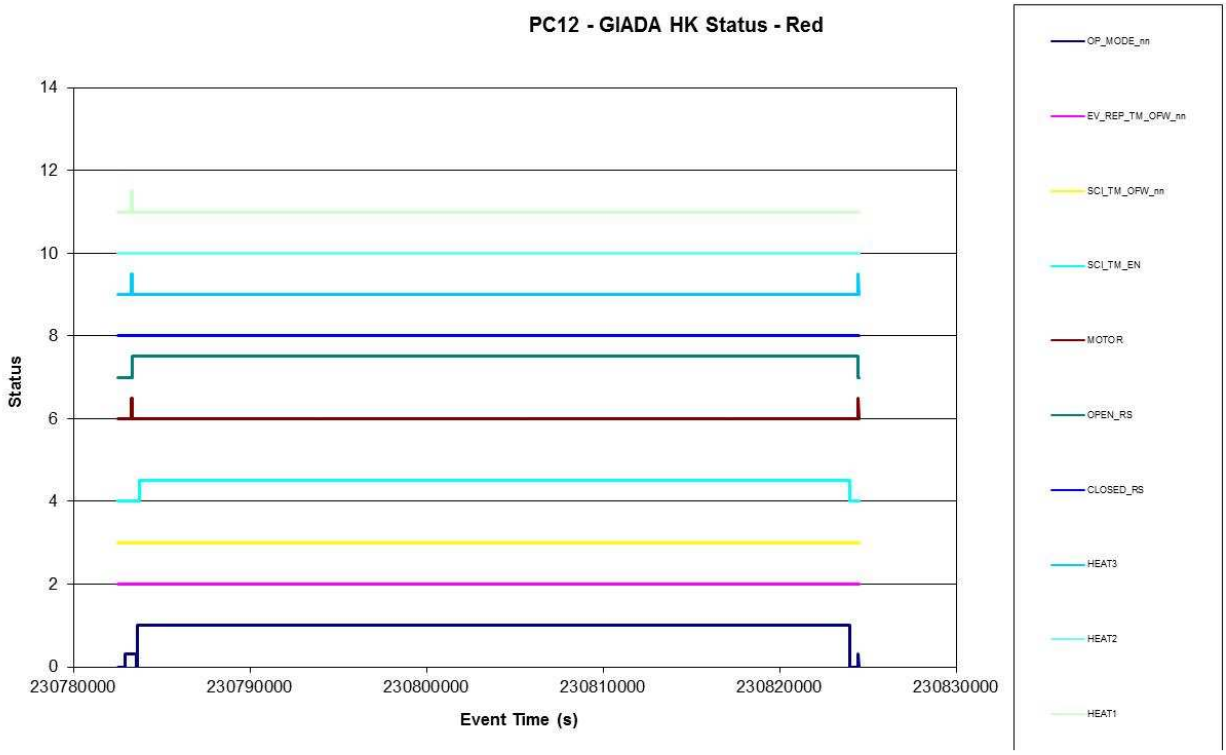


Figure 7.1-2. Power profile and Power Supply temperature vs. time - HK, Red

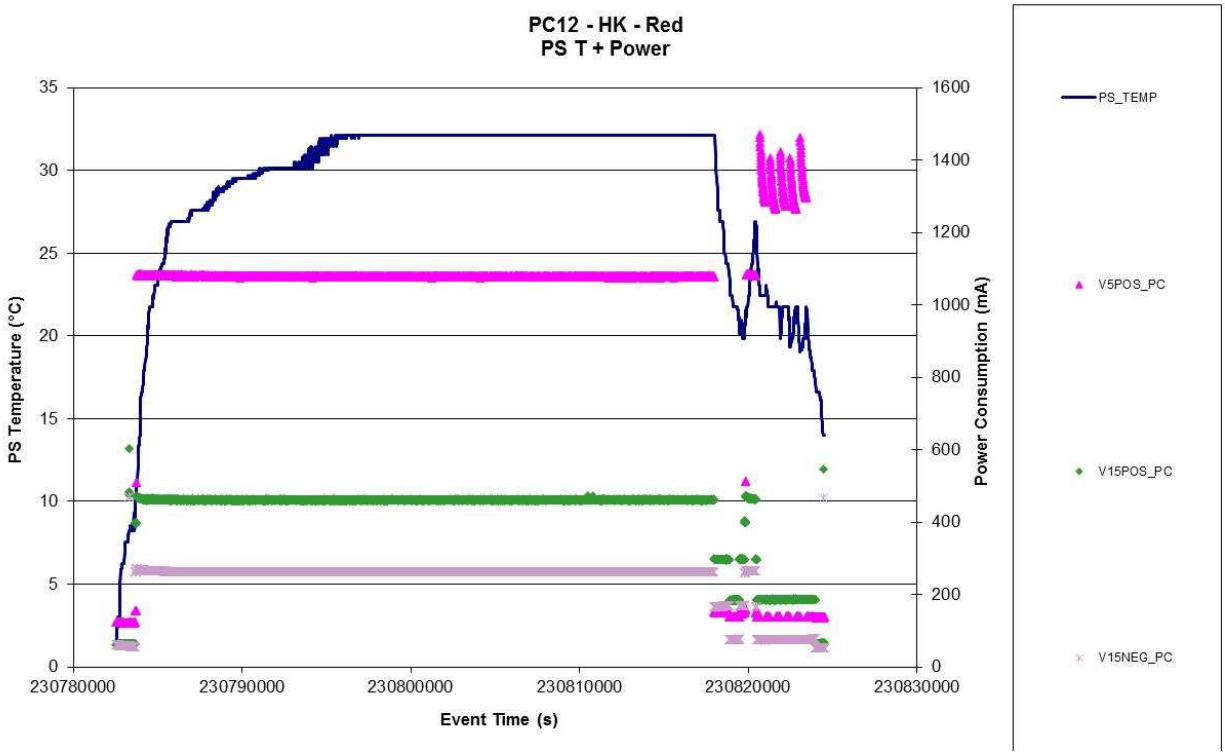


Figure 7.1-3. Evolution of temperatures of system elements vs. time - HK, Red

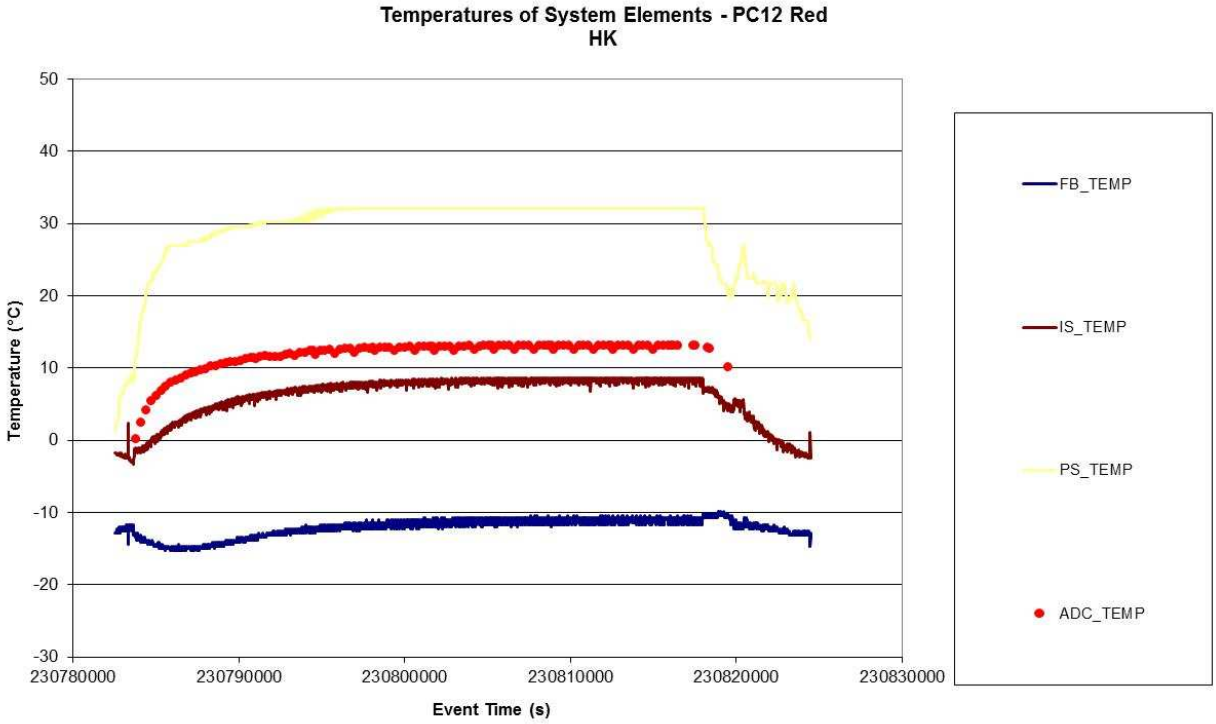


Figure 7.1-4. Evolution of temperatures of sub-systems vs. time with instrument in Normal Mode– Red

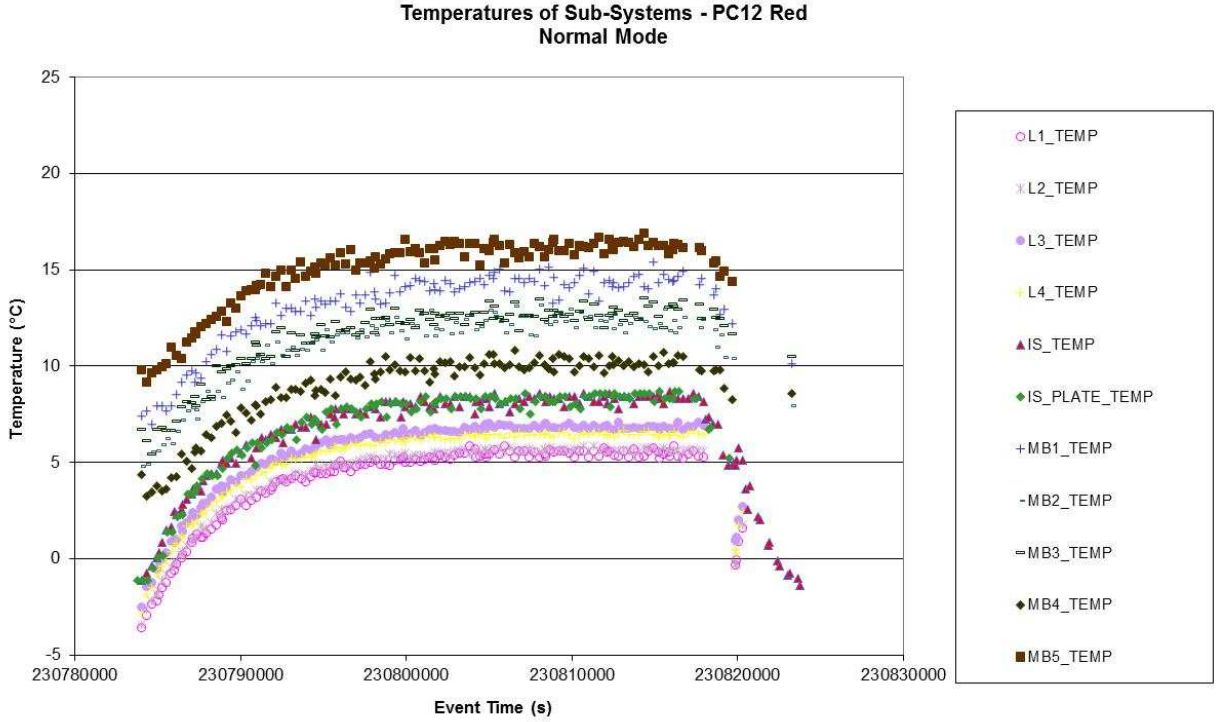


Figure 7.1-5. HK Status versus Temperatures of system elements – Red

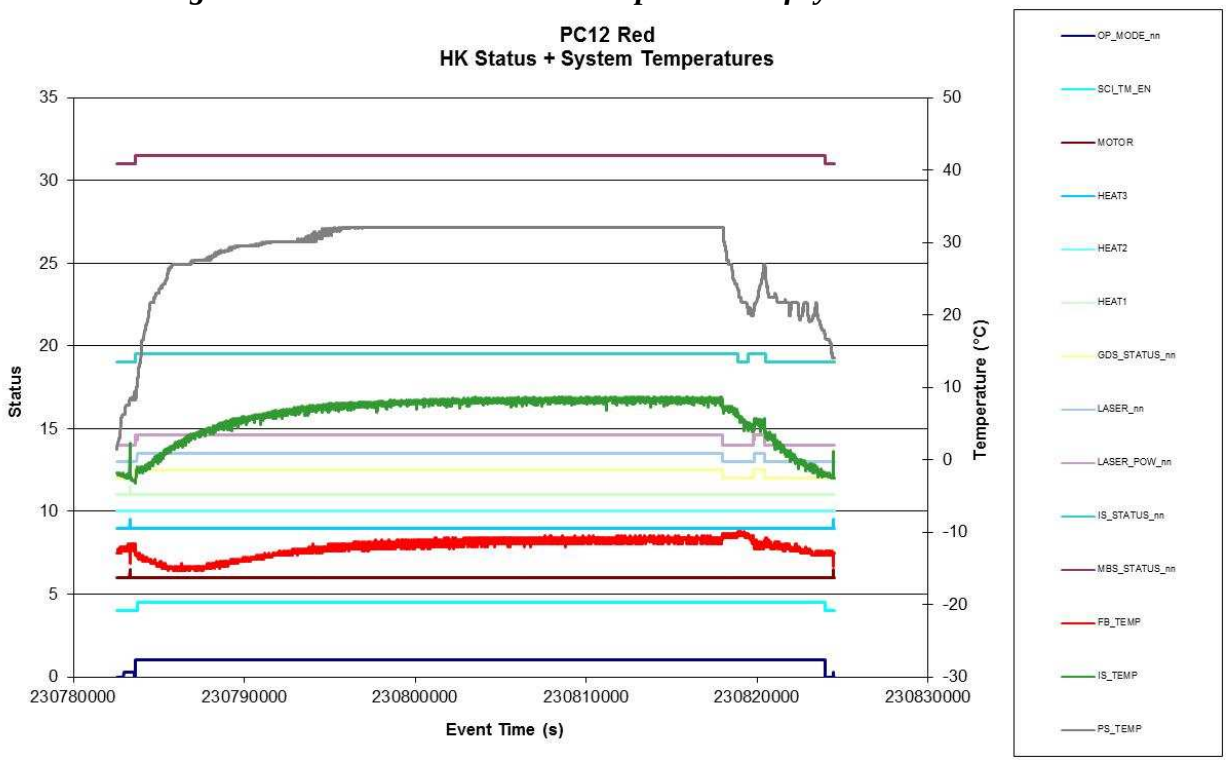
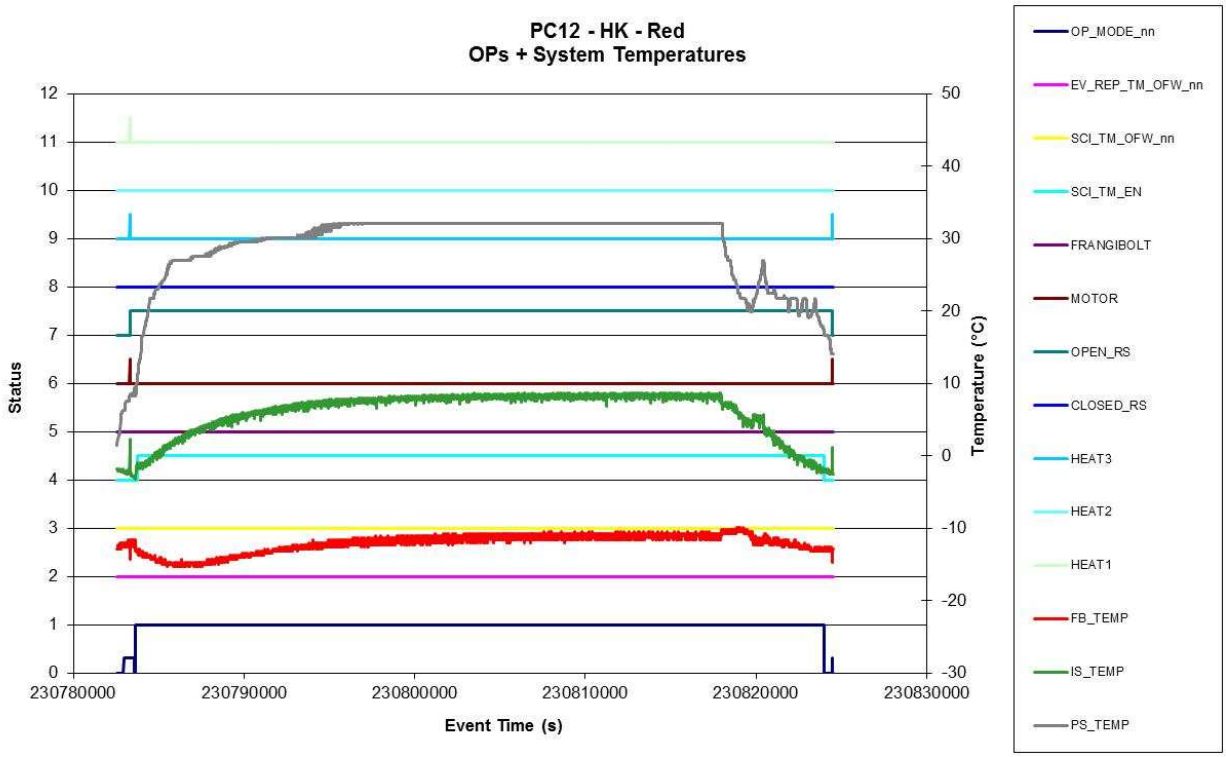


Figure 7.1-6. Operation Status versus Temperatures of system elements – Red
In the diagram are reported operative parameters with relevant variations.



7.2 GRAIN DETECTION SYSTEM (GDS)

7.2.1 GDS – Status

Figure 7.2-1. GDS Operation Status vs. time – Red

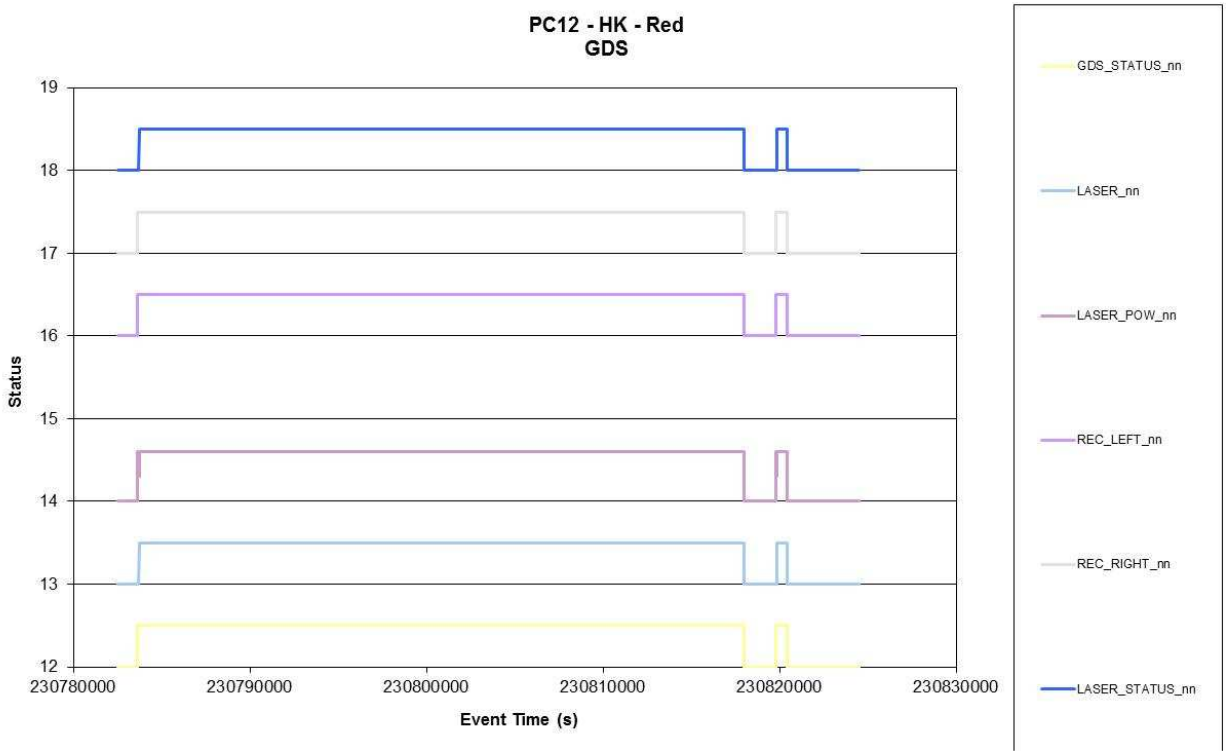


Figure 7.2-2. GDS Thresholds change vs. time – Red

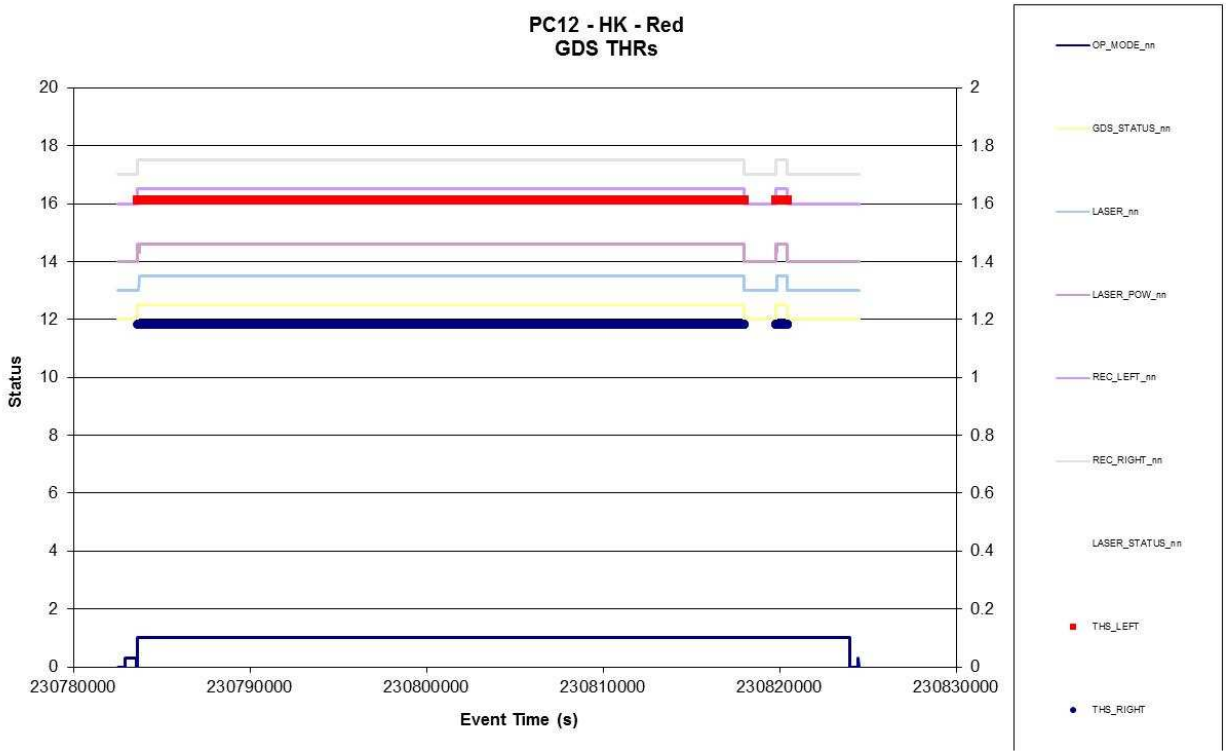


Figure 7.2-3. GDS Laser Temperatures vs. time– Red

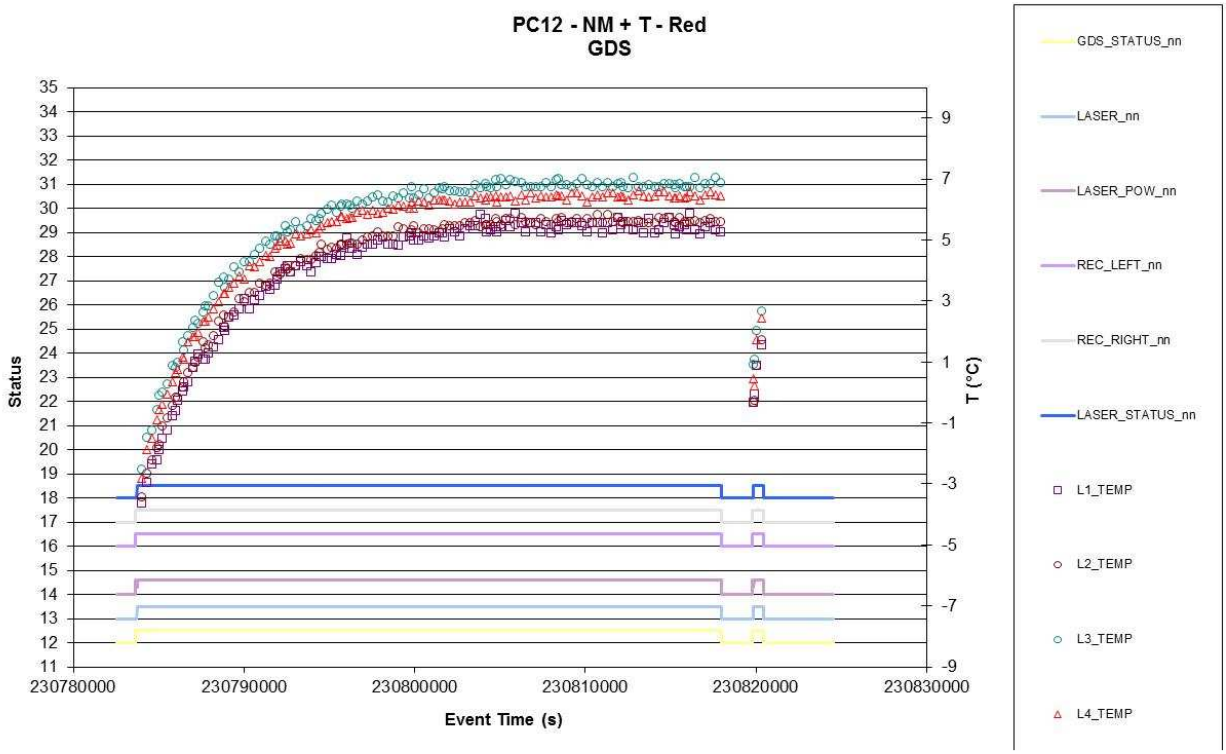


Figure 7.2-4. GDS Laser Monitor vs. time– Red

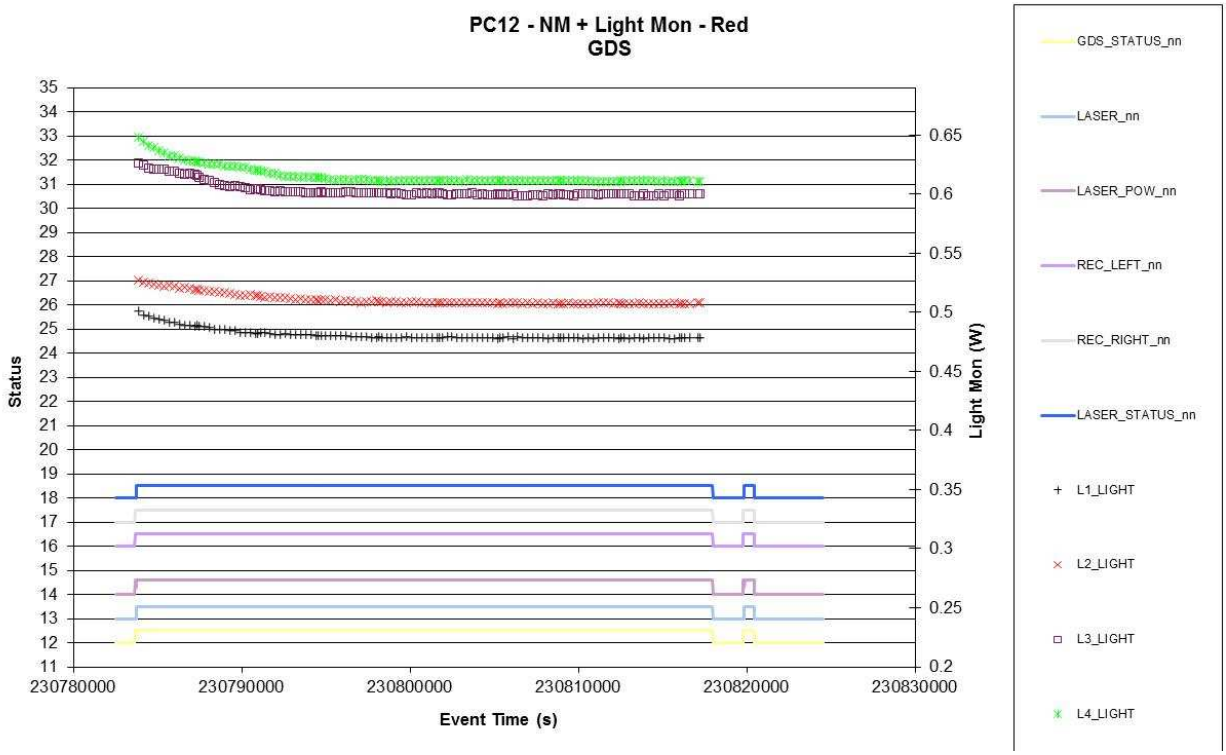


Figure 7.2-5. Lasers Light Monitor versus Temperature (HK, HK-SCI, SCI) –Red

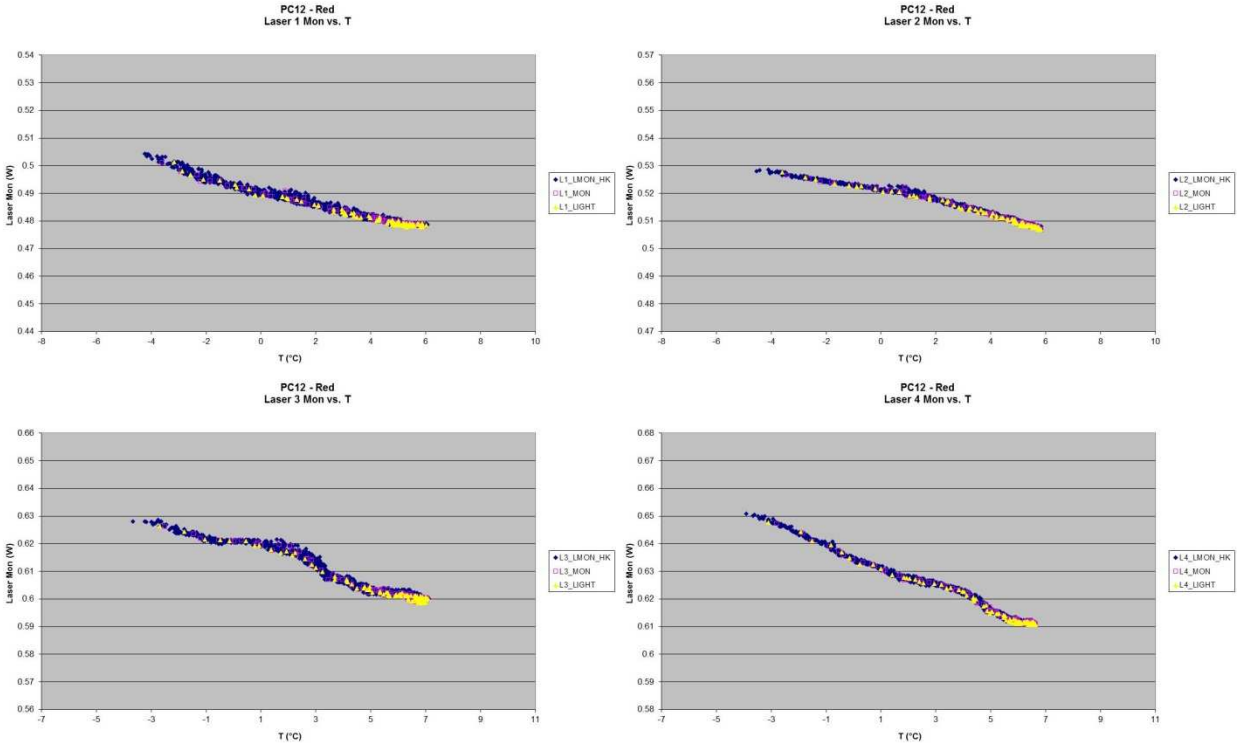
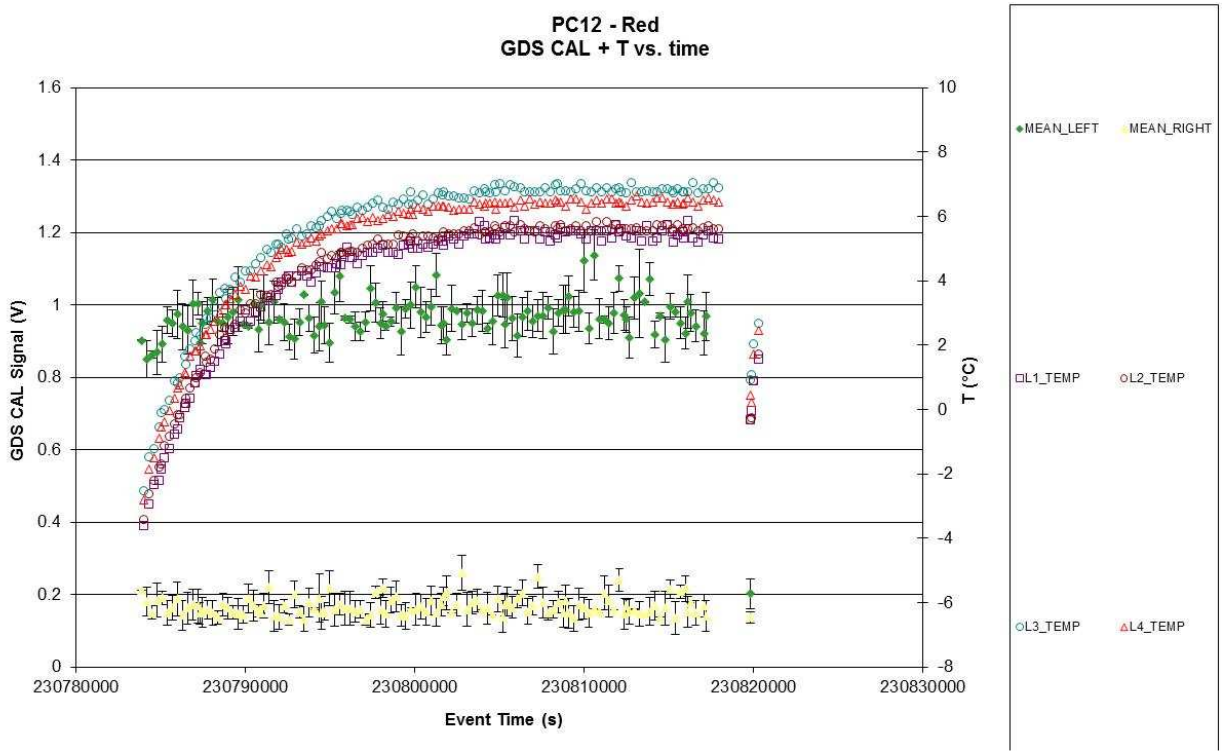


Figure 7.2-6. GDS Laser Monitor vs. time– Red



7.3 IMPACT SENSOR (IS)

7.3.1 IS – Status

Figure 7.3-1. IS Operation Status vs. time – Red

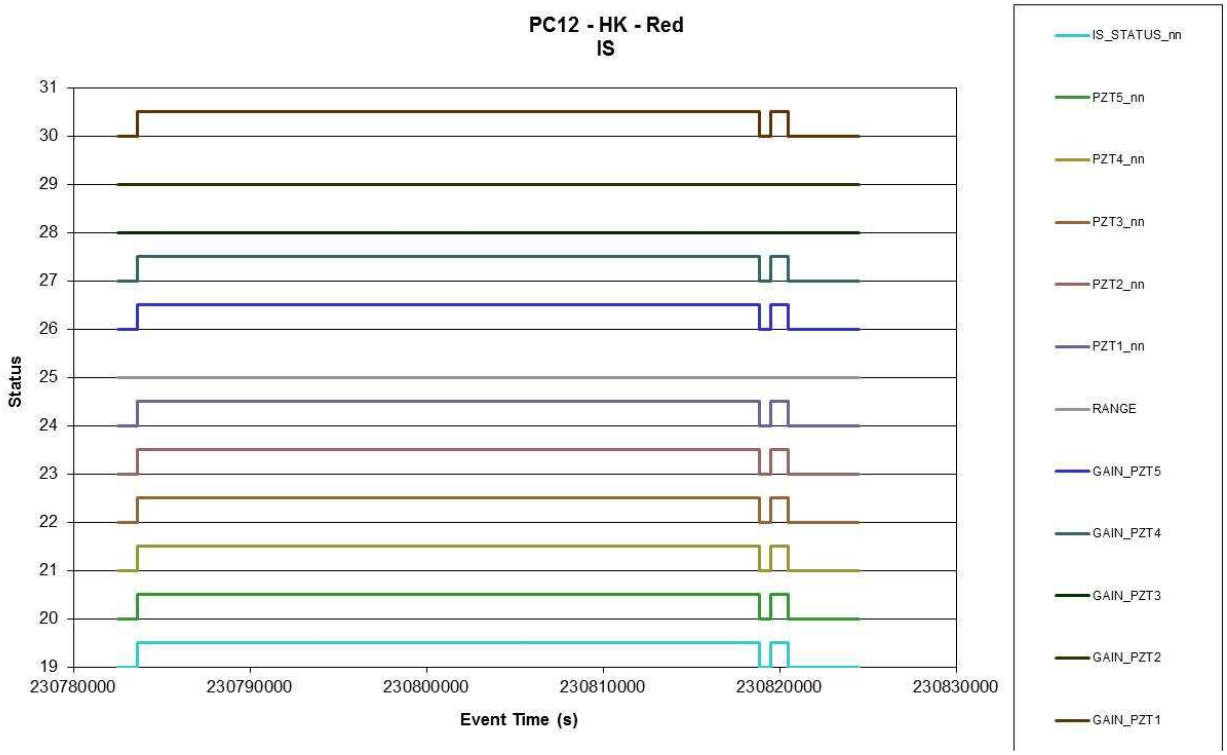


Figure 7.3-2. IS PZT 3 Thresholds change vs. time – Red

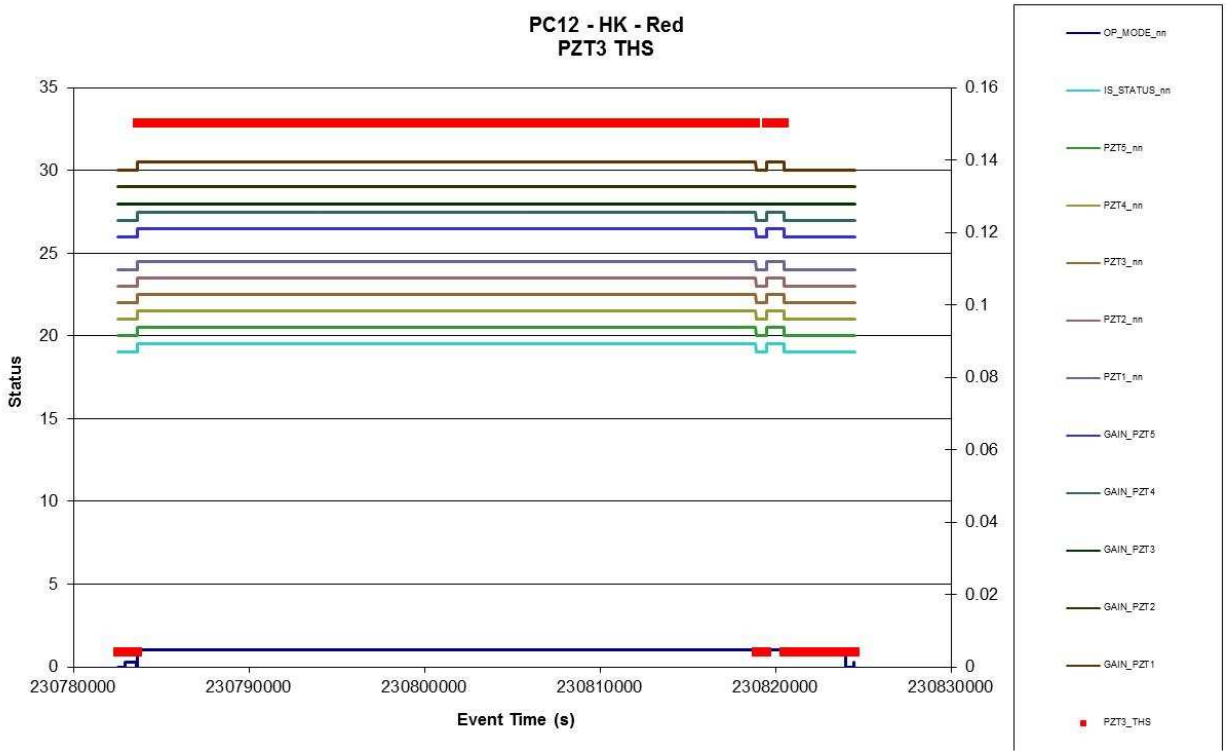


Figure 7.3-3. IS PZT 5 Thresholds change vs. time – Red

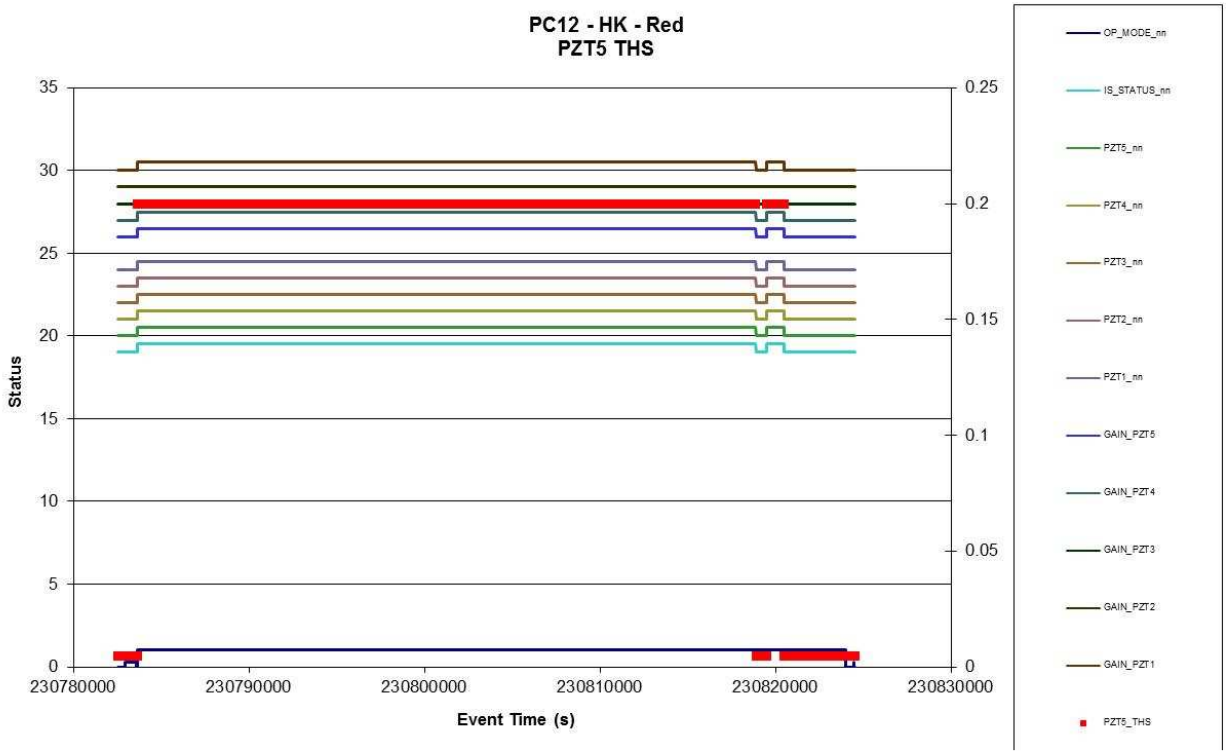
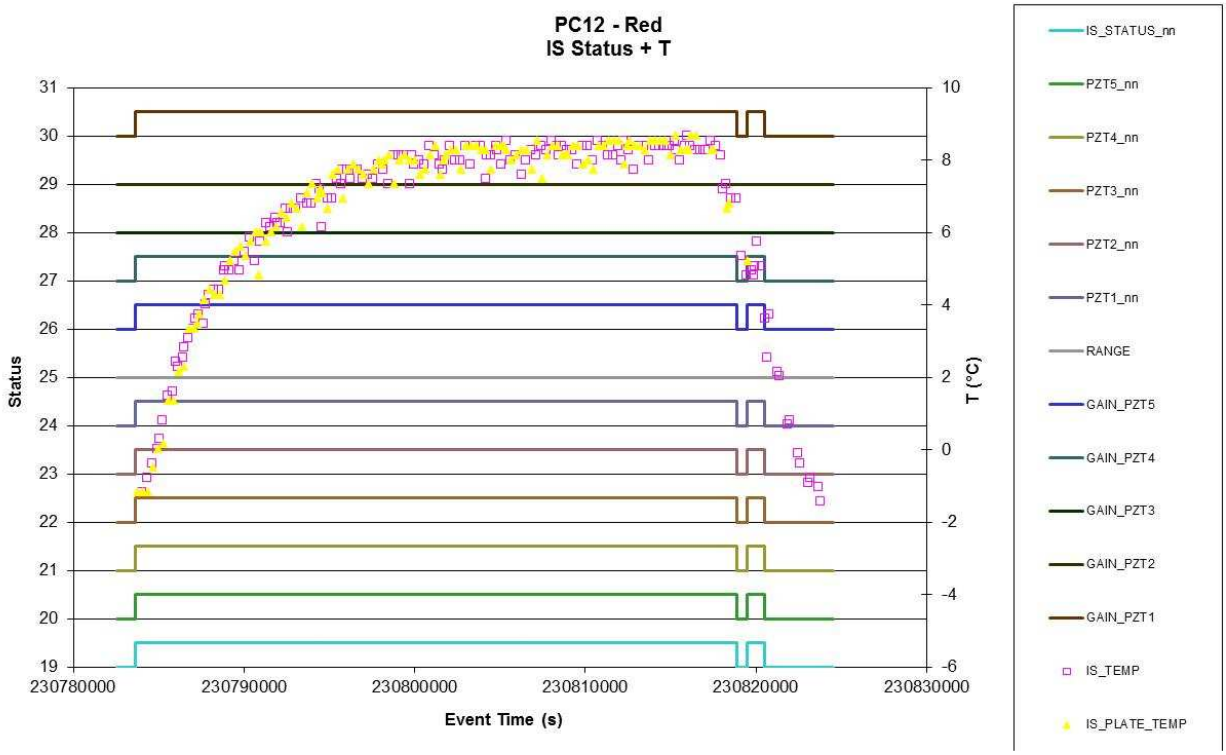


Figure 7.3-4. IS Temperature vs. time (HK, HK-SCI, SCI) – Red



7.3.1.1 CAL

Figure 7.3-5. PZTs Mean and St Dev. CAL vs. time – Red

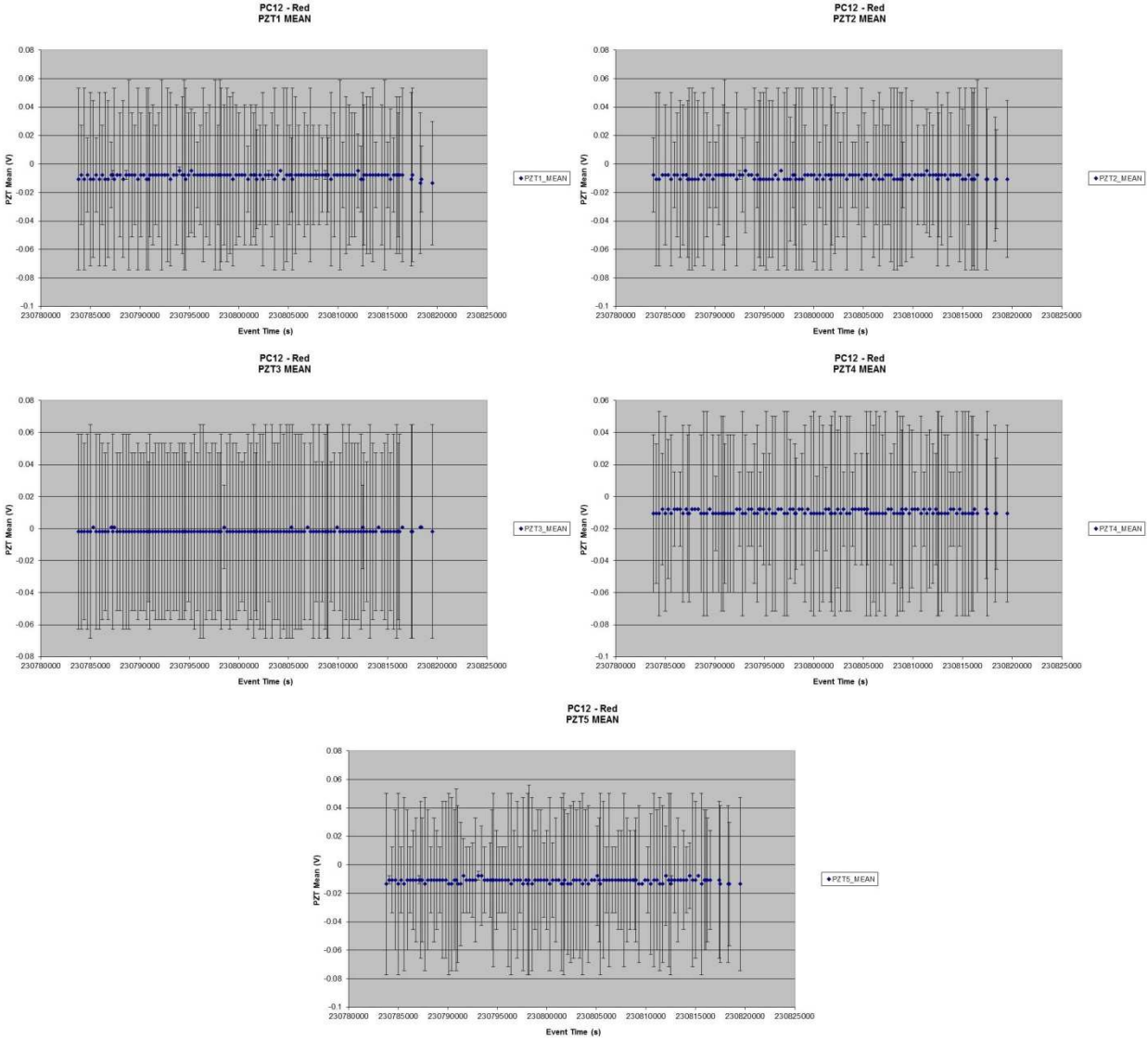


Figure 7.3-6. Reference Voltages for IS calibration vs. time – Red Voltages values for the calibrator don't show level variation

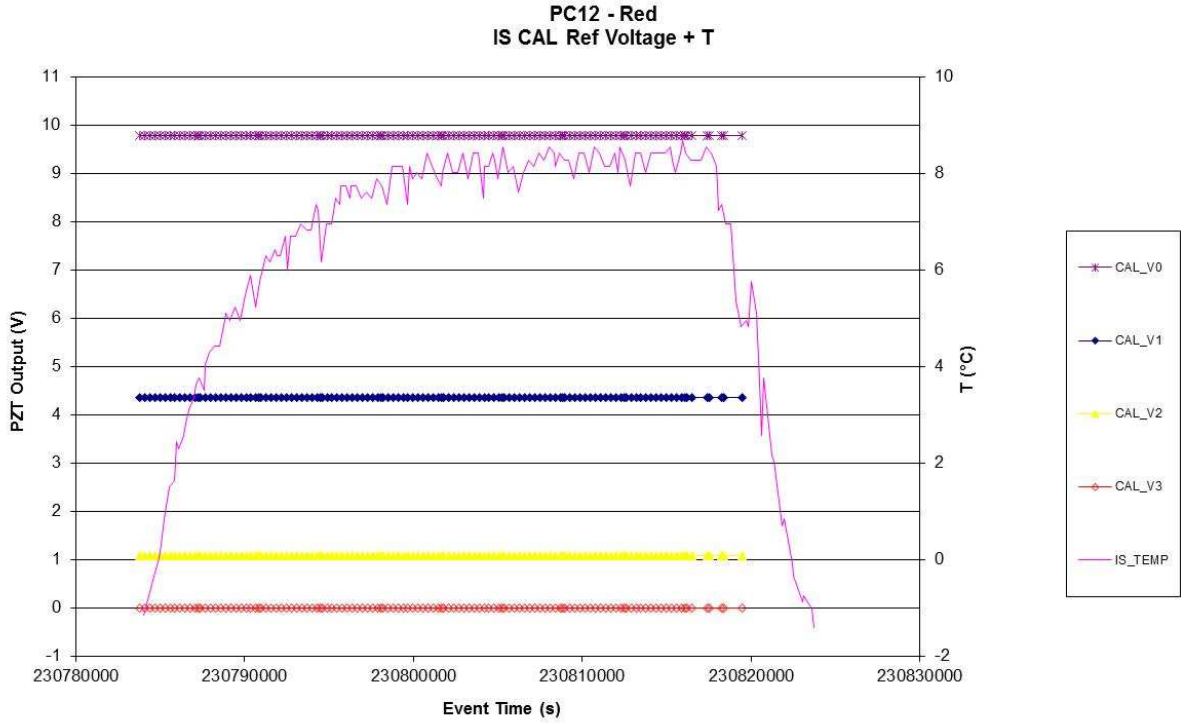
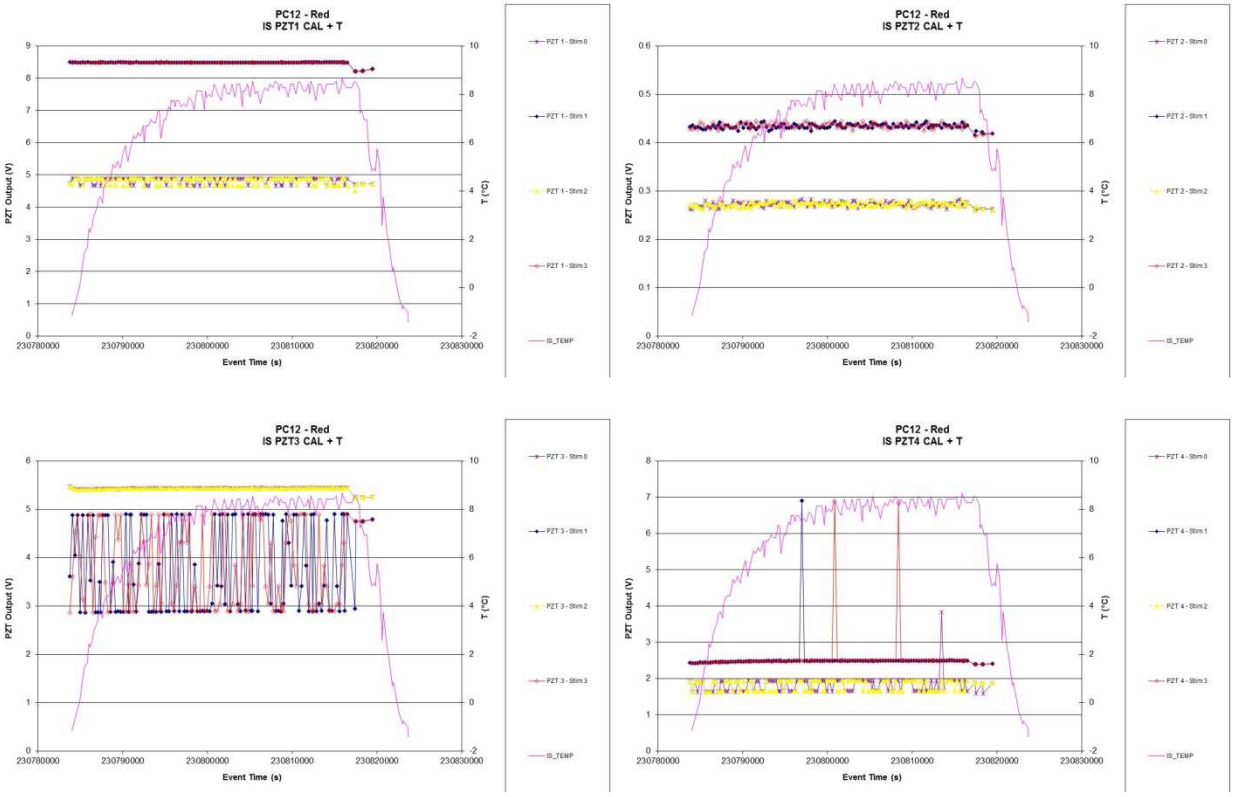
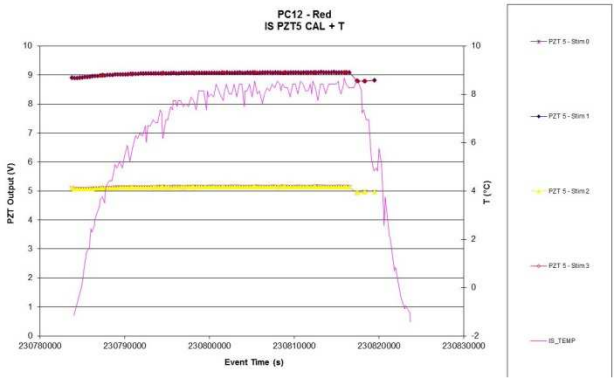


Figure 7.3-7. PZTs CAL Signal vs. time – Red





7.4 MICRO BALANCE SYSTEM (MBS)

7.4.1 MBS – Status

Figure 7.4-1. MBS Operation Status vs. time – Red

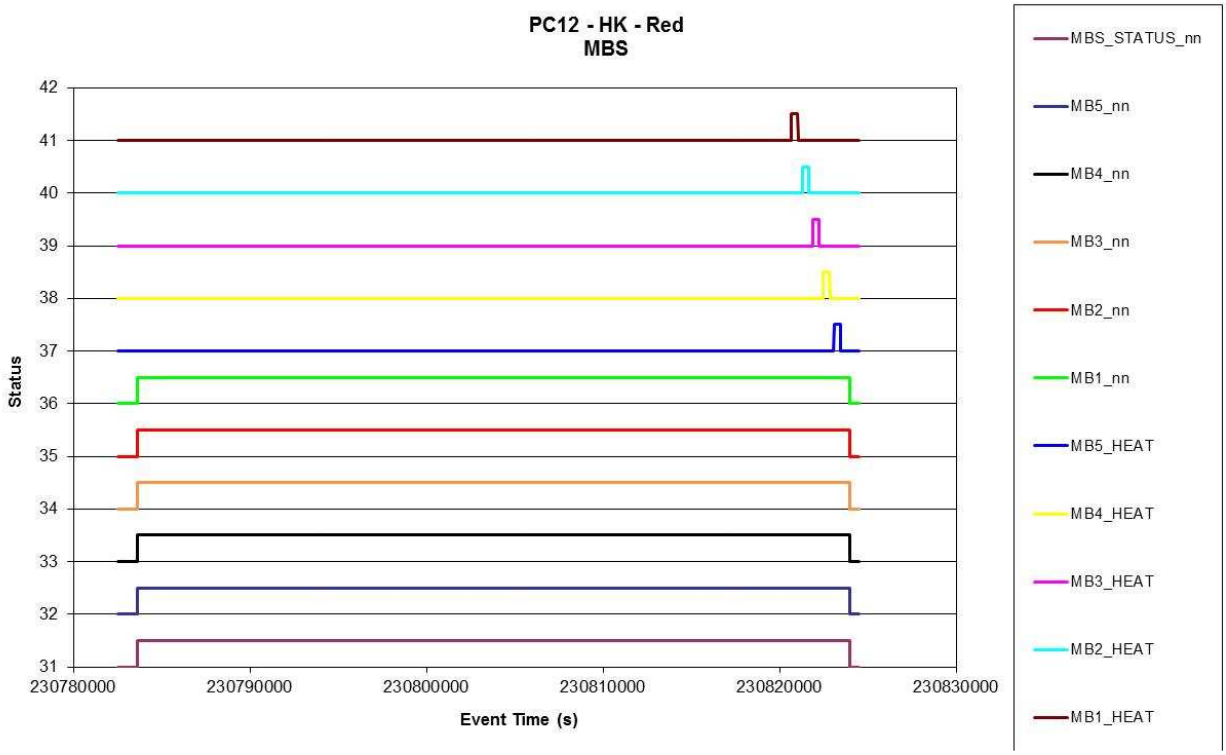
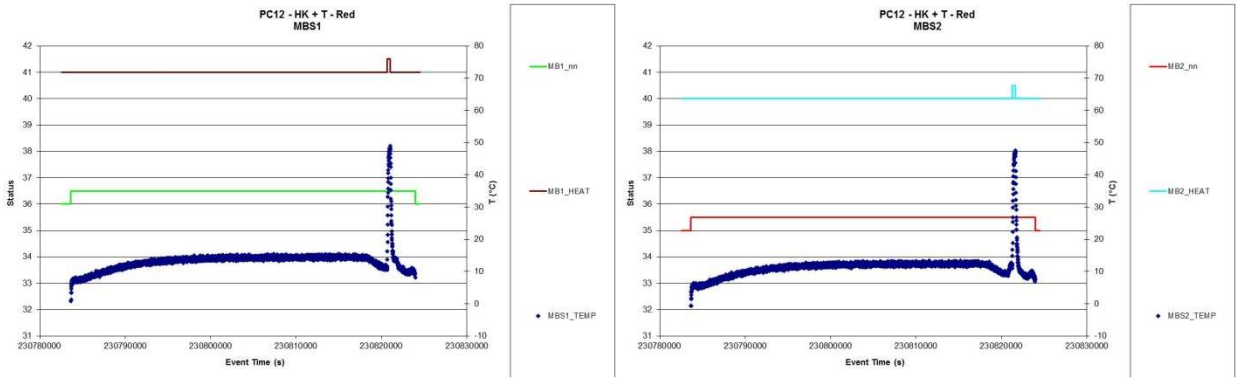


Figure 7.4-2. MBSs Temperature vs. time (SCI) – Red



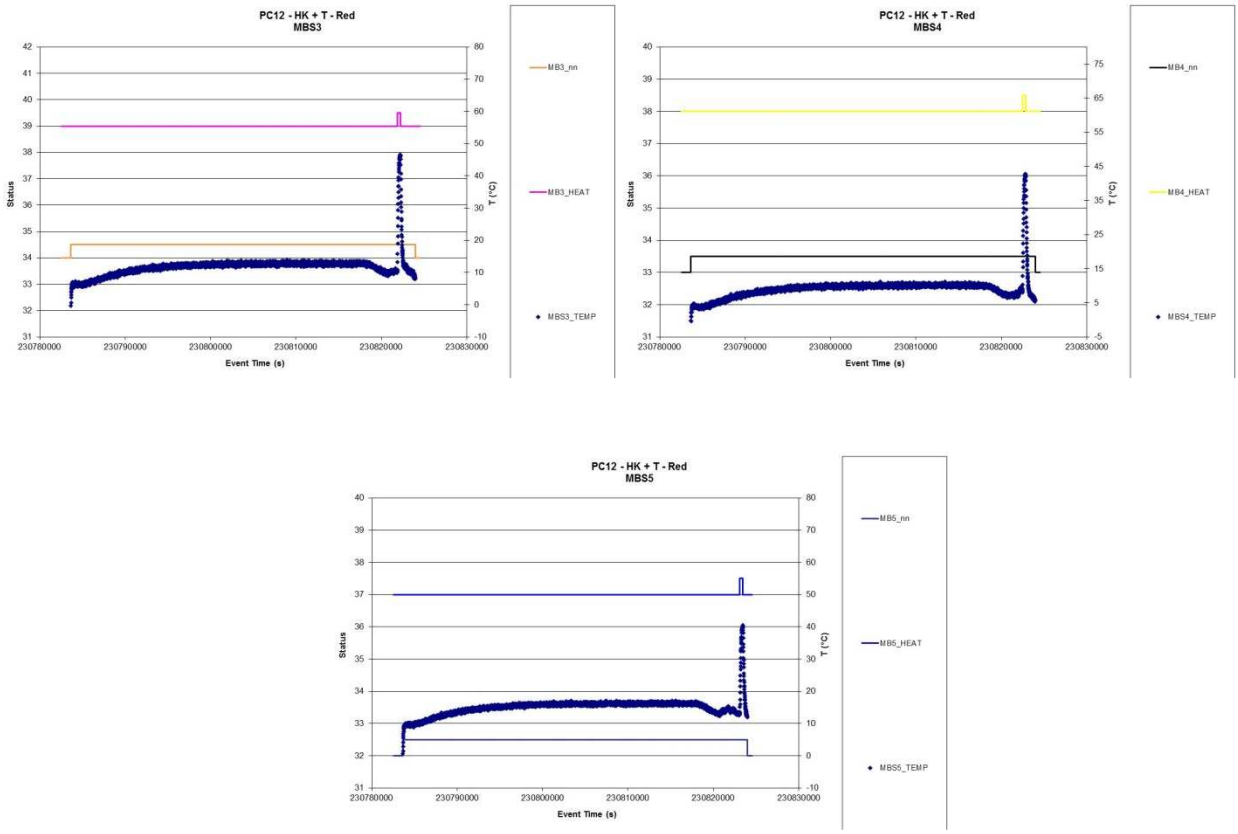
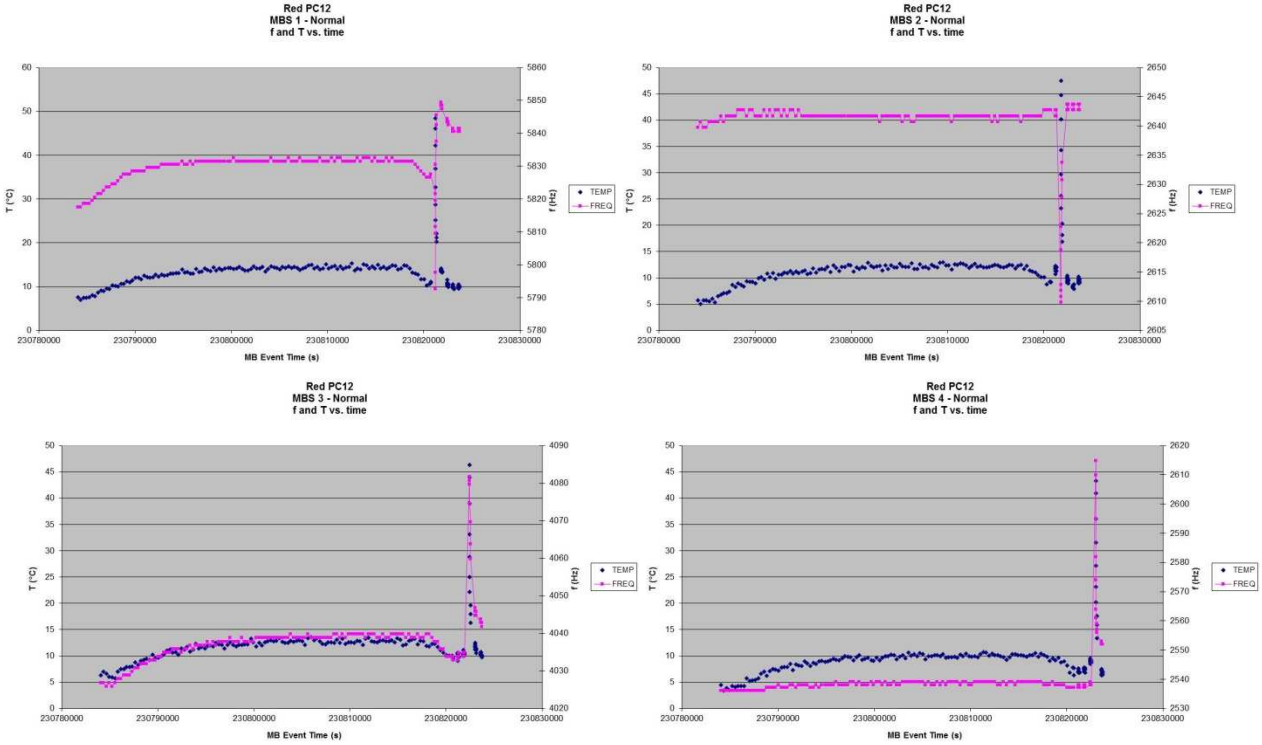
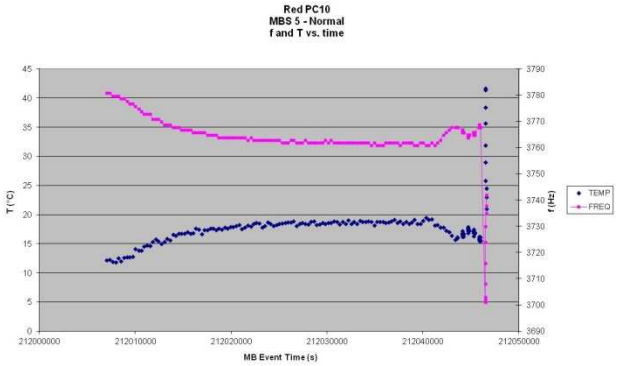


Figure 7.4-3. MBSs Frequency and Temperature vs. time– Red





8. TIMELINES FOR GIADA PC12

8.1 TIMELINE FOR MAIN INTERFACE (GD01)

```
# $Log: OIOR_PIHRSO_D_0017_GD_01M___00050.ROS,v $
#
# Revision 1.10  2010/02/05 12:00:00  GIADA
# Dump CT RAM inserted after Power ON and Patch SW in order to check the
last functional
# configuration of GIADA (i.e. the configuration at the previous Power OFF).
# Dump CF NVRAM inserted before shut down in order to get a report of the
last Context file.
# *** Only for Main I/F *** => Patch CT in RAM and CF in NVRAM in order to
load on-board
# the parameters settings again after the erasing of SSMM Payload Context
file occurred
# during the last DSHM commissioning test (20-27 Jan 2010).
#
# Revision 1.9  2009/06/22 12:00:00  GIADA
# Update and optimization of timing amongst all the sequences: now GIADA is
fully operating
# in Normal Mode after only 25 minutes.
# The sequence AGDS002A (Patch CT v.flight 1) has been removed as it was
unnecessary.
#
# Revision 1.8  2006/10/07 11:22:23  GIADA
# timing changed after results of PC2; sequences updated after PC1 have
internal timing
# slightly different wrt previous sequences and requires this correction in
the timeline
# for future PCn. Also IS and GDS thresholds have been modified.
#
# Revision 1.7  2006/09/05 11:22:23  vdhiri
# Updated to have relative timing. Note No Generic Switch ON/OFF used. Use
in PC4/Passive PCn.
#
# Revision 1.6  2006/07/13 09:03:58  vdhiri
# Updated for PC3. And use of top level itl that was necessary for use of
PORG.
#
# Revision 1.5  2006/01/24 18:51:20  kwirth
# Final GD OIOR for PC2.
```

```
# Original filename: OIOR_PIHRSO_D_0000_GD_PCA3__00013.ROS.
#
# Version  1.3  2005/12/12 giada MAIN for PCn
# Passive Checkout OIOR for GD after sequences update
# RSOC Assumption MSP I1
#
#============================================================================#
# Filename:      OIOR_PIHRSO_D_0017_GD_01M___00050.ROS
# Type:    Input Timeline file
#
# Description:   Passive Check-Out GD adapted to sequences updating
#
#
# Author:  PP, AA
#
#          GIADA
#
# Date:          05 February 2010
#
#
# Proposed by GIADA team
#
# (c) ESA/Estec
#
#----------------------------------------------------------------------------#
#============================================================================#

# EPS required, but RSOC will use CVS version
Version: 00001

Ref_date: 24-Apr-2010
Start_time: 000_00:00:00
End_time: 000_12:00:00

#============================================================================#
# Description: "1. | Switch on and test - Main I/F"
#============================================================================#

+000_00:00:00    GIADA   OFF AGDS001A ( \
                                       VGD0001B = "nom. branch" [ENG] \ #
GIADA on Main IF
                                       VGD0001A = "YES" [ENG])     #
Context exists

#============================================================================#
# Description: "2. | GD Patch CT in RAM"
#============================================================================#

000_00:03:00    GIADA   SAFE    AGDS004A ( \ # GD Patch CT in RAM
                            VGDX0001 = 0x0000 \  # CF spare 1
                            VGDX0002 = 0x1E00 \  # CF CovFra heat on time
                            VGDX0003 = 0x0000 \  # CF CovMot heat on time
                            VGDX0004 = 0xA105 \  # CF FB safety temp
                            VGDX0005 = 0xA105 \  # CF FB test temp
                            VGDX0006 = 0x1E00 \  # CF FB test timeout 1
```

```
VGDX0007 = 0x0000 \  # CF FB test timeout 2
VGDX0008 = 0x6506 \  # CF FB working temp
VGDX0009 = 0x5802 \  # CF FB op timeout 1
VGDX0010 = 0x0000 \  # CF FB op timeout 2
VGDX0011 = 0x3200 \  # CF velocity
VGDX0012 = 0xAB00 \  # CF steps to open
VGDX0013 = 0xAB00 \  # CF steps to close
VGDX0014 = 0x7800 \  # CF opening timeout 1
VGDX0015 = 0x0000 \  # CF opening timeout 2
VGDX0016 = 0x7800 \  # CF closing timeout 1
VGDX0017 = 0x0000 \  # CF closing timeout 2
VGDX0018 = 0x03AF \  # CF GDS status
VGDX0019 = 0x1A23 \  # CF GDS thresholds
VGDX0020 = 0xA9F5 \  # CF laser max temp
VGDX0021 = 0xE0FD \  # CF laser min temp
VGDX0022 = 0x0000 \  # CF spare 2
VGDX0023 = 0x0000 \  # CF spare 3
VGDX0024 = 0x100E \  # CF GDS time bet cal 1
VGDX0025 = 0x0000 \  # CF GDS time bet cal 2
VGDX0026 = 0x1F9F \  # CF IS status
VGDX0027 = 0xB71A \  # CF IS maxop temp
VGDX0028 = 0x0000 \  # CF spare 4
VGDX0029 = 0x3500 \  # CF IS hyst temp
VGDX0030 = 0x0500 \  # CF IS thresholds 1
VGDX0031 = 0x0F05 \  # CF IS thresholds 2
VGDX0032 = 0x1405 \  # CF IS thresholds 3
VGDX0033 = 0x100E \  # CF IS time bet cal 1
VGDX0034 = 0x0000 \  # CF IS time bet cal 2
VGDX0035 = 0x04F8 \  # CF IS cal config
VGDX0036 = 0x009F \  # CF MBS status
VGDX0037 = 0xA40A \  # CF MBS max temp
VGDX0038 = 0x00F8 \  # CF MBS temp checking
VGDX0039 = 0x2C01 \  # CF MBS time interval 1
VGDX0040 = 0x0000 \  # CF MBS time interval 2
VGDX0041 = 0xF309 \  # CF MBS max heat temp
VGDX0042 = 0x6801 \  # CF heating timeout 1
VGDX0043 = 0x0000 \  # CF heating timeout 2
VGDX0044 = 0x100E \  # CF MBS time bet cal 1
VGDX0045 = 0x0000 \  # CF MBS time bet cal 2
VGDX0046 = 0x6D1A \  # CF IS maxnonop temp
VGDX0047 = 0xCE1D \  # CF IS min temp
VGDX0048 = 0xC719 \  # CF ME maxop temp
VGDX0049 = 0x0000 \  # CF spare 5
VGDX0050 = 0x0000 \  # CF spare 6
VGDX0051 = 0x0000 \  # CF spare 7
VGDX0052 = 0x0000 \  # CF spare 8
VGDX0053 = 0x3C00 \  # CF timeout sci pkt 1
VGDX0054 = 0x0000 \  # CF timeout sci pkt 2
VGDX0055 = 0x0A00 \  # CF time HK pkt 1
VGDX0056 = 0x0000 \  # CF time HK pkt 2
VGDX0057 = 0x2800 \  # CF arm TC timeout 1
VGDX0058 = 0x0000 \  # CF arm TC timeout 2
VGDX0059 = 0x0000 \  # CF patches status 1
VGDX0060 = 0x0000 \  # CF patches status 2
VGDX0061 = 0x0000 \  # CF patches status 3
```

```
                              VGDX0062 = 0x0000 \  # CF patches status 4
                              VGDX0063 = 0x2800 \  # CF max GDS events sec
                              VGDX0064 = 0x2800 \  # CF max IS events sec
                              VGDX0065 = 0x0000 \  # CF PAD 1
                              VGDX0066 = 0x0000 \  # CF PAD 2
                              VGDX0067 = 0x0000 \  # CF PAD 3
                              VGDX0068 = 0x0000 \  # CF PAD 4
                              VGDX0069 = 0x8DA3 )  # CF CRC

#=============================================================================#
# Description: "3. | GD Patch CF in NVRAM"
#=============================================================================#

000_00:04:00    GIADA   SAFE    AGDS006A ( \ # GD Patch CF in NVRAM
                              GDX0001 = 0x0000 \  # CF spare 1
                              VGDX0002 = 0x1E00 \  # CF CovFra heat on time
                              VGDX0003 = 0x0000 \  # CF CovMot heat on time
                              VGDX0004 = 0xA105 \  # CF FB safety temp
                              VGDX0005 = 0xA105 \  # CF FB test temp
                              VGDX0006 = 0x1E00 \  # CF FB test timeout 1
                              VGDX0007 = 0x0000 \  # CF FB test timeout 2
                              VGDX0008 = 0x6506 \  # CF FB working temp
                              VGDX0009 = 0x5802 \  # CF FB op timeout 1
                              VGDX0010 = 0x0000 \  # CF FB op timeout 2
                              VGDX0011 = 0x3200 \  # CF velocity
                              VGDX0012 = 0xAB00 \  # CF steps to open
                              VGDX0013 = 0xAB00 \  # CF steps to close
                              VGDX0014 = 0x7800 \  # CF opening timeout 1
                              VGDX0015 = 0x0000 \  # CF opening timeout 2
                              VGDX0016 = 0x7800 \  # CF closing timeout 1
                              VGDX0017 = 0x0000 \  # CF closing timeout 2
                              VGDX0018 = 0x03AF \  # CF GDS status
                              VGDX0019 = 0x1A23 \  # CF GDS thresholds
                              VGDX0020 = 0xA9F5 \  # CF laser max temp
                              VGDX0021 = 0xE0FD \  # CF laser min temp
                              VGDX0022 = 0x0000 \  # CF spare 2
                              VGDX0023 = 0x0000 \  # CF spare 3
                              VGDX0024 = 0x100E \  # CF GDS time bet cal 1
                              VGDX0025 = 0x0000 \  # CF GDS time bet cal 2
                              VGDX0026 = 0x1F9F \  # CF IS status
                              VGDX0027 = 0xB71A \  # CF IS maxop temp
                              VGDX0028 = 0x0000 \  # CF spare 4
                              VGDX0029 = 0x3500 \  # CF IS hyst temp
                              VGDX0030 = 0x0500 \  # CF IS thresholds 1
                              VGDX0031 = 0x0F05 \  # CF IS thresholds 2
                              VGDX0032 = 0x1405 \  # CF IS thresholds 3
                              VGDX0033 = 0x100E \  # CF IS time bet cal 1
                              VGDX0034 = 0x0000 \  # CF IS time bet cal 2
                              VGDX0035 = 0x04F8 \  # CF IS cal config
                              VGDX0036 = 0x009F \  # CF MBS status
                              VGDX0037 = 0xA40A \  # CF MBS max temp
                              VGDX0038 = 0x00F8 \  # CF MBS temp checking
                              VGDX0039 = 0x2C01 \  # CF MBS time interval 1
                              VGDX0040 = 0x0000 \  # CF MBS time interval 2
                              VGDX0041 = 0xF309 \  # CF MBS max heat temp
```

```
                                VGDX0042 = 0x6801 \  # CF heating timeout 1
                                VGDX0043 = 0x0000 \  # CF heating timeout 2
                                VGDX0044 = 0x100E \  # CF MBS time bet cal 1
                                VGDX0045 = 0x0000 \  # CF MBS time bet cal 2
                                VGDX0046 = 0x6D1A \  # CF IS maxnonop temp
                                VGDX0047 = 0xCE1D \  # CF IS min temp
                                VGDX0048 = 0xC719 \  # CF ME maxop temp
                                VGDX0049 = 0x0000 \  # CF spare 5
                                VGDX0050 = 0x0000 \  # CF spare 6
                                VGDX0051 = 0x0000 \  # CF spare 7
                                VGDX0052 = 0x0000 \  # CF spare 8
                                VGDX0053 = 0x3C00 \  # CF timeout sci pkt 1
                                VGDX0054 = 0x0000 \  # CF timeout sci pkt 2
                                VGDX0055 = 0x0A00 \  # CF time HK pkt 1
                                VGDX0056 = 0x0000 \  # CF time HK pkt 2
                                VGDX0057 = 0x2800 \  # CF arm TC timeout 1
                                VGDX0058 = 0x0000 \  # CF arm TC timeout 2
                                VGDX0059 = 0x0000 \  # CF patches status 1
                                VGDX0060 = 0x0000 \  # CF patches status 2
                                VGDX0061 = 0x0000 \  # CF patches status 3
                                VGDX0062 = 0x0000 \  # CF patches status 4
                                VGDX0063 = 0x2800 \  # CF max GDS events sec
                                VGDX0064 = 0x2800 \  # CF max IS events sec
                                VGDX0065 = 0x0000 \  # CF PAD 1
                                VGDX0066 = 0x0000 \  # CF PAD 2
                                VGDX0067 = 0x0000 \  # CF PAD 3
                                VGDX0068 = 0x0000 \  # CF PAD 4
                                VGDX0069 = 0x8DA3 )  # CF CRC

+000_00:05:00    GIADA SAFE  AGDS003A # Patch SW v.2.3

+000_00:09:00    GIADA SAFE  AGDS005A # Dump CT RAM

+000_00:10:00    GIADA SAFE  AGDS035A # Go to Cover Mode

+000_00:11:00    GIADA COVER AGDF090A # Open cover

Description: "5 minutes waiting, then 1 min. for OBCP execution and 4 min.
for a margin of heating time"

+000_00:21:00    GIADA COVER AGDS065A # Go to Safe mode

+000_00:22:00    GIADA SAFE  AGDS110A # Go to Normal mode

Description: "GIADA operating in Normal mode"

+000_00:24:00    GIADA NORMAL     AGDS120A ( \
                       VGDS0010 = 0xF8 \
                       VGDS0011 = 0x04 \     # Calibrate IS, GDS, MBS
                                        REPEAT = 110 \
                                        SEPARATION = 00:05:00 )

Description: "Change GIADA settings and check effects"

+000_09:34:00    GIADA NORMAL     AGDF100A # Self-interference test
```

```
+000_10:34:00    GIADA NORMAL     AGDF055A # MBS heating

+000_11:34:00    GIADA NORMAL     AGDS065A # Go to Safe mode

+000_11:34:30    GIADA SAFE  AGDS007A # Dump CF NVRAM

#=========================================================================#
# Description: "4. | Shut down"
#=========================================================================#

+000_11:35:00    GIADA SAFE  AGDF060A # Go to Safe mode & Power-off
#=====================================END=================================#
```

8.2 TIMELINE FOR REDUNDANT INTERFACE (GD01)

```
# $Log: OIOR_PIHRSO_D_0017_GD_01R___00051.ROS,v $
#
# Revision 1.10  2010/02/05 12:00:00  GIADA
# Dump CT RAM inserted after Power ON and Patch SW in order to check the last
functional
# configuration of GIADA (i.e. the configuration at the previous Power OFF).
# Dump CF NVRAM inserted before shut down in order to have a report of the last
Context file.
#
# Revision 1.9  2009/06/22 12:00:00  GIADA
# Update and optimization of timing amongst all the sequences: now GIADA is
fully operating
# in Normal Mode after only 25 minutes.
# The sequence AGDS002A (Patch CT v.flight 1) has been removed as it was
unnecessary.
#
# Revision 1.8  2006/10/07 11:22:23  GIADA
# timing changed after results of PC2; sequences updated after PC1 have internal
timing
# slightly different wrt previous sequences and requires this correction in the
timeline
# for future PCn. Also IS and GDS thresholds have been modified.
#
# Revision 1.7  2006/09/05 11:22:23  vdhiri
# Updated to have relative timing. Note No Generic Switch ON/OFF used. Use in
PC4/Passive PCn.
#
# Revision 1.6  2006/07/13 09:03:58  vdhiri
# Updated for PC3. And use of top level itl that was necessary for use of PORG.
#
# Revision 1.5  2006/01/24 18:51:46  kwirth
# Final GD OIOR for PC2.
# Original filename: OIOR_PIHRSO_D_0000_GD_PCB3__00014.ROS.
#
# Version  1.3  2005/12/12 giada REDUNDANT for PCn
# Passive Checkout OIOR for GD after sequences update
# RSOC Assumption MSP I1
#
#=========================================================================#
# Filename:       OIOR_PIHRSO_D_0017_GD_01R___00051.ROS
# Type:     Input Timeline file
#
```

```
# Description:    Passive Check-Out GD adapted to sequences updating
#
#
# Author:   PP, AA
#
#           GIADA
#
# Date:           05 February 2010
#
#
# Proposed by GIADA team
#
# (c) ESA/Estec
#
#-------------------------------------------------------------------------------#
#===============================================================================#

# EPS required, but RSOC will use CVS version
Version: 00001

Ref_date: 24-Apr-2010
Start_time: 000_00:00:00
End_time: 001_00:00:00

#===============================================================================#
# Description: "1. | Switch on and test - Redundant I/F"
#===============================================================================#

+000_12:00:00     GIADA   OFF AGDS001A ( \
                                        VGD0001B = "red. branch" [ENG] \ #
GIADA on Red IF
                                        VGD0001A = "YES" [ENG]) # Context
exists

+000_12:03:00     GIADA SAFE  AGDS003A # Patch SW v.2.3

+000_12:07:00     GIADA SAFE  AGDS005A # Dump CT RAM

+000_12:08:00     GIADA SAFE  AGDS035A # Go to Cover Mode

+000_12:09:00     GIADA COVER AGDF090A # Open cover

Description: "5 minutes waiting, then 1 min. for OBCP execution and 4 min. for a
margin of heating time"

+000_12:19:00     GIADA COVER AGDS065A # Go to Safe mode

+000_12:20:00     GIADA SAFE  AGDS110A # Go to Normal mode

Description: "GIADA operative in normal mode"

+000_12:22:00     GIADA NORMAL      AGDS120A ( \
                            VGDS0010 = 0xF8 \
                            VGDS0011 = 0x04 \ # Calibrate IS, GDS, MBS
                                        REPEAT = 110 \
                                        SEPARATION = 00:05:00 )

Description: "Change GIADA settings and check effects"
```

```
+000_21:32:00     GIADA NORMAL      AGDF100A # Self-interference test

+000_22:32:00     GIADA NORMAL      AGDF055A # MBS heating

+000_23:32:00     GIADA NORMAL      AGDS065A # Go to Safe mode

+000_23:32:30     GIADA SAFE  AGDS007A # Dump CF NVRAM

#=============================================================================#
# Description: "2. | Shut down"
#=============================================================================#

+000_23:33:00     GIADA SAFE  AGDF060A # Go to Safe mode & Power-off

#=====================================END=====================================#
```