GIADA FS MODEL

REPORT ON
IN FLIGHT PASSIVE PAYLOAD CHECKOUT N. 2 (PC2)
performed on
05/06-03-2006

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REVISIONS LOG

REV	DOCUMENT CHANGE ORDER	DATE	CHANGES DESCRIPTION	PREPARED
0	-	05-02-2007	First issue	GIADA Team

1. SCOPE AND APPLICABILITY

The Passive Payload Checkout n. 2 (PC2) test is one of the routine checkouts performed during Rosetta cruise. It has been executed on 05-06 March 2006 by switching on Main and Redundant interfaces in sequence and executing similar procedures for the two cases.

This document reports the results obtained on GIADA experiment during PC2.

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 @ INAF - Osservatorio Astronomico di Capodimonte in Naples.

GIADA IWS software configuration is GES 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

2.2 REFERENCE DOCUMENT

	None.	

3. DEFINITIONS AND ABBREVIATIONS

3.1 ABBREVIATIONS

CAL	Calibration
CF	Context File
CREP	Cover REPort
CT	Context 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 Passive Payload Checkout n. 2 (PC2) was performed on 05-06 March 2006 according to the timelines reported in Section 10. Commands were previously loaded in the Rosetta S/C and sent to GIADA via MTL.

We recall that some new FCPs have been agreed and consolidated with ESA in the 2005-2006 period, for a proper rationalisation of GIADA in-flight commanding. Some of them replace those used in previous in-flight tests, although the content of the test is similar. Starting with PC2, some of these new FCPs have been used, together with other FCPs already validated in the previous GIADA Commissioning phases.

The plan of activities foresees the following steps for the Main Interface:

Sequence	**Description – Main Interface**

AGDS001A	VGD0001B = "nom. Branch" [ENG] \ # GIADA on Main IF
	VGD0001A = "YES" [ENG]) # Context exists

AGDS002A	Patch CT v. flight 1
AGDS003A	Patch SW v.2.3
AGDS035A	Go to Cover Mode
AGDF090A	Open cover
AGDS065A	Go to Safe mode
AGDS110A	Go to Normal mode (science enabled)
AGDS038A	Set **GDS L/R** receiver thresholds to **1.6/0.8 V**
AGDS037A	Set IS Off
AGDS036A	Set IS **PZTA/B/C/D/E** threshold to **0.05/0.05/0.15/0.05/0.15 V** **Range = L – Gain = H/H/H/H/H**
AGDS037A	Set IS On
AGDS120A	Calibrate GDS – IS – MBS at 5 min intervals
AGDF100A	Self-interference test
AGDF055A	MBS # 1-2-3-4-5 heating
AGDF060A	GIADA Switch-off (with Cover close operation in the Power-off OBCP)

followed by similar steps for the Redundant Interface:

Sequence	**Description – Red Interface**

AGDS001A	VGD0001B = "red. branch" [ENG] \ # GIADA on Red IF
	VGD0001A = "YES" [ENG]) # Context exists

AGDS002A	Patch CT v. flight 1
AGDS003A	Patch SW v.2.3
AGDS035A	Go to Cover Mode
AGDF090A	Open cover
AGDS065A	Go to Safe mode
AGDS110A	Go to Normal mode (science enabled)
AGDS038A	Set **GDS L/R** receiver thresholds to **1.6/0.8 V**
AGDS037A	Set IS Off
AGDS036A	Set IS **PZTA/B/C/D/E** threshold to **0.05/0.05/0.15/0.05/0.15 V** **Range = L – Gain = H/H/H/H/H**
AGDS037A	Set IS On
AGDS120A	Calibrate GDS – IS – MBS at 5 min intervals

Sequence	**Description – Red Interface**
AGDF055A	MBS # 1-2-3-4-5 heating
AGDF100A	Self-interference test
AGDF060A	GIADA Switch-off (with Cover close operation in the Power-off OBCP)

Newly defined FCPs are reported in bold-italic in the previous list. Settings of Thresholds and Parameters are reported in bold.

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 and Science data are reported in Sections 7 and 8 for the Main and the Redundant I/F's respectively.

Here following the main findings are summarized.

5.1 GENERAL CONSIDERATIONS

The test started on "Sun Mar 05 2006 23:01:13.672340", 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 "Mon Mar 06 2006 10:38:02.847204. The test on the Redundant interface started on "Mon Mar 06 2006 11:01:13.679465" (1^{st} packet received) and ended on "Mon Mar 06 2006 22:38:02.85823" (last packet received).

All expected steps were correctly executed.

The first expected packet **(Connection Report, service 17,2) was not received** in the time window of the test, probably because the DDS has marked it with a wrong UTC time, being an unsynchronised time tag (bad time quality) TM report. As understood after iteration with RMOC people, this is a nominal situation for unsynchronised TM packets that are not received in real time; in this condition the DDS system cannot distinguish for how long the packet was stored in SSMM.

At one of the IS power-on both on Main and Red I/F, the event **'*Hardware error in IS event detection circuitry. No IRQ received*' was received**. This is a known problem that may happen @ IS power-on.

Except for the mentioned "lost event", no packet were lost, neither HK nor SCI TM; this means that **SSMM memory allocated to GIADA (1 Mbytes) is not saturated.** About HK TM see Figure 7.1-8 and Figure 7.1-9 for Main I/F and Figure 8.1-8 and Figure 8.1-9 for Red I/F. About SCI TM the previous considerations were deduced from TCTM report file resident in the log directory of GES.

The behaviour of the cover during the different open-close operations was monitored by the **"Cover Reports" (CREP)** (see Figure 7.2-1 and Figure 7.2-2 for Main–open and Main–close respectively; Figure 8.2-1 and Figure 8.2-2 for Red–open and Red–close respectively). The reports testify a **nominal behaviour** of the open-close operations but the CREP generated by the EGSE SW shows an anomalous coincidence of "Begin time of operation" and "End time of operation" for "open cover" on the Main I/F (Section 7.2.1). A revision of on-ground data has demonstrated that this problem was already present in previous tests (although not identified, so far). A careful analysis of TM data has shown that the behaviour of GIADA is nominal and the time data provided by the experiment are as expected. The cause of the anomalous coincidence is identified in a bug in the conversion from the Hex time stamp values to the Dec time stamp values operated by the GES SW. Possibly it is due to the roundoff in the HEX to DEC conversion that can vary between 0 and 16 seconds. As a consequence, the identified problem in the GES was flagged in the GIADA User Manual and shall have to be recovered as soon as possible in future updating of the GIADA EGSE SW.

The following additional problems have been detected both on the Main and on the Redundant I/Fs:

1. At switch ON, the first 6 packets are received at 10 s interval
2. At switch ON, the first 5 packets have patch status = 1, packets from 6 to 11 have patch status = 0

3. After GIADA goes to Normal Mode, the usual phase with laser in “Armed” + “Low” is not present and the laser goes directly to “Armed” + “Medium” (this could be a risky situation for the laser health!)
4. The first CAL of IS contains only 2 steps (1 impulse applied to stimuli PZT = rise-fall of the square wave) instead of the usual 4 steps (2 impulses applied to stimuli PZT = rise-fall-rise-fall of the square wave)
5. All Cover Reports contain only 162 steps (instead of the usual 170), even if the operation lasts 8 s as nominal

The reason of these problems has been identified in the wrong timing of the commanding sequence as it follows:

GIADA sequences were updated and modified before PC2. Due to that, timeline was updated for PC2. These actions resulted in a modification in the time interval between some telecommands. In particular, during PC2 the TC ZGDX0601 “Giada Patch Context File” was executed 60 s after timeline started (see Sections 10.1 and 10.2), while in PC1 it was executed after 180 s. As the first part of the procedure foresees the switch-on OBCP, which includes as last TC “accept context” after more than 70 s from beginning, during the PC2 the “Giada Patch Context File” TC was executed before the end of switch-on OBCP. The TC “accept context”, which uploads the CF stored in the SSMM, has the effect to overwrite the default CF already uploaded with the “Giada Patch Context File” TC.

5.2 GIADA STATUS

The **current consumption** and **power supply temperatures** (Main: Figure 7.1-7; Red: Figure 8.1-7) are in line with nominal evolution of operative modes (Main: Figure 7.1-6; Red: Figure 8.1-6).

Power values must be compared with soft and hard limits reported in GIADA FS UM (**AD4**) and summarized 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 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 PC2 test behave as expected.

In previous in flight tests different values of **current on the 5 V line** between Main (1050 mA) and Red (< 1000 mA) I/Fs were measured. A deeper analysis of the causes of this effect has evidenced a ***wrong digitalization of the CAL factors*** in the conversion tables of the PI EGSE SW. This problem has been fixed for the analysis of the PC2 data, so that the inconsistency between Main (Figure 7.1-6) and Red (Figure 8.1-6) I/Fs has been removed.

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	800 mA	1600 mA	100 mA	1800 mA
+15V Power Consumption (3)	NGDD0087	Current +15V	350 mA	550 mA	20 mA	600 mA
-15V Power Consumption (3)	NGDD0088	Current -15V	250 mA	350 mA	50 mA	400 mA
+5V Power Consumption (4)	NGDD0086	Current +5V	110 mA	170 mA	100 mA	1500 mA
+15V Power Consumption (4)	NGDD0087	Current +15V	140 mA	200 mA	20 mA	220 mA
-15V Power Consumption (4)	NGDD0088	Current -15V	75 mA	135 mA	50 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: Figure 7.1-2, Figure 7.1-3, Figure 7.1-4, Red: Figure 8.1-2, Figure 8.1-3, Figure 8.1-4). The trend of the IS Temperature is more noisy with the Main than with the Red I/F (Main: Figure 7.4-4; Red: Figure 8.4-4).

The behaviour of the **GDS Laser 1 Monitor vs. Temperature** presents an *offset* between Main and Red measurements (Figure 7.3-5, Figure 8.3-5 and Figure 9.1-1). This effect is simply due to a *wrong digitalization of the CAL factors* in the conversion tables of the PI EGSE SW, to be corrected for future computations.

The detection **Thresholds** applied on GDS are shown in Figure 7.3-2 (Main) and Figure 8.3-2 (Red), while those applied to PZT3 and PZT5 of IS are shown in Figure 7.4-2 and Figure 7.4-3 (Main) as well as in Figure 8.4-2 and Figure 8.4-3 (Red). 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

About **scientific data** we notice the following points.

During PC2 the Sun is not in the GDS detectors FoV, so that saturation of GDS output does NOT occur. Therefore, it is possible to evaluate the effect of internal stray-light. The **GDS CAL data** show for the **GDS Left side** an output level rising from **0.7 to 0.8 V** with temperature and for the **GDS Right side** a level around **0.16 V** (Main: Figure 7.3-10, Red: Figure 8.3-10). These values are compatible with previous measurements (e.g., about 0.7 V and 0.2 V for Left and Right, respectively, measured at first Commissioning).

Since there is NO saturation, **GDS scientific events** are detected (Main: Figure 7.3-9 and Red: Figure 8.3-9). On the Main I/F, 9 events are detected on the GDS Left detector, and 33 on the GDS Right detector; on the Red I/F, 10 events are detected on the GDS Left detector, and 35 on the GDS Right detector. Most of them are at the saturation limit of 6.9375 V.

The "**Dust Monitor**" presents the following results: several single detections, 3 double detections and 1 triple detection on the Main I/F (Figure 7.4-14). The several detections are related to the detections by the PZT-E (or 5) at 0.14-0.15 V level (see Figure 7.4-11 and Figure 7.4-12). On the contrary, on the Red I/F only 3 single and 2 double detections are observed (Figure 8.4-9). ***The previous results indicate the need to increase the Detection threshold on the PZT-E (or 5) from 0.15 V to 0.20 V.***

It must be recalled that the Dust Monitor counts IS events even when the Scientific TM is not enabled. One IS event is marked when one (the first) PZT signal crosses the threshold (with the filtering). So it is possible to have Dust Monitor > 0 even if **no IS** event has been **detected** simultaneously by ALL the PZTs.

As said before, most of IS scientific events are detected with the Main I/F on the PZT-E (see from Figure 7.4-5 to Figure 7.4-13). An analysis of the occurrence of the **IS scientific events** for the Main I/F is reported in Section 5.2.1. A similar analysis for the (few) IS scientific events with the Red I/F (see from Figure 8.4-5 to Figure 8.4-8) is reported in Section 5.2.2.

The last IS CAL (8 steps rather than 4) are performed at 9.6 V amplitude instead of 10 V as the others. This is linked to the different setting of the calibrations. Thus, the IS outputs of the stimuli are lower than in the former cases (see Main: from Figure 7.4-21 to Figure 7.4-25 and Red: from Figure 8.4-16 to Figure 8.4-20).

The frequency level of all MBS has not changed significantly with respect to PC1 test. Only MBS 1 has slightly increased its frequencies by an amount of 40-50 Hz (Figure 9.3-1). The frequency – temperature behaviour for all MBSs has not changed since previous in-flight tests (see Figure 9.3-1 for MBS 1, Figure 9.3-2 for MBS 2, Figure 9.3-3 for MBS 3, Figure 9.3-4 for MBS 4 and Figure 9.3-5 for MBS 5).

5.2.1 Analysis of IS SCI events on the Main I/F

Here following is an analysis of the IS SCI events detected on the Main I/F.

IS Events detected by Channel A (Figure 7.4-7)
- 5 events detected at IS_Event_Time = 100255777.33, 100257577.30, 100257577.31, 100257643.28, 100258237.31 s – 1 of them is detected only by Ch-B
- 4 events detected by Ch-A are also detected by Ch-B
- all events detected by Ch-A but 1 are also detected by Ch-C
- all events detected by Ch-A but 1 are also detected by Ch-D
- no event detected by Ch-A is also detected by Ch-E

IS Events detected by Channel B (Figure 7.4-8)
- 6 events detected at IS_Event_Time = 100237559.32, 100255777.33, 100257577.31, 100257643.28, 100257878.75, 100258237.31 s – 2 of them is not detected by any other channel
- 4 events detected by Ch-B are also detected by Ch-A
- 3 events detected by Ch-B are also detected by Ch-C
- 3 events detected by Ch-B are also detected by Ch-D
- no event detected by Ch-B is also detected by Ch-E

IS Events detected by Channel C (Figure 7.4-9)
- 4 events detected at IS_Event_Time = 100255777.33, 100257577.30, 100257643.28, 100258237.31 s
- all events detected by Ch-C are also detected by Ch-A
- 3 events detected by Ch-C are also detected by Ch-B
- all events detected by Ch-C are the same detected by Ch-D
- no event detected by Ch-C is also detected by Ch-E

IS Events detected by Channel D (Figure 7.4-10)
- 4 events detected at IS_Event_Time = 100255777.33, 100257577.30, 100257643.28, 100258237.31 s
- all events detected by Ch-D are also detected by Ch-A
- 3 events detected by Ch-D are also detected by Ch-B
- all events detected by Ch-D are the same detected by Ch-C
- no event detected by Ch-D is also detected by Ch-E

IS Events detected by Channel E (Figure 7.4-11)
- Ch-E detects 428 events
- None of them is detected by the other Channels

Conclusions:
- Ch-C and Ch-D detect the same (four) events
- 3 events are simultaneously detected by Ch-A, B, C and D, but not by Ch-E, at IS_Event_Time = 100255777.33, 100257643.28, 100258237.31 s
- 1 event is simultaneously detected by Ch-A, C, D, but not by Ch-B, E, at IS_Event_Time = 100257577.30 s

- 1 event is simultaneously detected by Ch-A, B but not by Ch-C, D, E, at IS_Event_Time = 100257577.31 s
- 2 events are detected by Ch-B only at IS_Event_Time = 100237559.32, 100257878.75 s
- 428 events are detected by Ch-E only
- None of the events detected by Ch-A, B, C, D is also detected by Ch-E
- None of the events detected by Ch-E is also detected by Ch-A, B, C, D

The 7 events detected by Channels A-B-C-D are summarized in Table 5.2-3. 5 of these events do occur in coincidence with other GIADA transitions. The others 2 (detected by Ch-B only) do not seem correlated to any other GIADA event and cannot be easily identified.

IS	Time	Event
B	100237559.32	
A, B, C, D	100255777.33	Laser OFF
A, C, D	100257577.30	Laser Power ON
A, B	100257577.31	Laser Power ON
A, B, C, D	100257643.28	Laser ON
B	100257878.75	
A, B, C, D	100258237.31	Laser OFF

Table 5.2-3. IS SCI Events from PZTs A-B-C-D

About the 428 events detected by Ch-E, they may be due to some noise effect on the channel, as they do not correspond to any detection on the other PZTs. In addition, these events do not appear correlated to IS Calibrations (Figure 7.4-13). Some correlation could be present with IS Temperature (Figure 7.4-12): in fact the IS signal decreases with increasing T.

5.2.2 Analysis of IS SCI events on the Redundant I/F

Here following is an analysis of the IS SCI events detected on the Redundant I/F.

IS Events detected by Channel A (Figure 8.4-7)
- 5 events detected at IS_Event_Time = 100298978.32, 100300778.30, 100300778.31, 100300844.28, 100301438.31 s
- 3 events detected by Ch-A are also detected by Ch-B
- no event detected by Ch-A is also detected by Ch-C-D-E

IS Events detected by Channel B (Figure 8.4-8)
- 4 events detected at IS_Event_Time = 100298978.32, 100300844.28, 100300956.02, 100301438.31 s
- 3 events detected by Ch-B are also detected by Ch-B
- no event detected by Ch-B is also detected by Ch-C-D-E

IS Events detected by Channel C
- no event detected

IS Events detected by Channel D
- no event detected

IS Events detected by Channel E
- no event detected

Conclusions:
- 3 events are simultaneously detected by Ch-A, B but not by Ch-C, D, E, at IS_Event_Time = 100298978.32, 100300844.28, 100301438.31 s
- 2 events are detected by Ch-A only at IS_Event_Time = 100300778.30, 100300778.31 s
- 1 event is detected by Ch-B only at IS_Event_Time = 100300956.02 s
- No event detected by Ch-C, D, E

The 6 events detected by Channels A-B are summarized in Table 5.2-4. 5 of these events do occur in coincidence with other GIADA transitions. The other one (detected by Ch-B only) does not seem correlated to any other GIADA event and cannot be easily identified.

IS	Time	Event
A, B	100298978.32	Laser OFF
A	100300778.30	Laser Power ON
A	100300778.31	Laser Power ON
A, B	100300844.28	Laser ON
B	100300956.02	
A, B	100301438.31	Laser OFF

Table 5.2-4. IS SCI Events from PZTs A-B

6. CONCLUSIONS

According to the above data elaboration and results, the following conclusions can be drawn about the Passive Payload Checkout 2:

- No loss of science TM was observed and no flood of ghost events was produced by GIADA.
- The not synchronised TM report (i.e., Connection report 17,2 which is the first packet produced by GIADA after the switch-on) had a wrong UTC time and this can result in absence of this packet in the time window of the test. **This issue has been understood**: if the packet is received on VC0, the delay of the time stamping is about some seconds, because the RMOC is able to calculate quite accurately when the packet was generated on-board. When the packet is received on VC1, the Mission Control Centre is not able to calculate the generation time since the packet could have been generated many days before.
- The internal (Impact Sensor, Laser and Power Supply) and external (Frangibolt and MBS's) **temperatures were in the nominal range**, as well as the current consumption during all the phases of the test. The GIADA cover operations followed the nominal behaviour.
- The received Acceptance Failure Report (1,2) '*Inconsistent Packet Data Field (TC Packet Type/Subtype = 20,1) - TC does not produce any change'* (which is received at the start of the MBS heating procedure) is **fully understandable** because GIADA has already the science TM enabled (refer to the procedure in Section 10) and thus the second 'Enable Sci TM' command is correctly discarded.
- At one of the IS power-on, both on Main and Red I/Fs, the event '*Hardware error in IS event detection circuitry. No IRQ received*' was received. This is a **known problem that may happen @ IS power-on**.
- Some problems on GIADA operation settings were experienced due to **wrong timing on the command timelines**, updated for PC2. All faced anomalies (see Section 5.1) are understood and attributed to the fact that the CF stored in SSMM was used during the test instead of the nominal CF uploaded with the sequence AGDS002A.
- The GDS is not saturated, so that GDS CAL data gave information about **internal stray-light levels**, that are similar to those measured in previous on-ground and in-flight tests.
- The GDS produced some scientific 'ghost events'. Most of them are at the saturation level.
- The IS produced several 'ghost events' on the PZT-E when operating on the Main I/F. **Therefore, the threshold level for this sensor has to be refined.** The results of the IS calibration are the same as measured during previous tests.
- MBS frequency and frequency-temperature trends are as in previous tests. Only MBS 1 presents a slight increase in frequency (about 40-50 Hz) with respect to PC1 test.
- The CREP generated by the EGSE S/W shows an anomalous coincidence of "Begin time of operation" and "End time of operation" for "open cover" on the Main I/F. This coincidence is due to a bug in the conversion from the Hex time stamp values to the CREP time stamp values in the EGSE SW. **The problem shall be fixed in future GES update.**

7. PC2 DATA ANALYSIS – MAIN INTERFACE

7.1 GIADA STATUS

Figure 7.1-1. HK Status of GIADA and S/S vs. time - Main

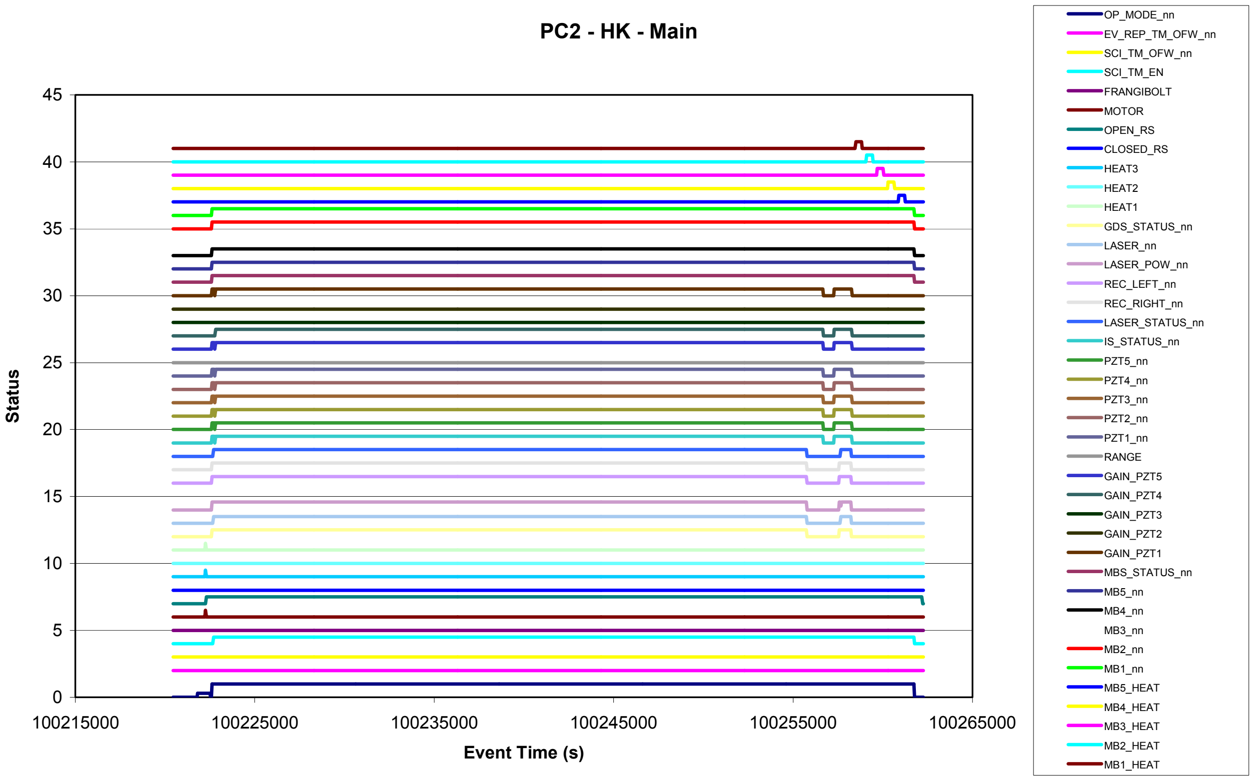


Figure 7.1-2. Evolution of all temperatures vs. time - HK, HK-SCI, SCI - Main

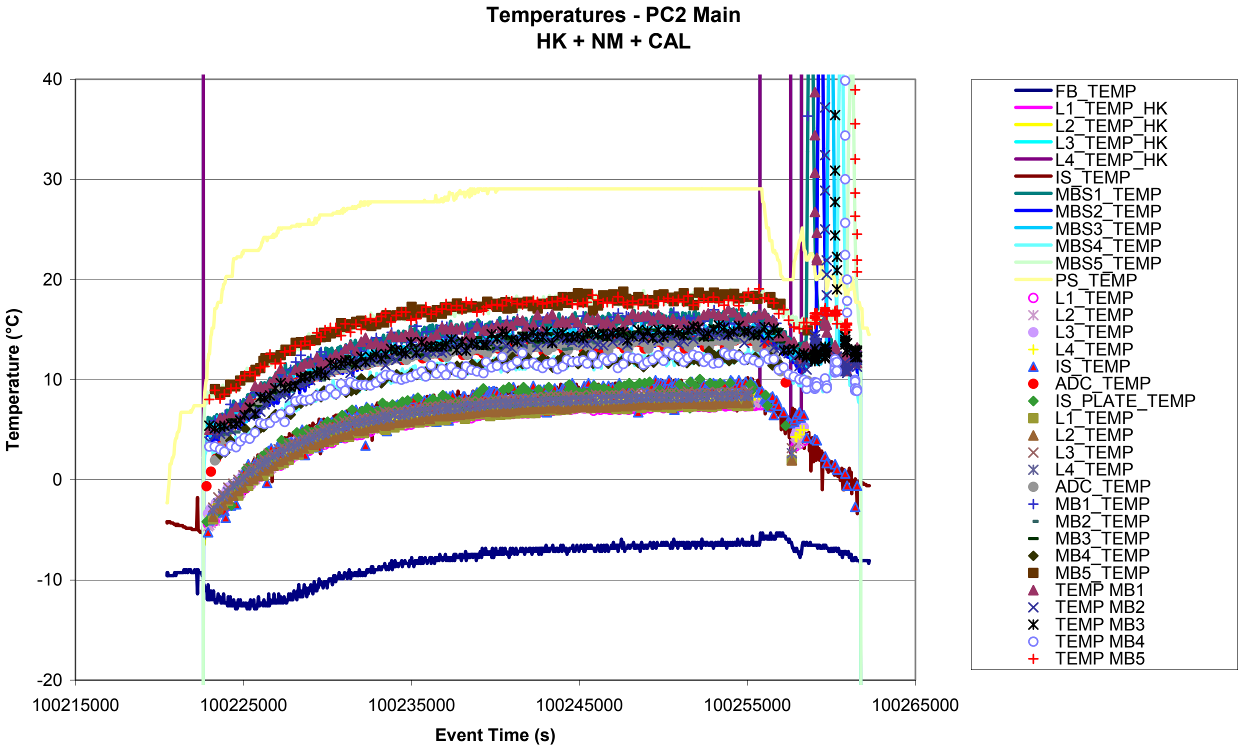


Figure 7.1-3. Evolution of temperatures of system elements vs. time - HK, HK-SCI, SCI - Main

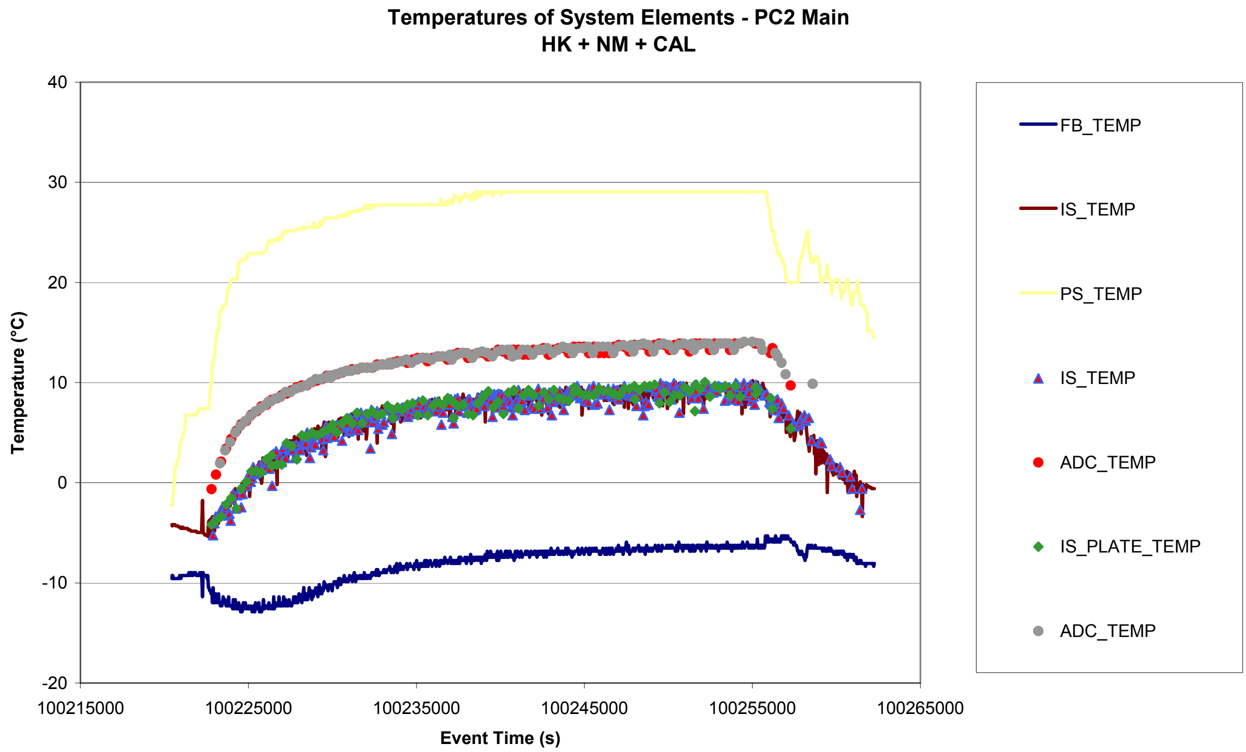


Figure 7.1-4. Evolution of temperatures of sub-systems vs. time - HK, HK-SCI, SCI - Main

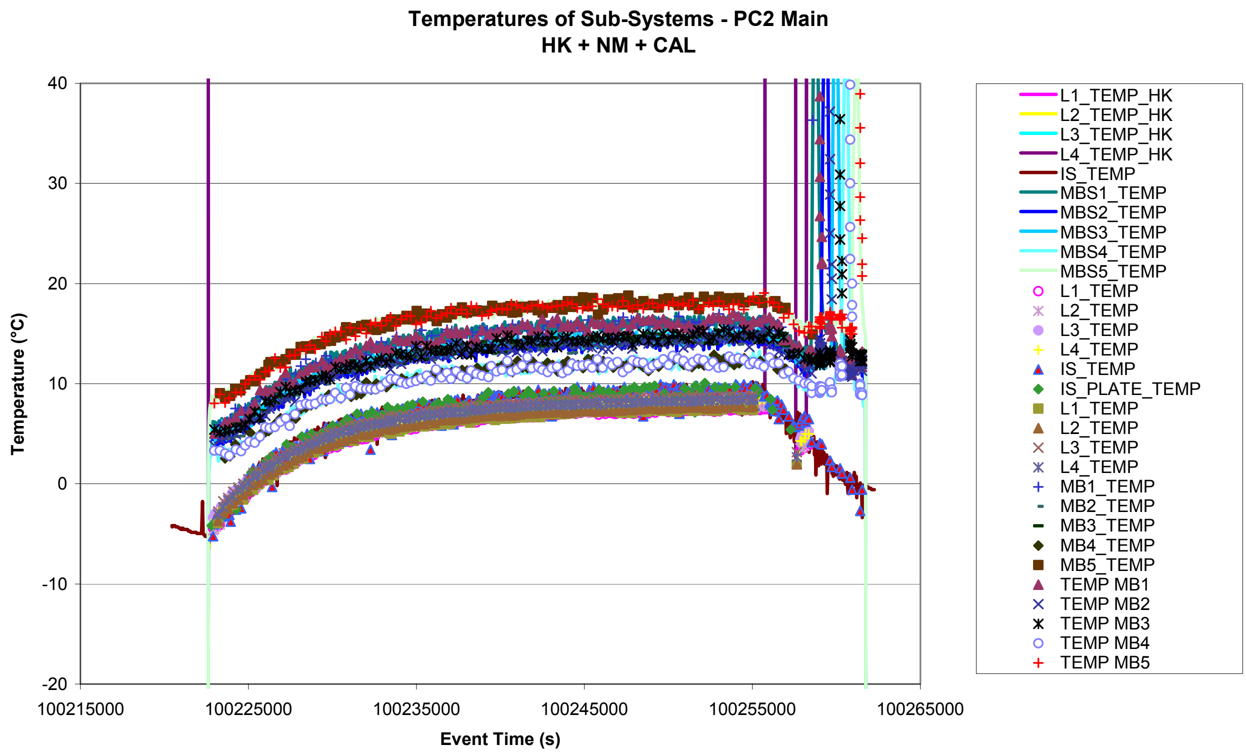


Figure 7.1-5. Operation Status vs. time - Main

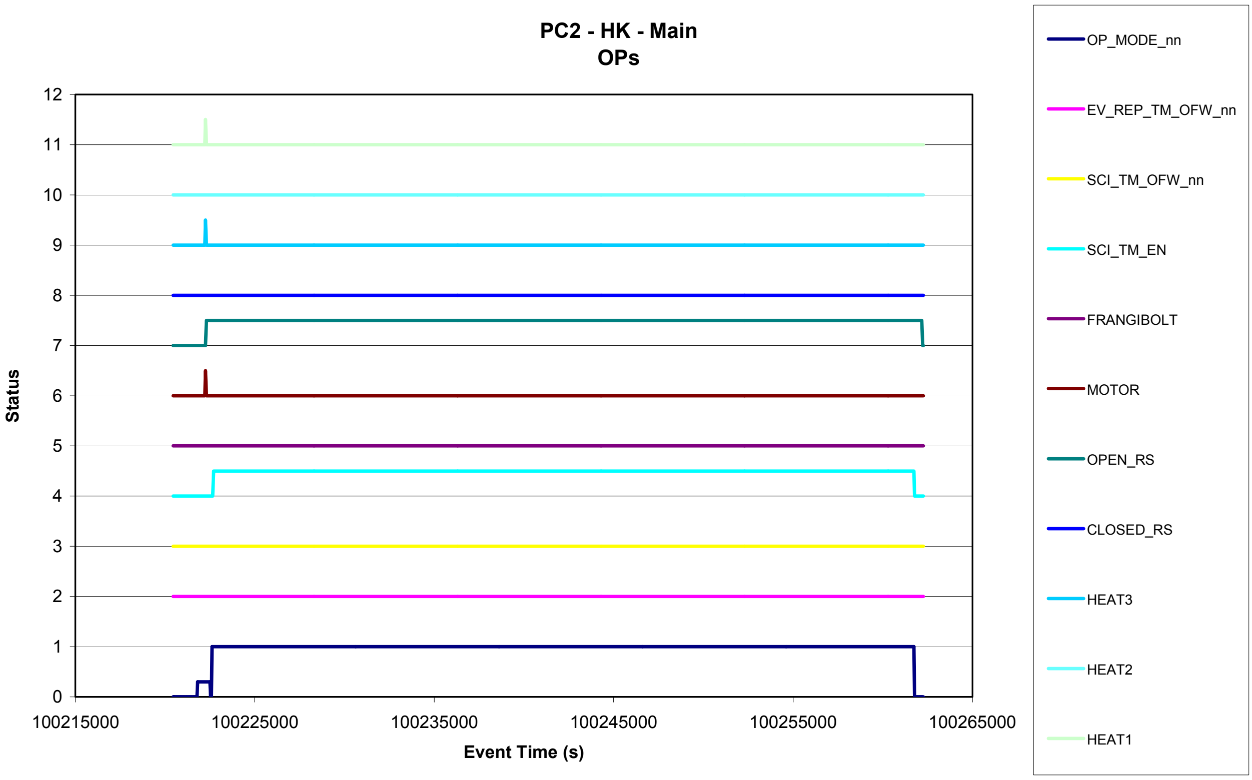


Figure 7.1-6. Power behaviour - Main

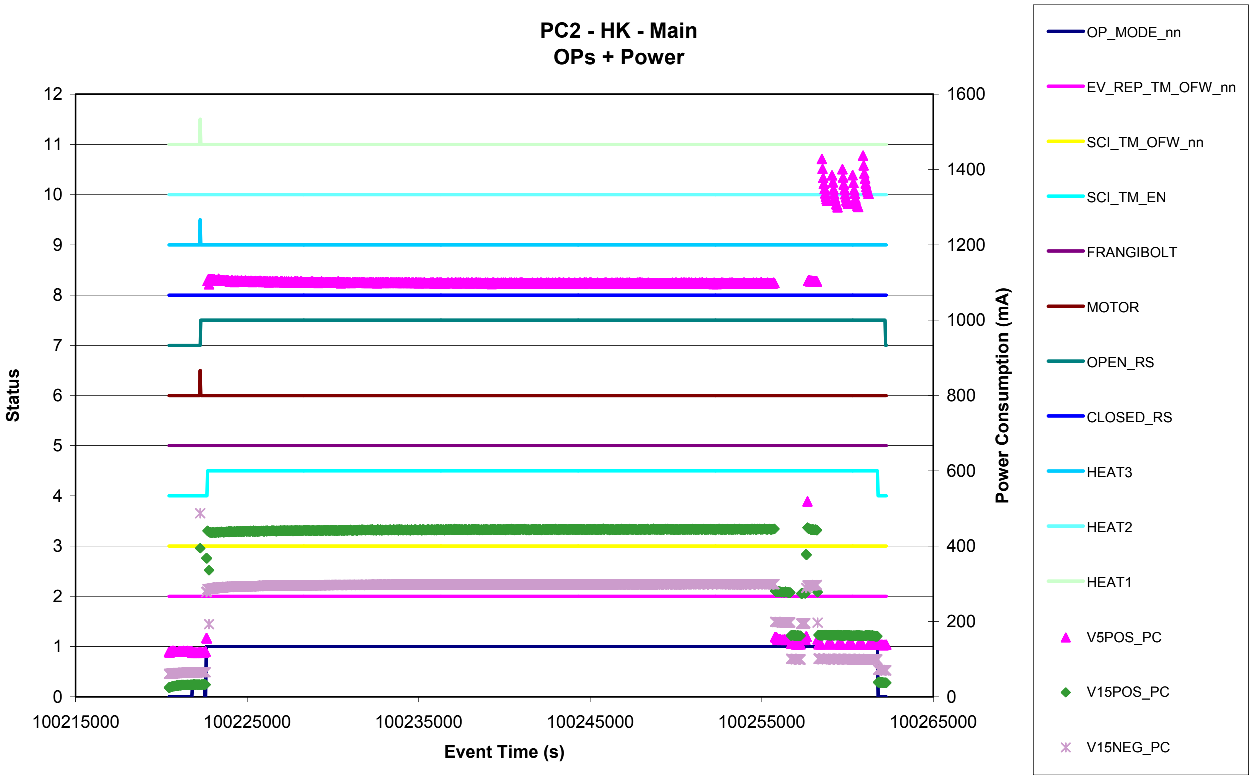


Figure 7.1-7. Power and PS temperature behaviour - Main

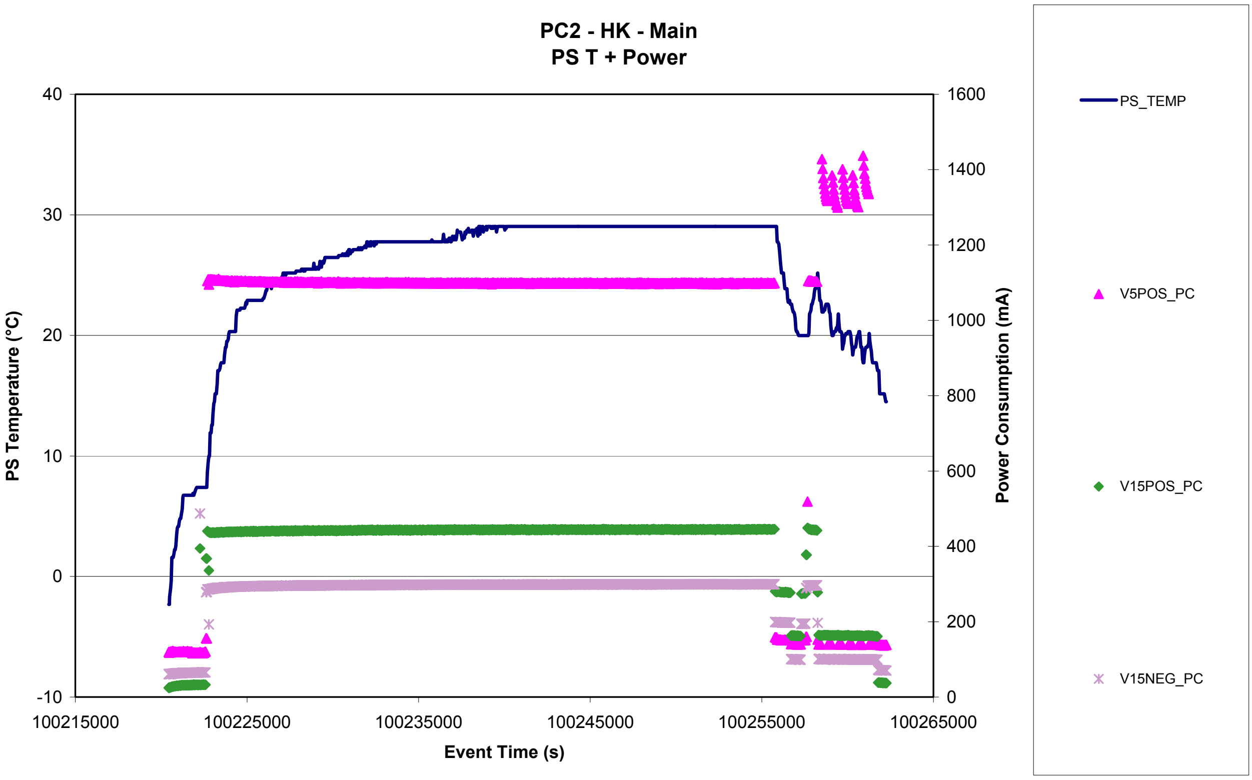


Figure 7.1-8. Source Sequence Count (SSC) of HK Telemetry vs. Time - Main

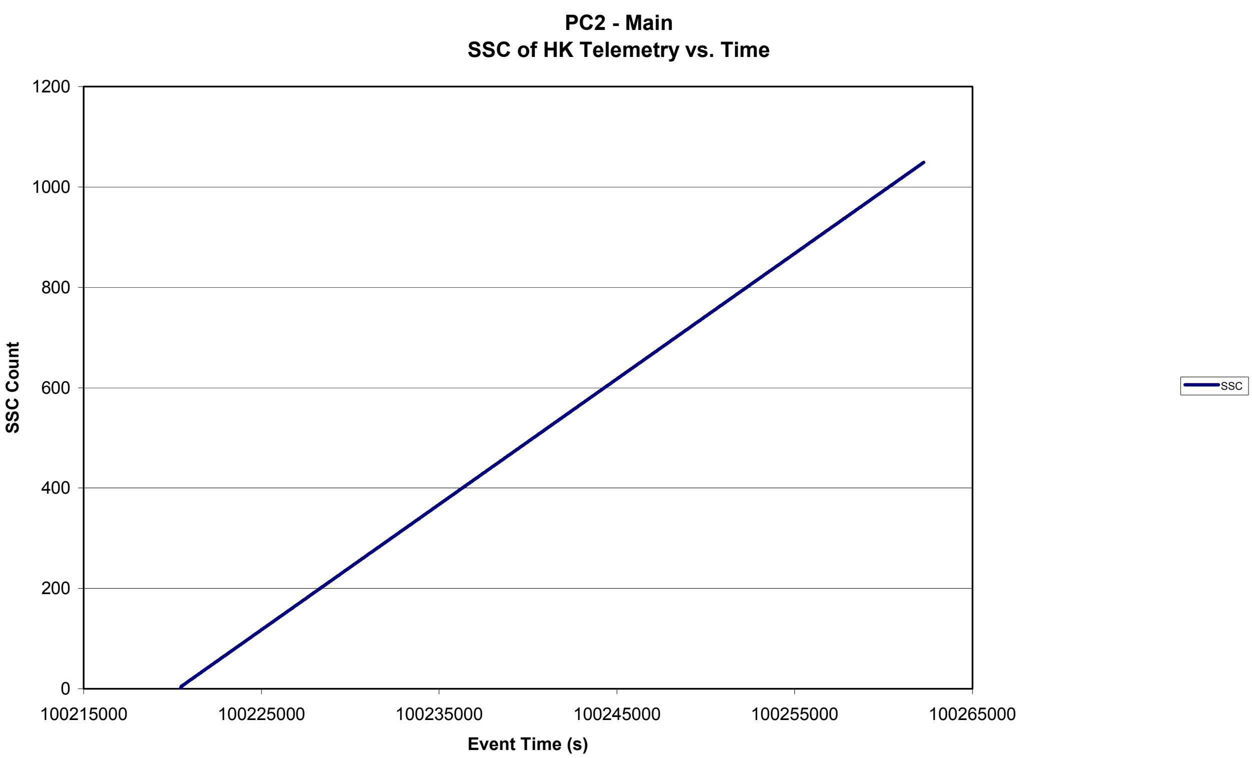


Figure 7.1-9. Source Sequence Count (SSC) of HK Telemetry vs. Number - Main

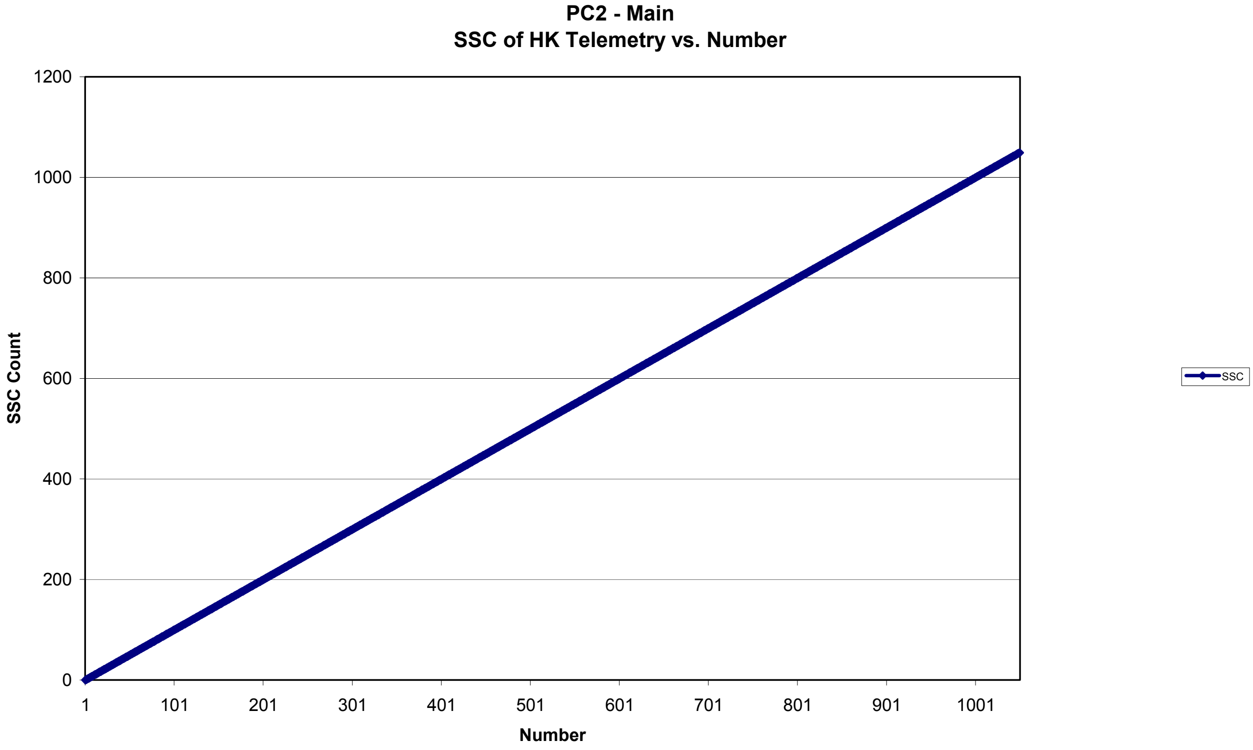


Figure 7.1-10. Source Sequence Count (SSC) of SCI Telemetry vs. Time - Main

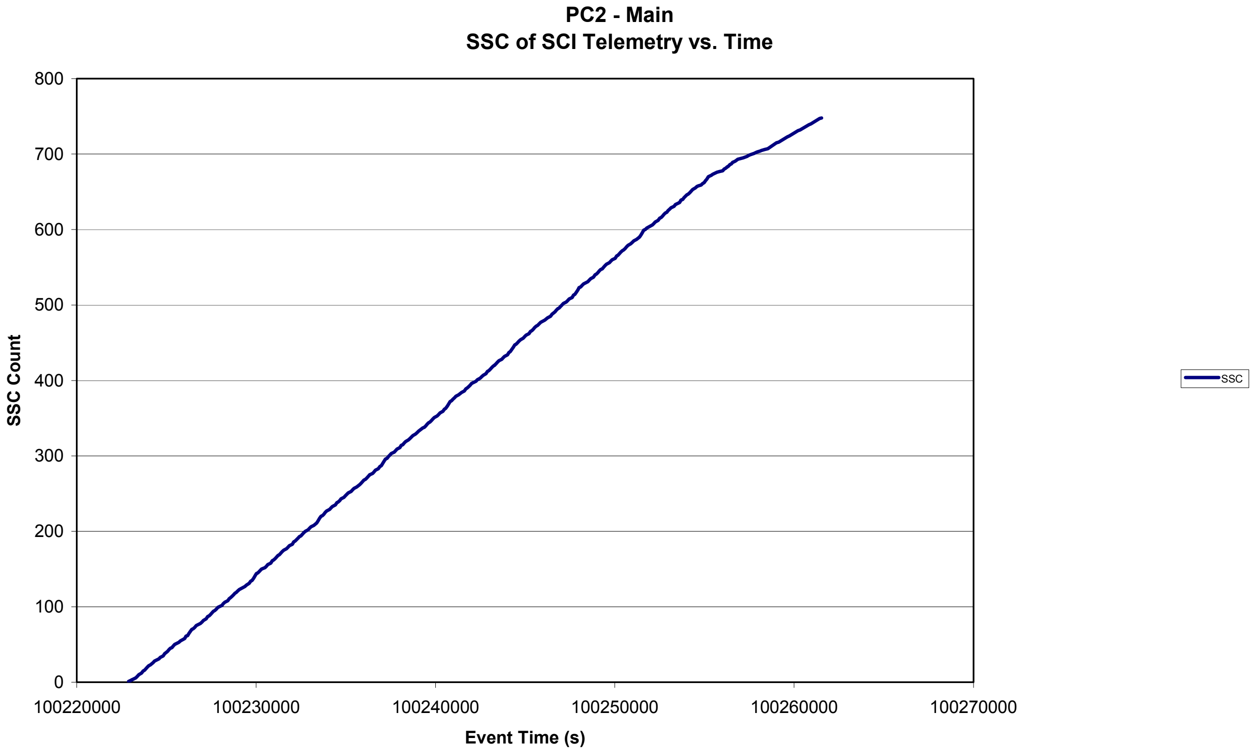
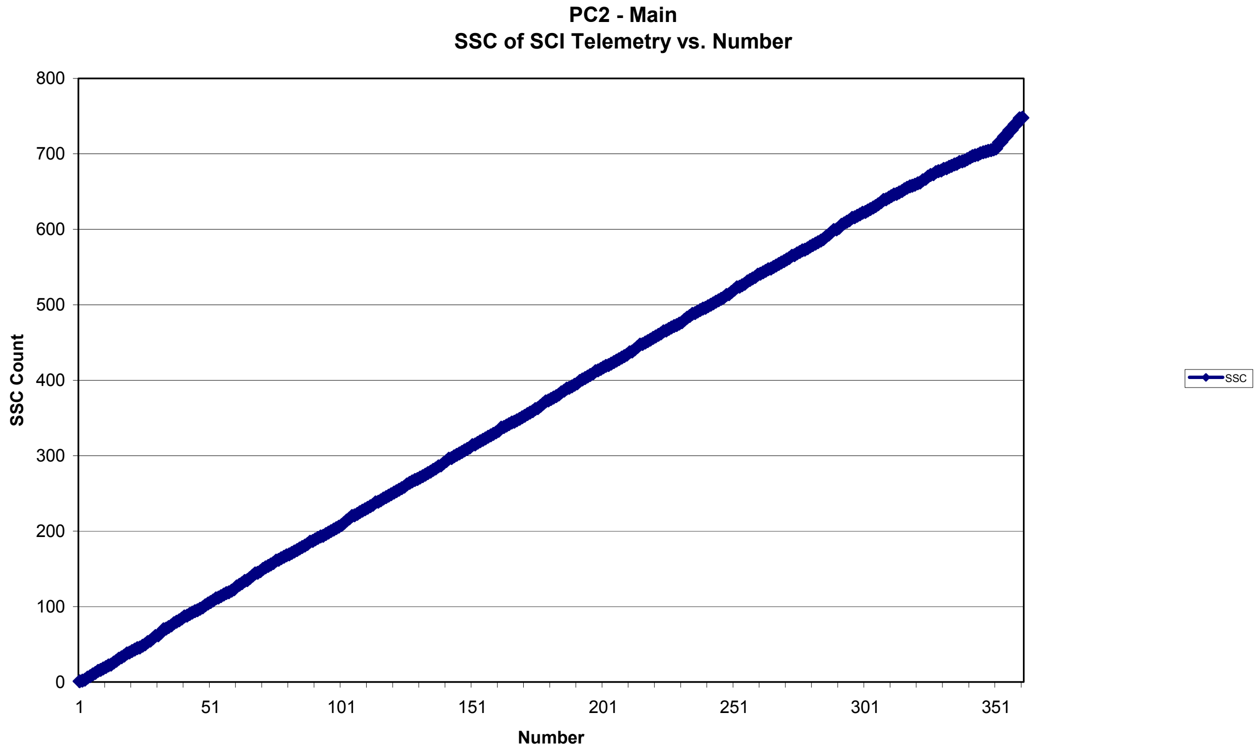


Figure 7.1-11. Source Sequence Count (SSC) of SCI Telemetry vs. Number - Main



7.2 COVER REPORTS

7.2.1 Open Cover

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HEADER_END
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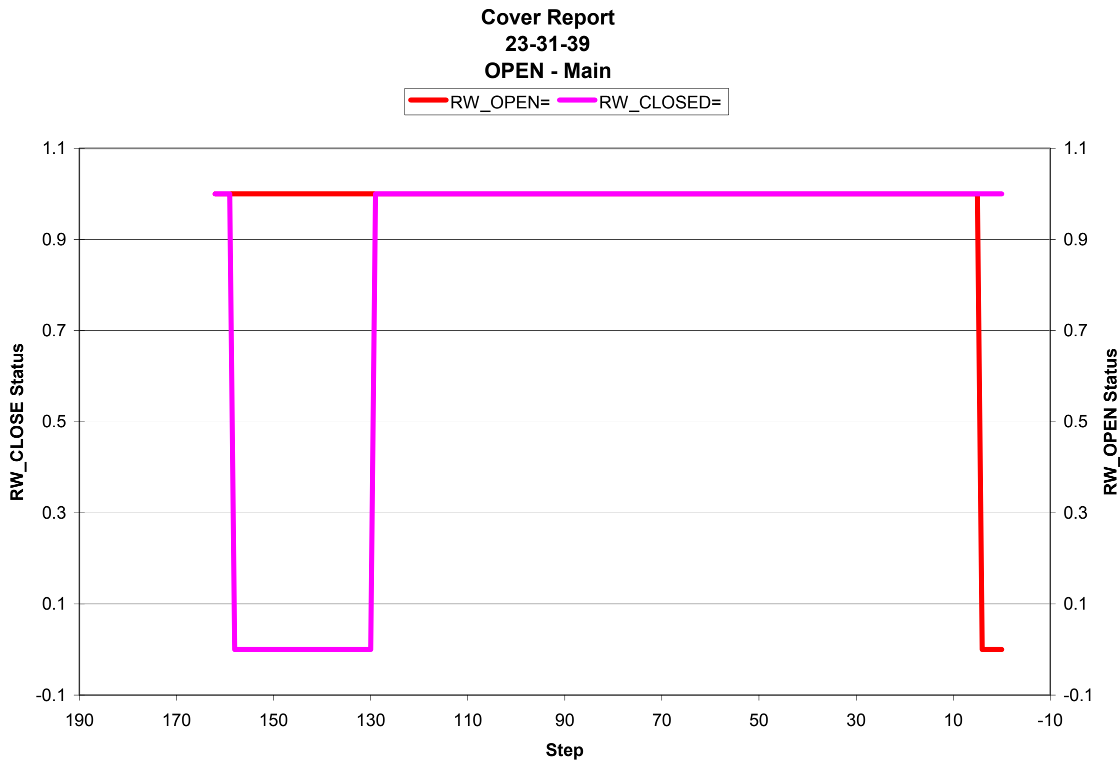
// Generated by 'GIADA_EGSE_SW '
//
MOVEMENT DIRECTION: To open
BEGIN TIME OF OPERATION: 100222272.000000
END TIME OF OPERATION: 100222272.000000

Figure 7.2-1 Cover Report – Open - Main



7.2.2 Close Cover

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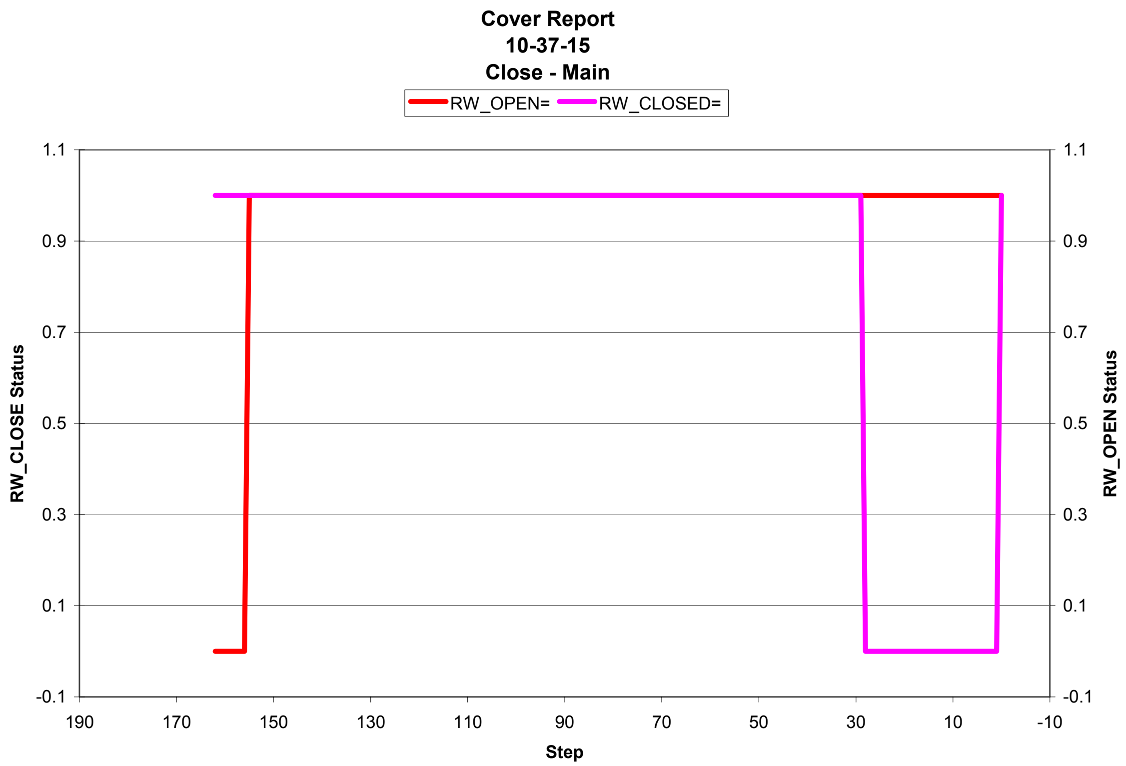
Figure 7.2-2 Cover Report – Close - Main



7.3 GRAIN DETECTION SYSTEM (GDS)

7.3.1 GDS – Status

Figure 7.3-1. GDS Operation Status vs. time - Main

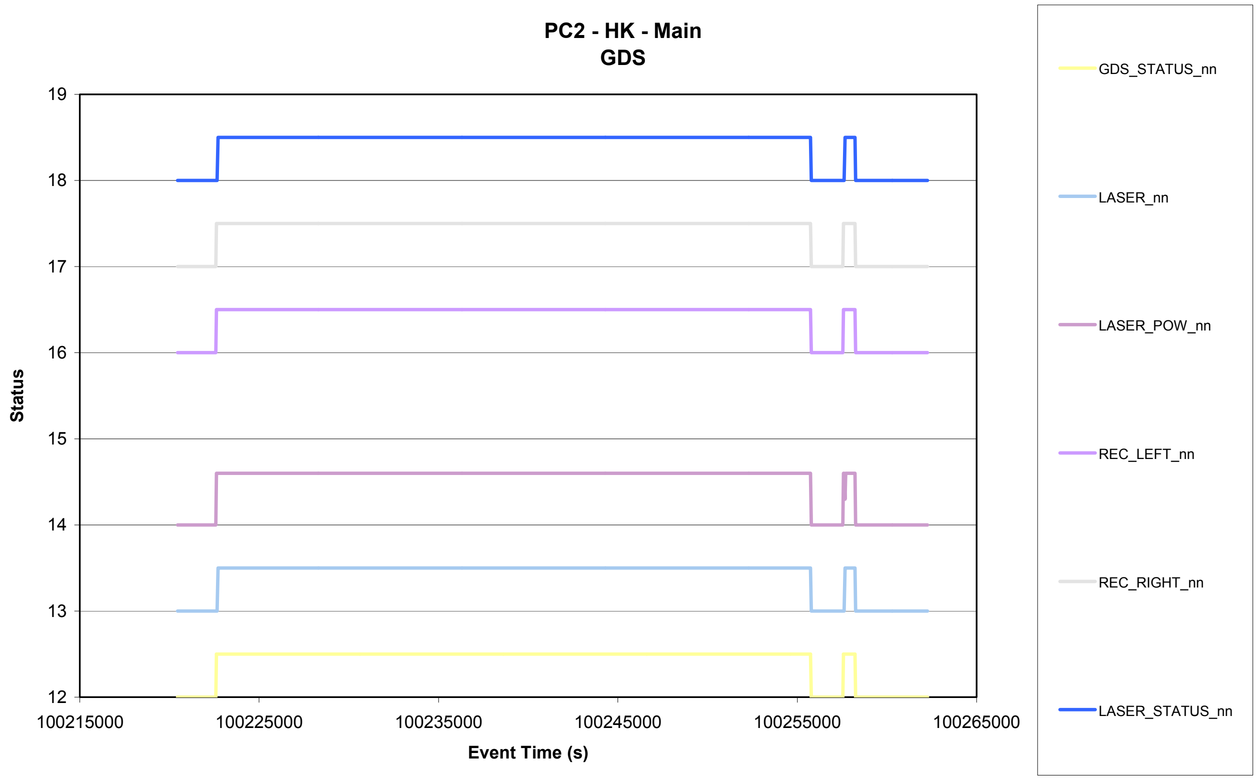


Figure 7.3-2. GDS Thresholds change vs. time - Main

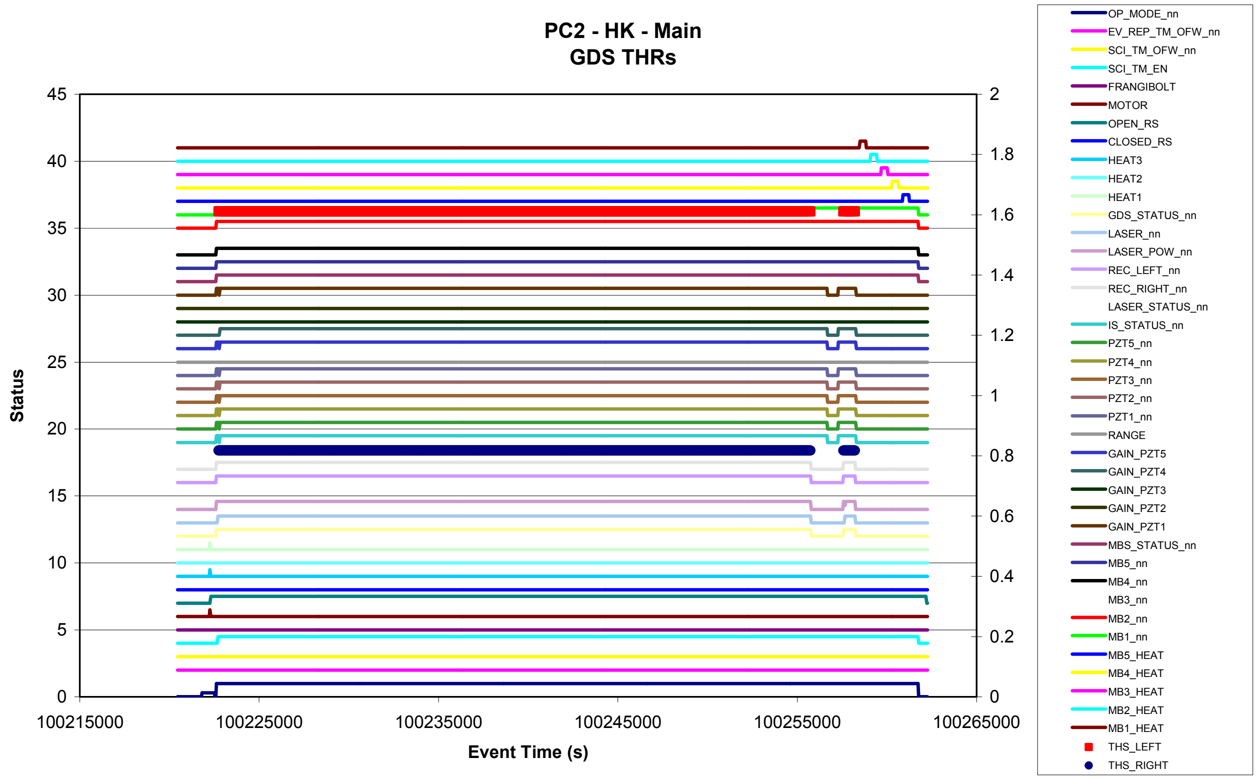


Figure 7.3-3. GDS Laser Temperatures vs. time (HK, HK-SCI, SCI) - Main

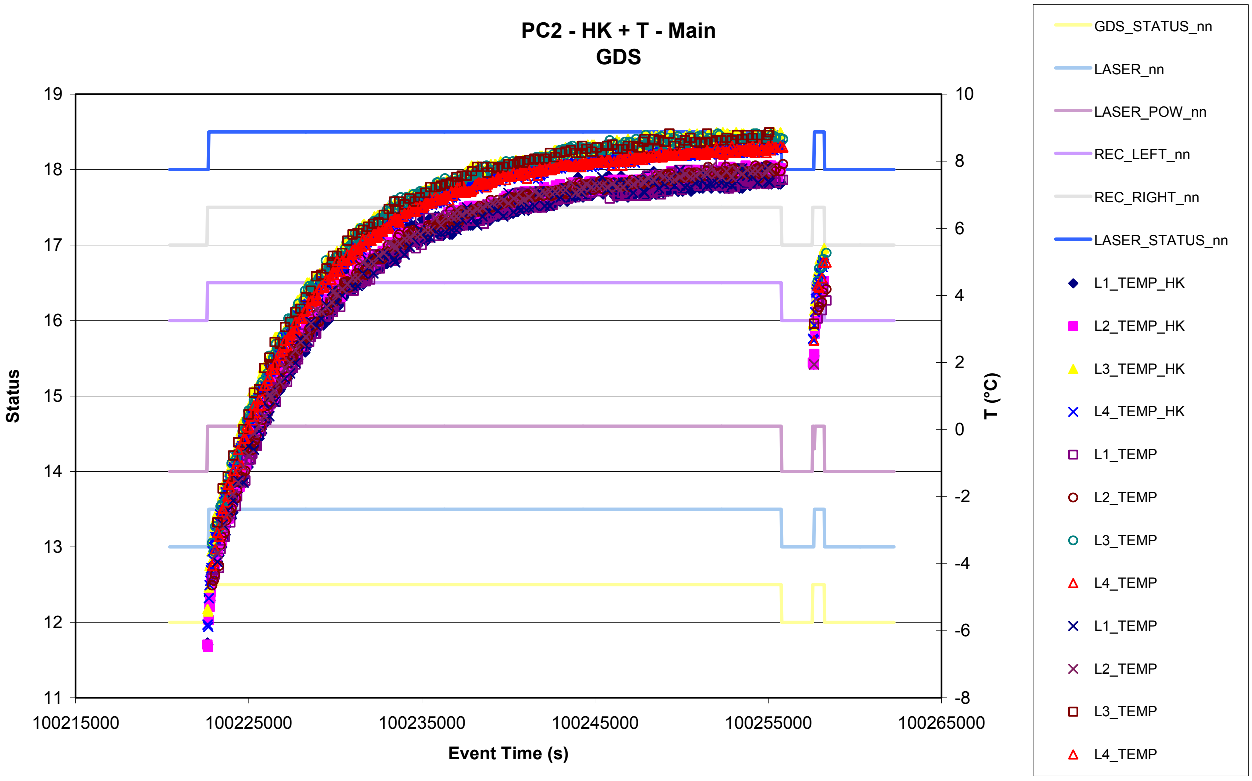


Figure 7.3-4. GDS Laser Monitor vs. time (HK, HK-SCI, SCI) - Main

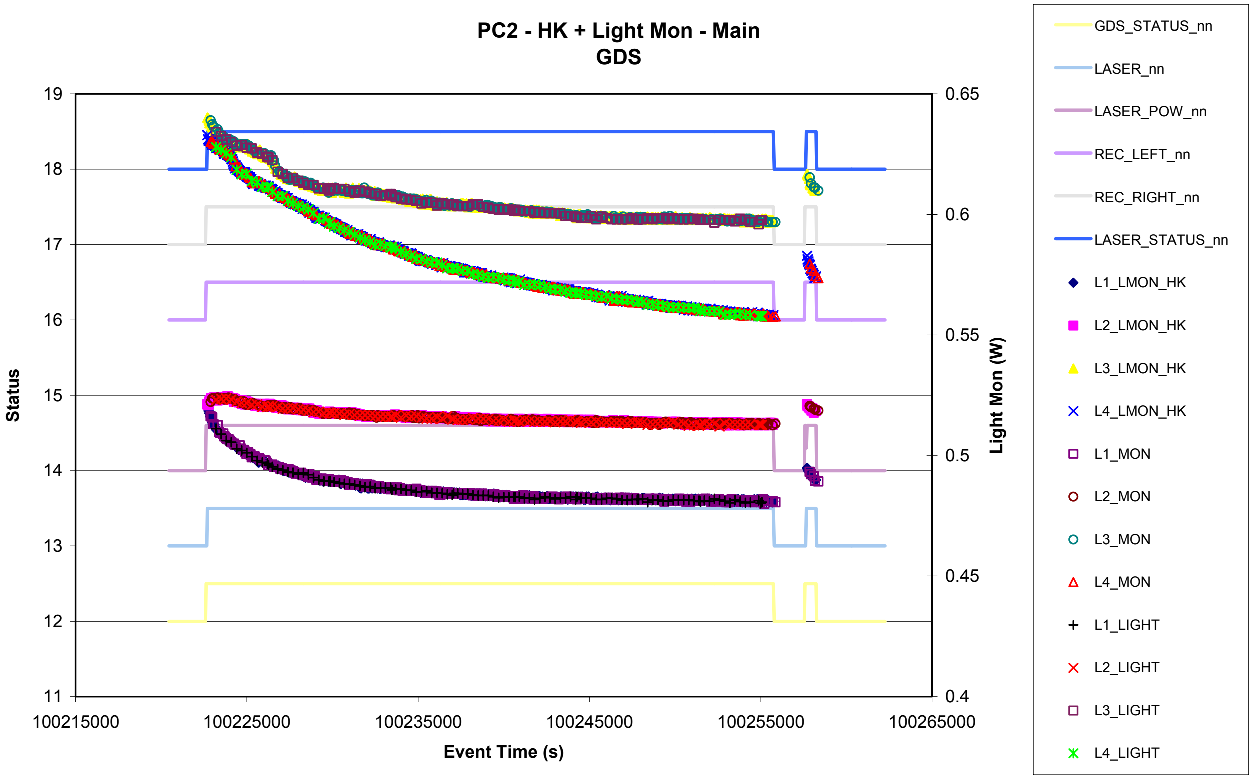


Figure 7.3-5. Laser 1 Light Monitor versus Temperature (HK, HK-SCI, SCI) - Main

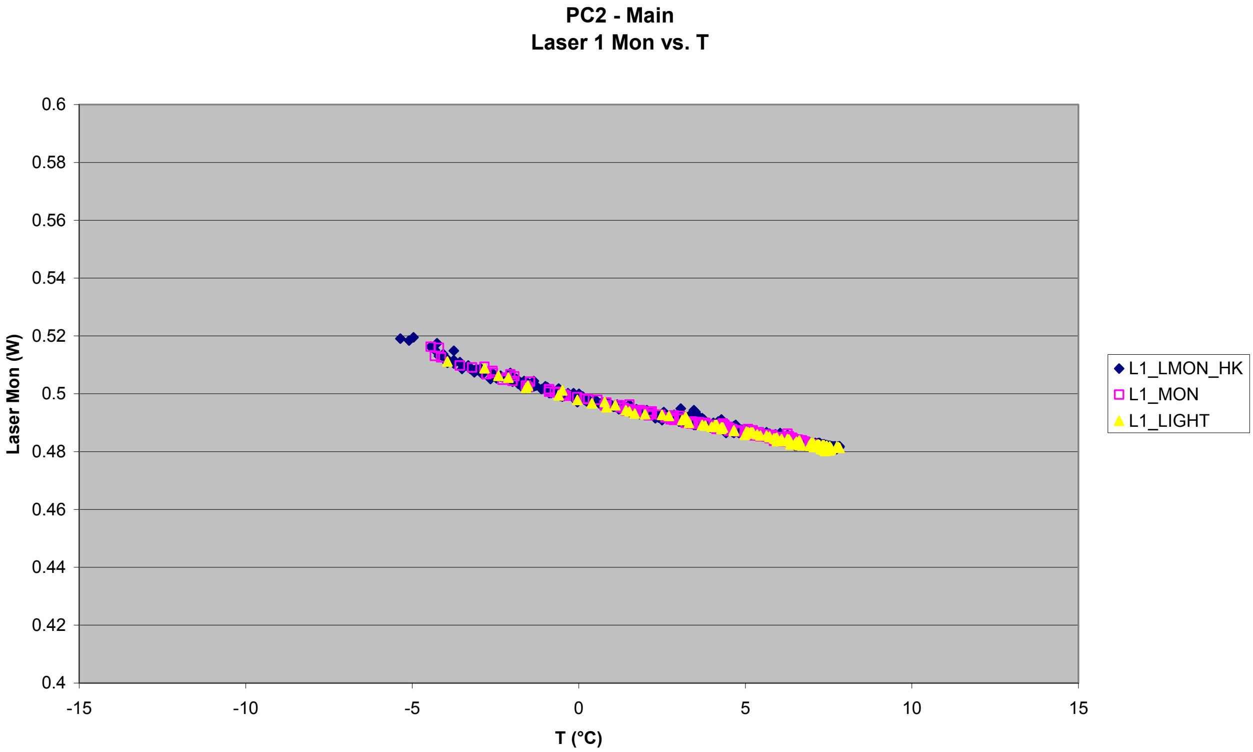


Figure 7.3-6. Laser 2 Light Monitor versus Temperature (HK, HK-SCI, SCI) - Main

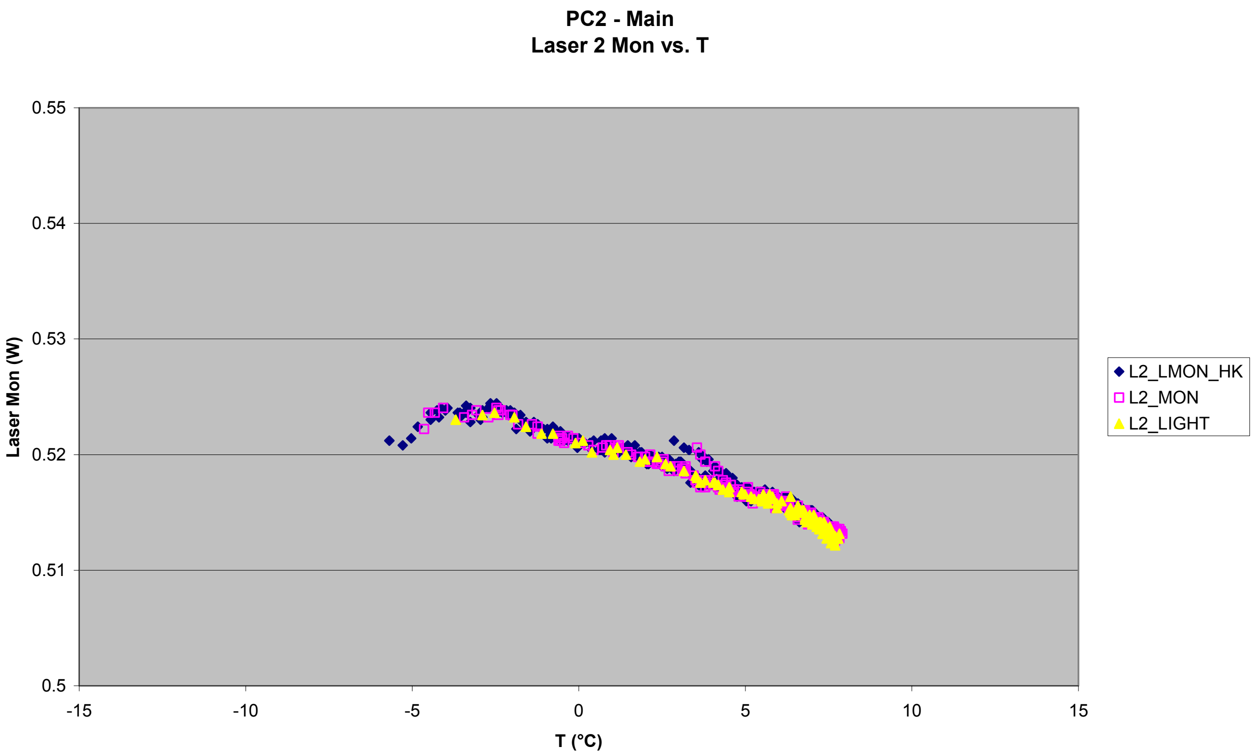


Figure 7.3-7. Laser 3 Light Monitor versus Temperature (HK, HK-SCI, SCI) - Main

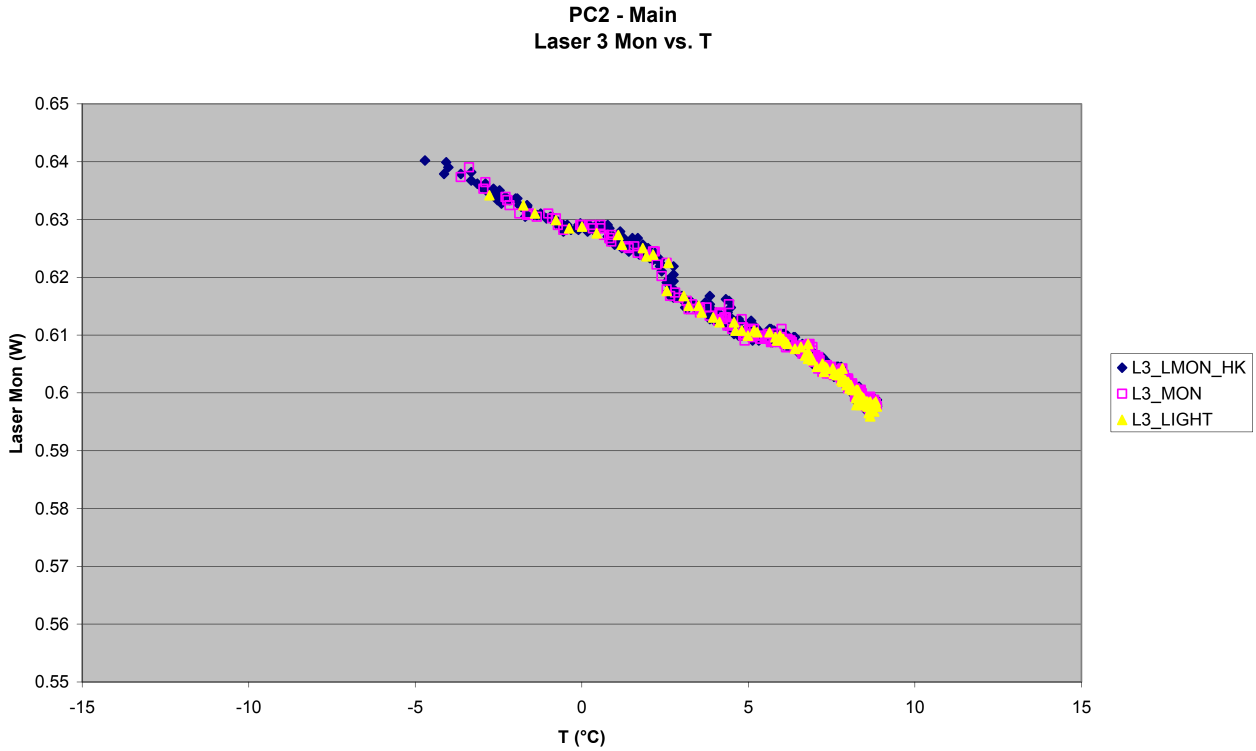
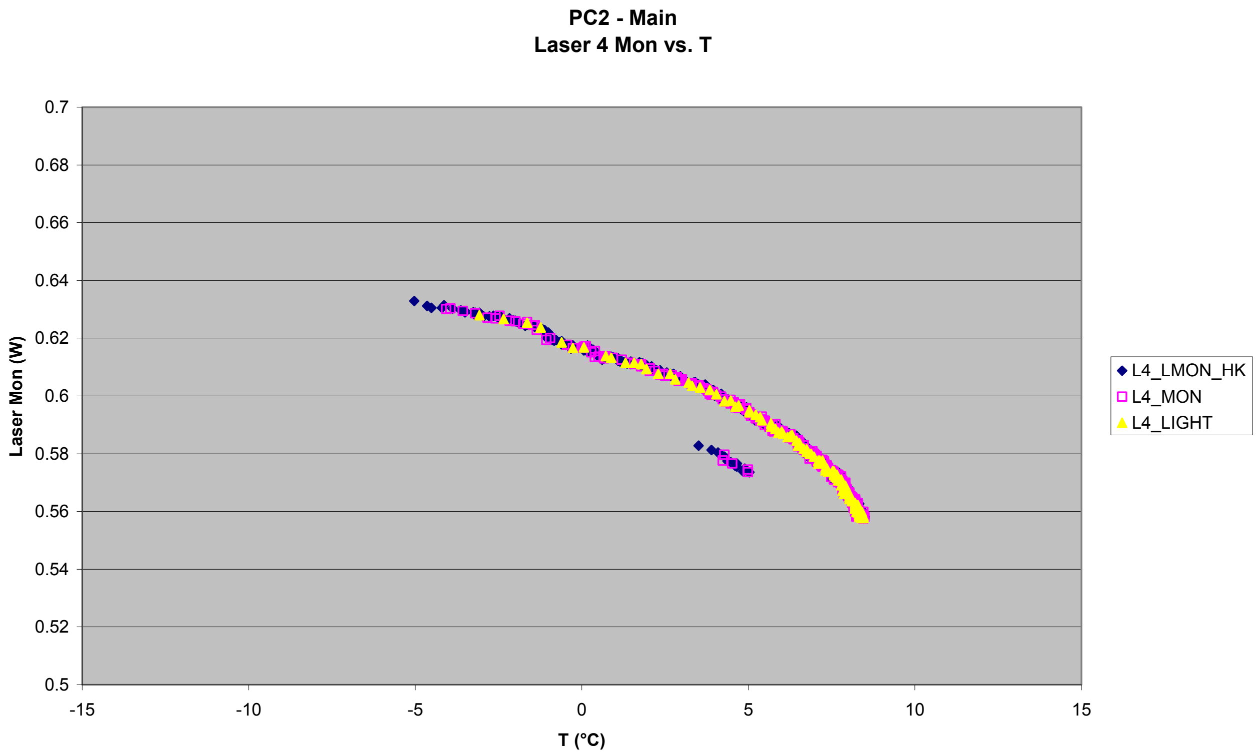


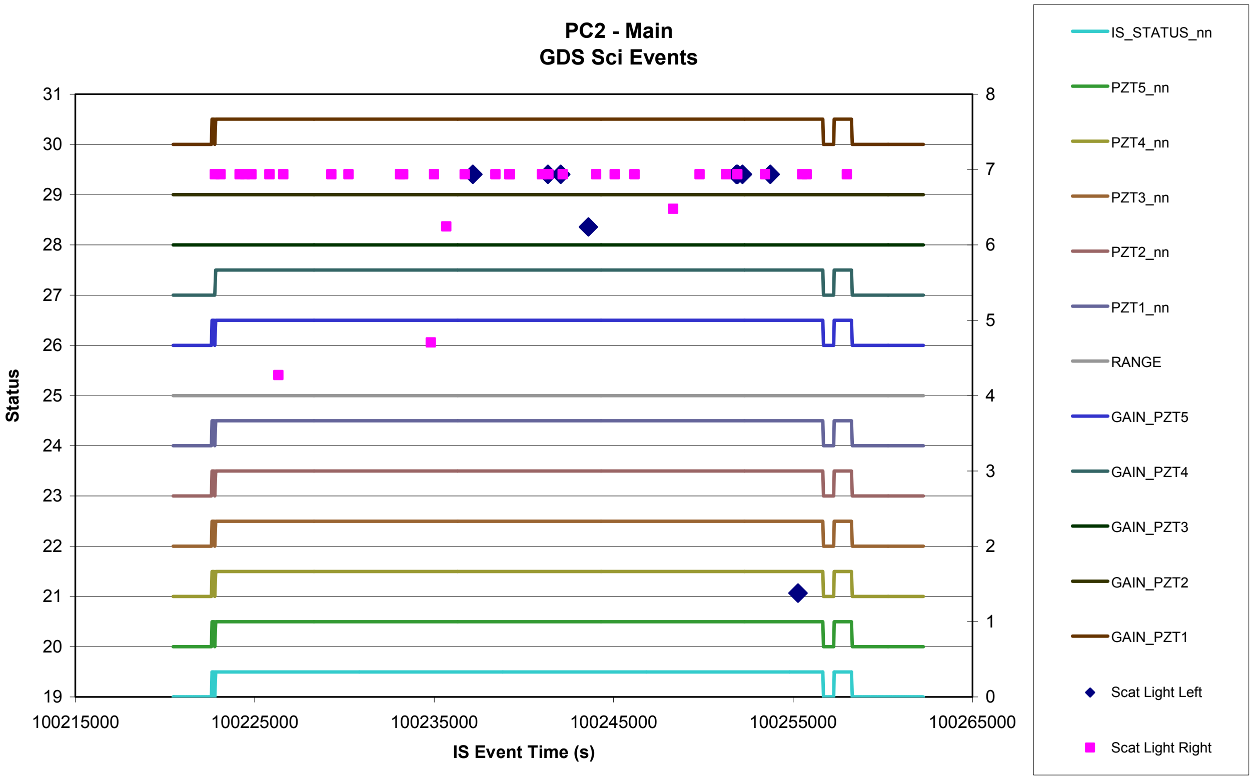
Figure 7.3-8. Laser 4 Light Monitor versus Temperature (HK, HK-SCI, SCI) - Main



7.3.2 GDS – Behaviour

7.3.2.1 Science Events

Figure 7.3-9. GDS Left and Right SCI events vs. time - Main

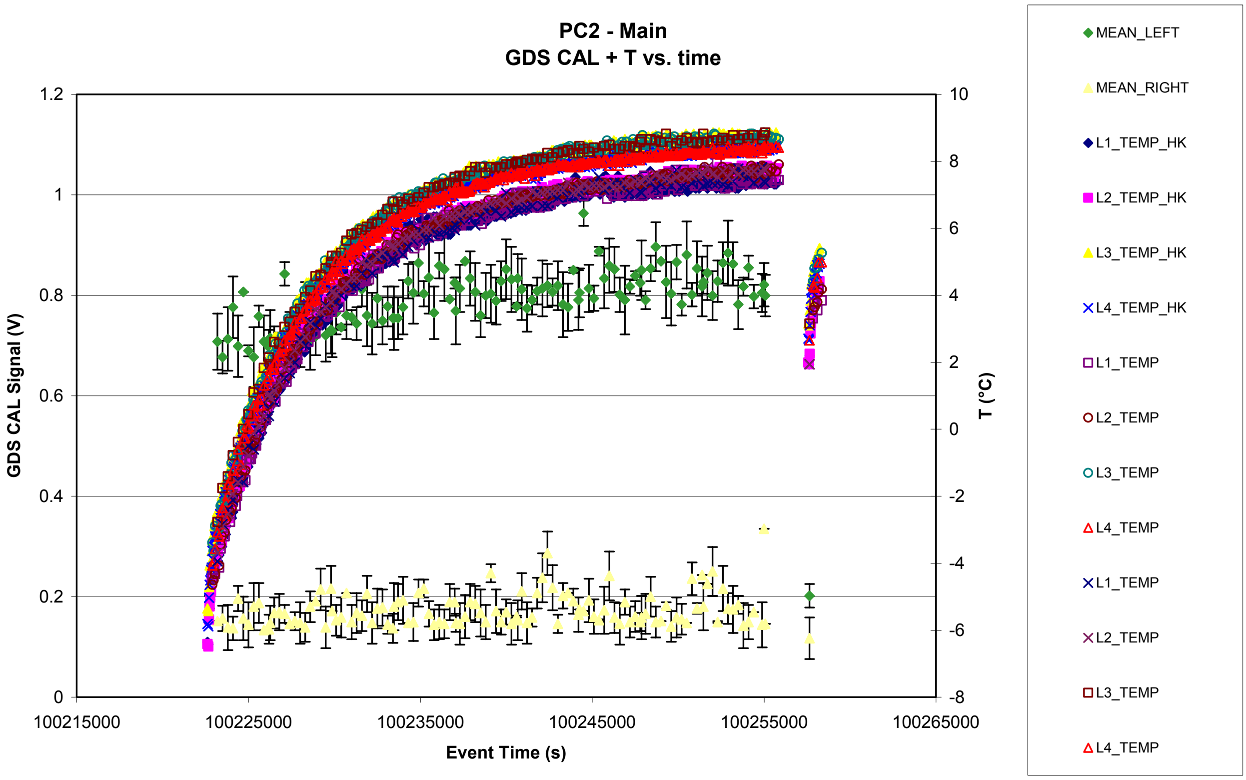


7.3.2.2 Event Rates

Not applicable

7.3.2.3 CAL

Figure 7.3-10. Evolution of GDS CAL Left and Right signals (and T) vs. time (Main)



7.4 IMPACT SENSOR (IS)

7.4.1 IS – Status

Figure 7.4-1. IS Operation Status vs. time - Main

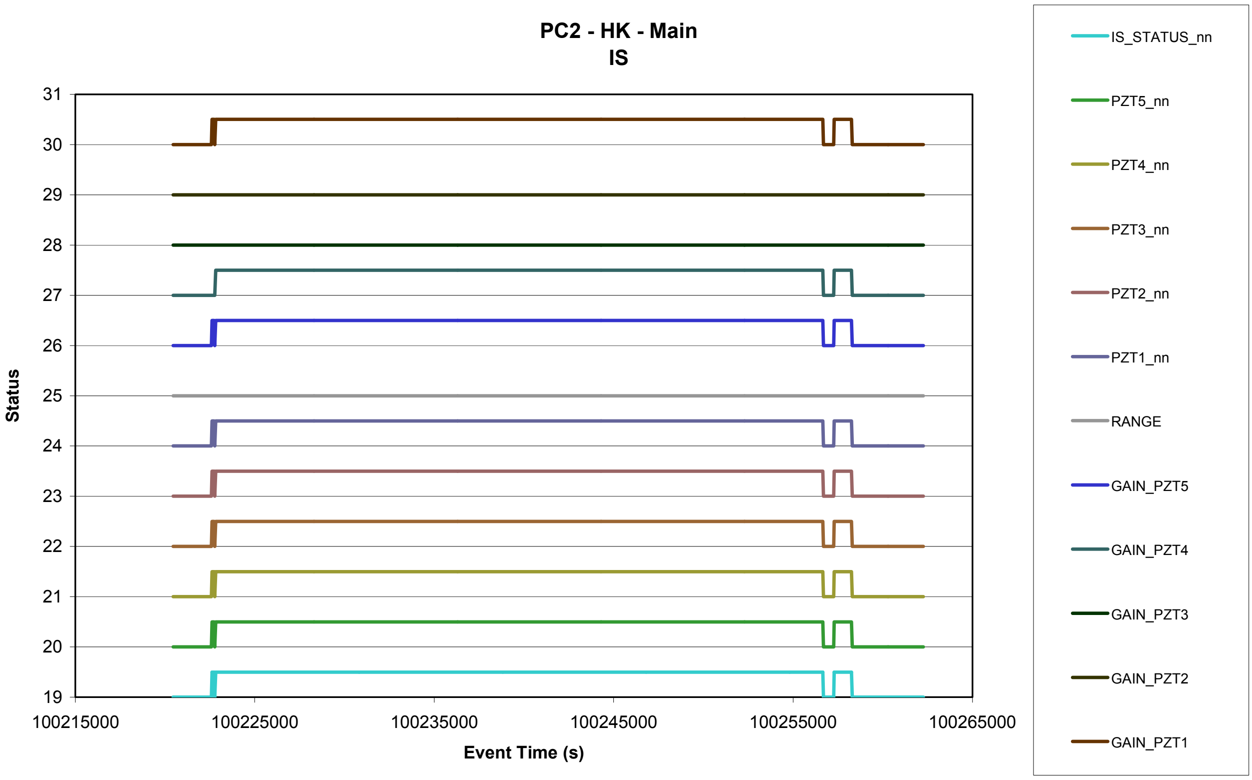


Figure 7.4-2. IS PZT 3 Thresholds change vs. time - Main

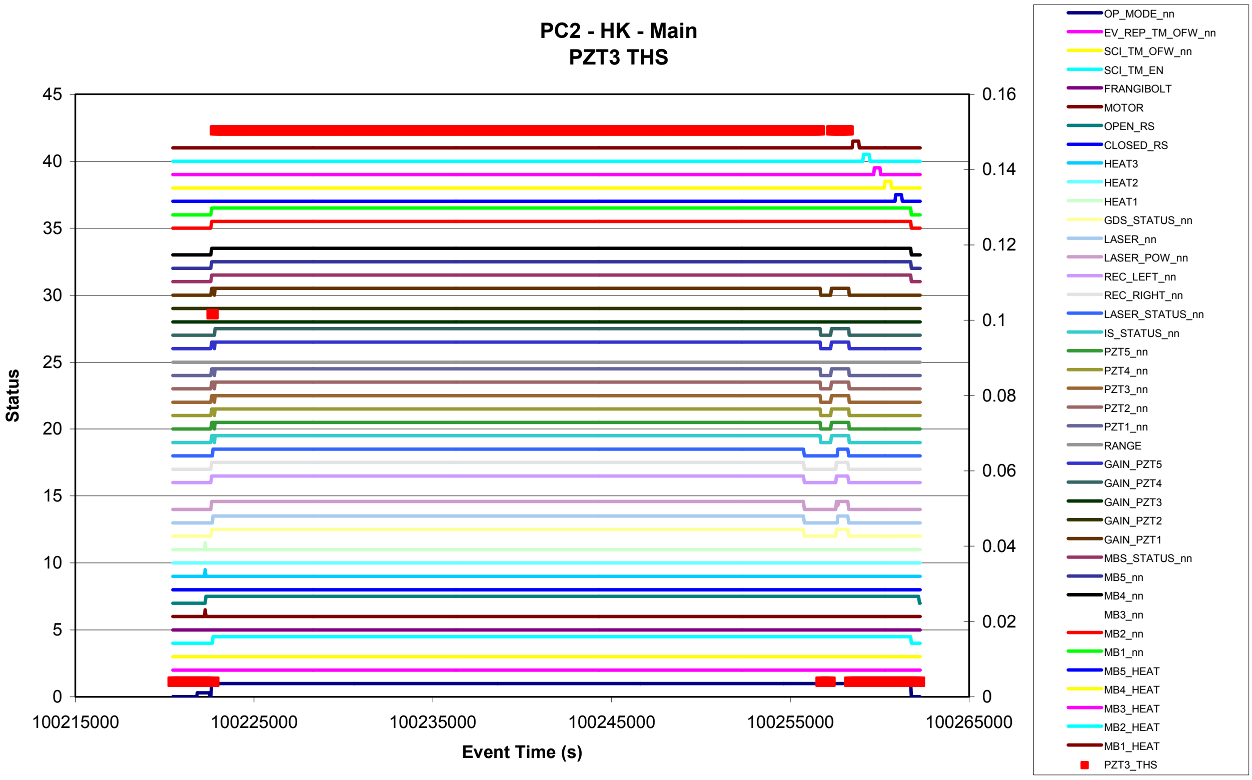


Figure 7.4-3. IS PZT 5 Thresholds change vs. time - Main

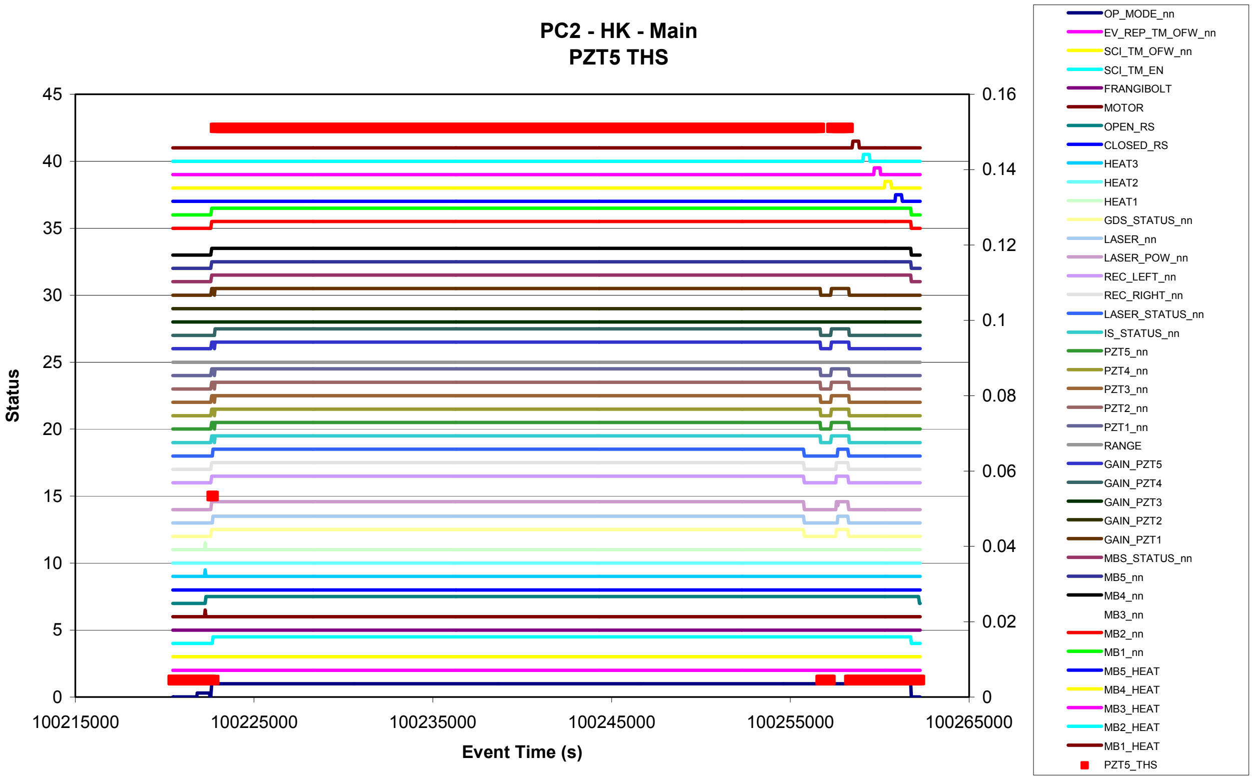
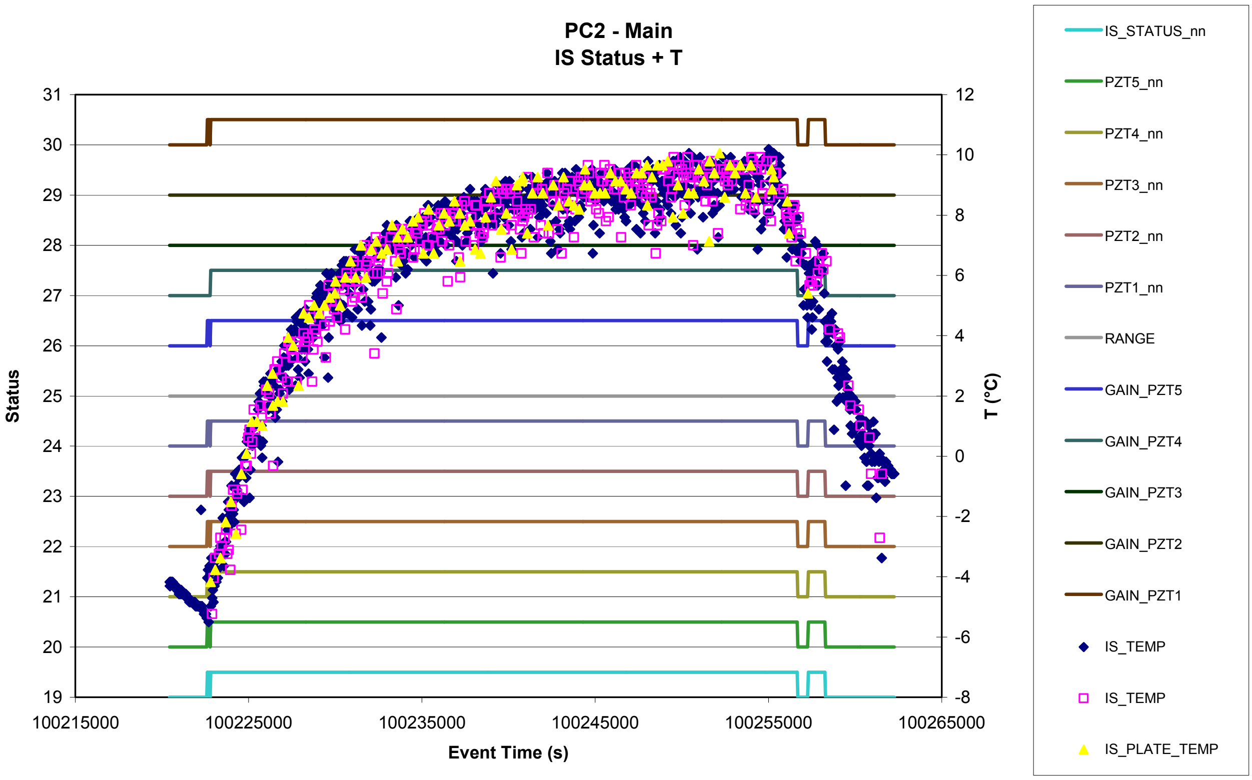


Figure 7.4-4. IS Temperature vs. time (HK, HK-SCI, SCI) - Main



7.4.2 IS – Behaviour

7.4.2.1 Science Events

Figure 7.4-5. All PZT Events (det and non-det) vs. time - Main

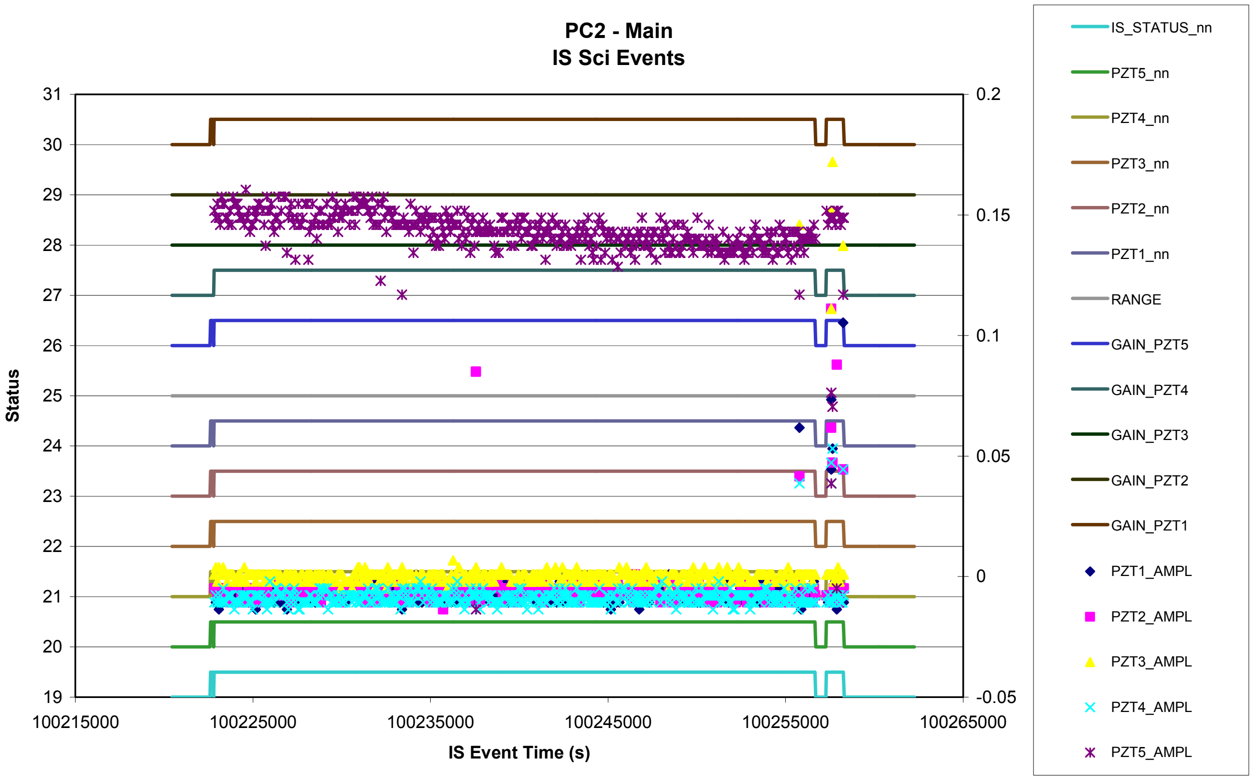


Figure 7.4-6. PZT 1-2-3-4 Detected Events vs. time - Main

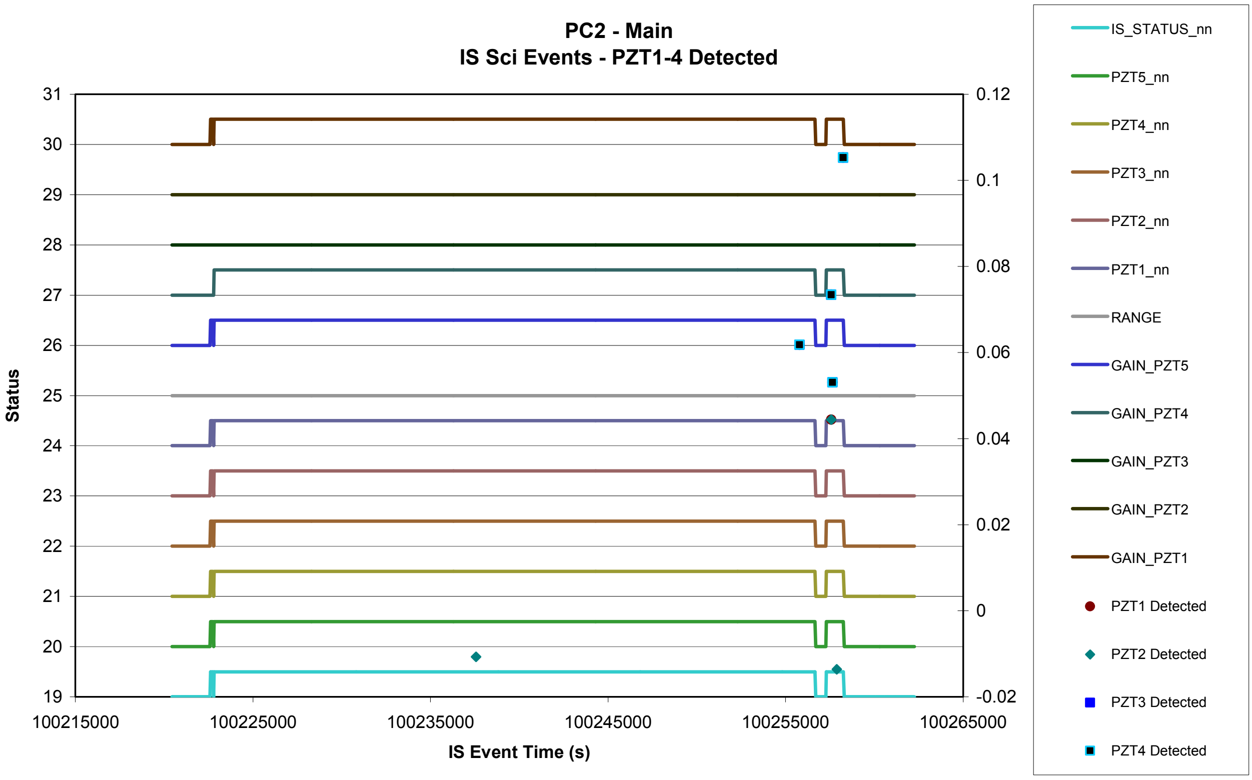


Figure 7.4-7. PZT 1 Detected Events vs. time - Main

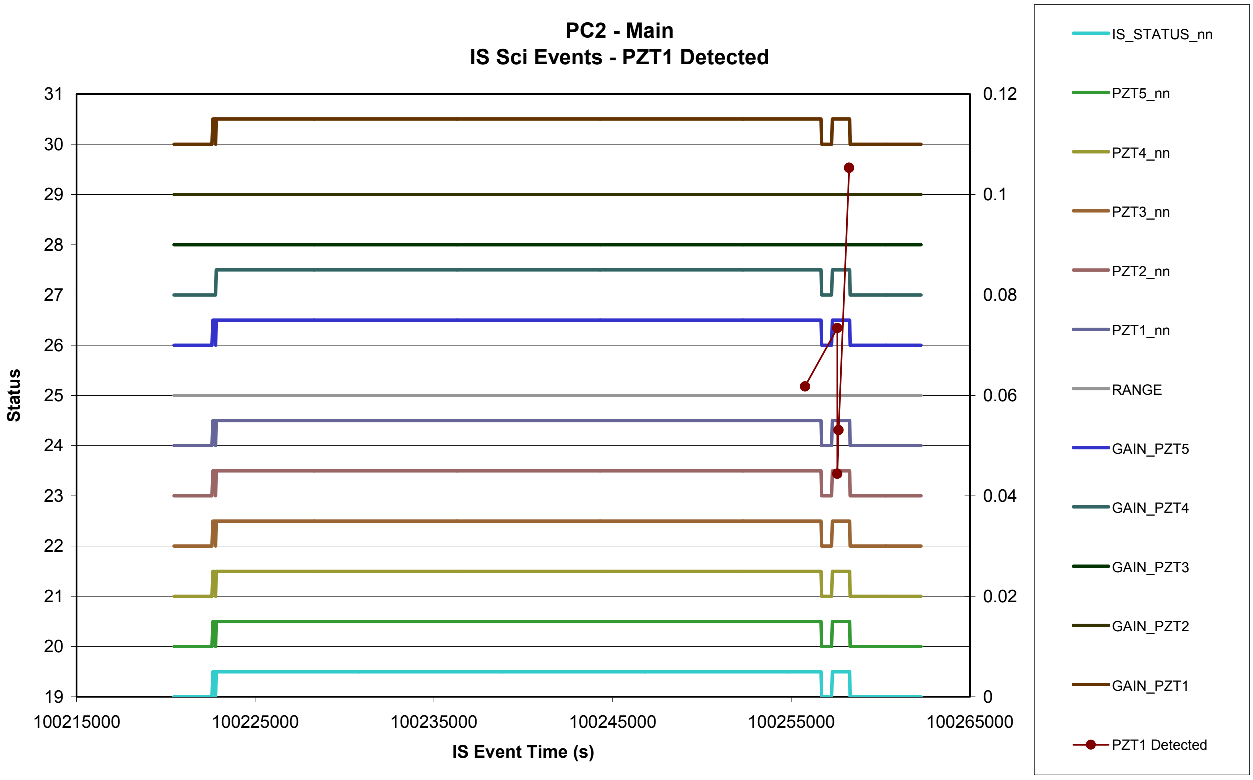


Figure 7.4-8. PZT 2 Detected Events vs. time - Main

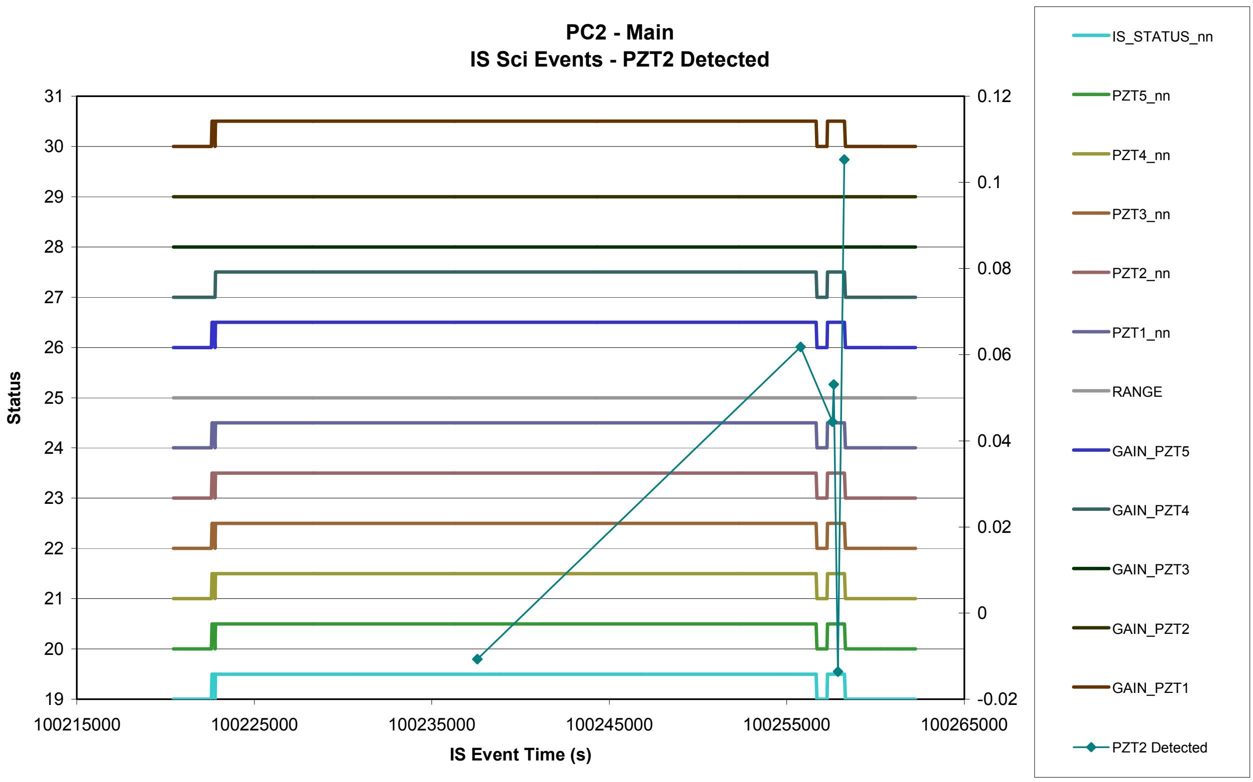


Figure 7.4-9. PZT 3 Detected Events vs. time - Main

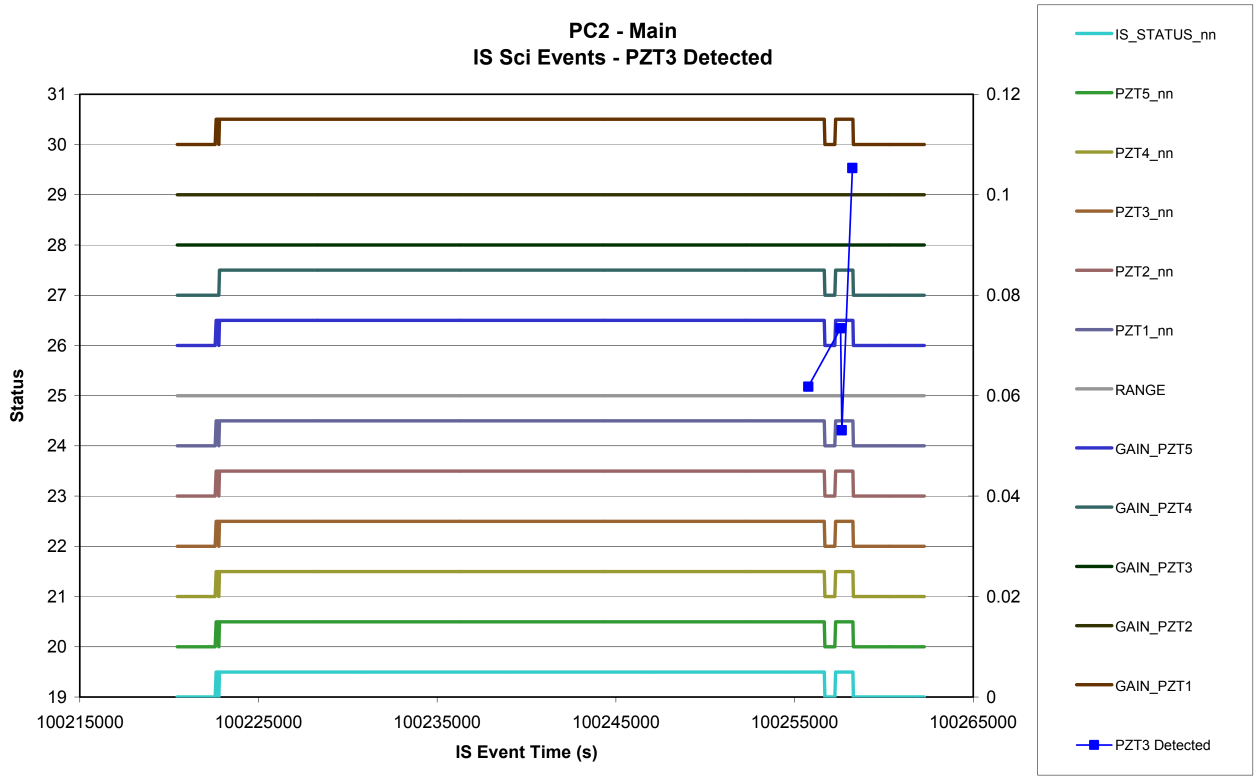


Figure 7.4-10. PZT 4 Detected Events vs. time - Main

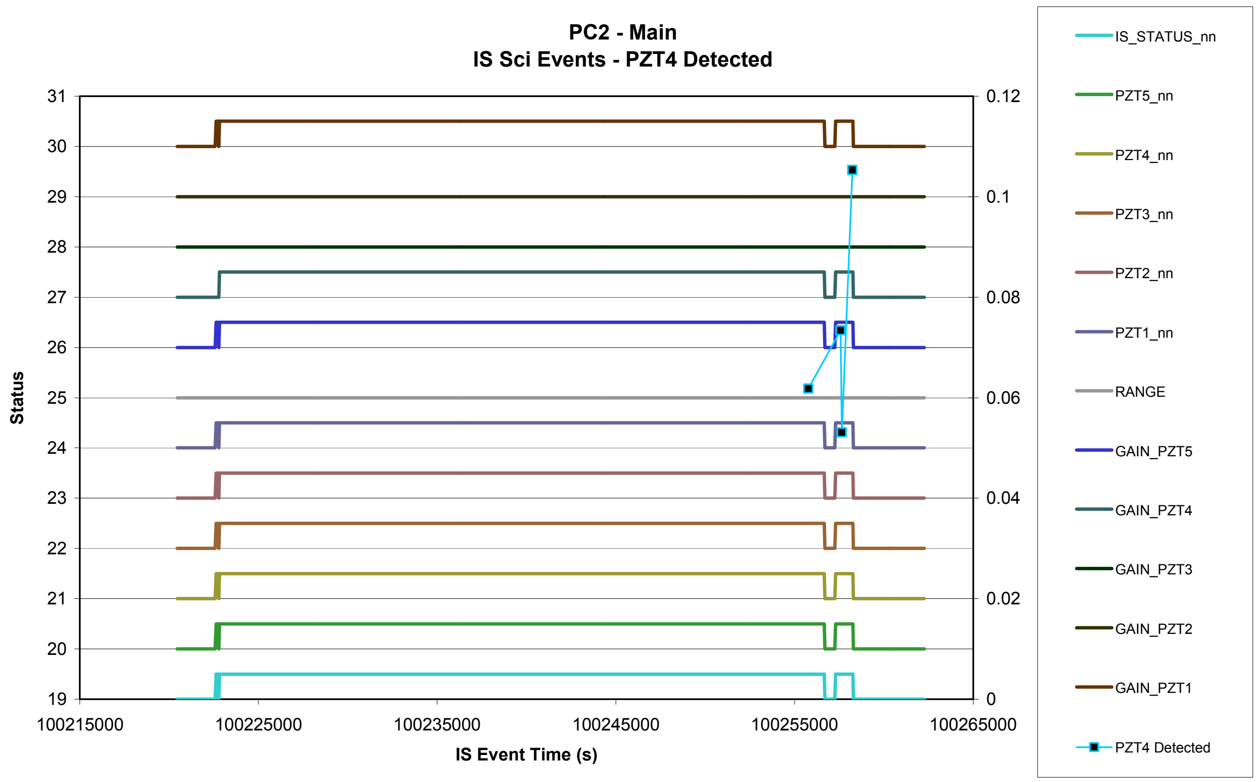


Figure 7.4-11. PZT 5 Detected Events vs. time - Main

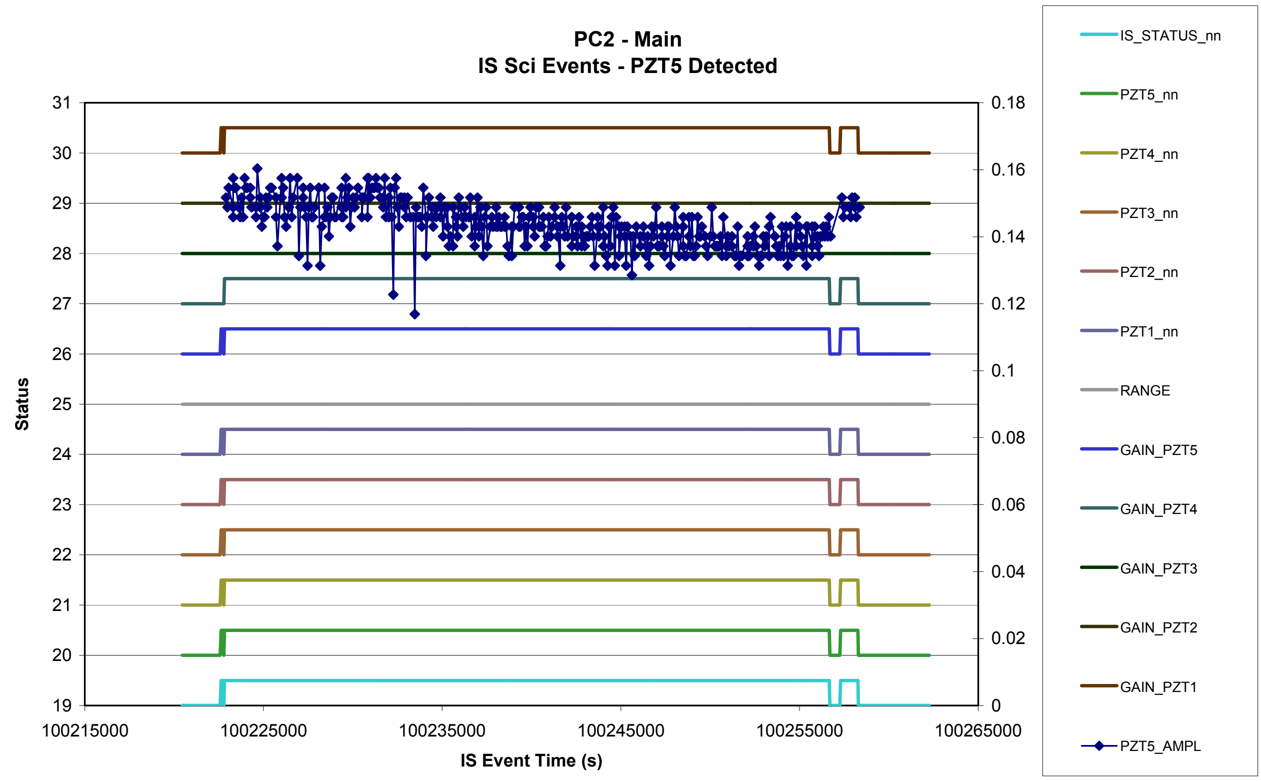


Figure 7.4-12. PZT 5 Detected Events and IS T vs. time - Main

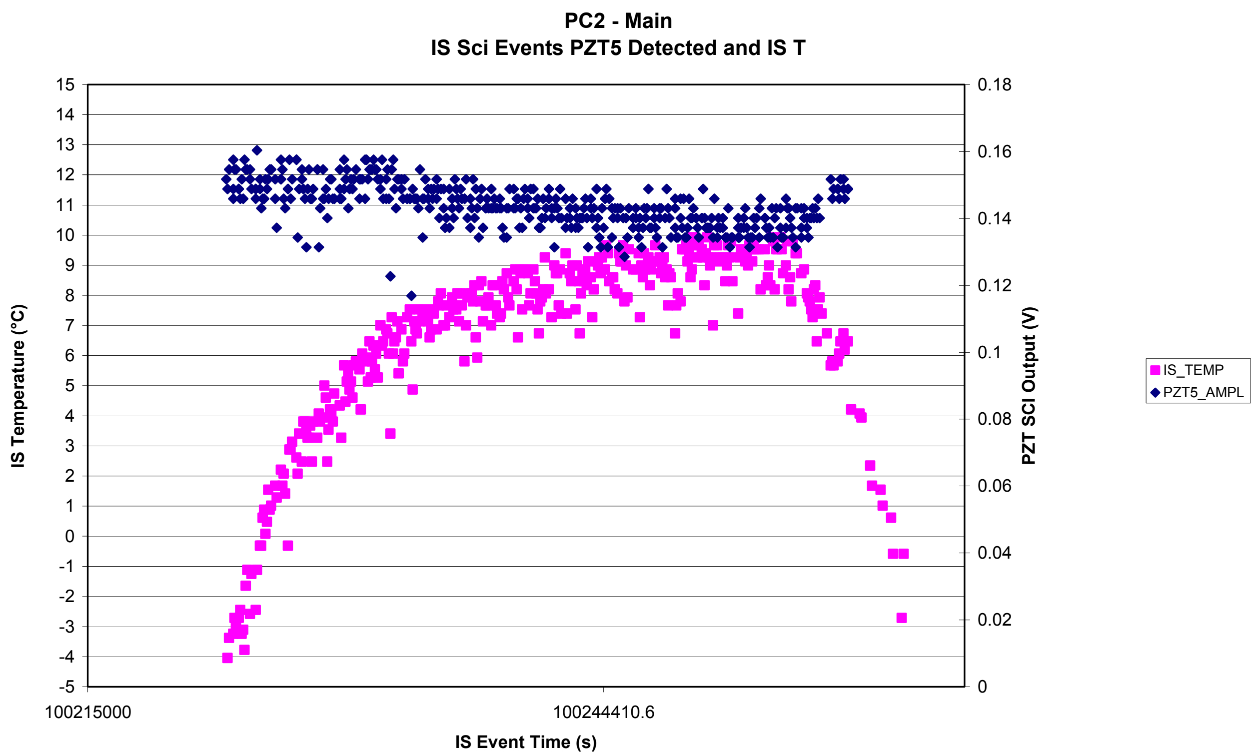


Figure 7.4-13. PZT 5 SCI Detected Events and PZT 5 CAL events vs. time - Main

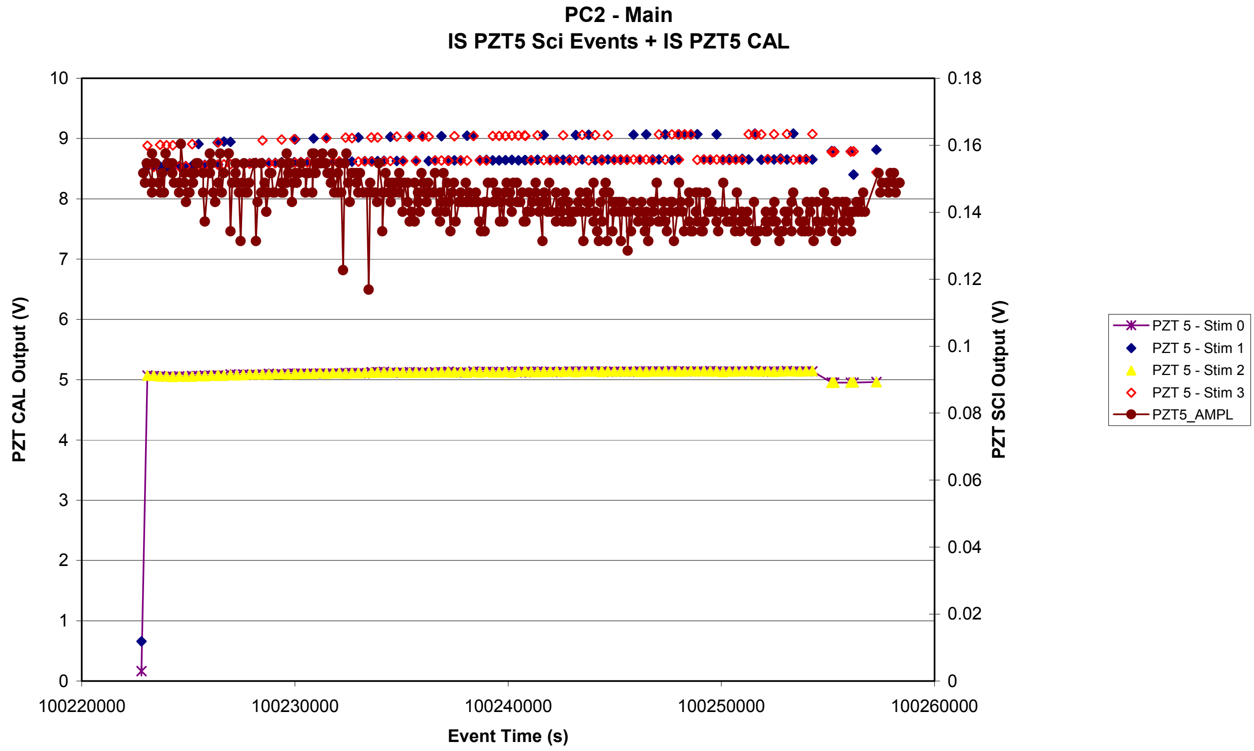
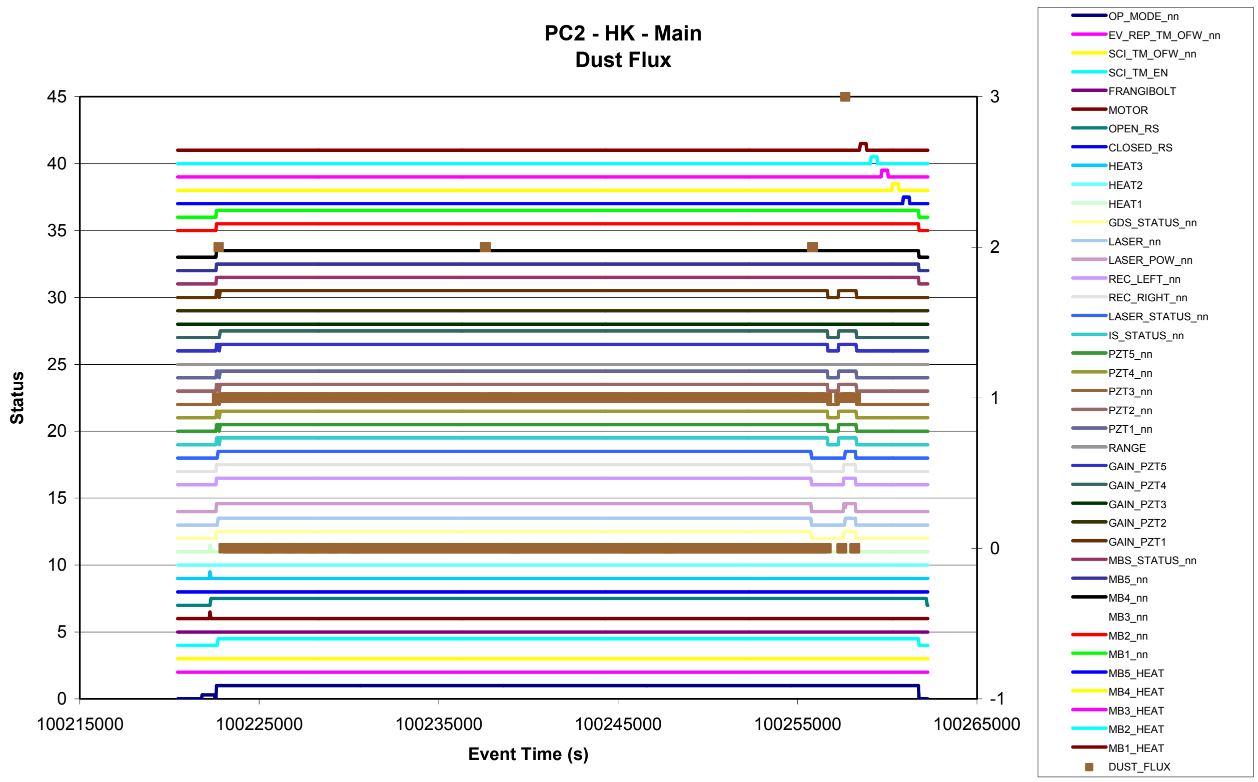


Figure 7.4-14. Dust Flux vs. time - Main



7.4.2.2 Event Rates

Not applicable

7.4.2.3 CAL

Figure 7.4-15. PZT 1 Mean and St Dev. CAL vs. time - Main

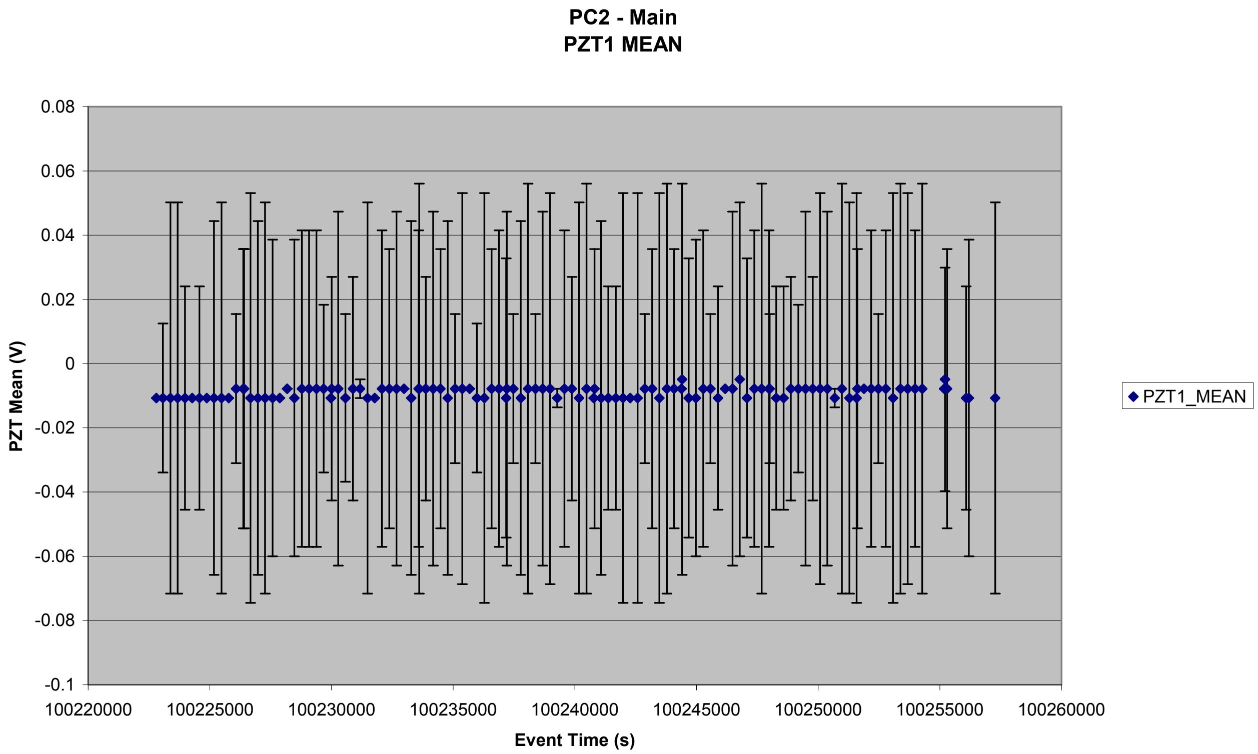


Figure 7.4-16. PZT 2 Mean and St Dev. CAL vs. time - Main

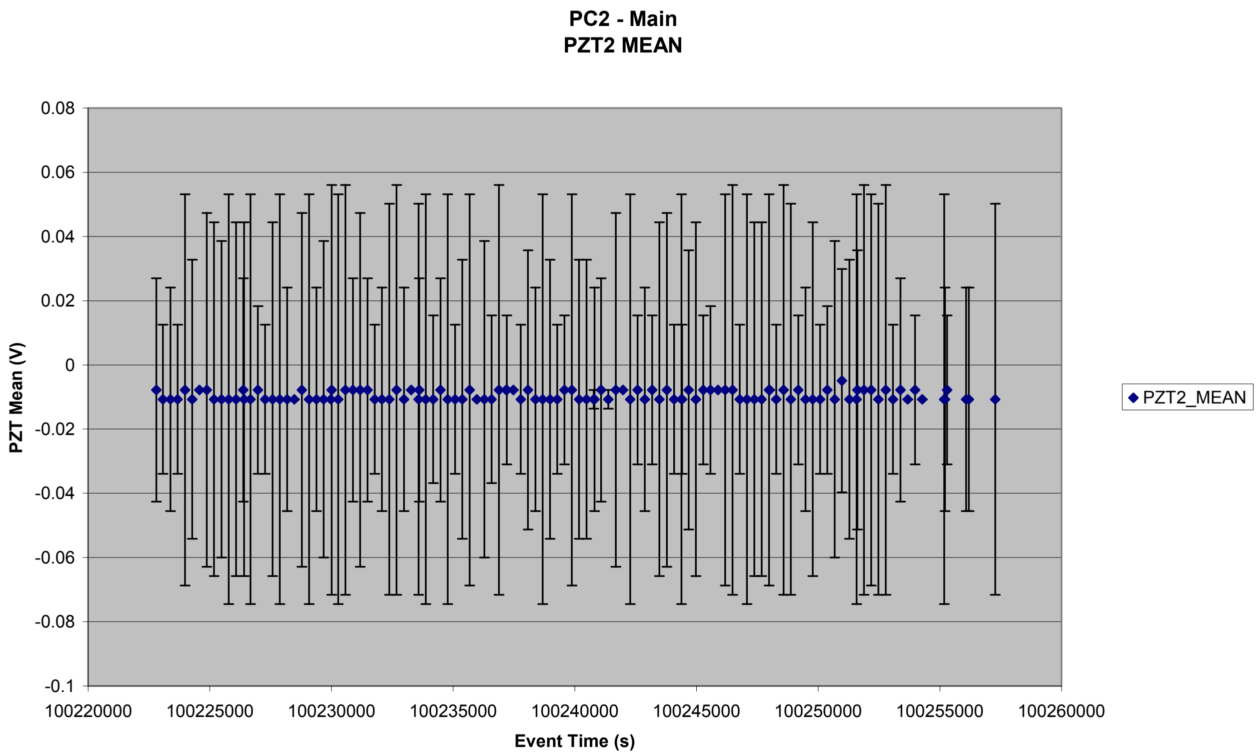


Figure 7.4-17. PZT 3 Mean and St Dev. CAL vs. time - Main

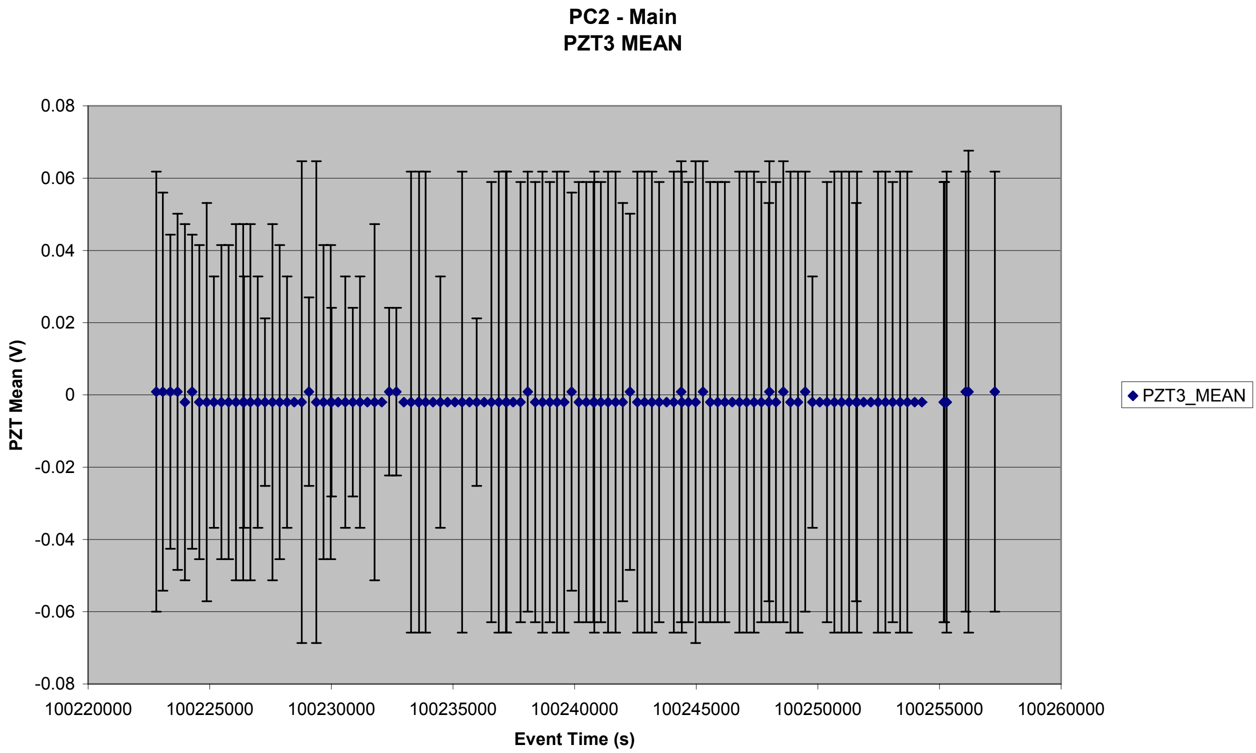


Figure 7.4-18. PZT 4 Mean and St Dev. CAL vs. time - Main

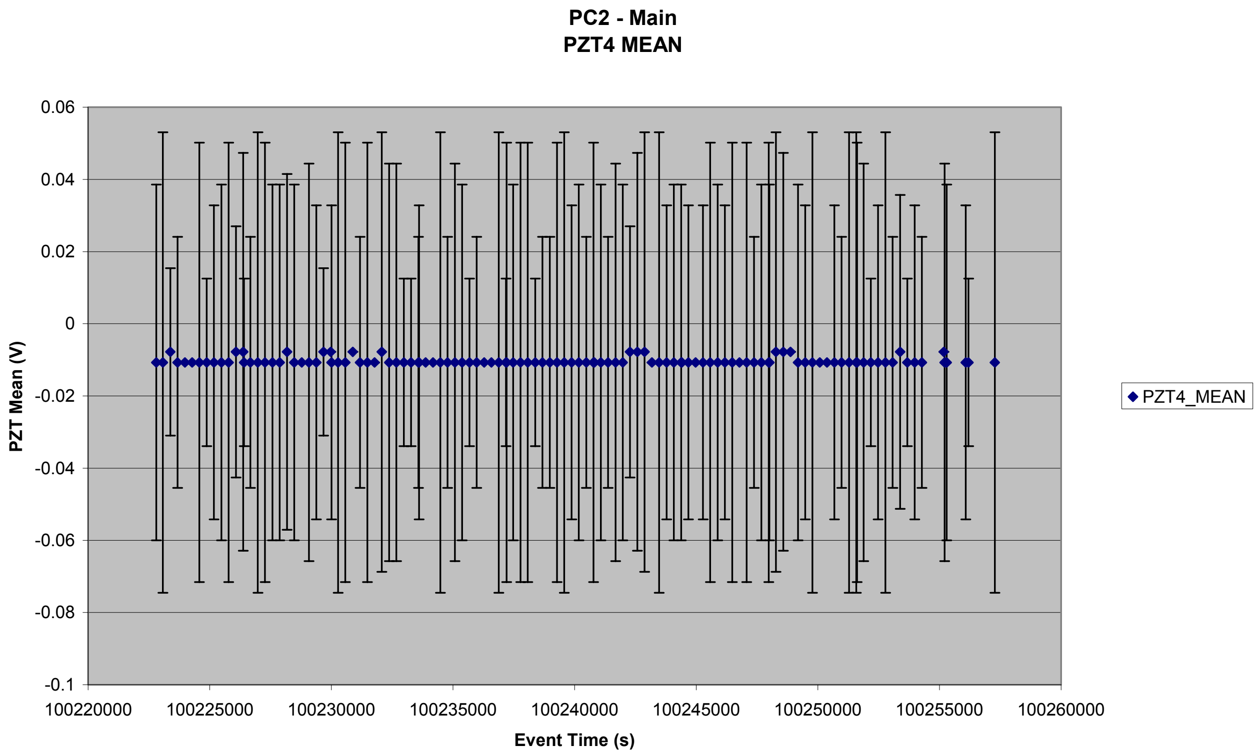


Figure 7.4-19. PZT 5 Mean and St Dev. CAL vs. time - Main

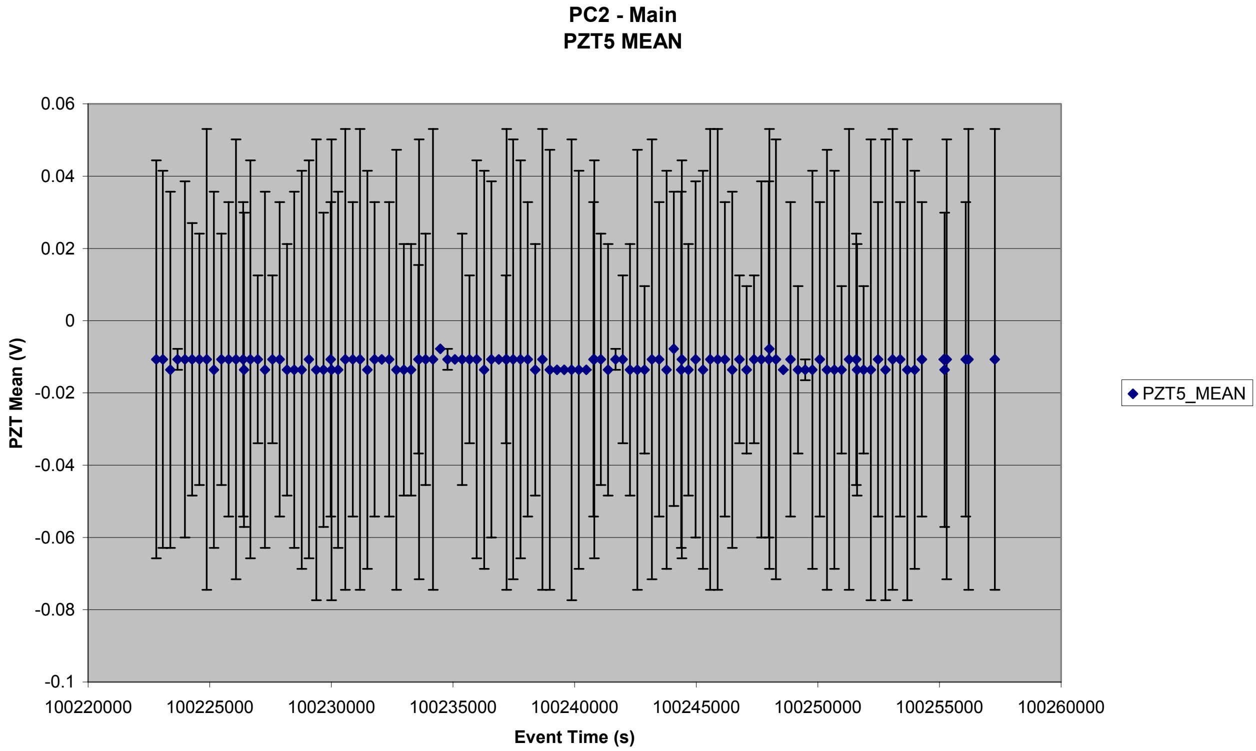


Figure 7.4-20. Reference Voltages for IS calibration vs. time - Main

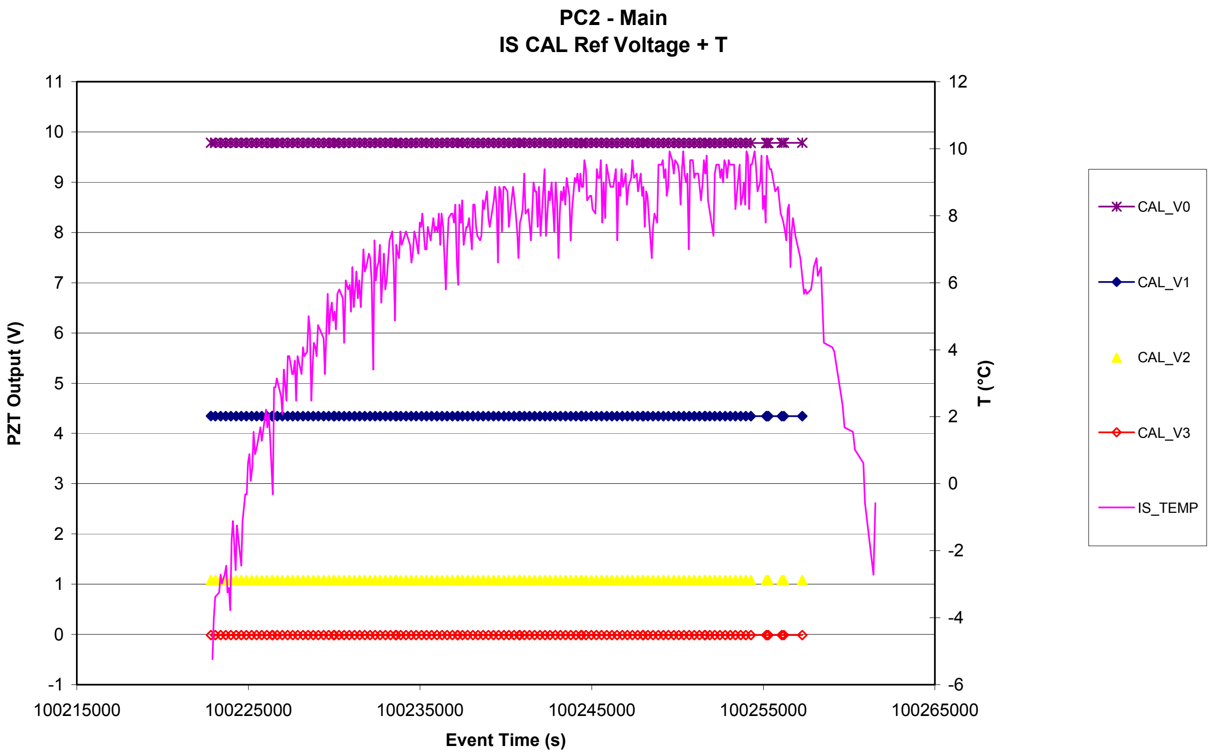


Figure 7.4-21. PZT 1 CAL Signal vs. time - Main

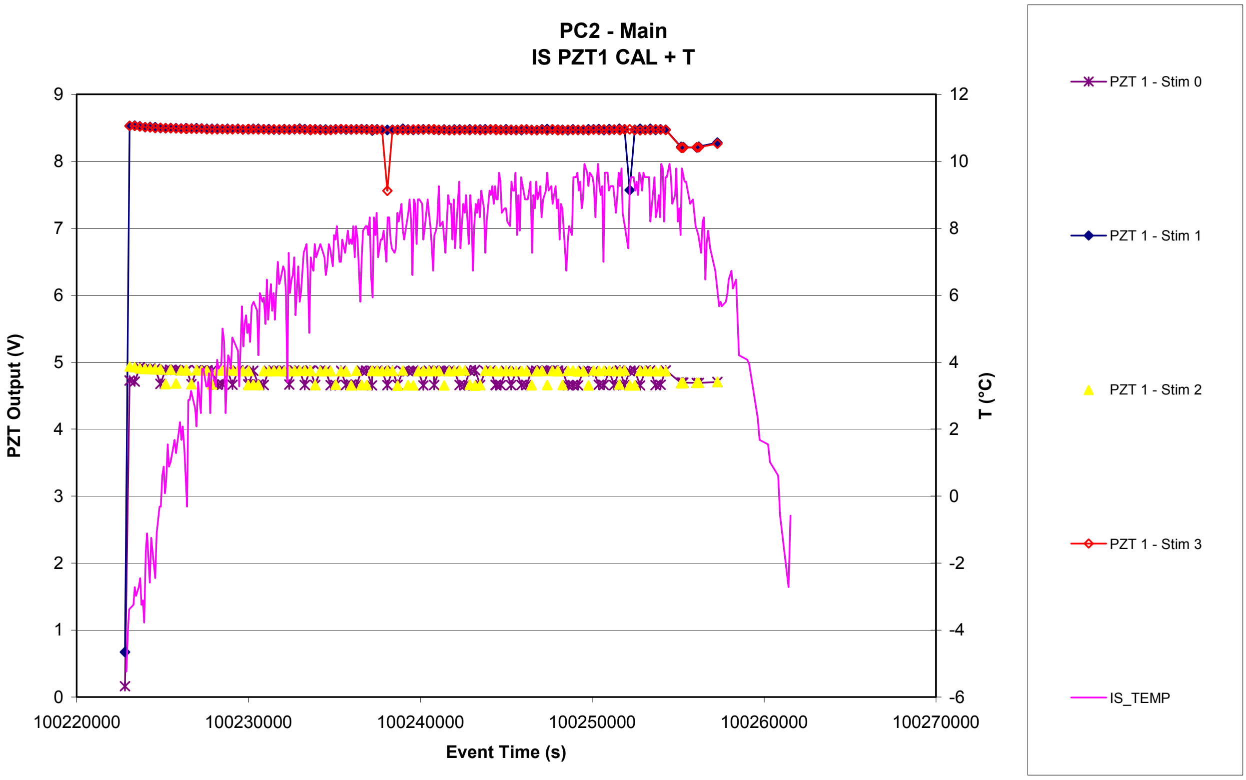


Figure 7.4-22. PZT 2 CAL Signal vs. time - Main

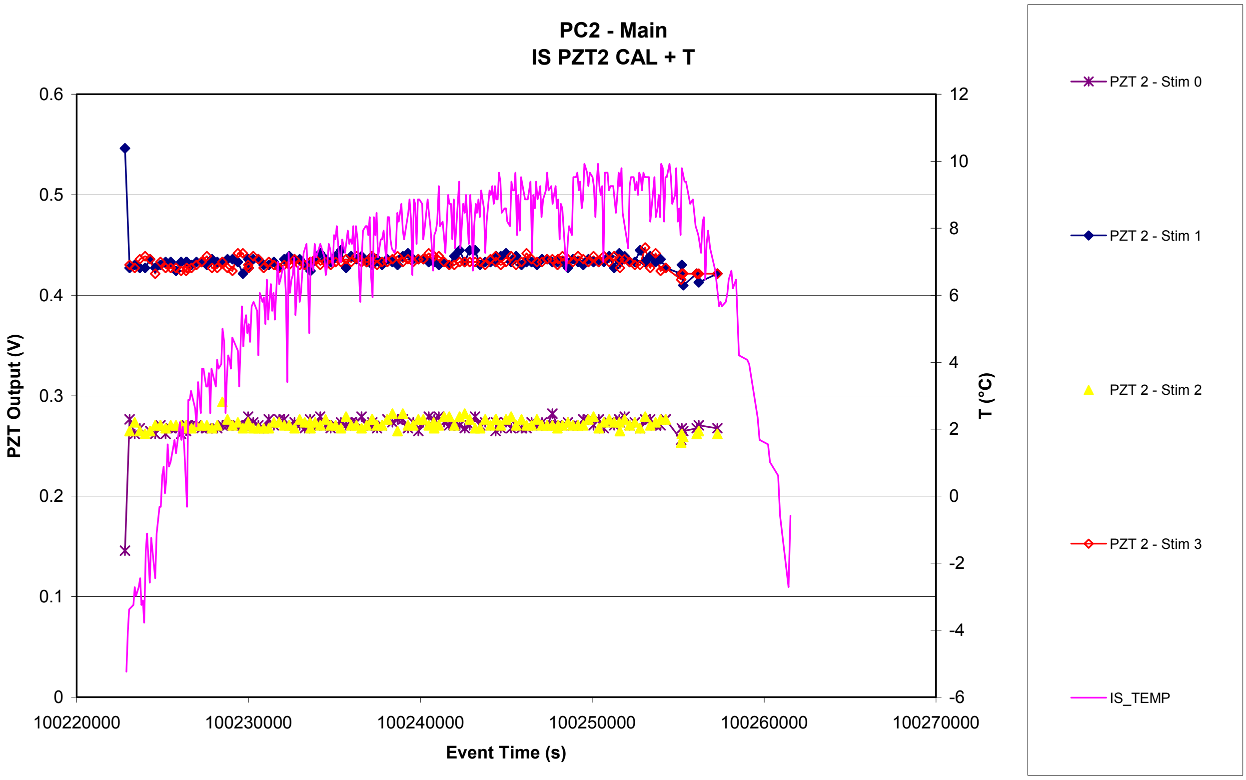


Figure 7.4-23. PZT 3 CAL Signal vs. time - Main

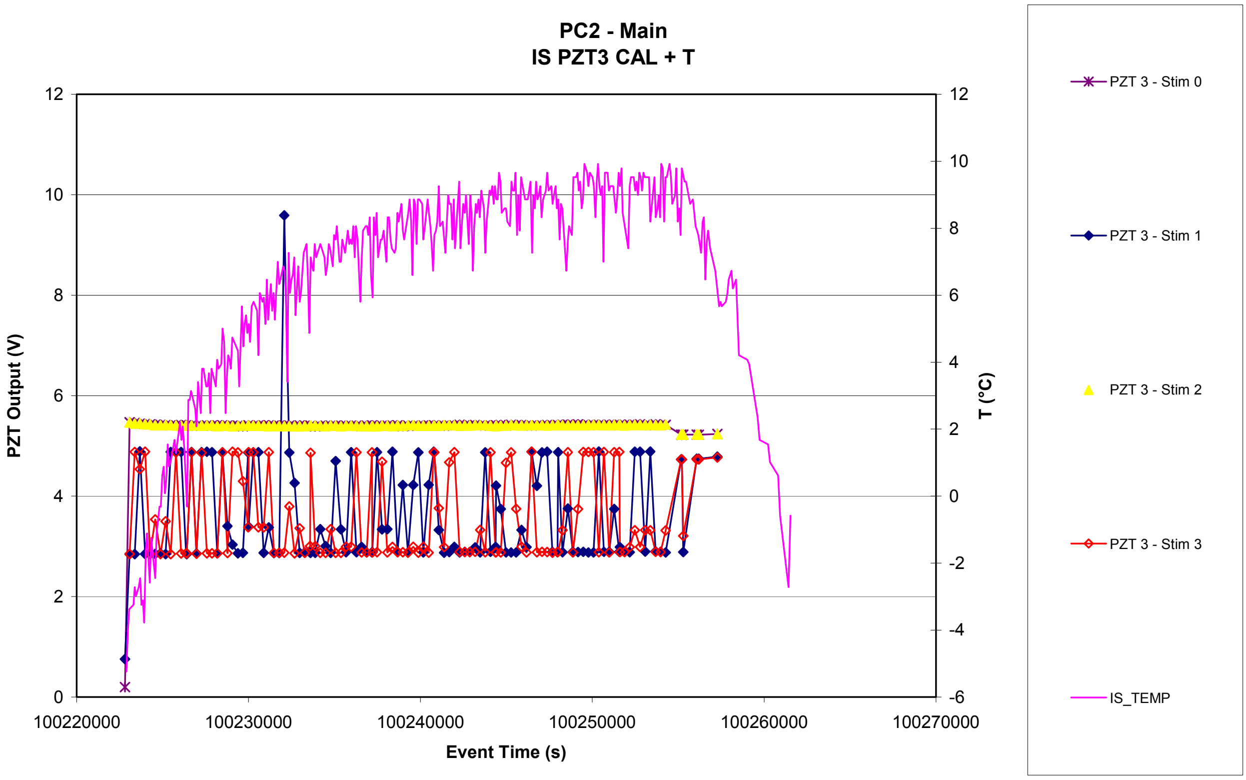


Figure 7.4-24. PZT 4 CAL Signal vs. time - Main

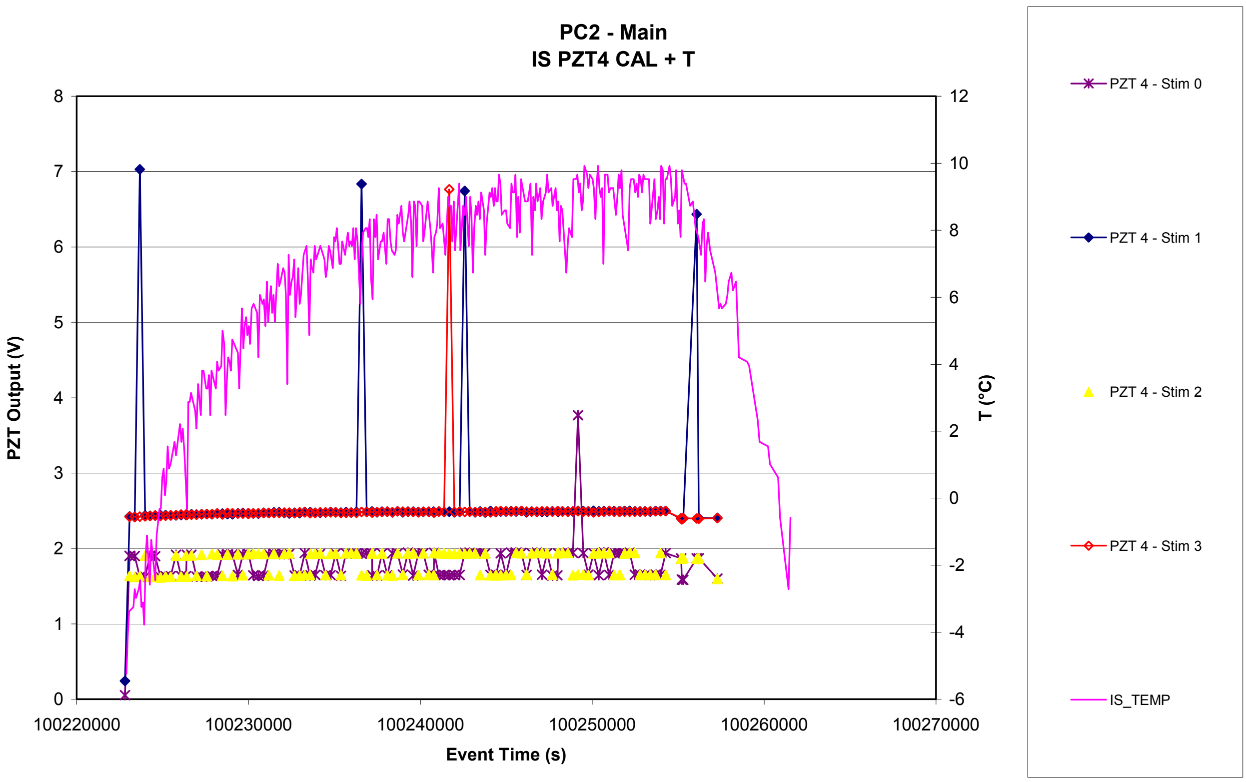


Figure 7.4-25. PZT 5 CAL Signal vs. time - Main

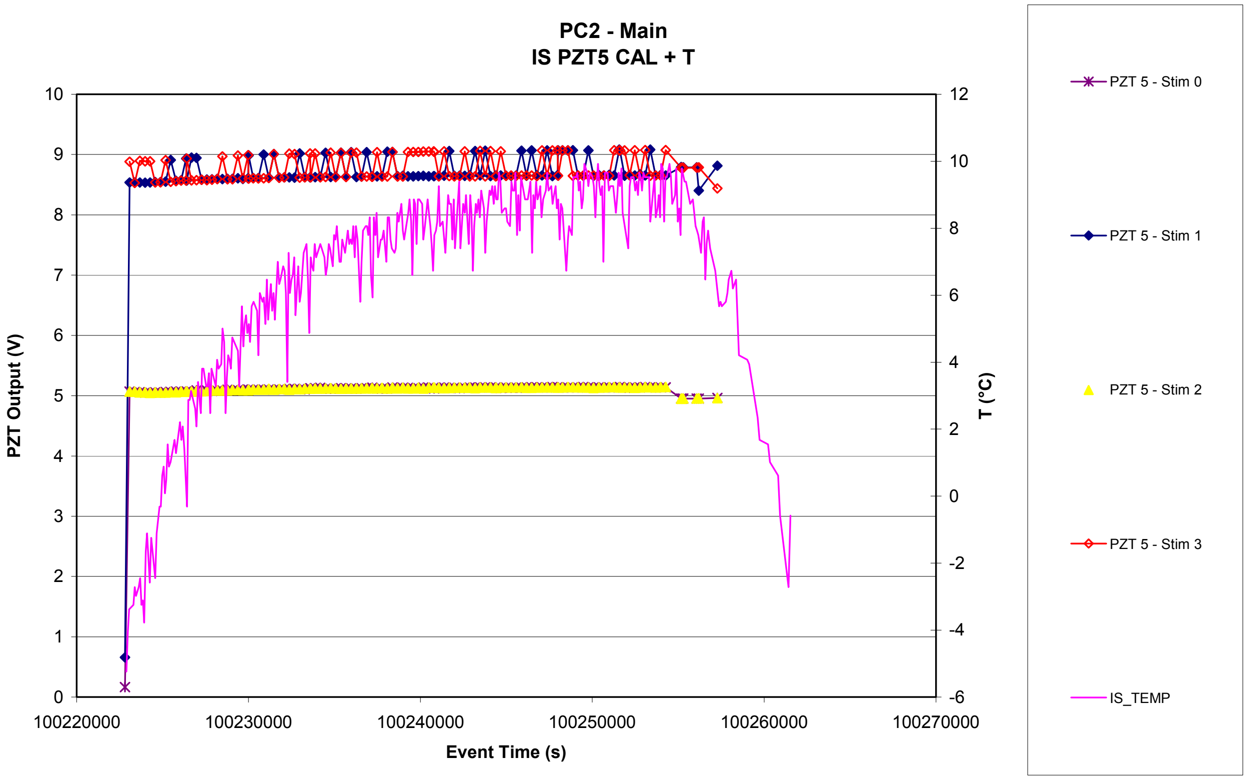


Figure 7.4-26. PZT 1 CAL Time delay vs. time - Main

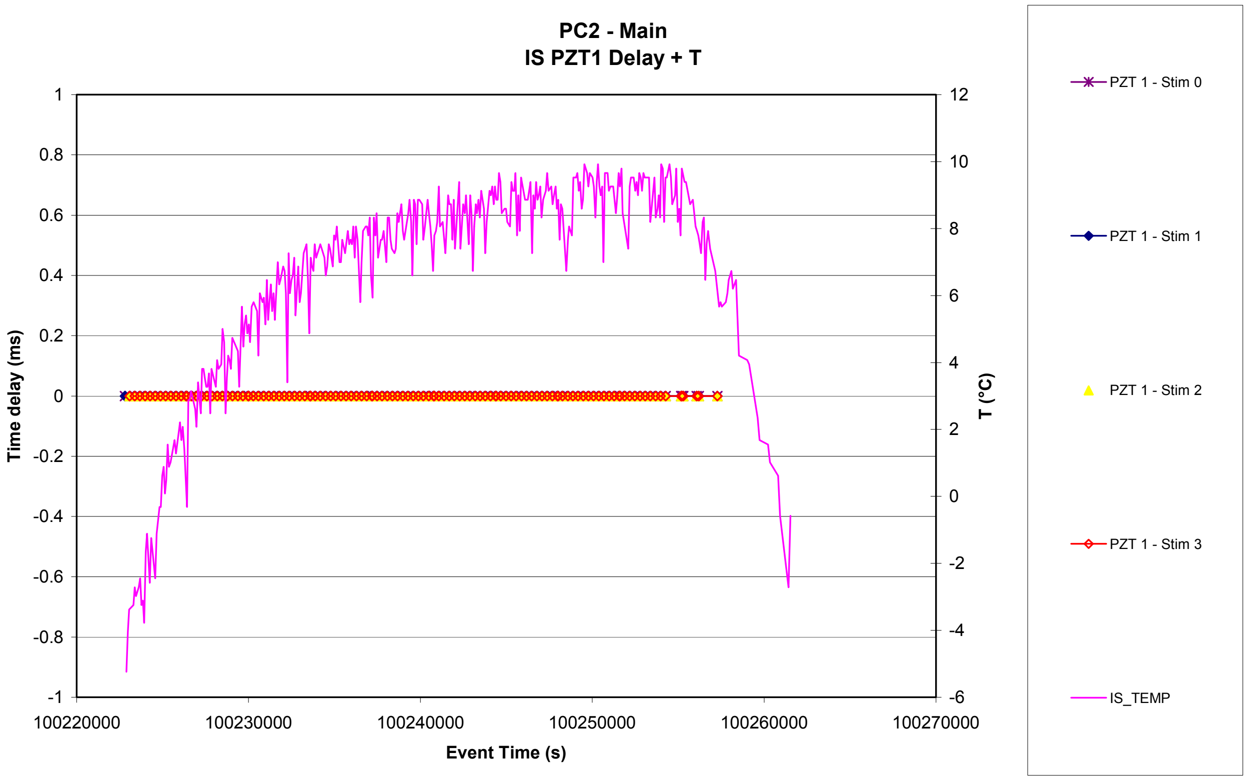


Figure 7.4-27. PZT 2 CAL Time delay vs. time - Main

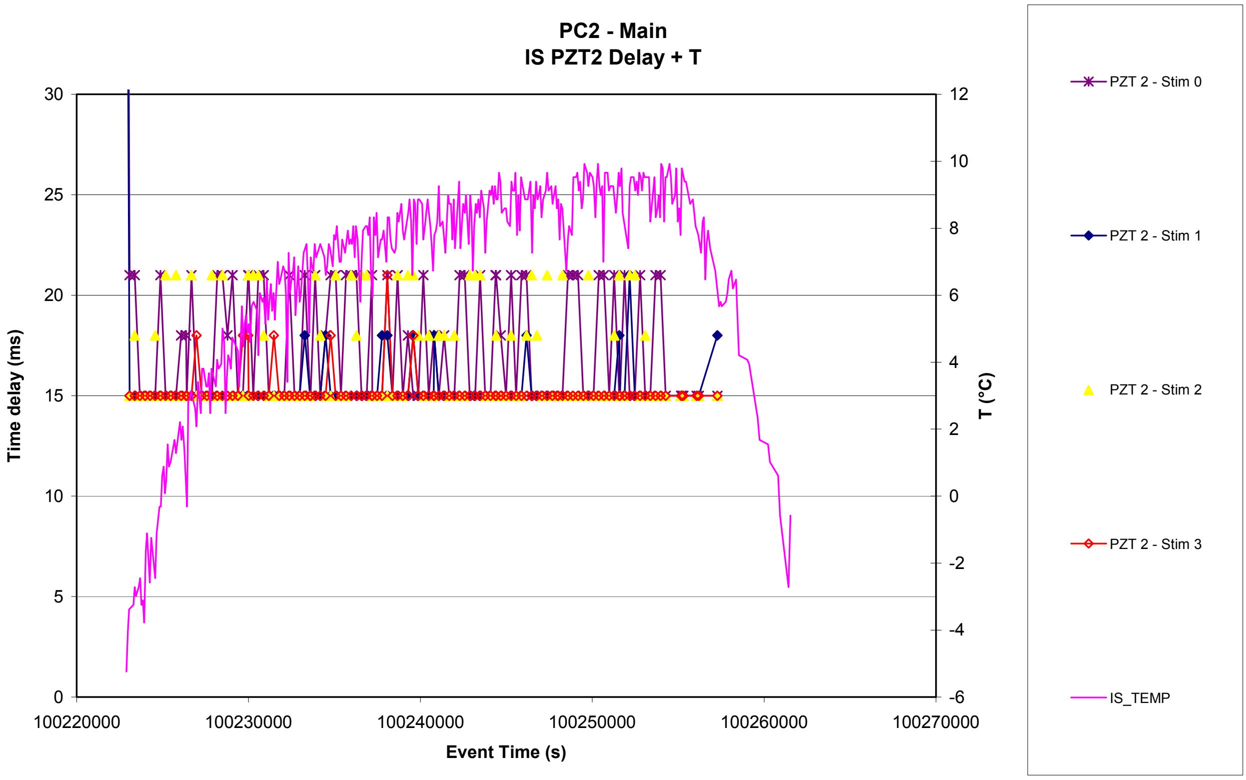


Figure 7.4-28. PZT 3 CAL Time delay vs. time - Main

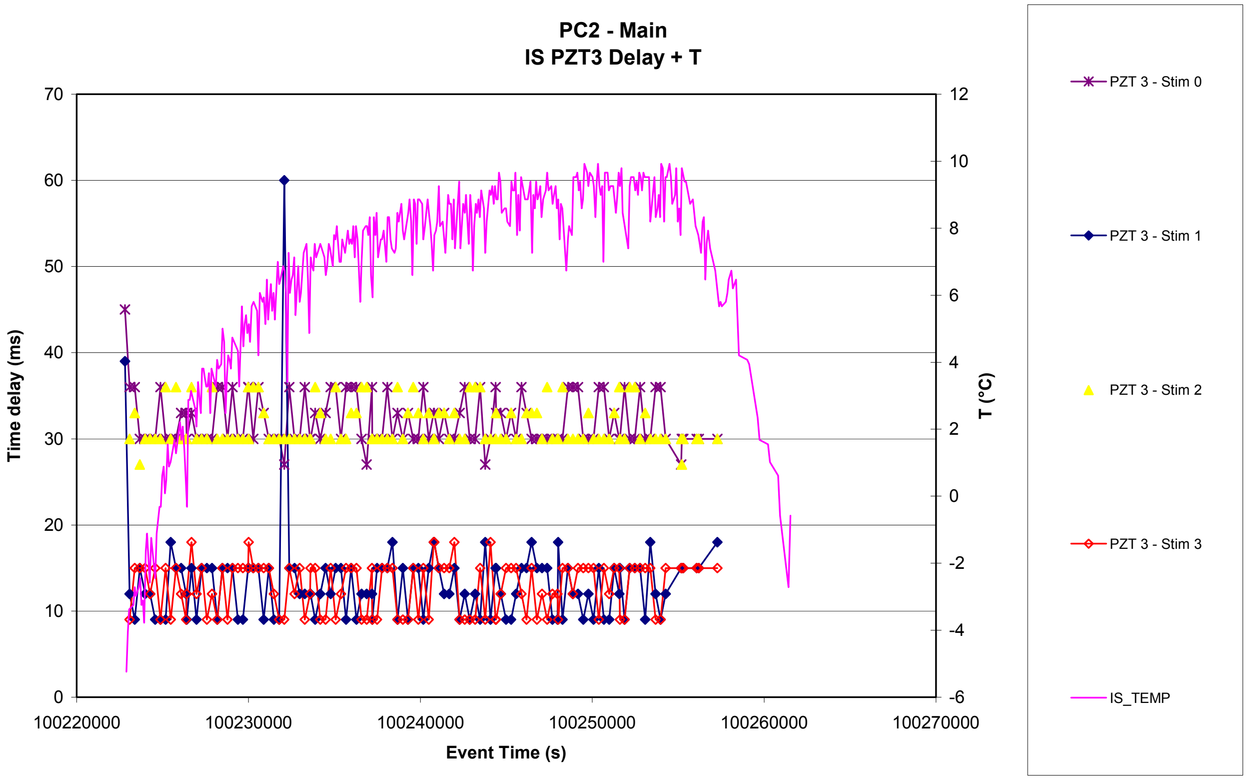


Figure 7.4-29. PZT 4 CAL Time delay vs. time - Main

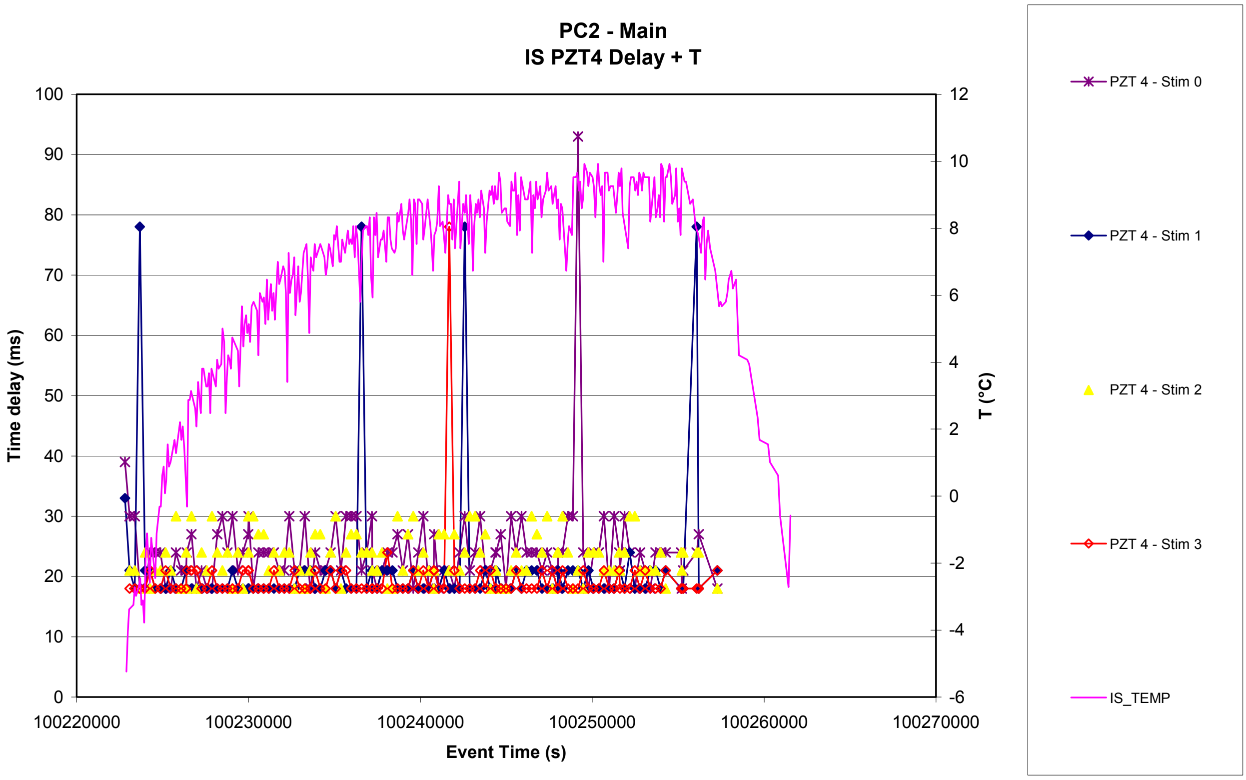


Figure 7.4-30. PZT 5 CAL Time delay vs. time - Main

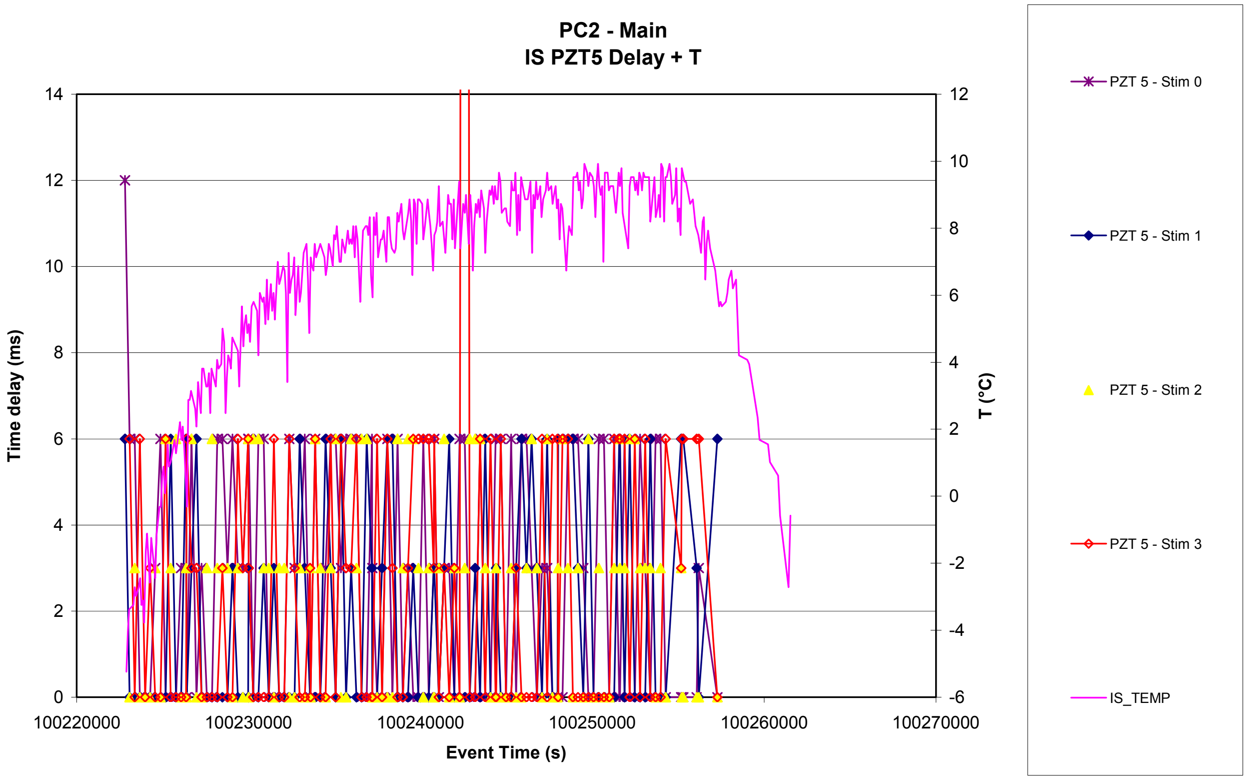


Figure 7.4-31. PZT 1 CAL Signal vs. stimulus – Main

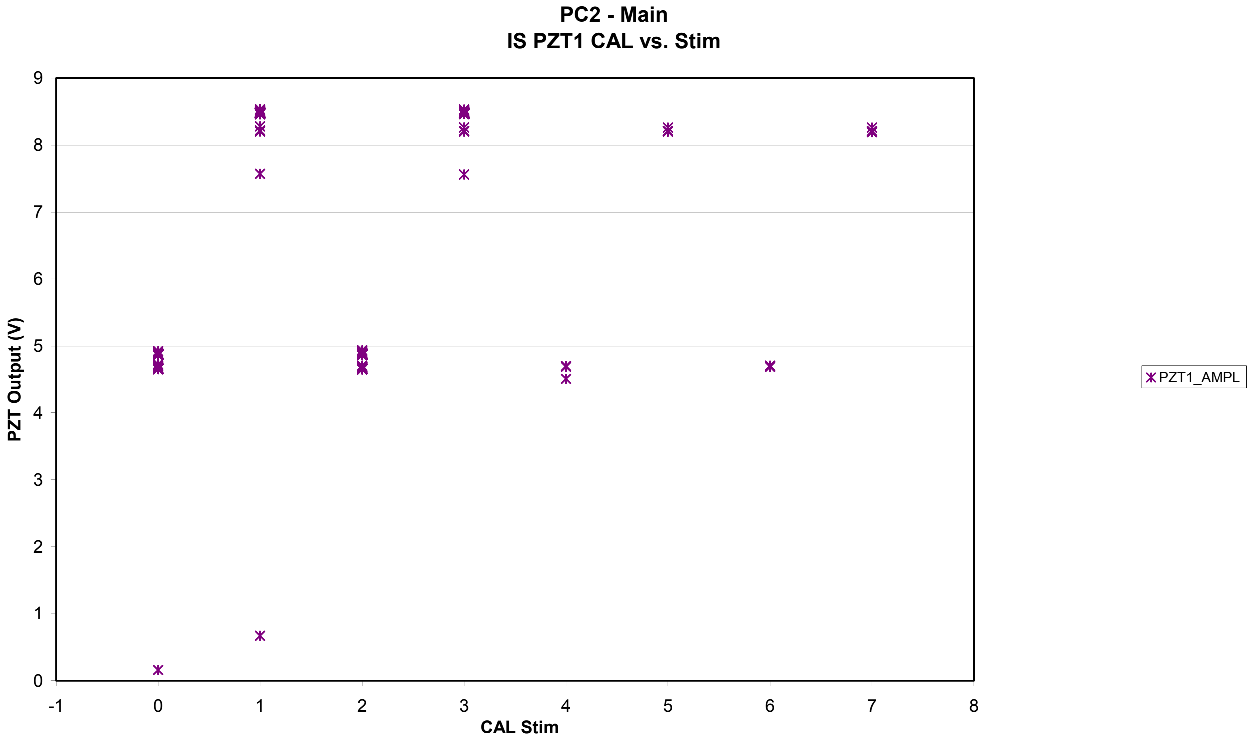


Figure 7.4-32. PZT 2 CAL Signal vs. stimulus – Main

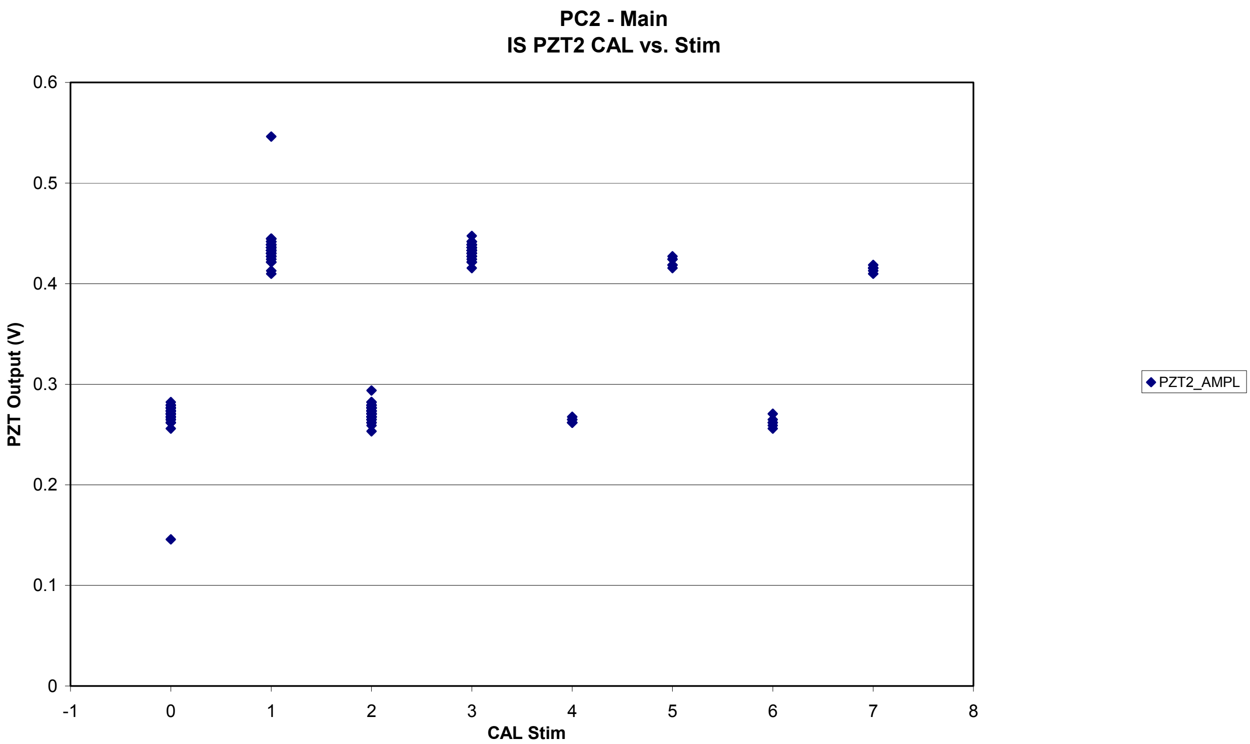


Figure 7.4-33. PZT 3 CAL Signal vs. stimulus – Main

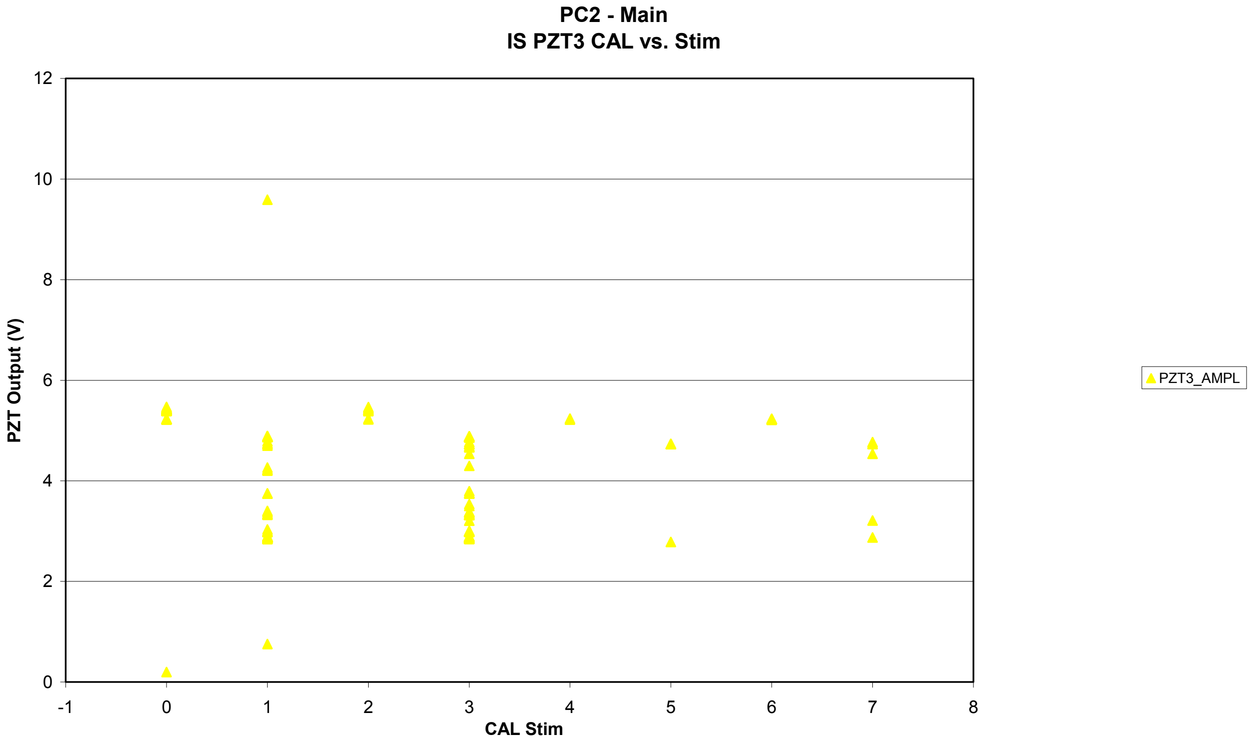


Figure 7.4-34. PZT 4 CAL Signal vs. stimulus – Main

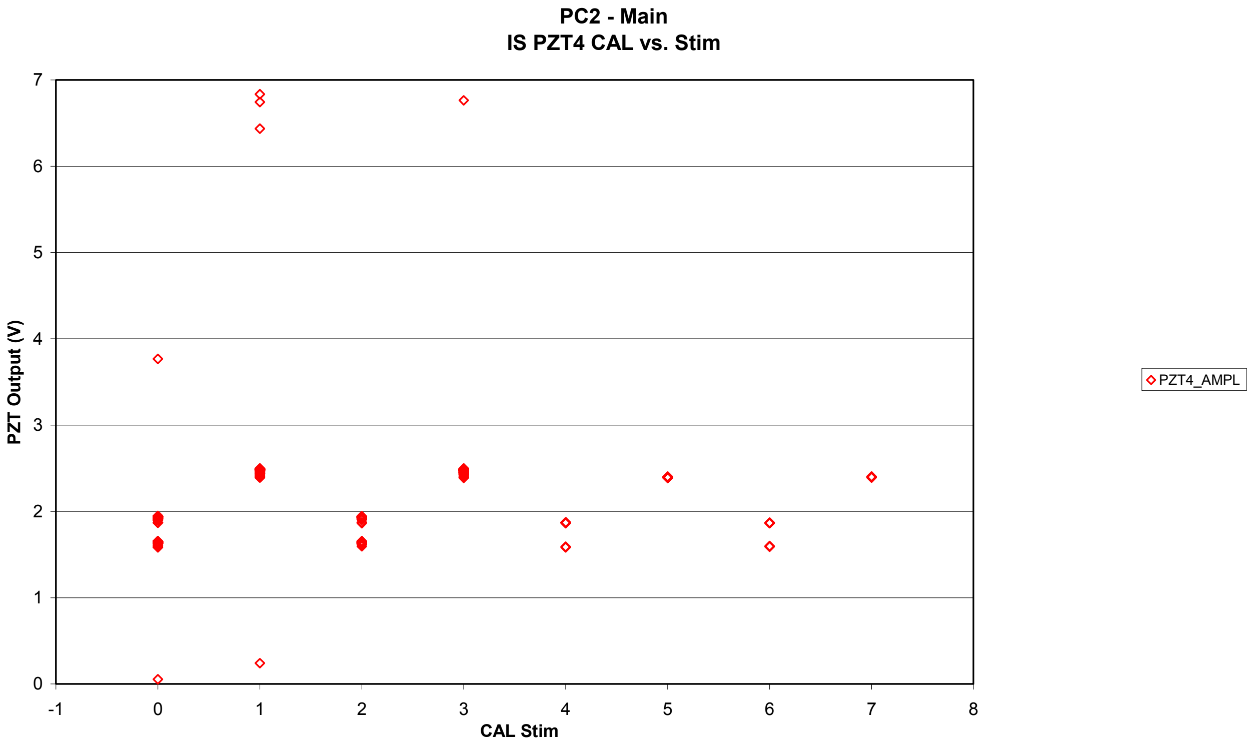


Figure 7.4-35. PZT 5 CAL Signal vs. stimulus – Main

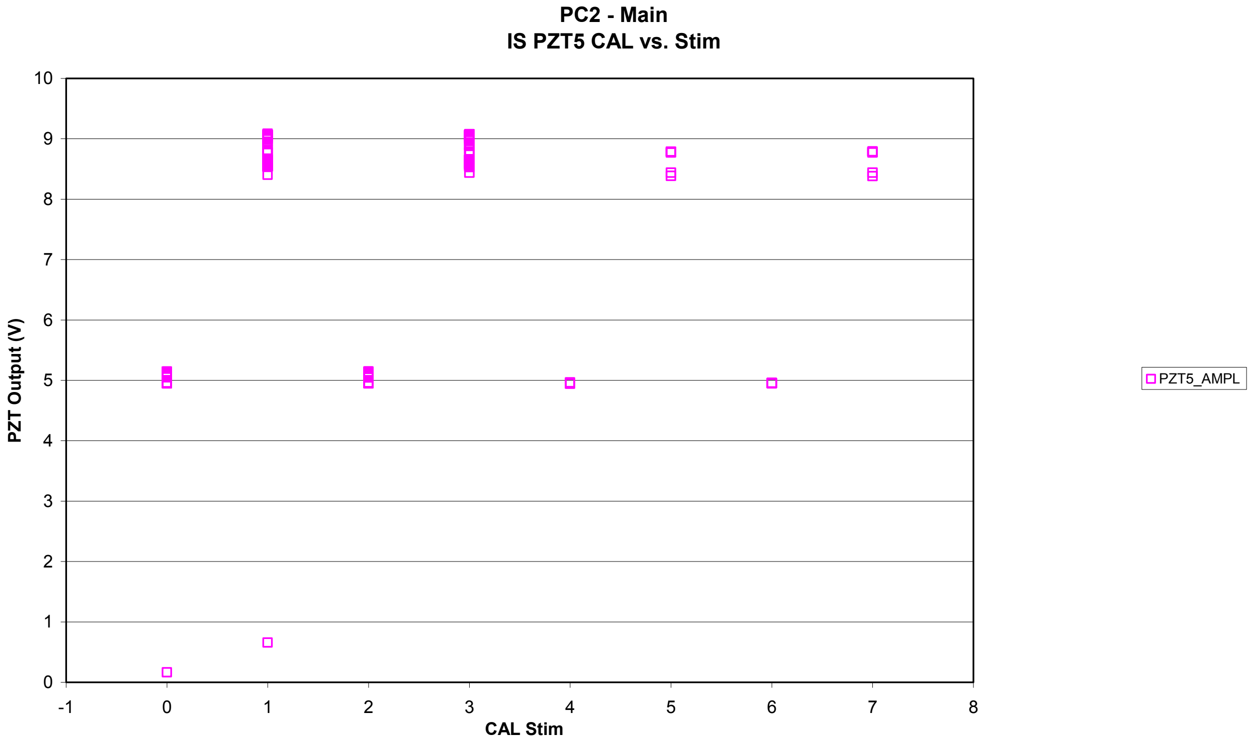


Figure 7.4-36. PZT 1 CAL Time delay vs. stimulus – Main

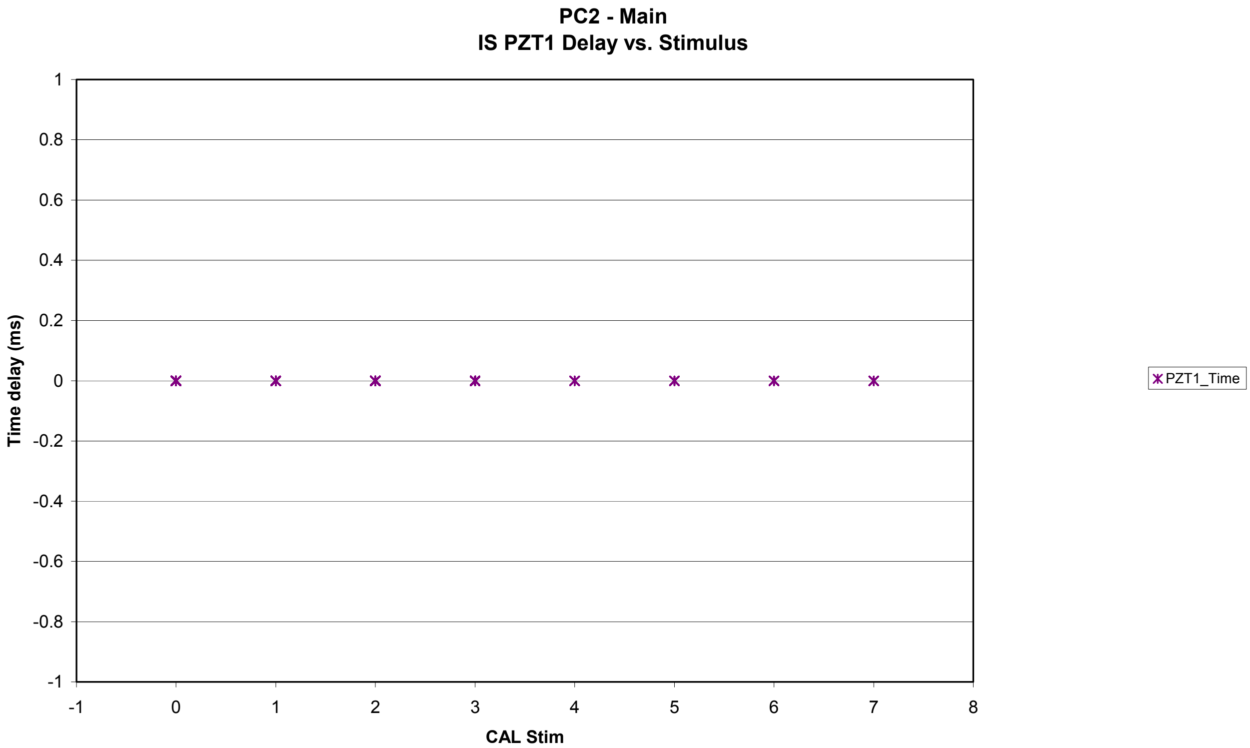


Figure 7.4-37. PZT 2 CAL Time delay vs. stimulus - Main

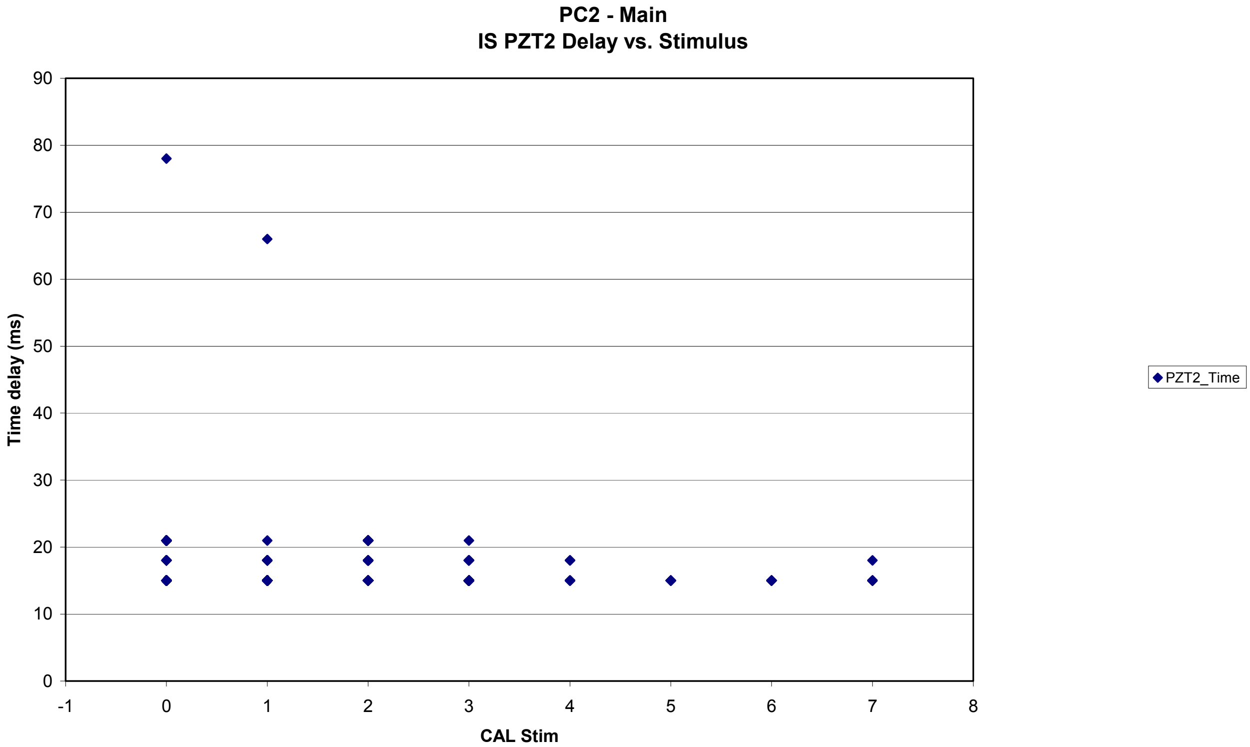


Figure 7.4-38. PZT 3 CAL Time delay vs. stimulus - Main

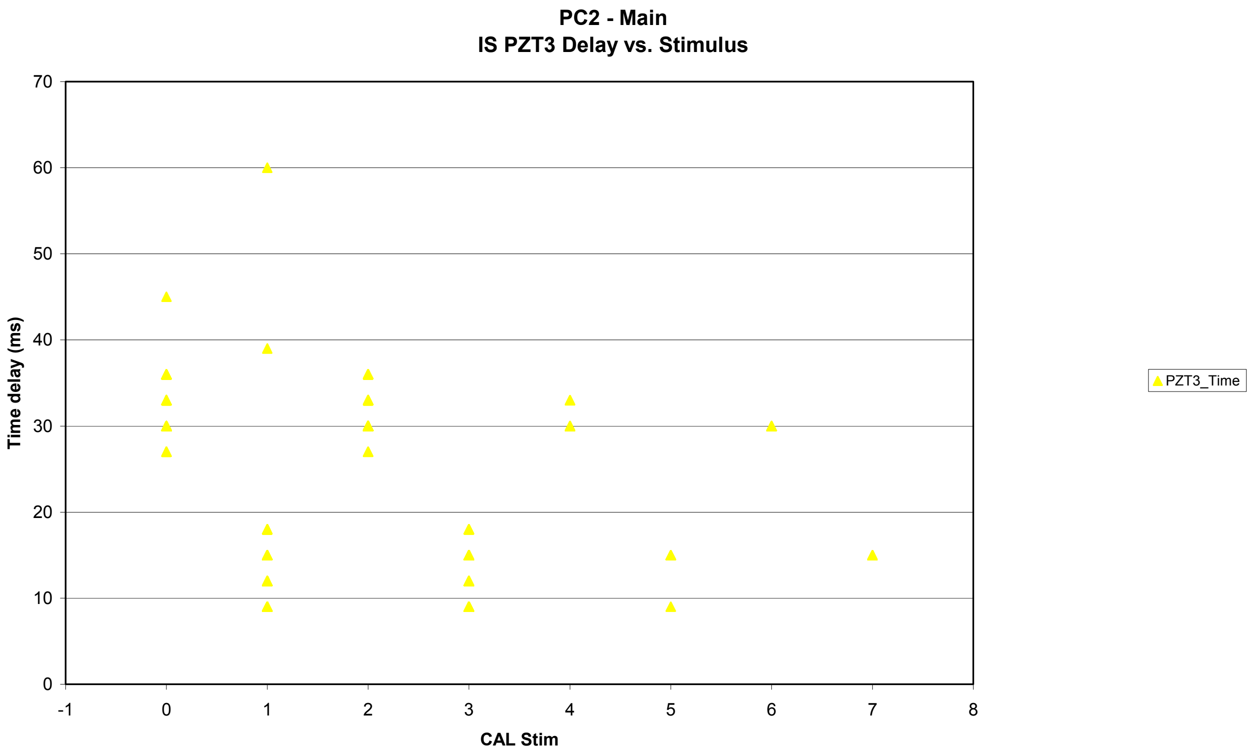


Figure 7.4-39. PZT 4 CAL Time delay vs. stimulus - Main

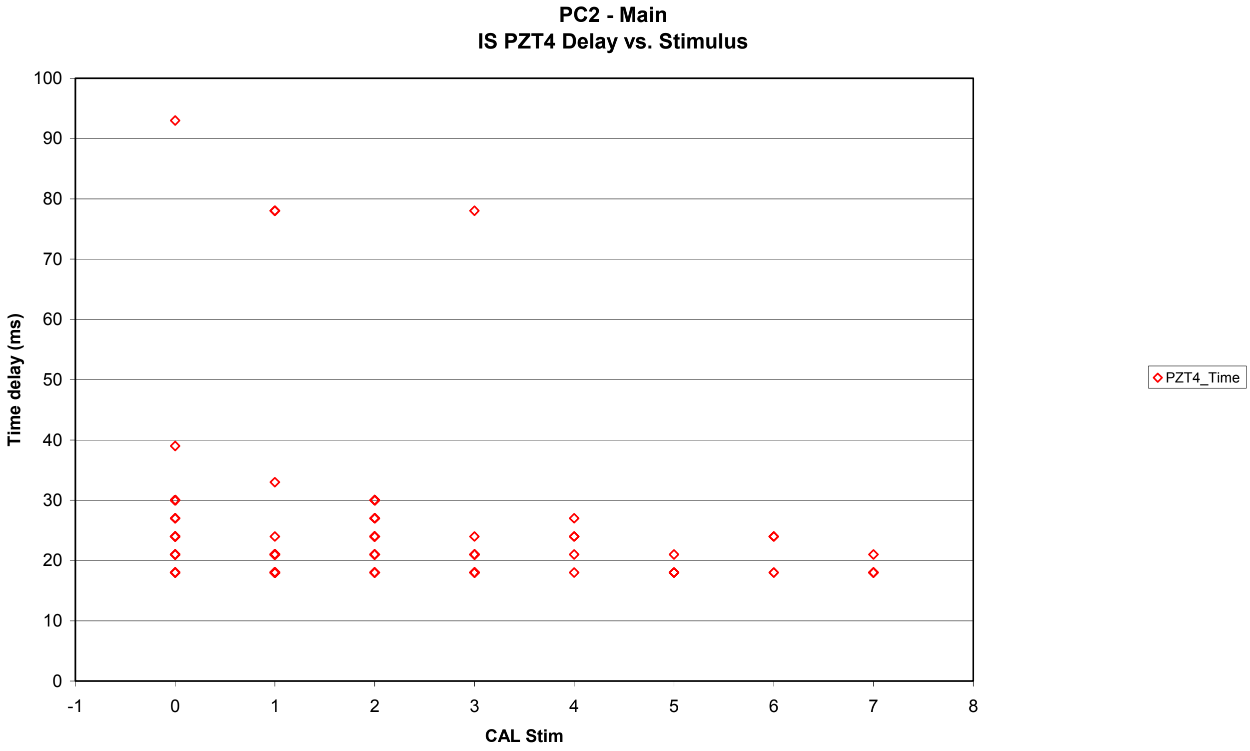
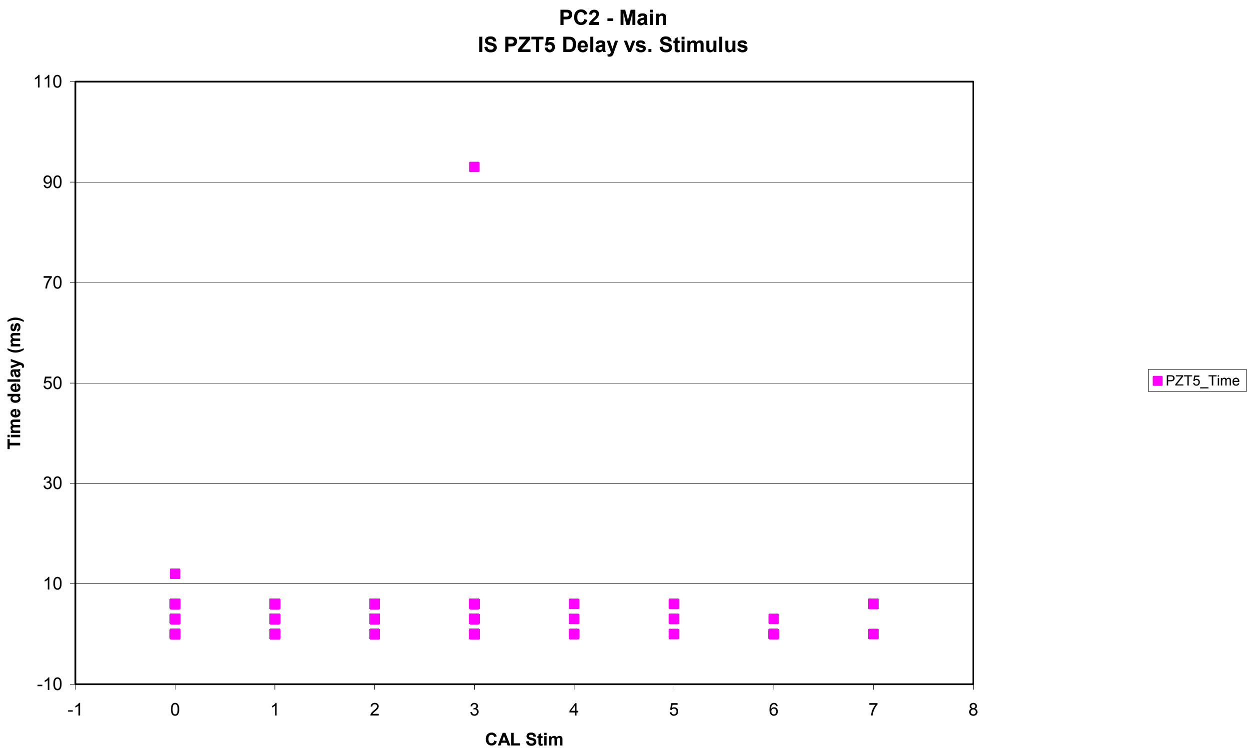


Figure 7.4-40. PZT 5 CAL Time delay vs. stimulus - Main



7.5 MICRO BALANCE SYSTEM (MBS)

7.5.1 MBS – Status

Figure 7.5-1. MBS Operation Status vs. time - Main

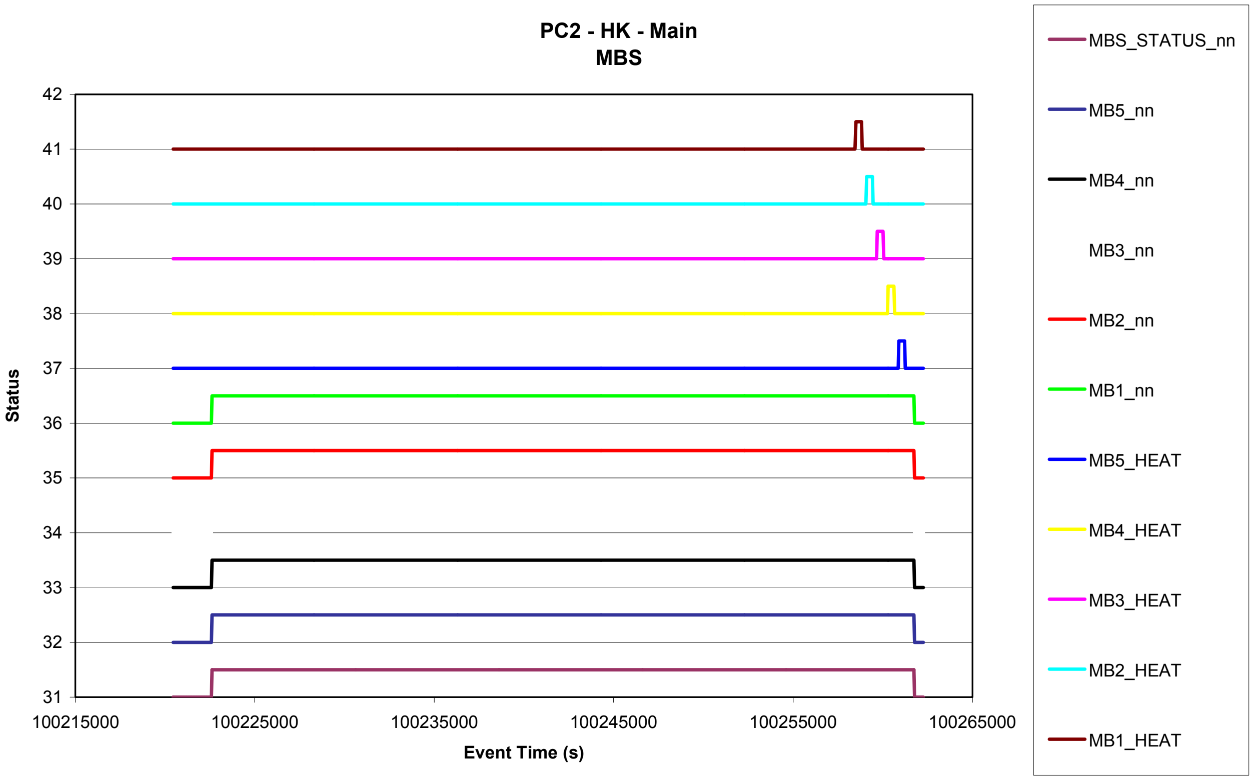


Figure 7.5-2. MBS 1 Temperature vs. time (HK, HK-SCI, SCI) – Main

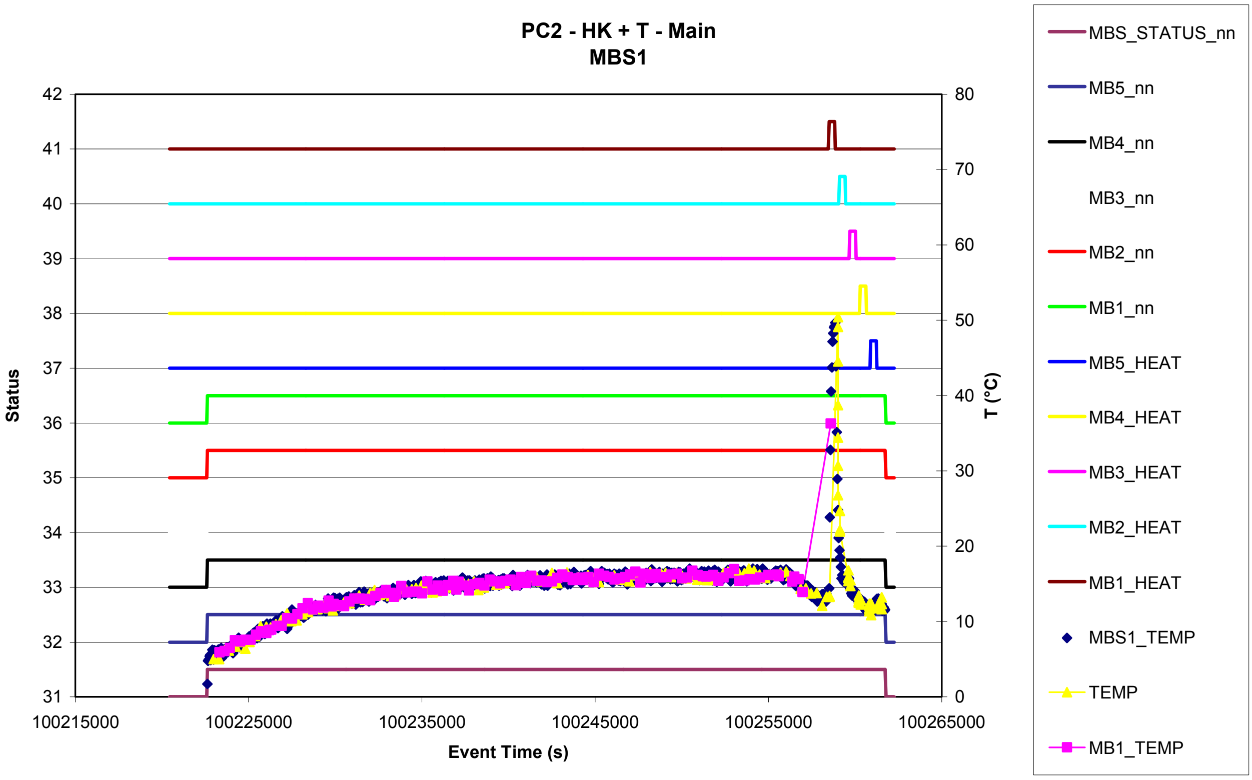


Figure 7.5-3. MBS 2 Temperature vs. time (HK, HK-SCI, SCI) - Main

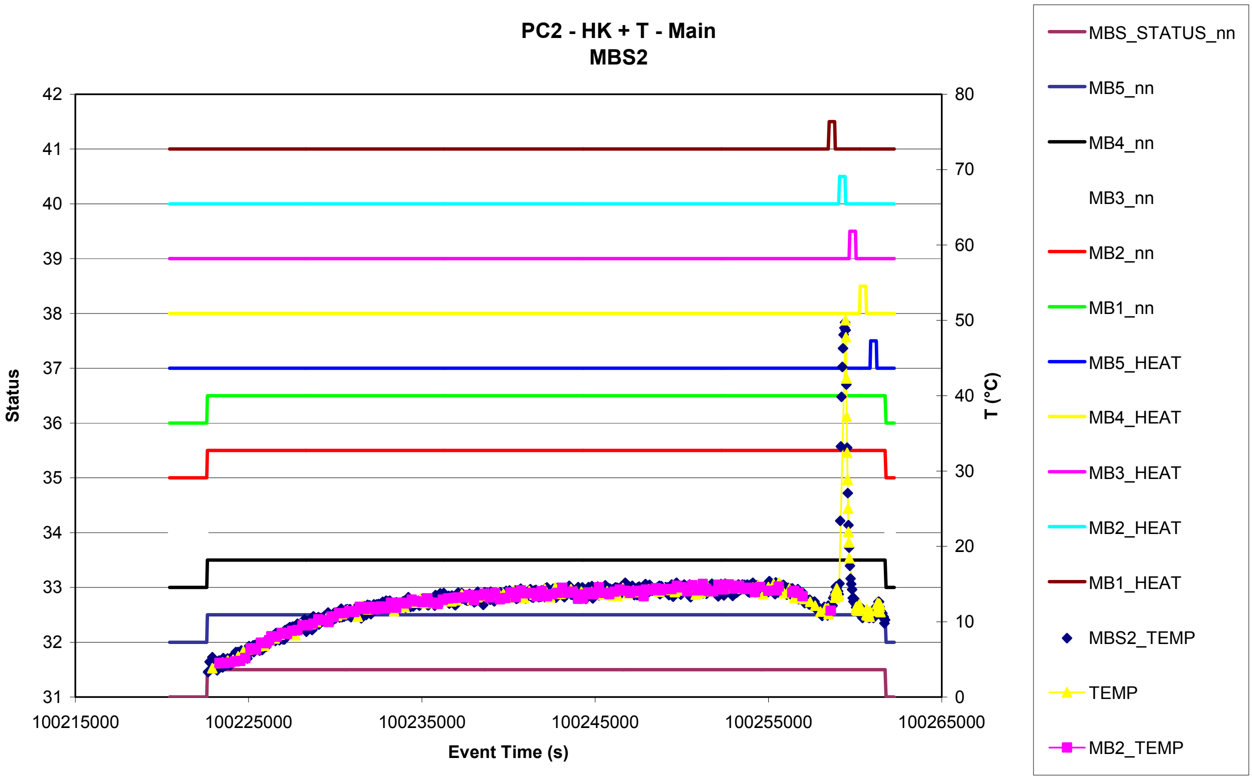


Figure 7.5-4. MBS 3 Temperature vs. time (HK, HK-SCI, SCI) - Main

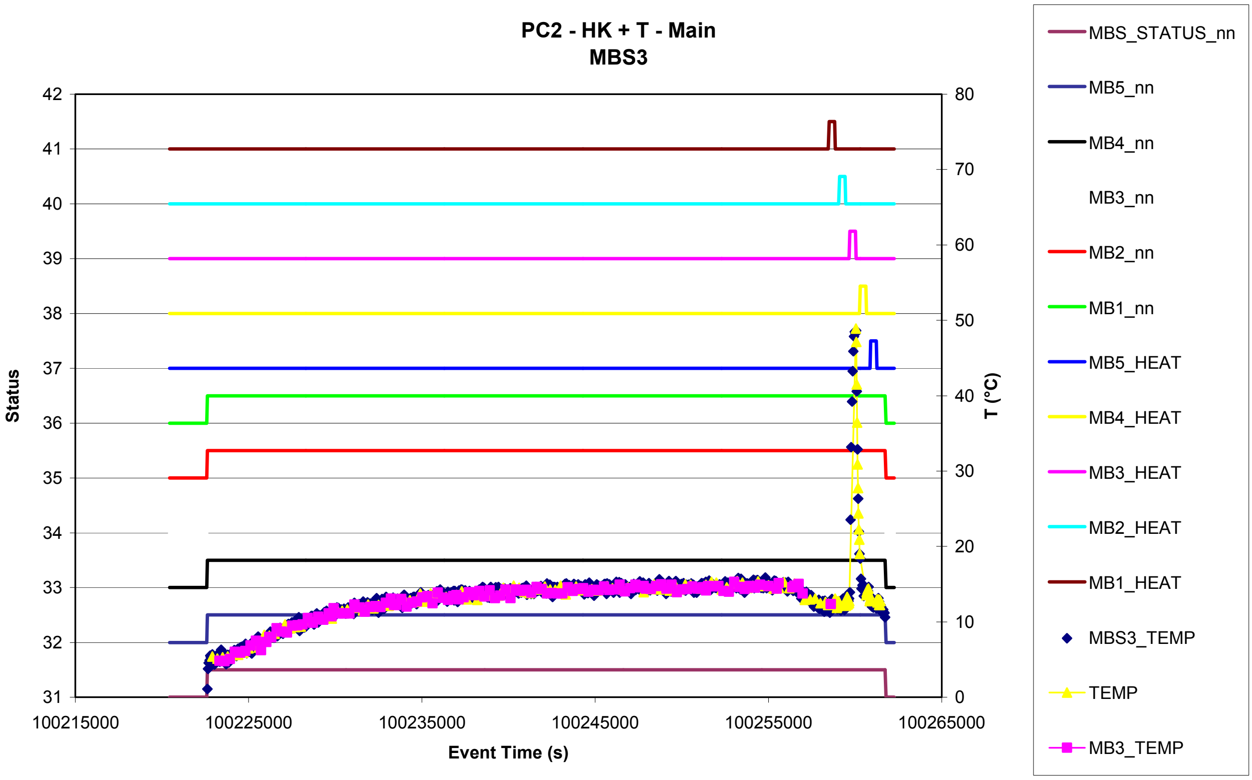


Figure 7.5-5. MBS 4 Temperature vs. time (HK, HK-SCI, SCI) - Main

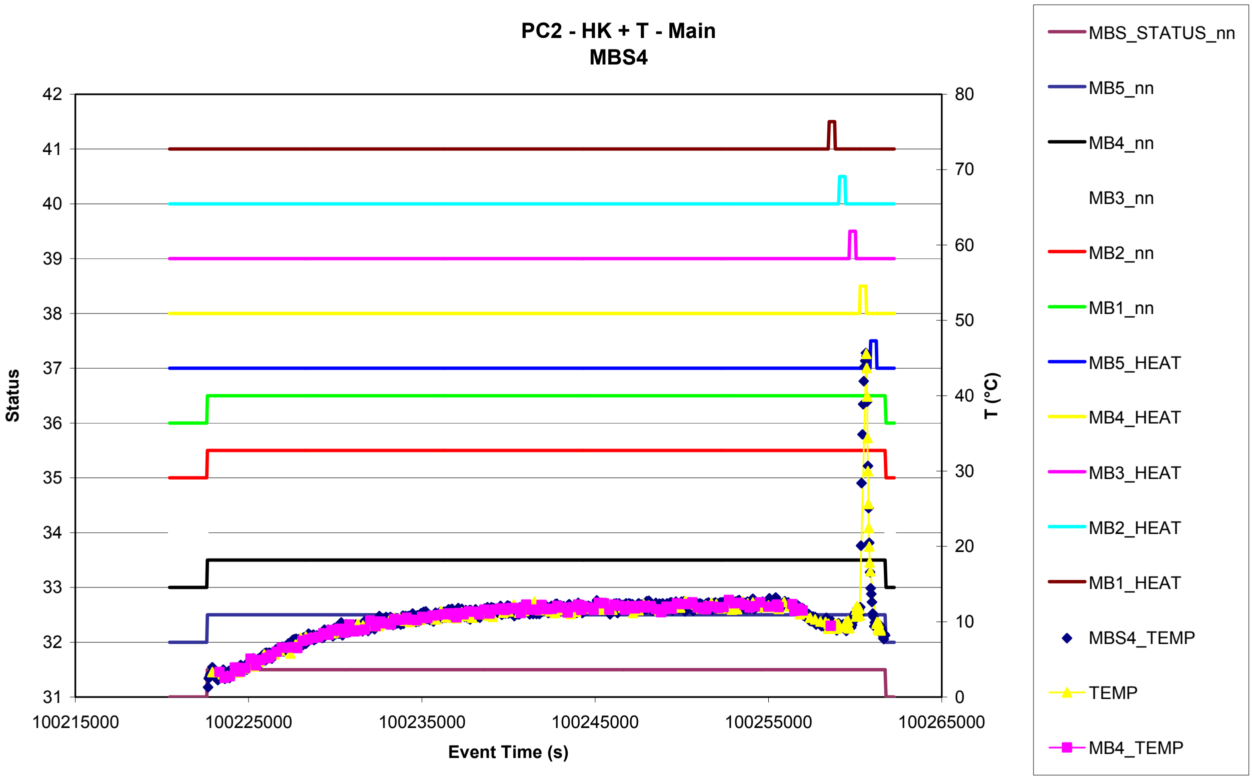
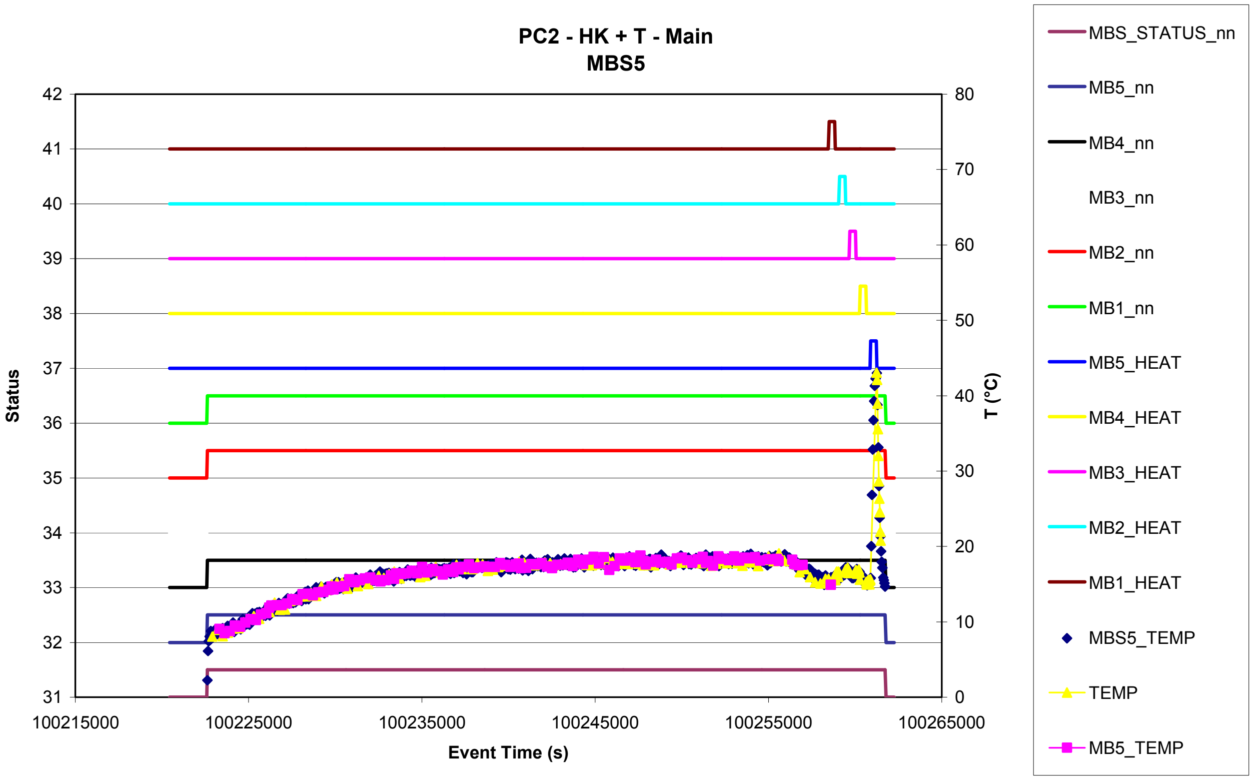


Figure 7.5-6. MBS 5 Temperature vs. time (HK, HK-SCI, SCI) - Main



7.5.2 MBS – Behaviour

7.5.2.1 Science Events (Normal + Heating)

Figure 7.5-7. MBS 1 Frequency and Temperature vs. time - Main

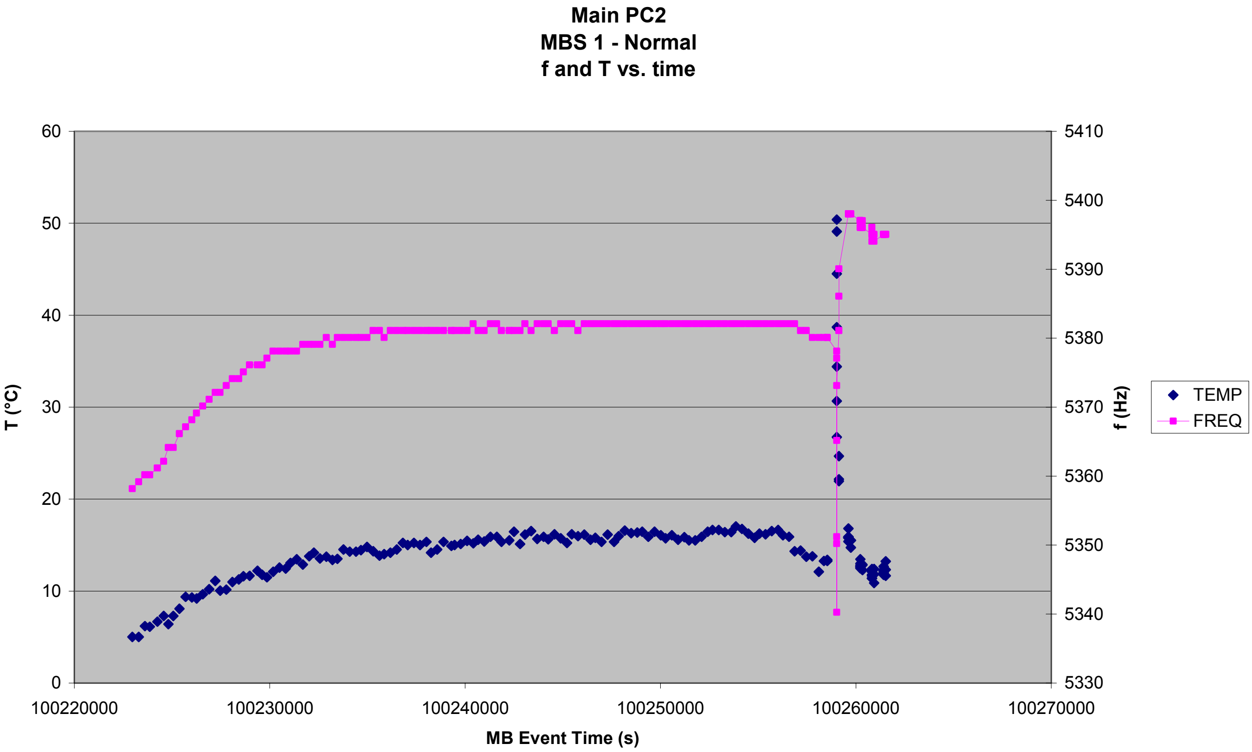


Figure 7.5-8. MBS 2 Frequency and Temperature vs. time - Main

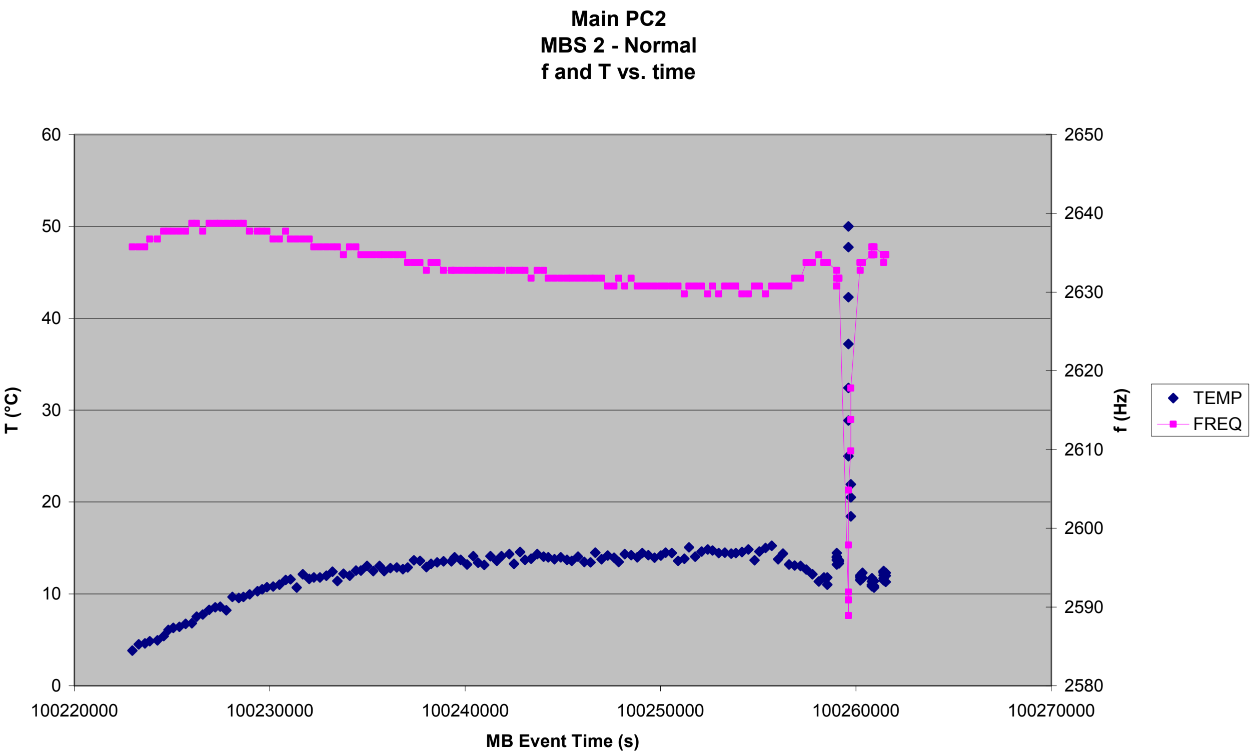


Figure 7.5-9. MBS 3 Frequency and Temperature vs. time - Main

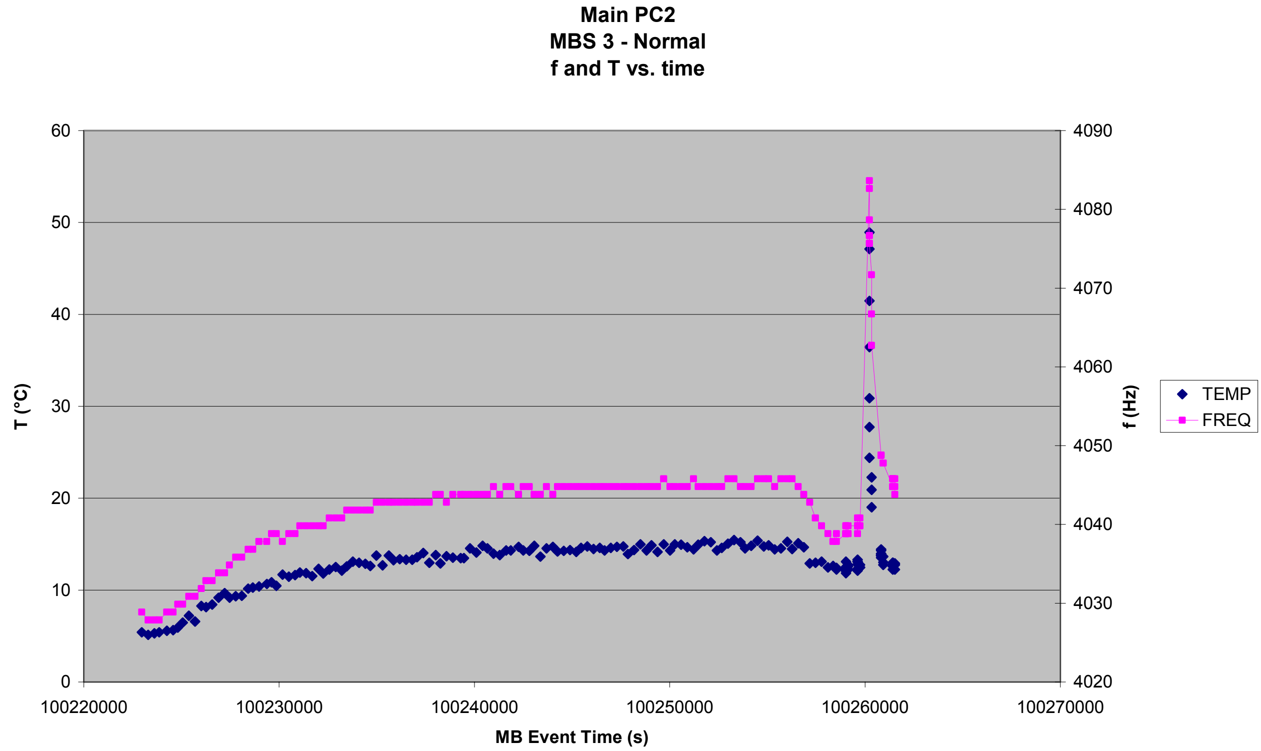


Figure 7.5-10. MBS 4 Frequency and Temperature vs. time - Main

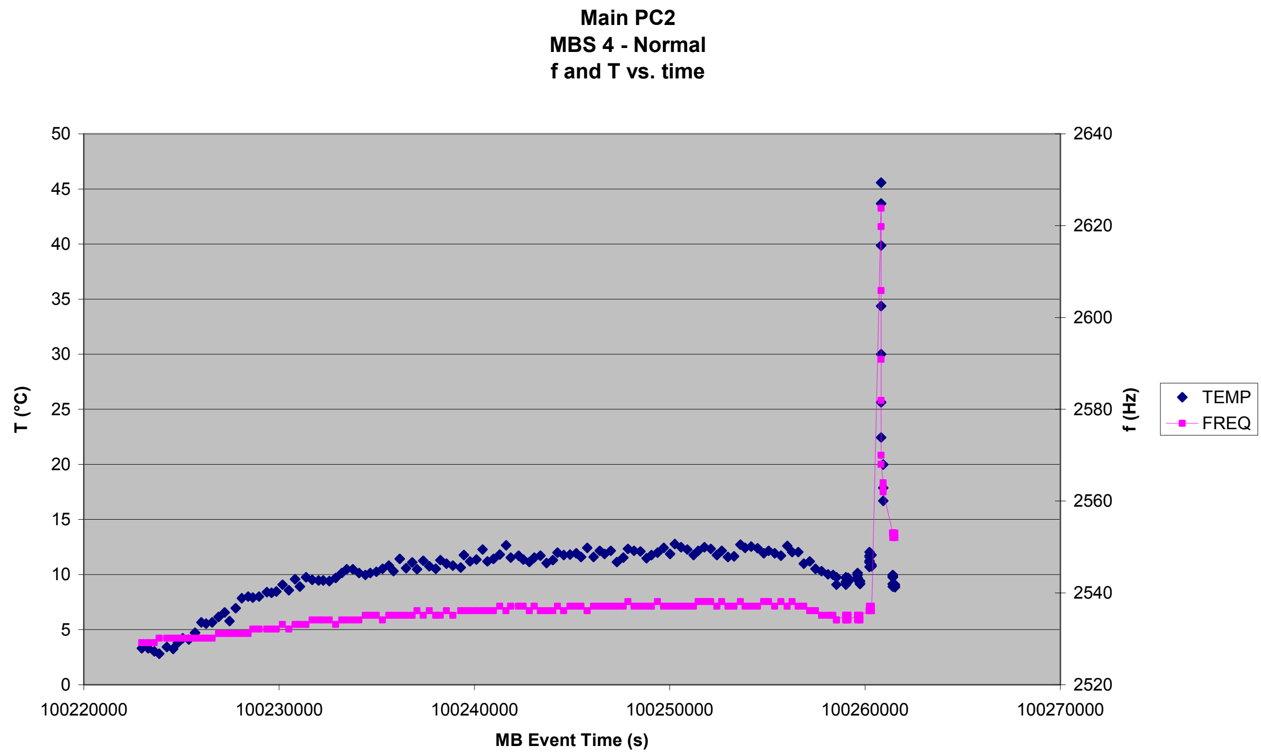


Figure 7.5-11. MBS 5 Frequency and Temperature vs. time - Main

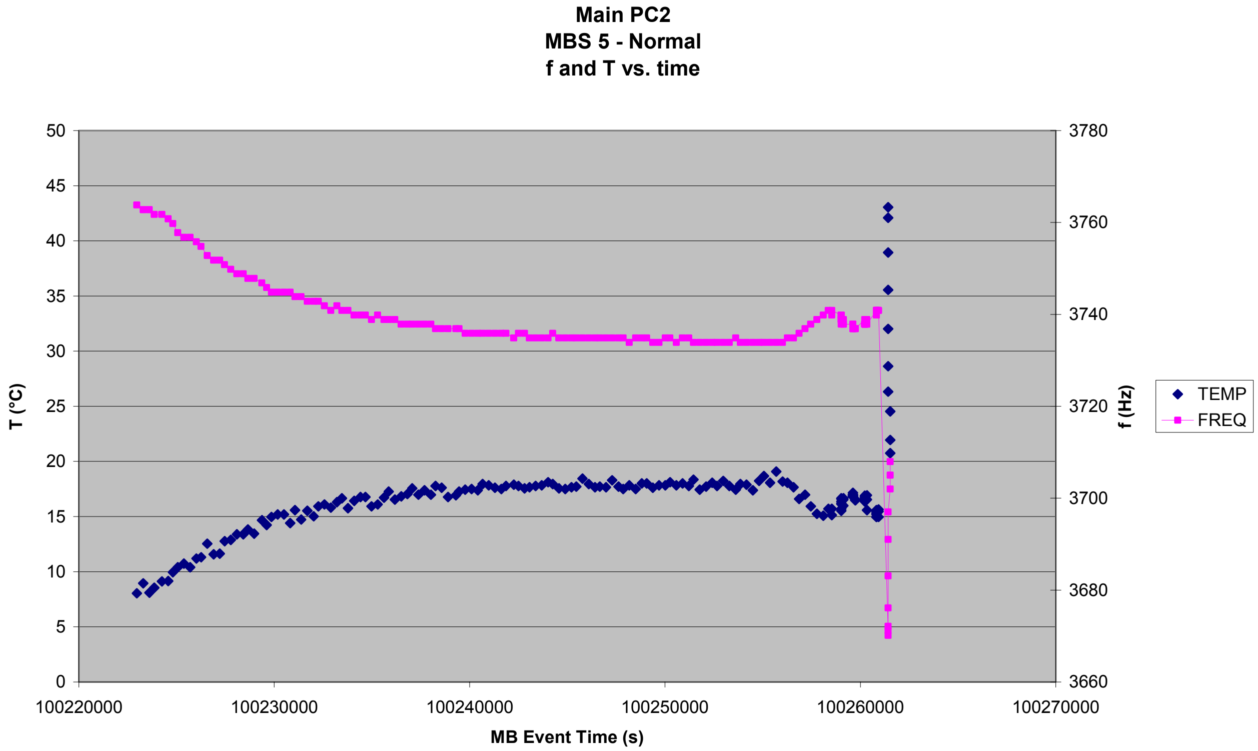


Figure 7.5-12. MBS 1 Frequency vs. Temperature - Main

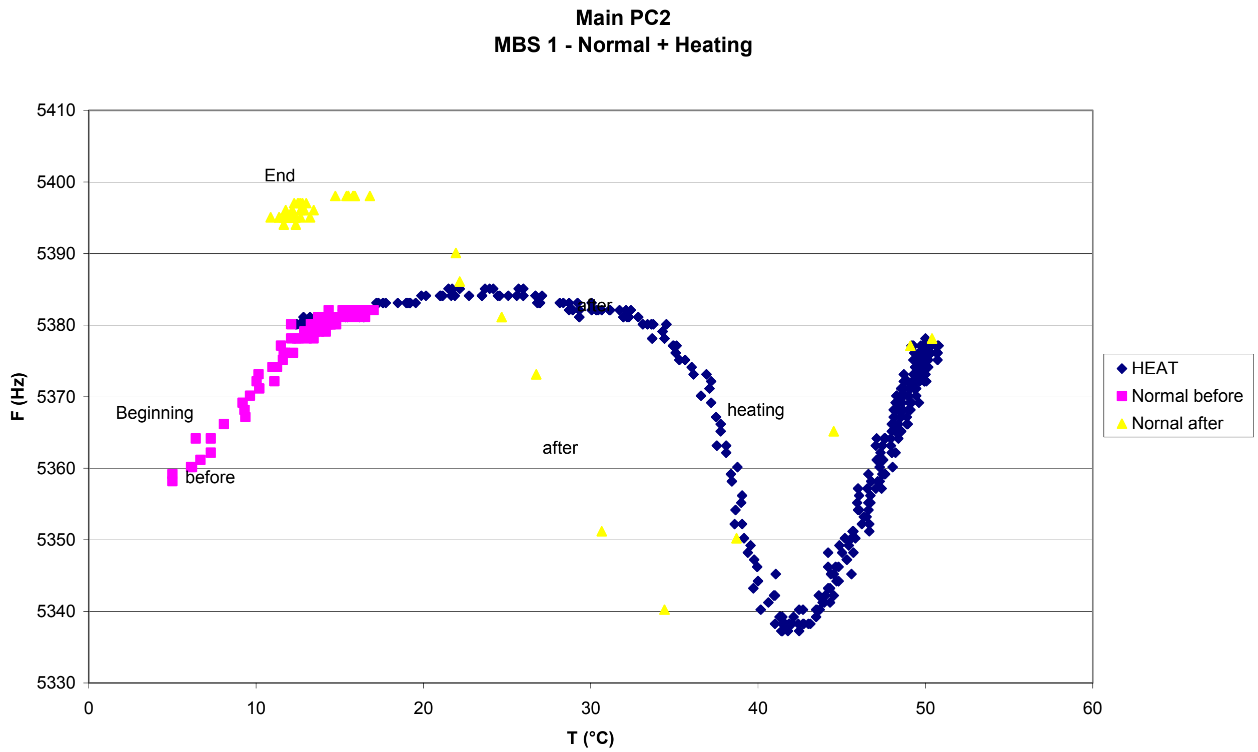


Figure 7.5-13. MBS 2 Frequency vs. Temperature - Main

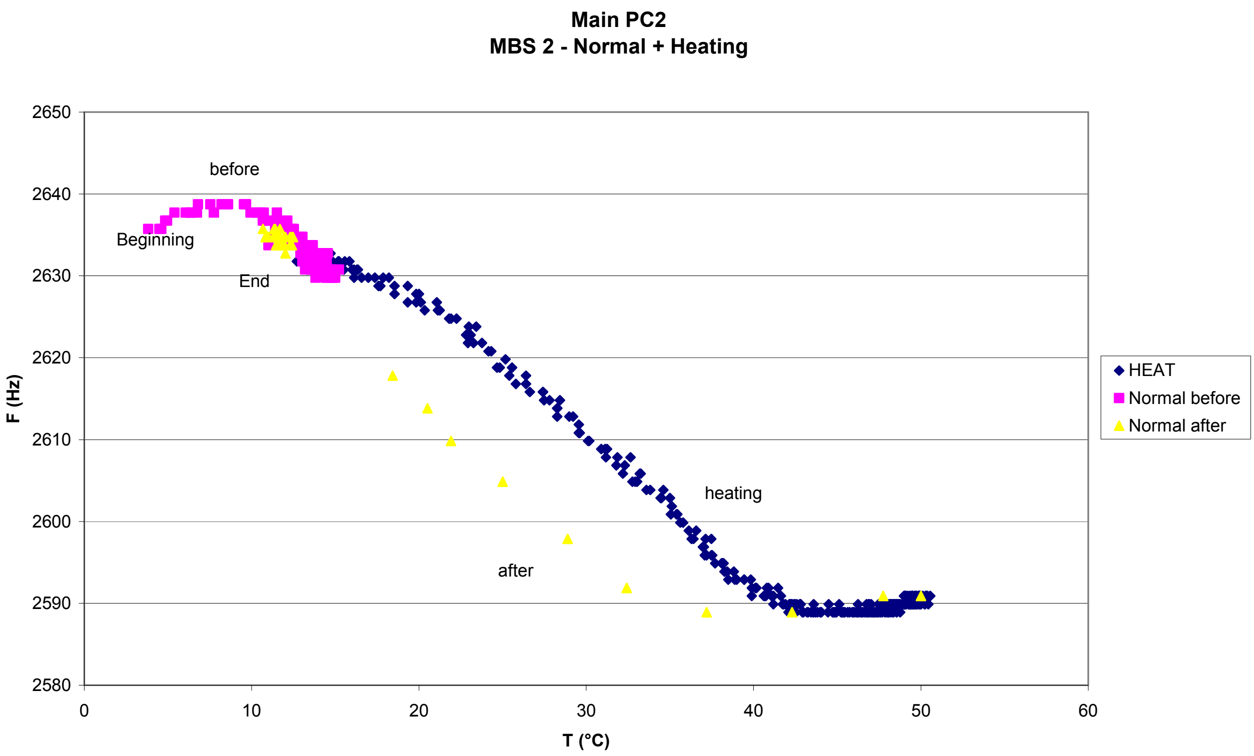


Figure 7.5-14. MBS 3 Frequency vs. Temperature - Main

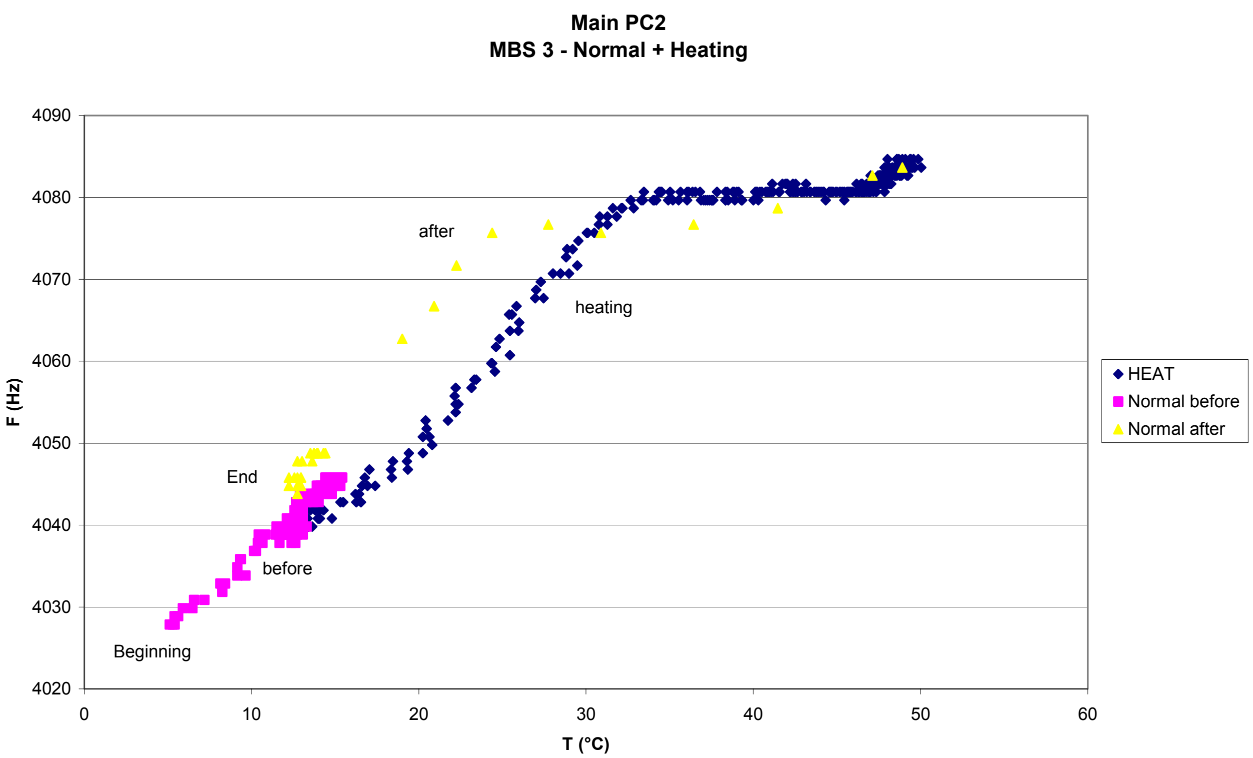


Figure 7.5-15. MBS 4 Frequency vs. Temperature - Main

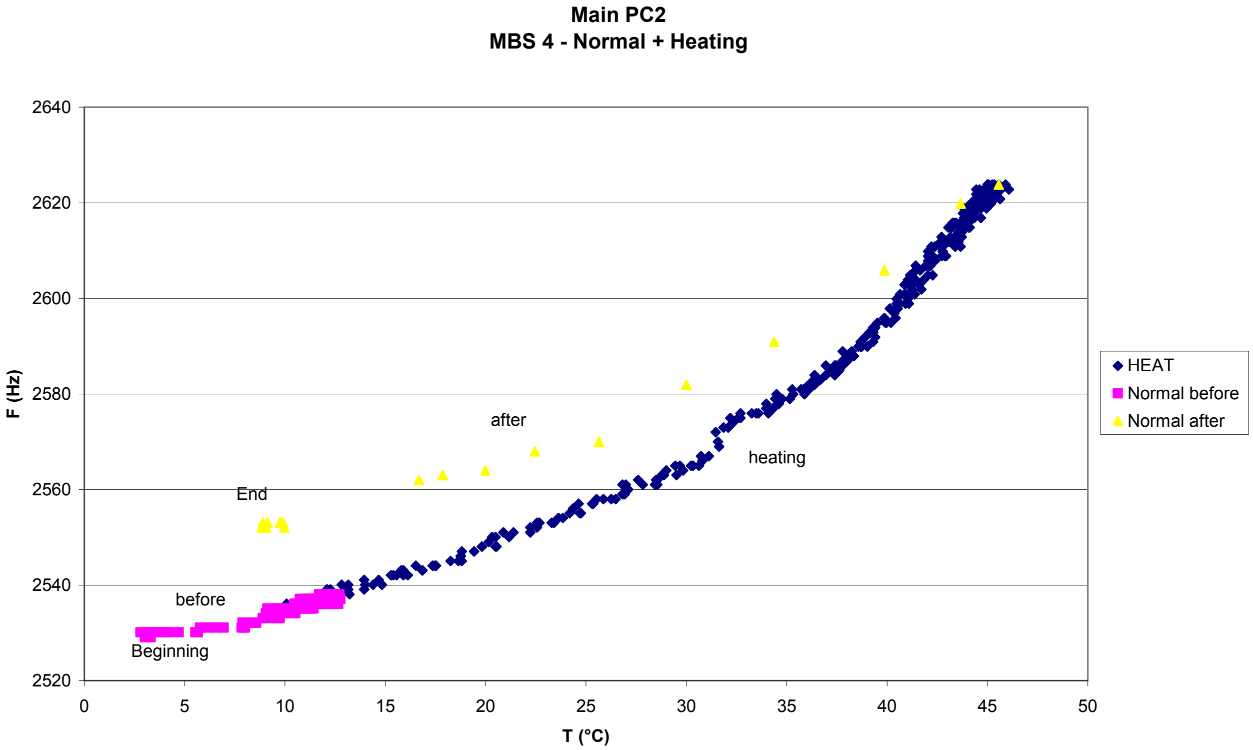
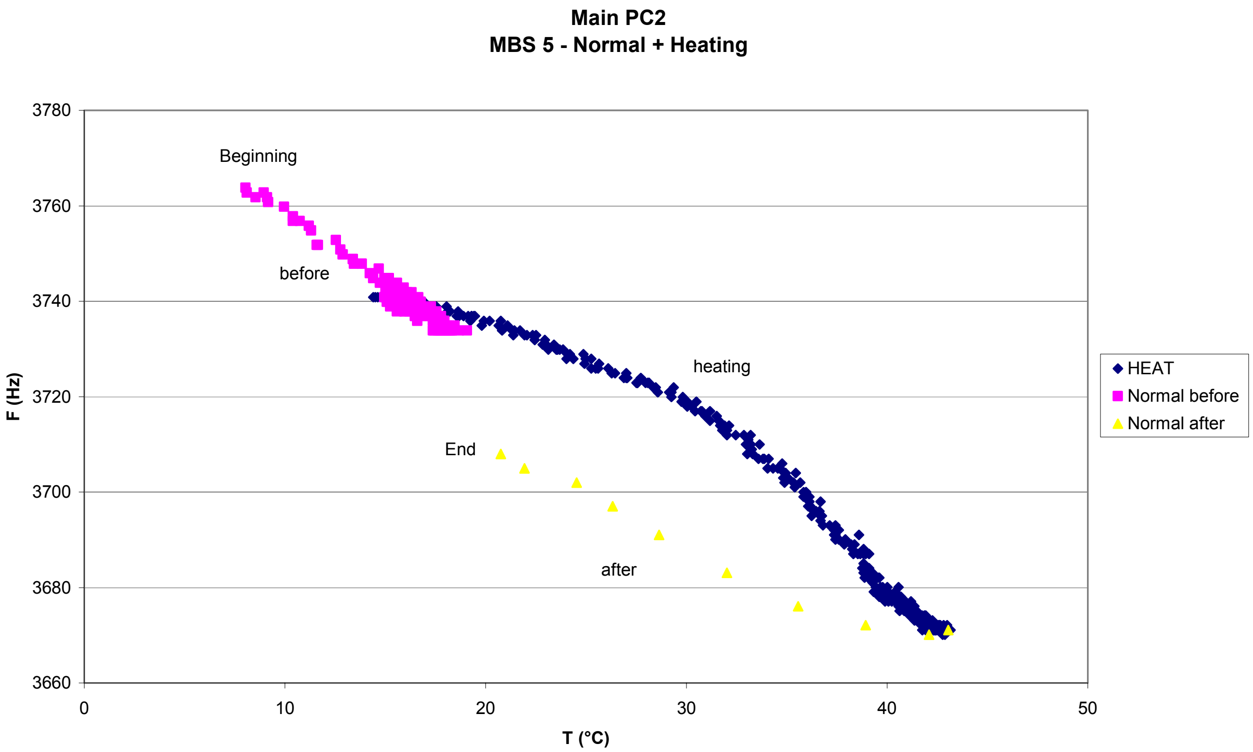


Figure 7.5-16. MBS 5 Frequency vs. Temperature - Main



8. PC2 DATA ANALYSIS – REDUNDANT INTERFACE

8.1 GIADA STATUS

Figure 8.1-1. HK Status of GIADA and S/S vs. time - Redundant

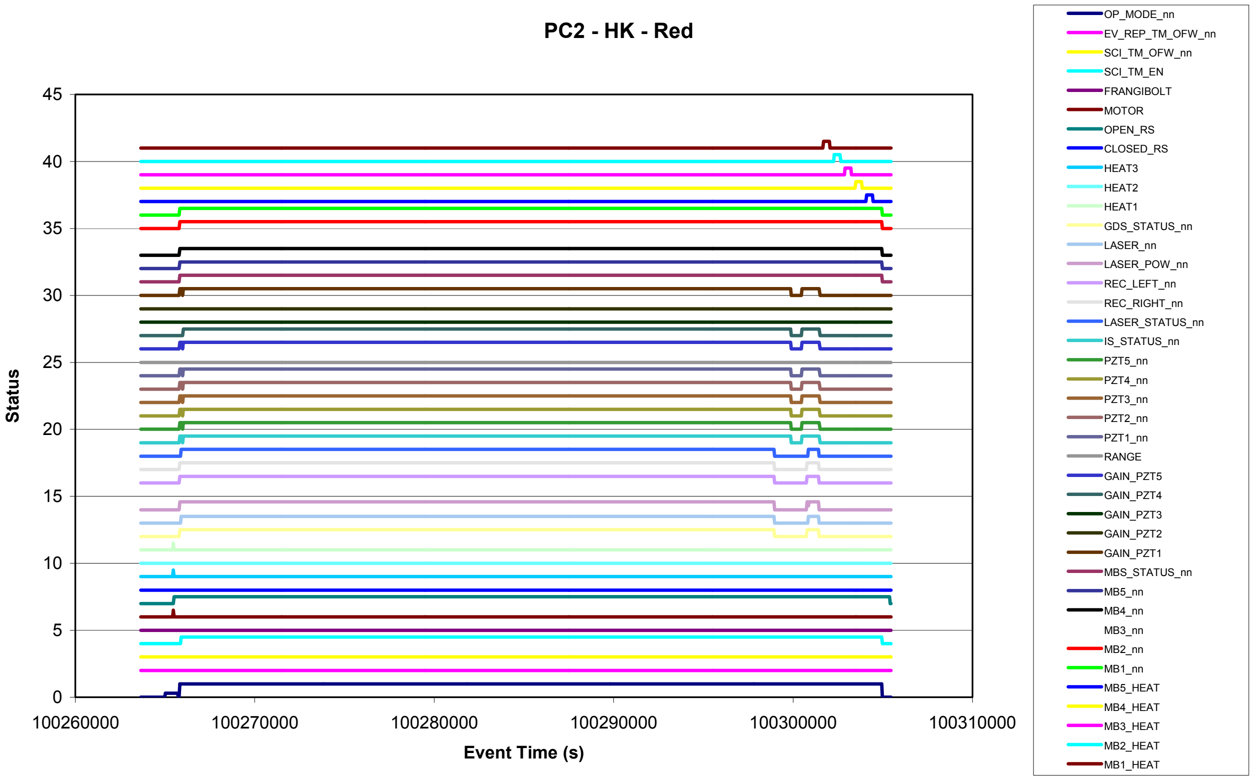


Figure 8.1-2. Evolution of all temperatures vs. time - HK, HK-SCI, SCI - Redundant

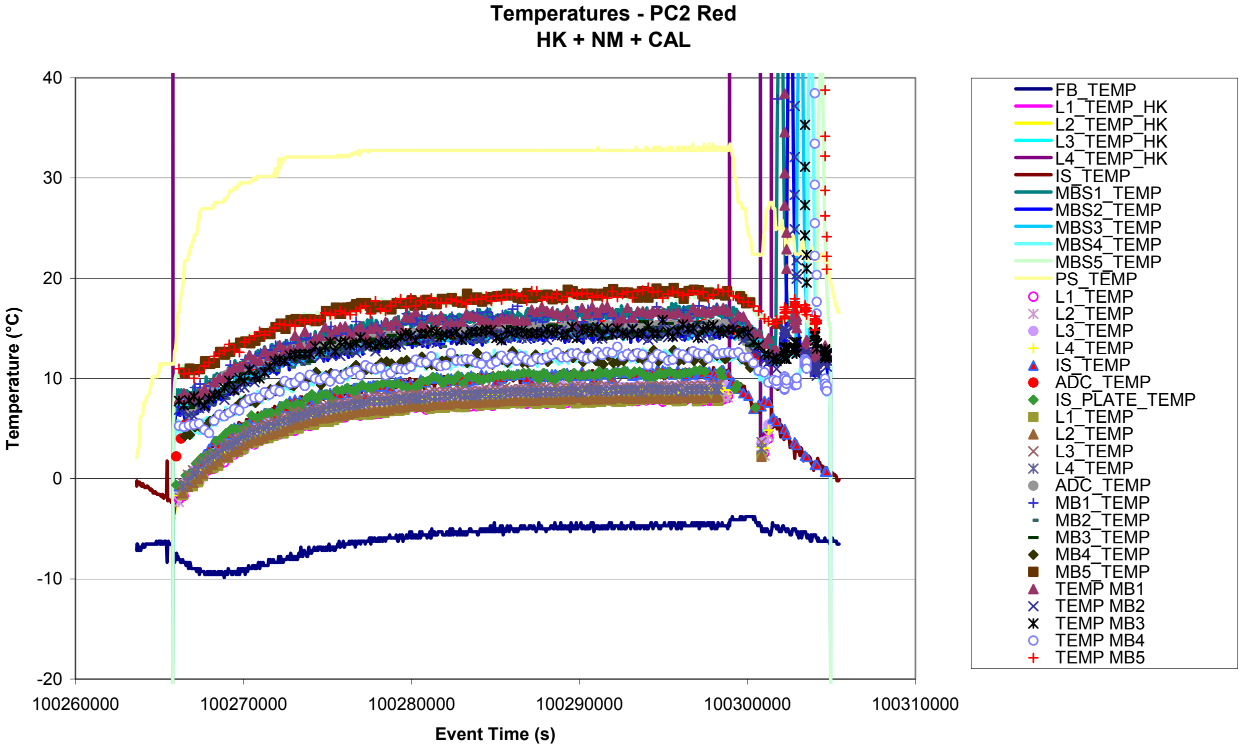


Figure 8.1-3. Evolution of temperatures of system elements vs. time - HK, HK-SCI, SCI - Red

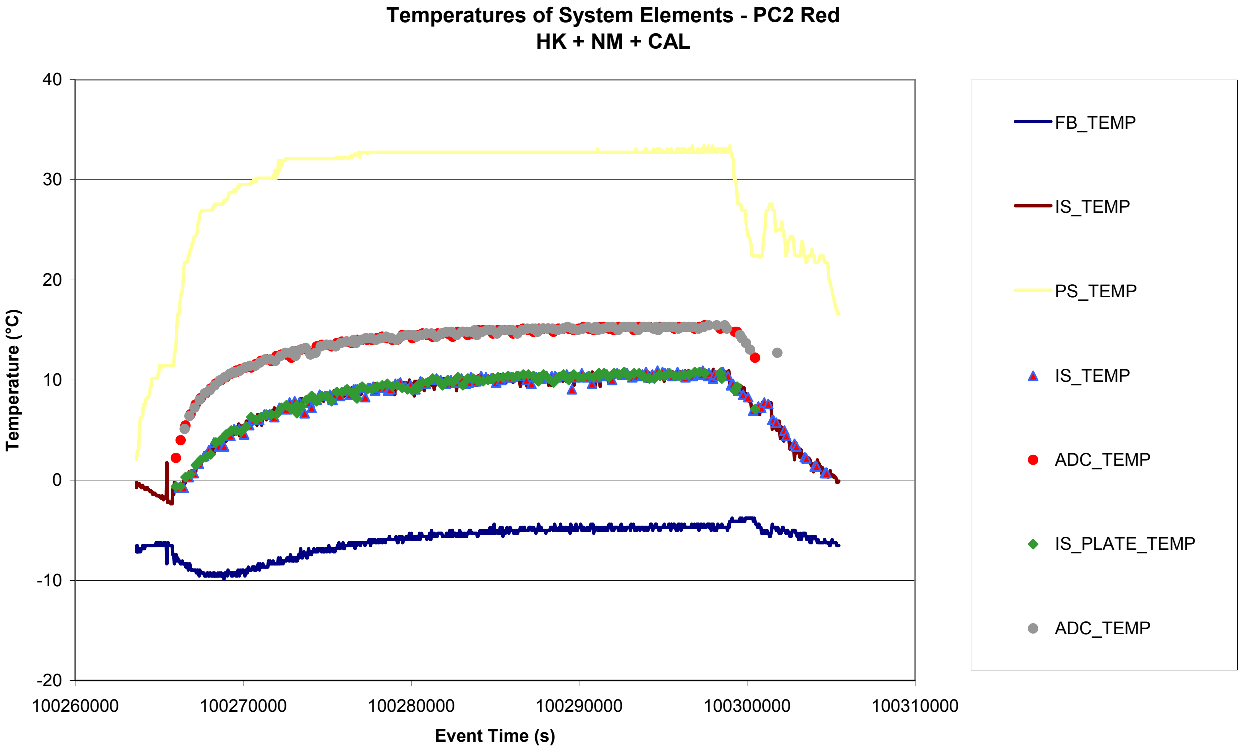


Figure 8.1-4. Evolution of temperatures of sub-systems vs. time - HK, HK-SCI, SCI - Red

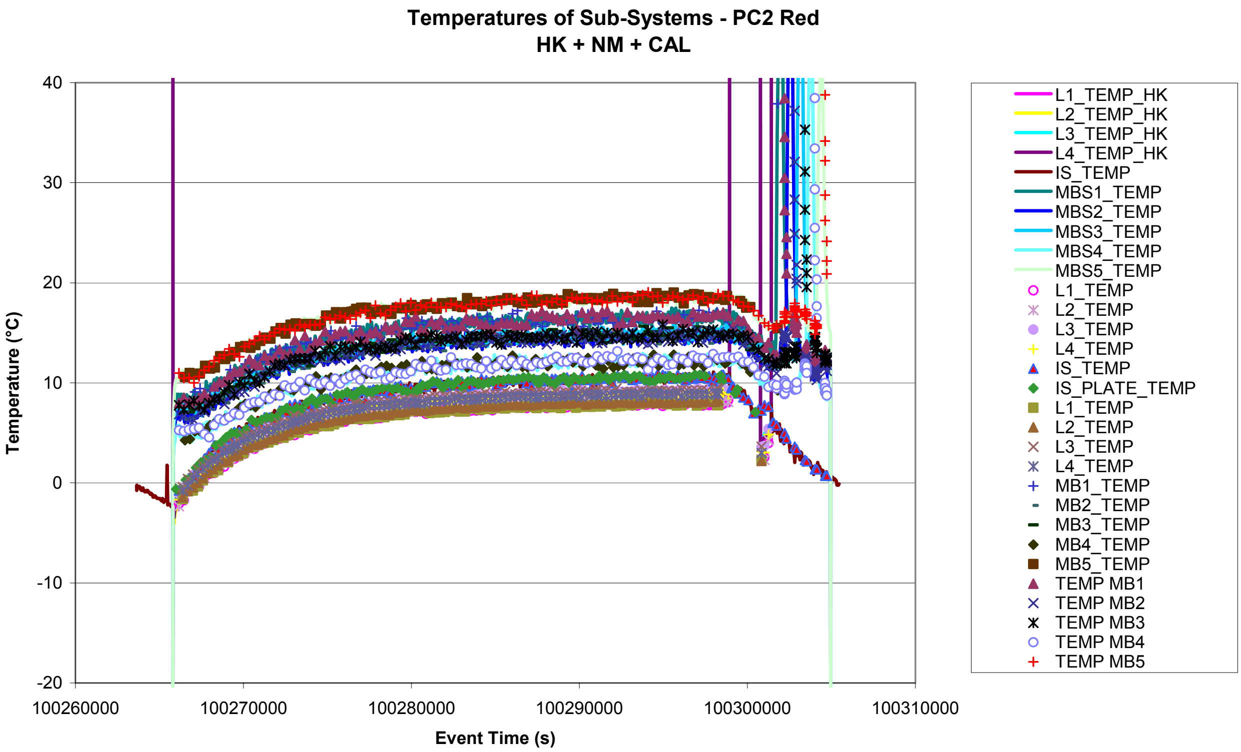


Figure 8.1-5. Operation Status vs. time - Red

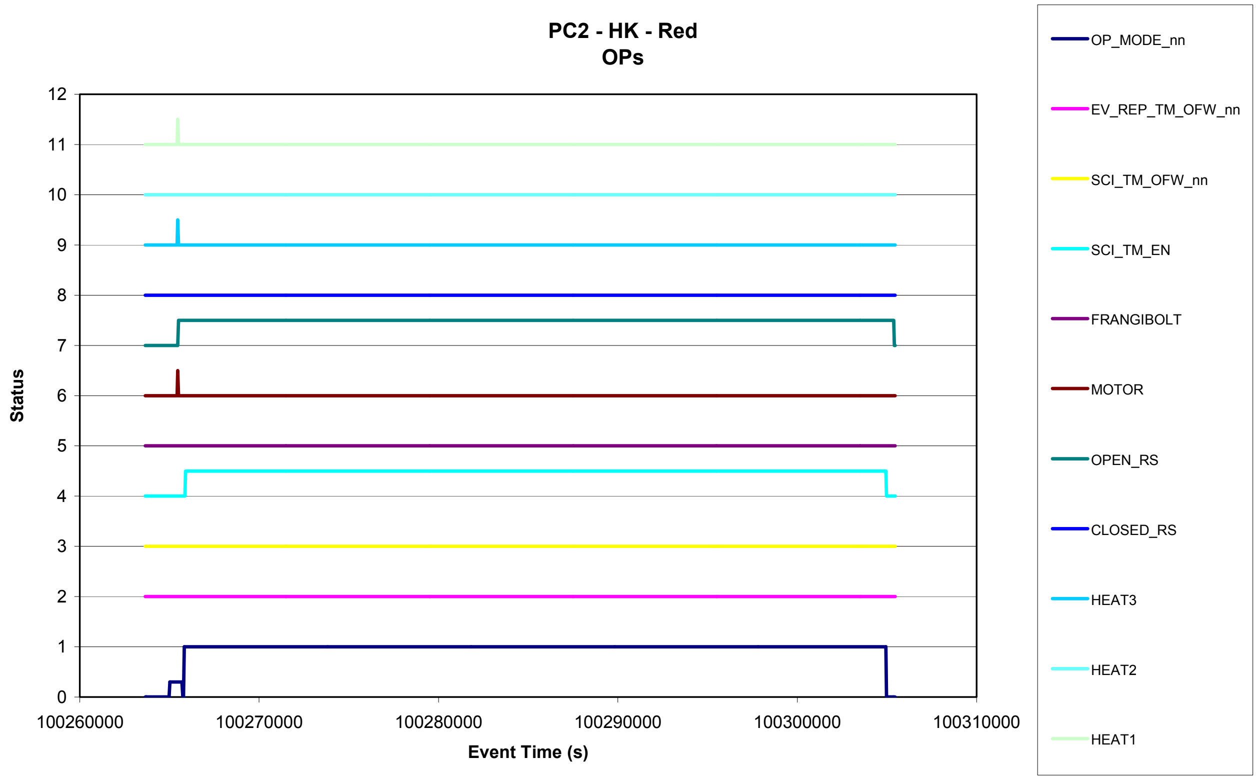


Figure 8.1-6. Power behaviour - Red

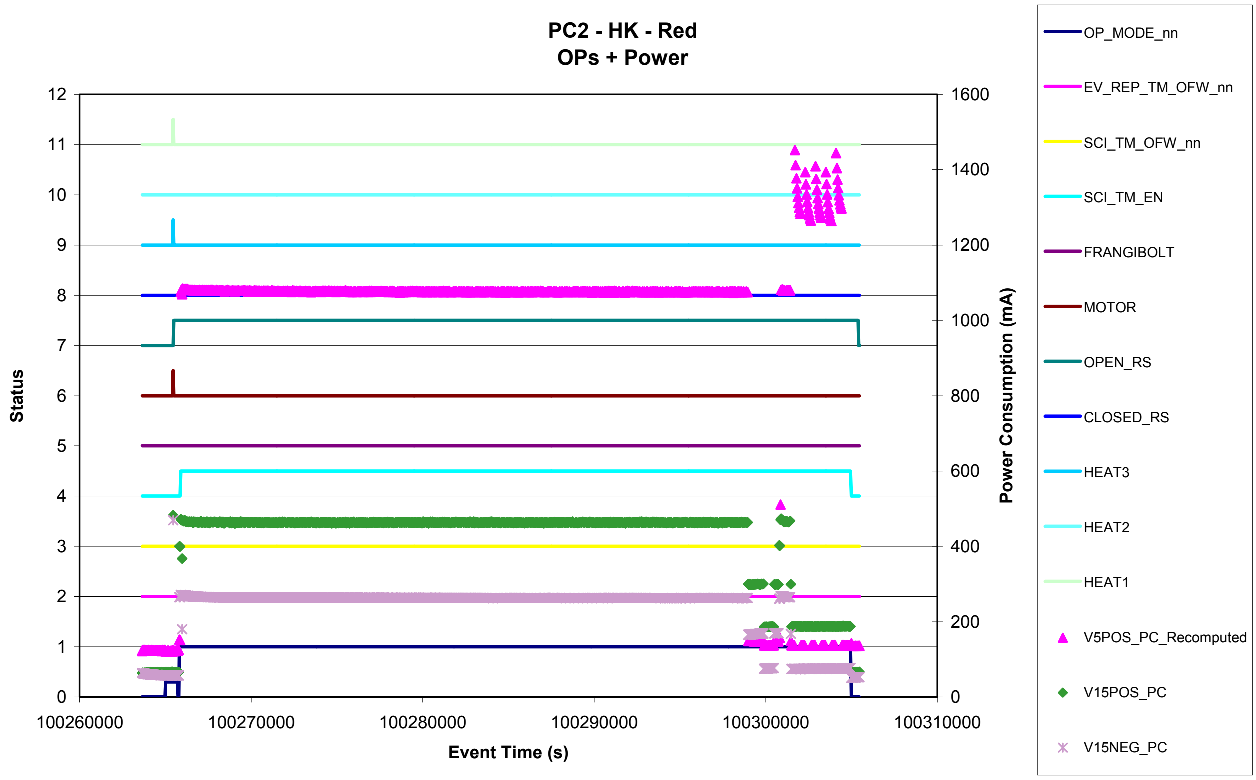


Figure 8.1-7. Power and PS temperature behaviour - Red

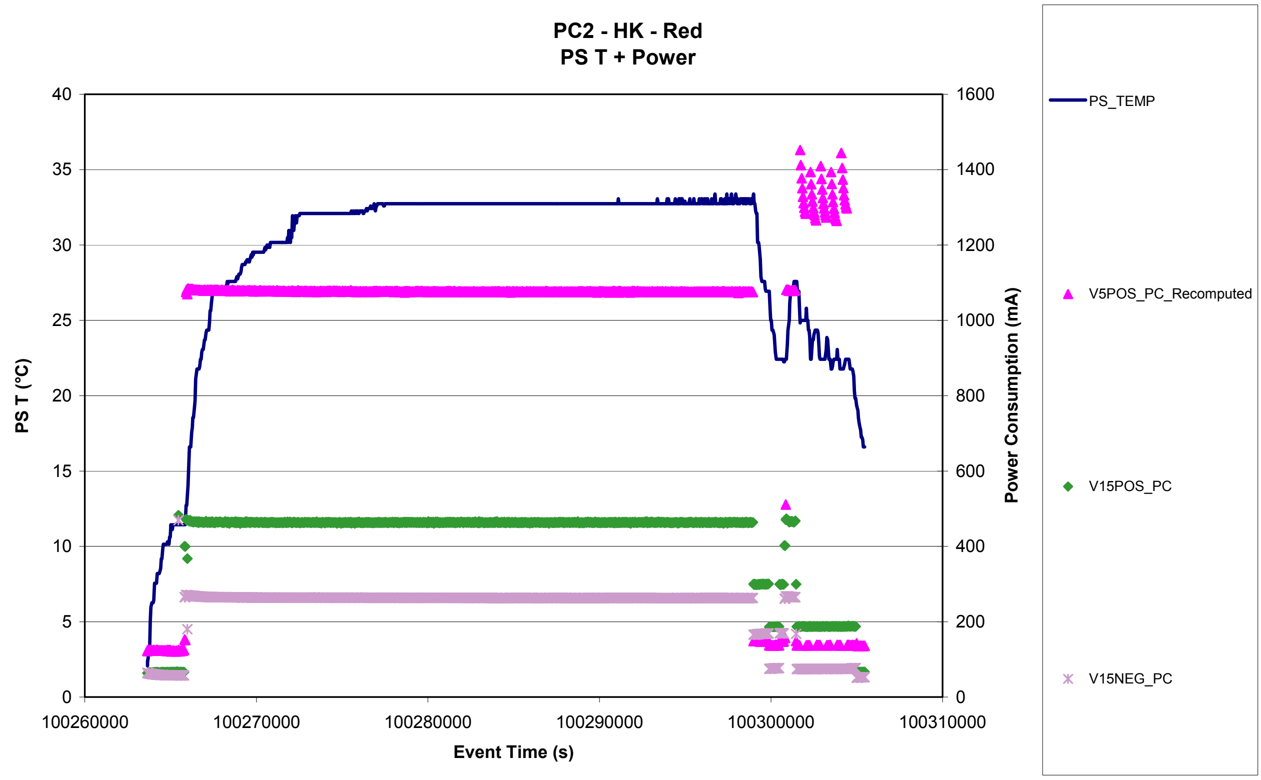


Figure 8.1-8. Source Sequence Count (SSC) of HK Telemetry vs. Time - Red

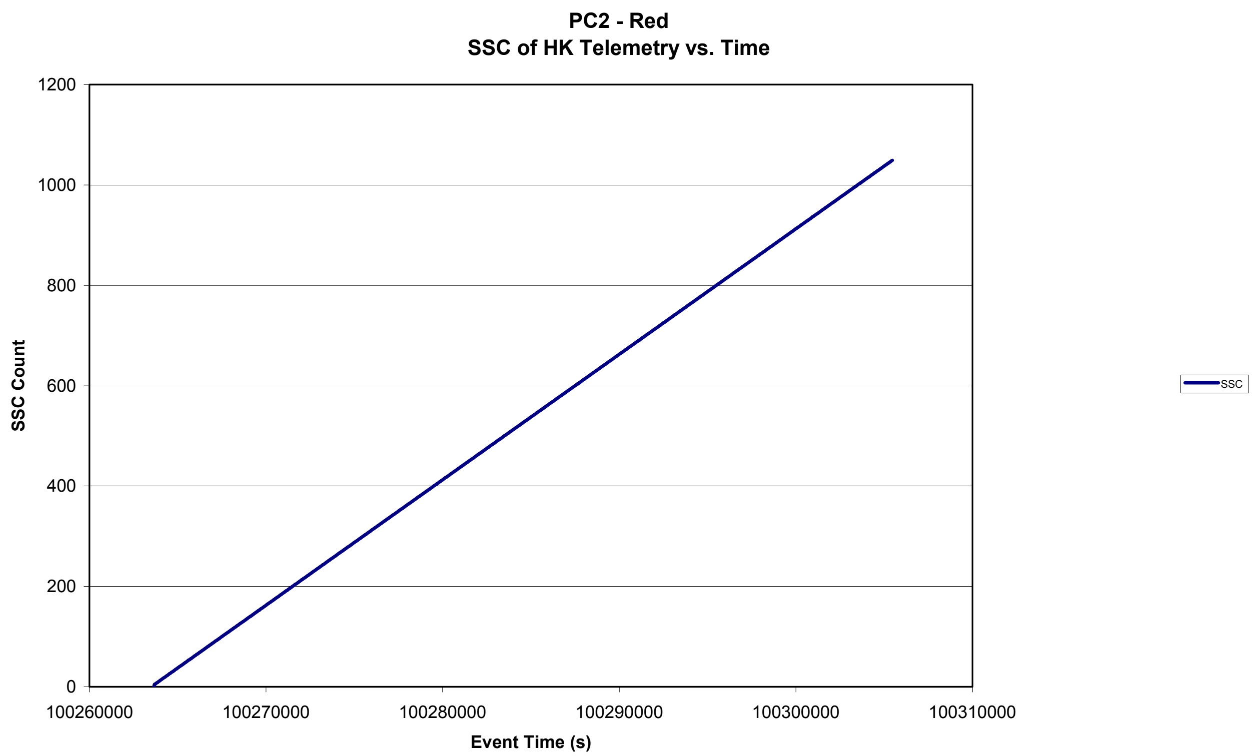


Figure 8.1-9. Source Sequence Count (SSC) of HK Telemetry vs. Number - Red

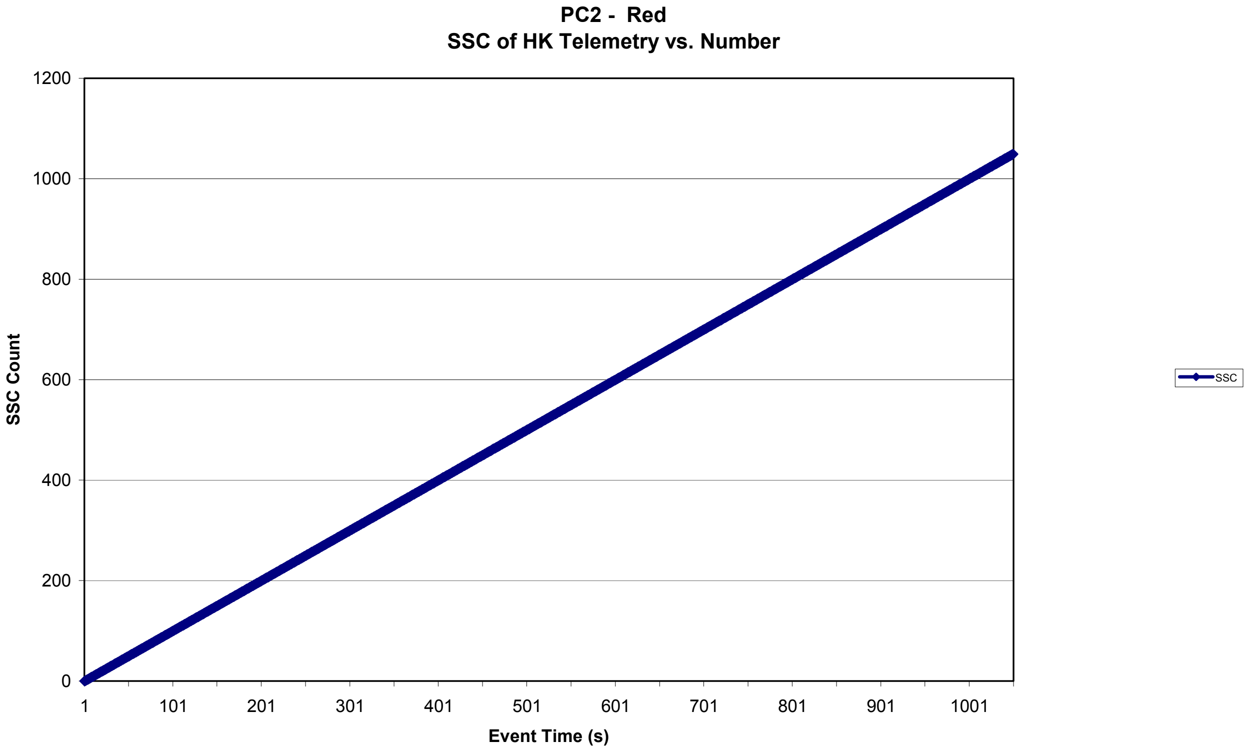


Figure 8.1-10. Source Sequence Count (SSC) of SCI Telemetry vs. Time - Red

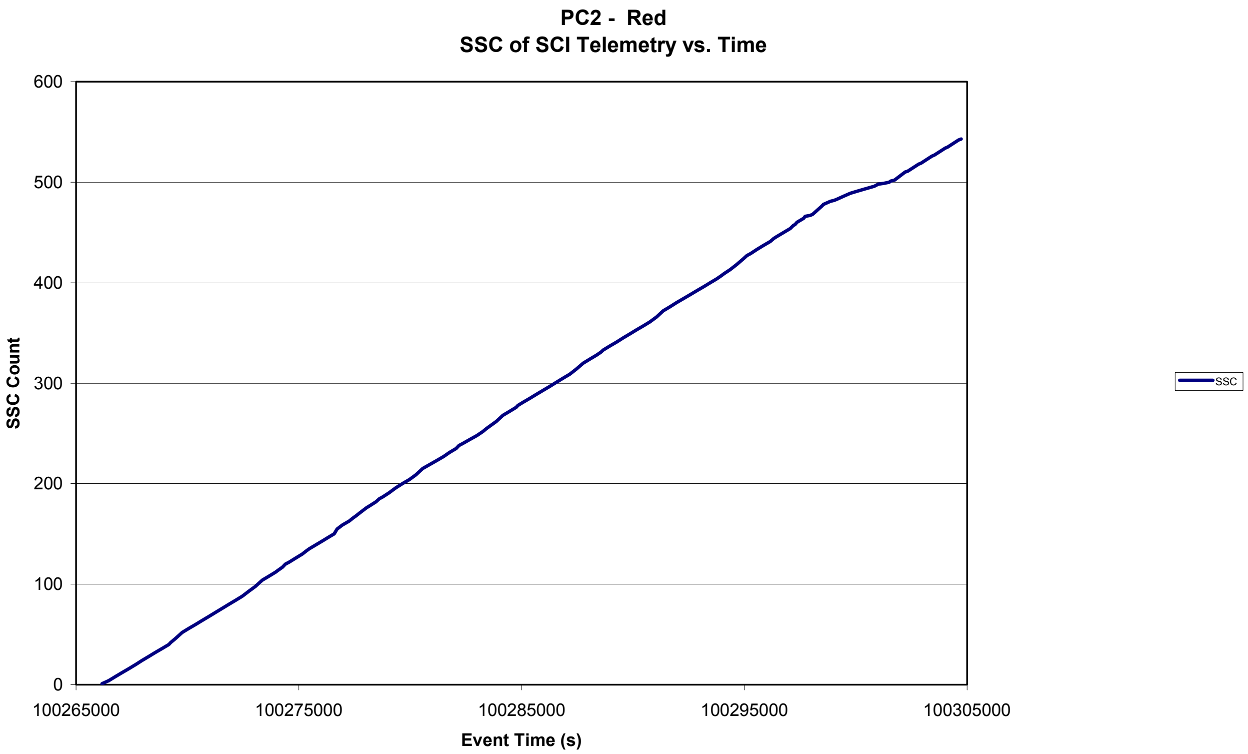
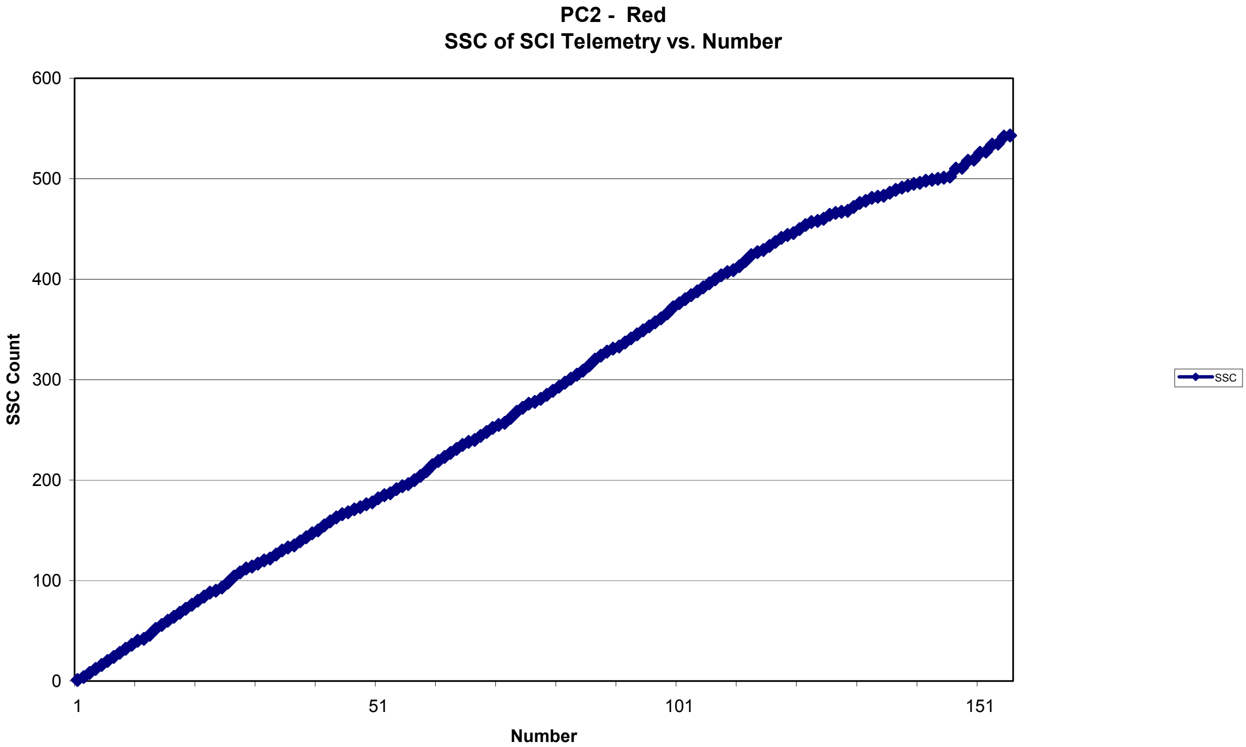


Figure 8.1-11. Source Sequence Count (SSC) of SCI Telemetry vs. Number - Red

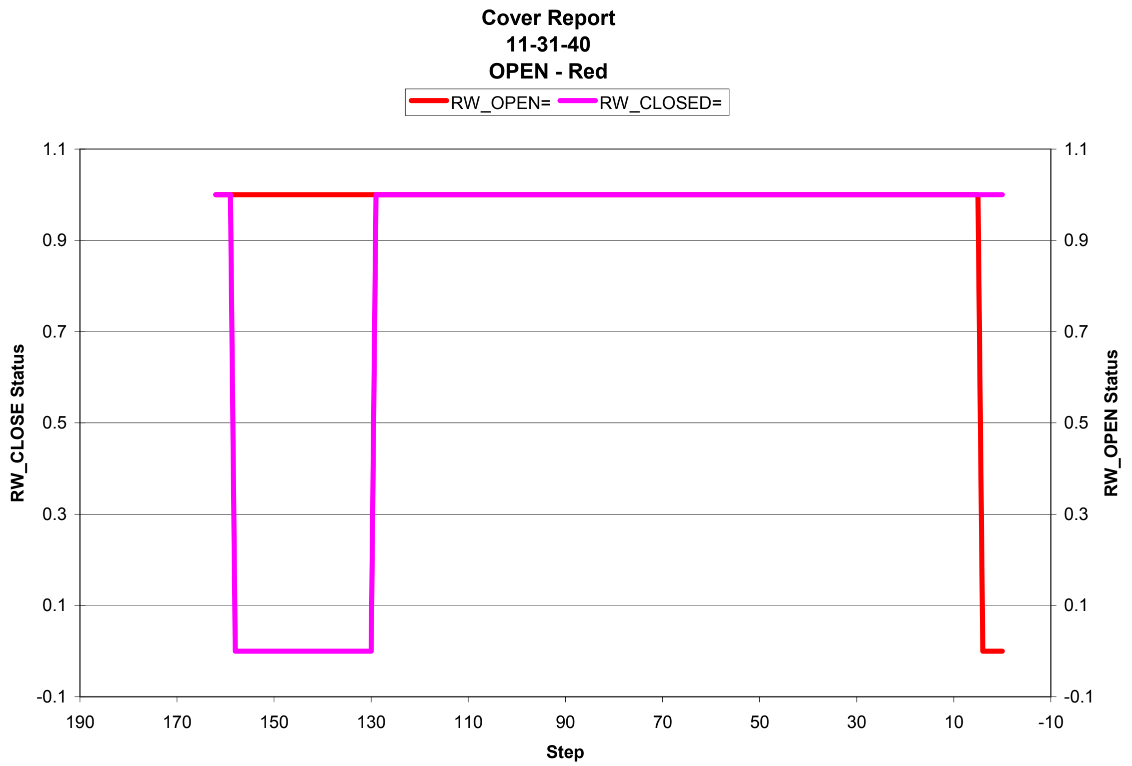


8.2 COVER REPORTS

8.2.1 Open Cover

HEADER_START
CREATION_TIME=2006-03-06T11:31:40Z
USER=AA0000
HEADER_END
//
// Generated by 'GIADA_EGSE_SW '
//
MOVEMENT DIRECTION: To open
BEGIN TIME OF OPERATION: 100265472.000000
END TIME OF OPERATION: 100265480.000000

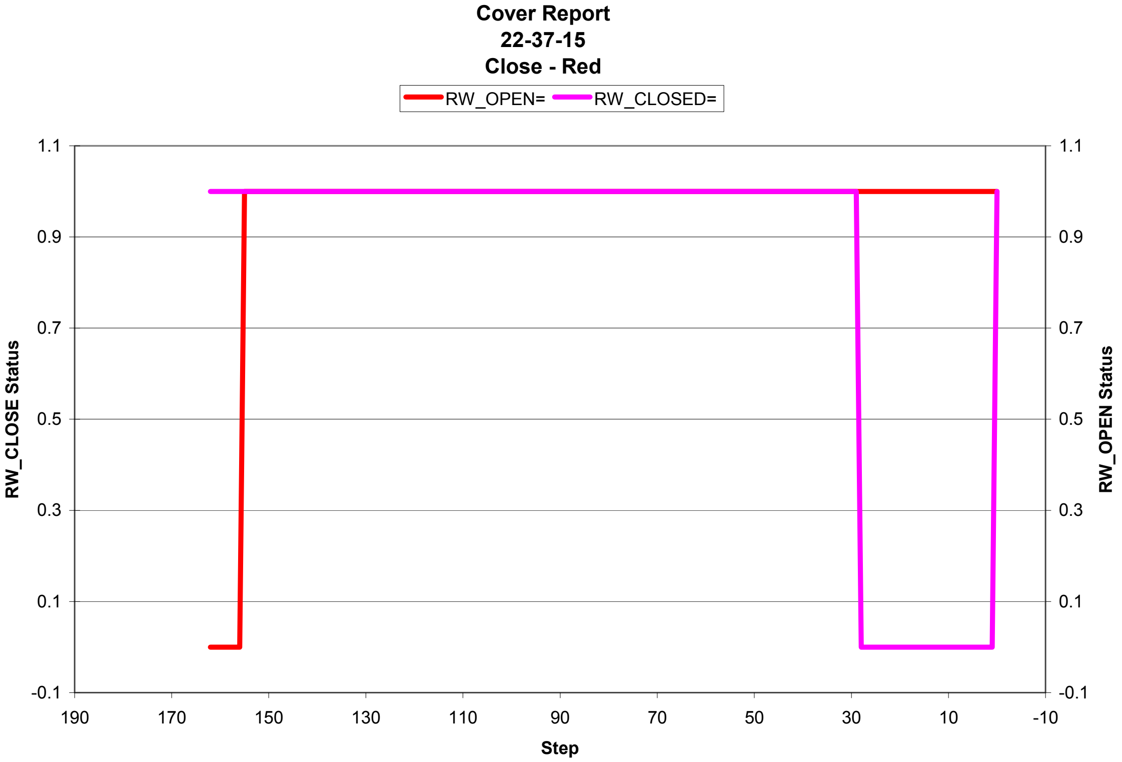
Figure 8.2-1 Cover Report – Open – Red



8.2.2 Close Cover

HEADER_START
CREATION_TIME=2006-03-06T22:37:15Z
USER=AA0000
HEADER_END
//
// Generated by 'GIADA_EGSE_SW '
//
MOVEMENT DIRECTION: To close
BEGIN TIME OF OPERATION: 100305408.000000
END TIME OF OPERATION: 100305416.000000

Figure 8.2-2 Cover Report – Close – Red



8.3 GRAIN DETECTION SYSTEM (GDS)

8.3.1 GDS – Status

Figure 8.3-1. GDS Operation Status vs. time - Red

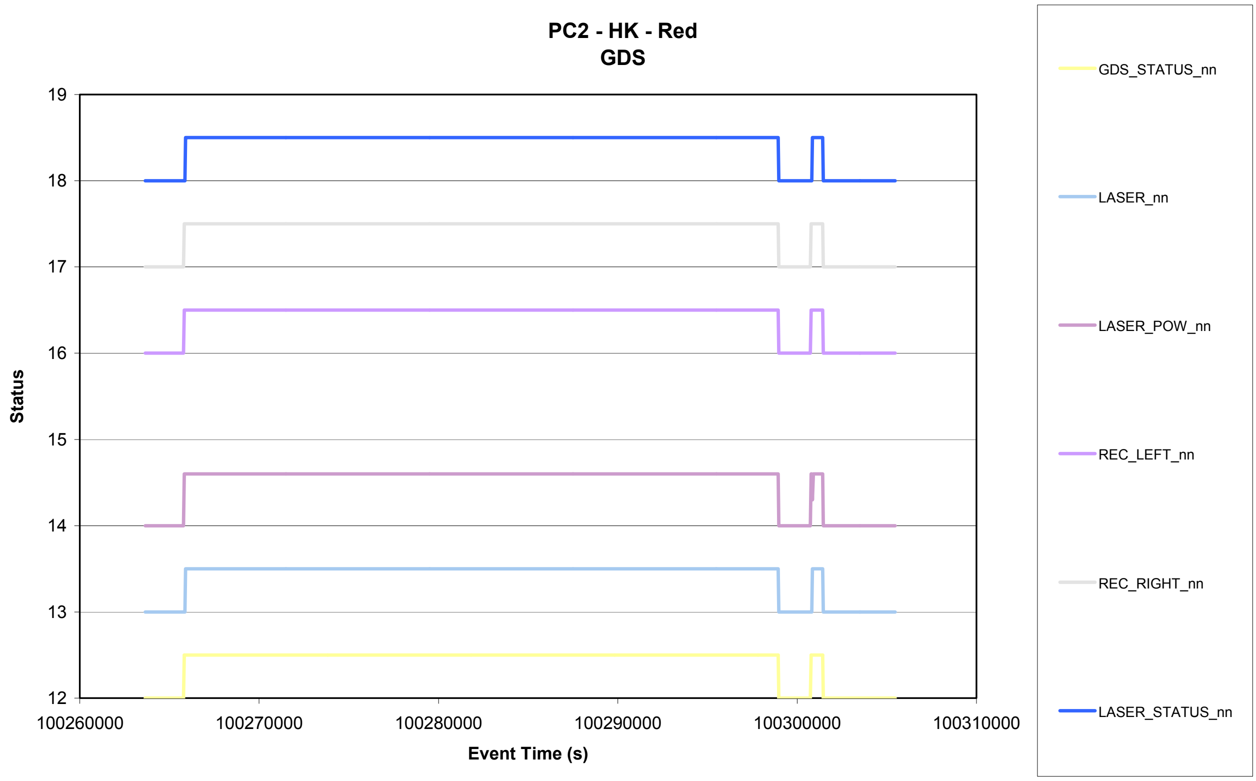


Figure 8.3-2. GDS Thresholds change vs. time - Red

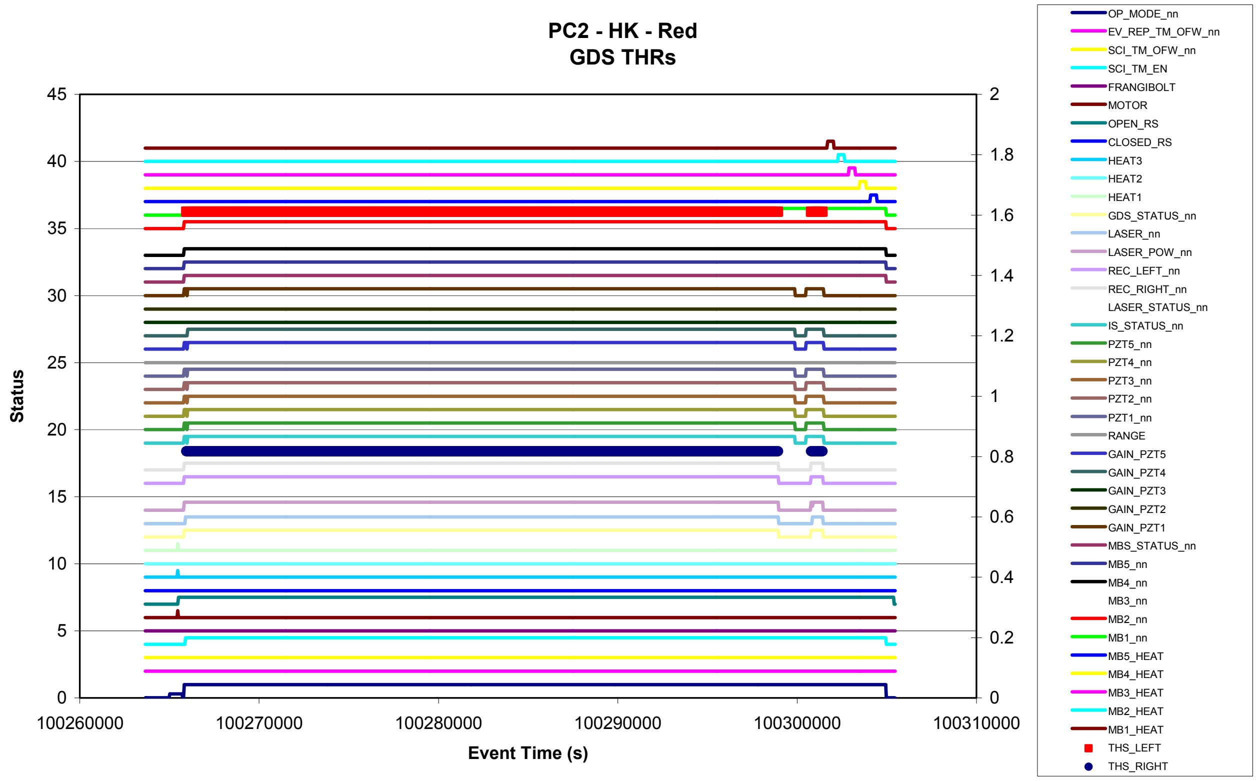


Figure 8.3-3. GDS Laser Temperatures vs. time (HK, HK-SCI, SCI) - Red

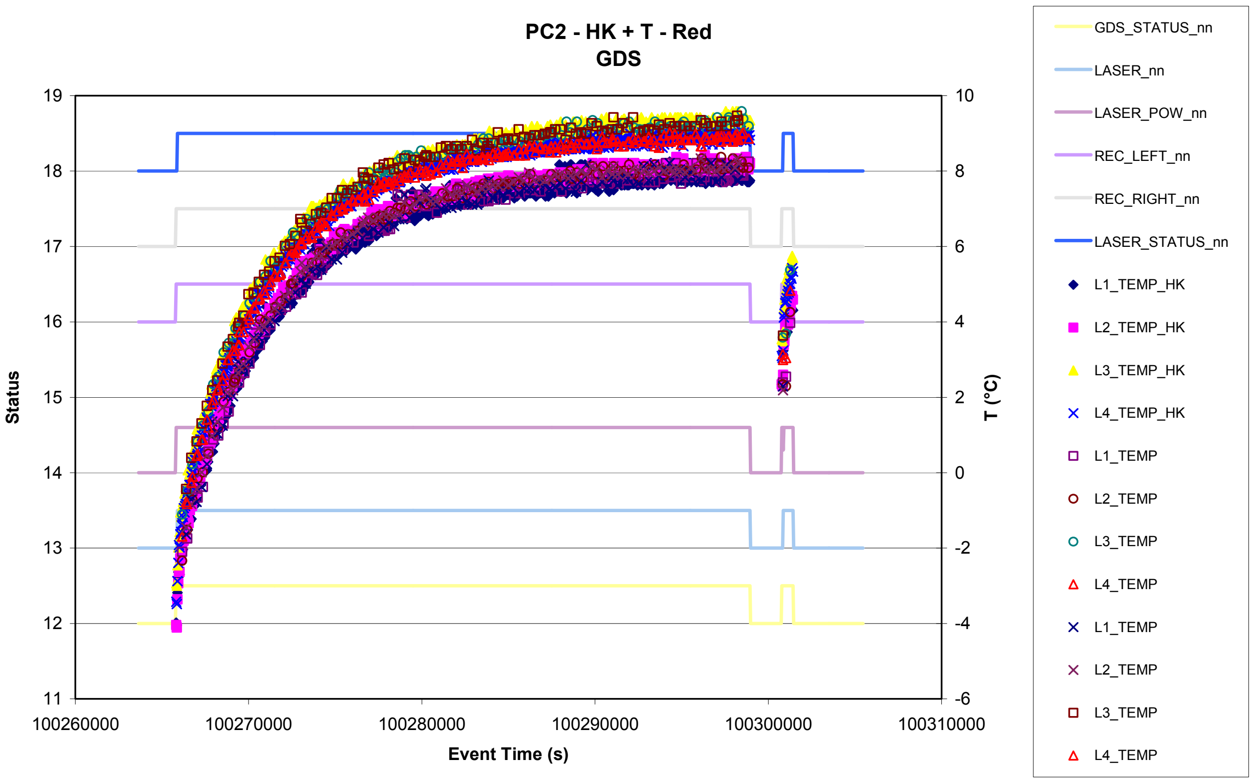


Figure 8.3-4. GDS Laser Monitor vs. time (HK, HK-SCI, SCI) - Red

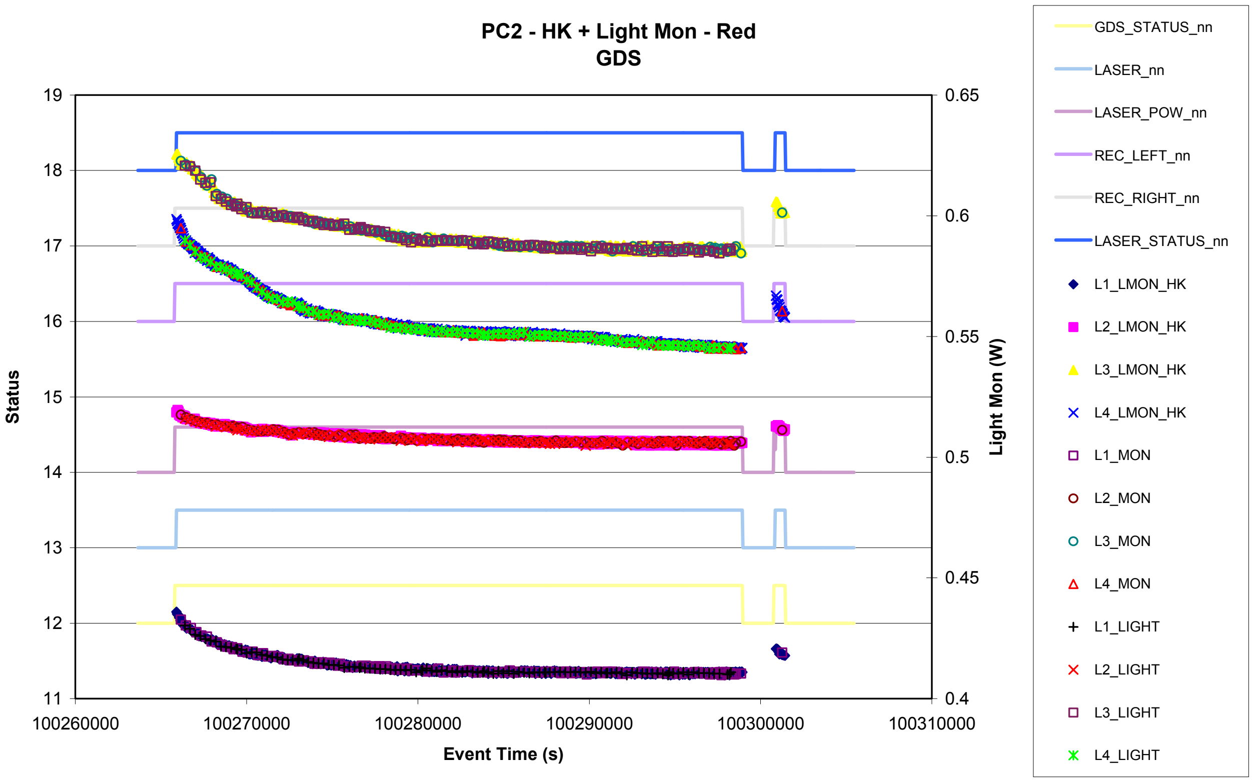


Figure 8.3-5. Laser 1 Light Monitor versus Temperature (HK, HK-SCI, SCI) - Red

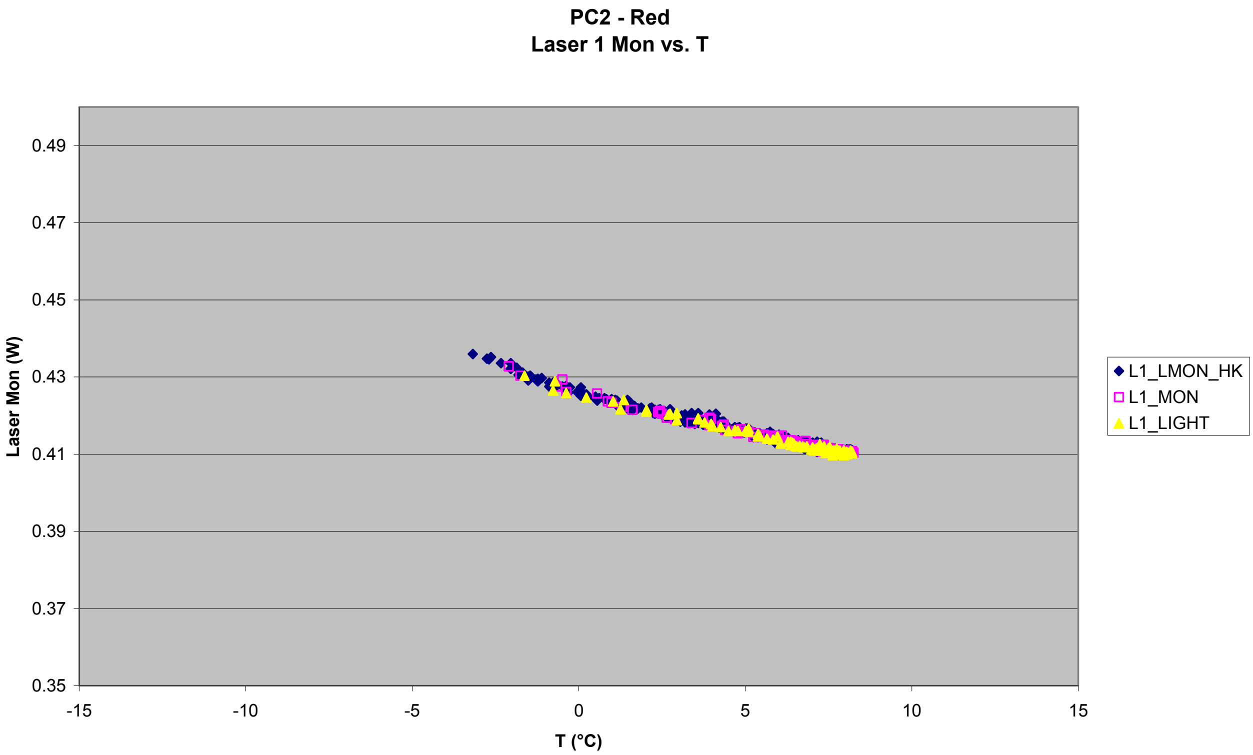


Figure 8.3-6. Laser 2 Light Monitor versus Temperature (HK, HK-SCI, SCI) - Red

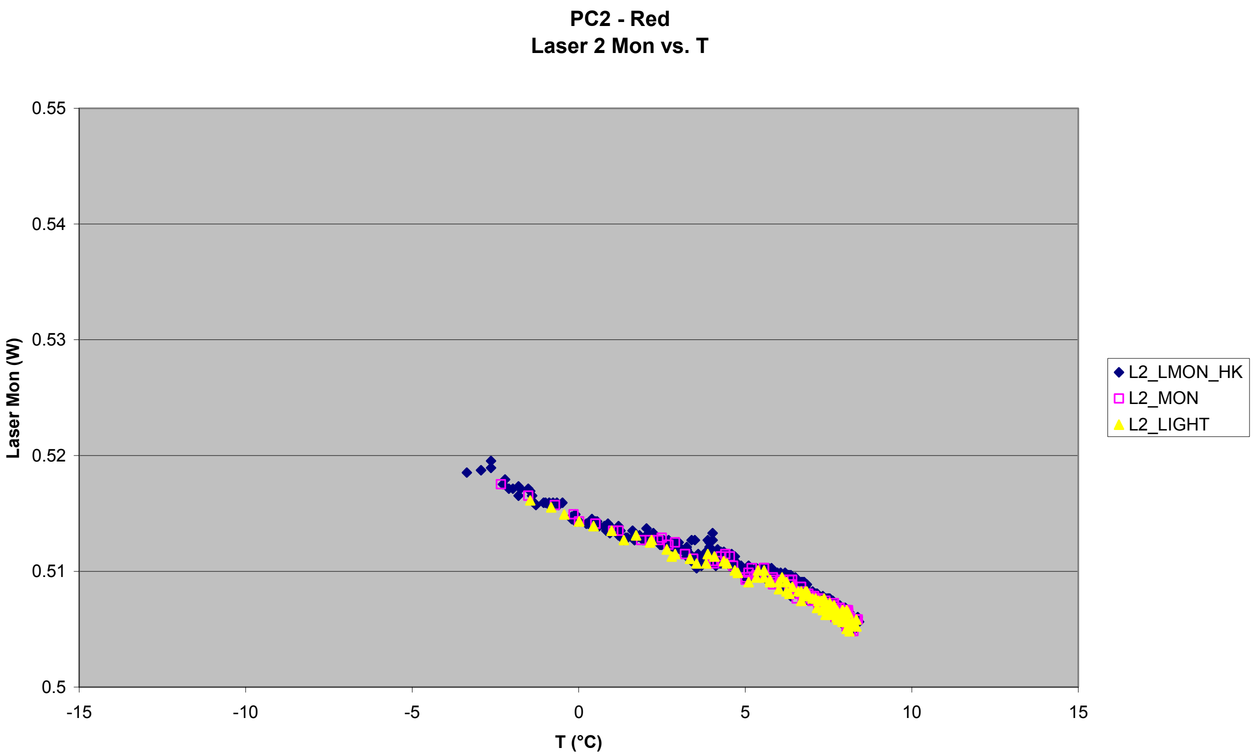


Figure 8.3-7. Laser 3 Light Monitor versus Temperature (HK, HK-SCI, SCI) - Red

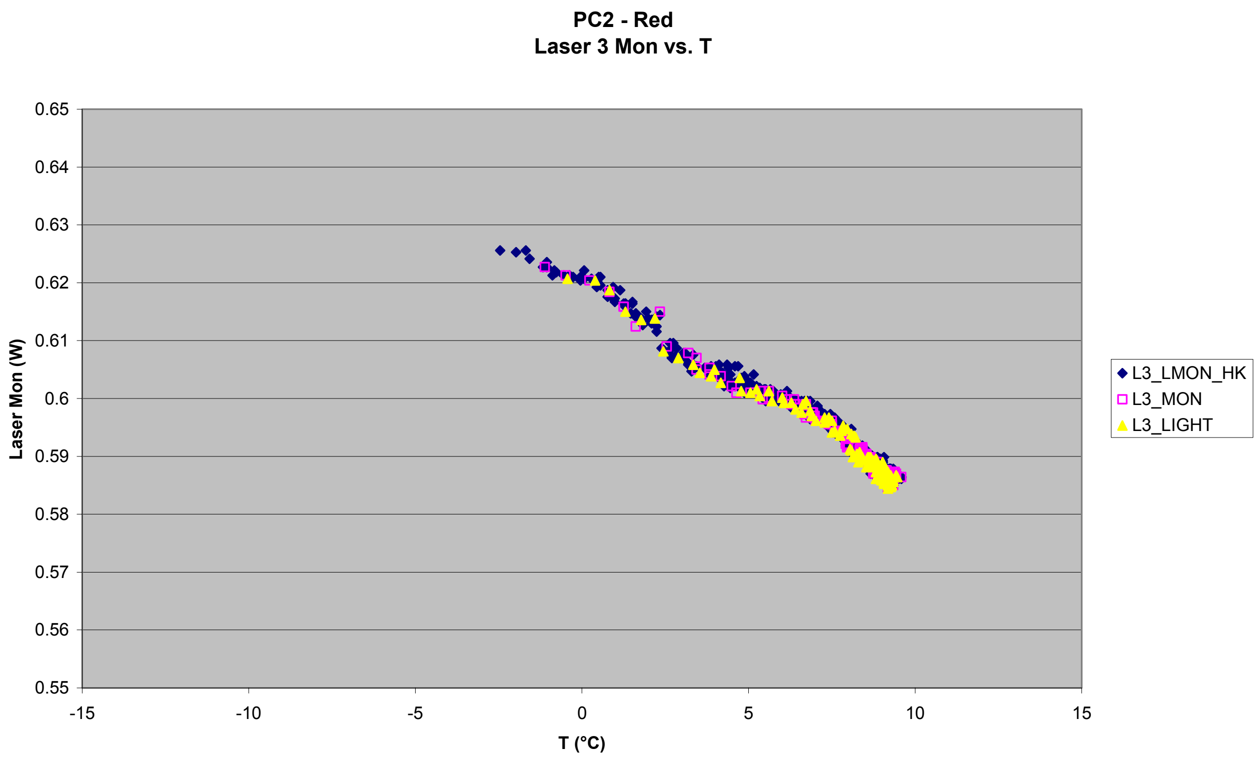
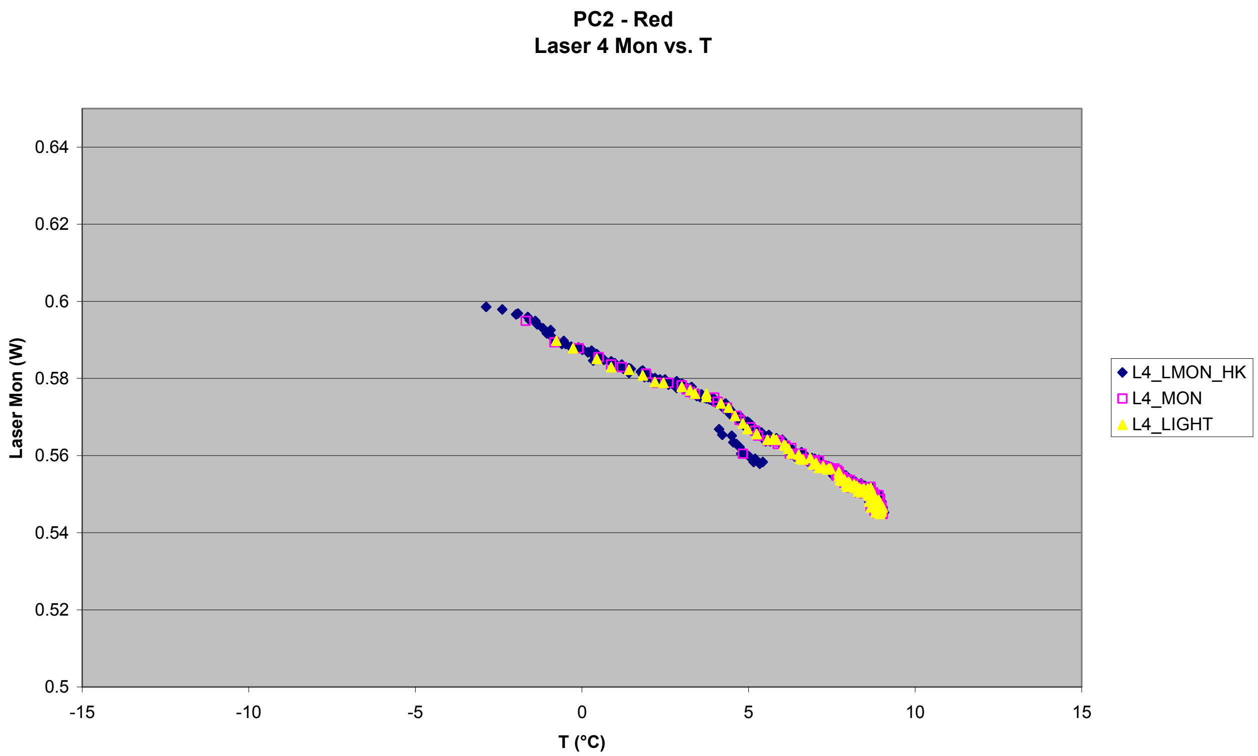


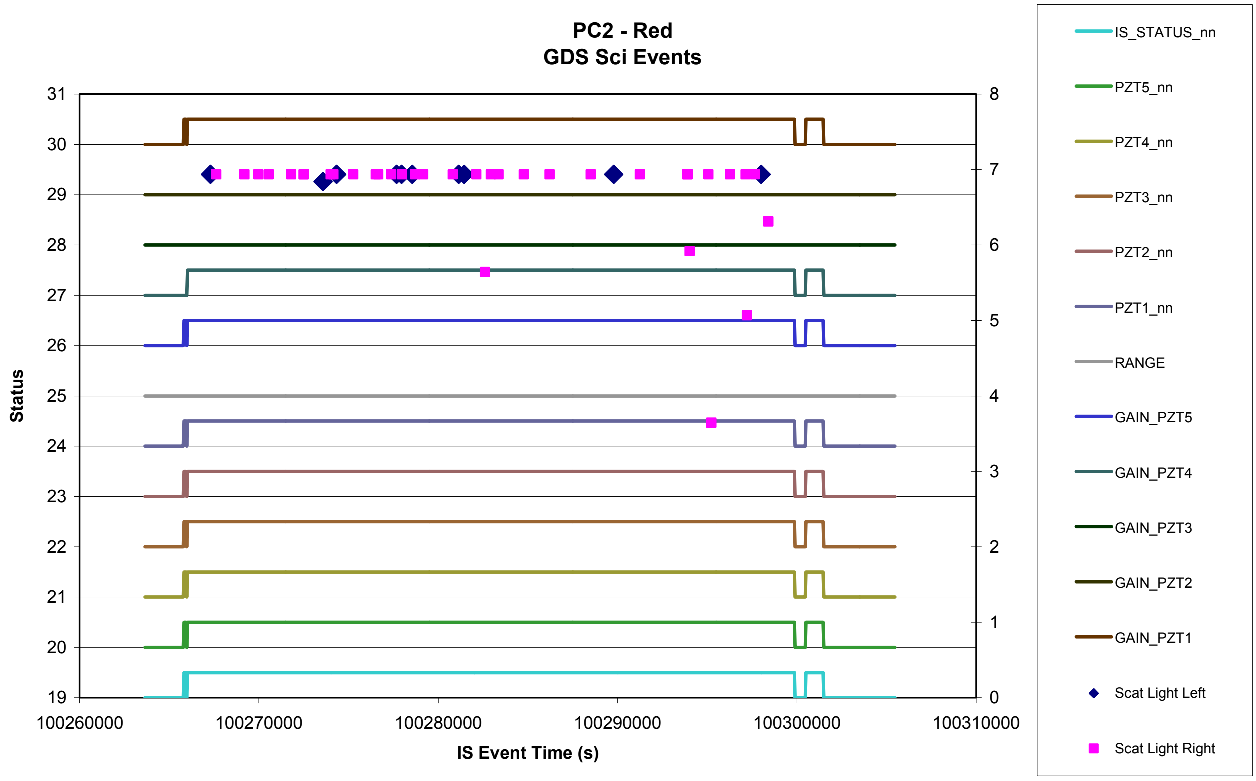
Figure 8.3-8. Laser 4 Light Monitor versus Temperature (HK, HK-SCI, SCI) - Red



8.3.2 GDS – Behaviour

8.3.2.1 Science Events

Figure 8.3-9. GDS Left and Right SCI events vs. time – Red

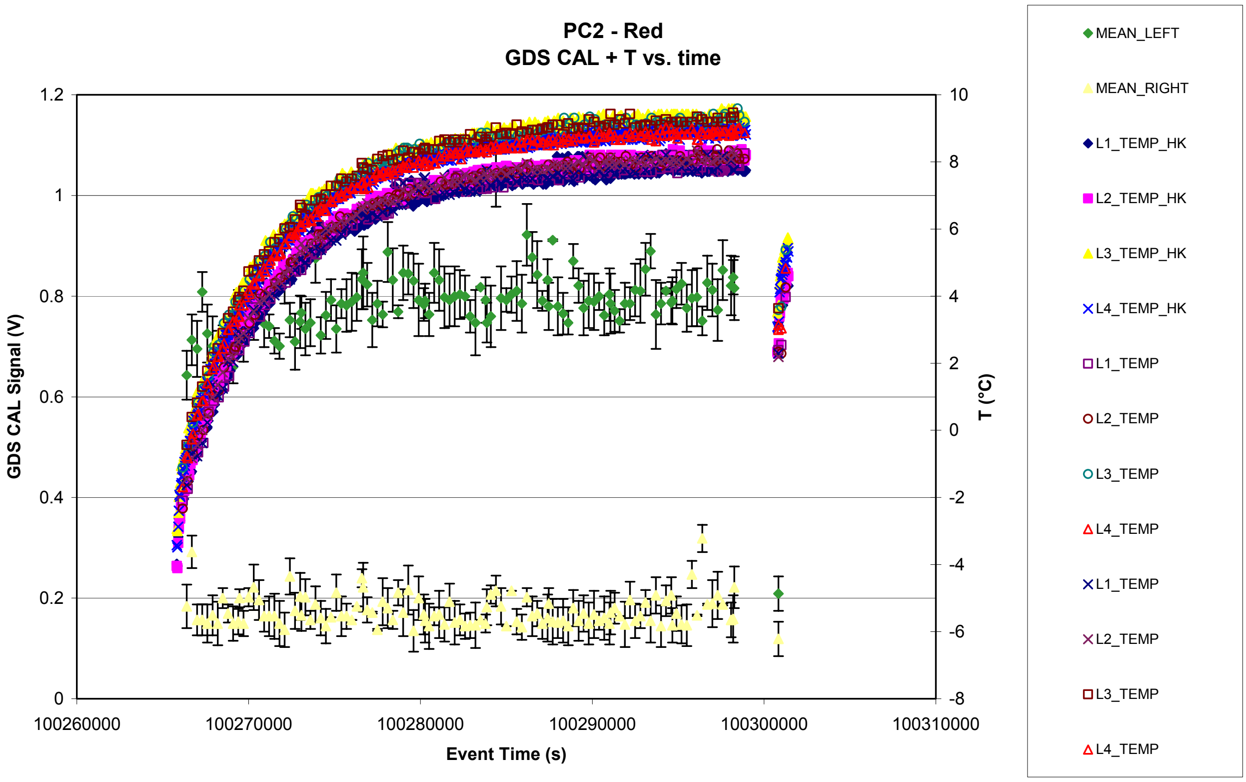


8.3.2.2 Event Rates

Not applicable

8.3.2.3 CAL

Figure 8.3-10. Evolution of GDS CAL Left and Right signals (and T) vs. time (Red)



8.4 IMPACT SENSOR (IS)

8.4.1 IS – Status

Figure 8.4-1. IS Operation Status vs. time - Red

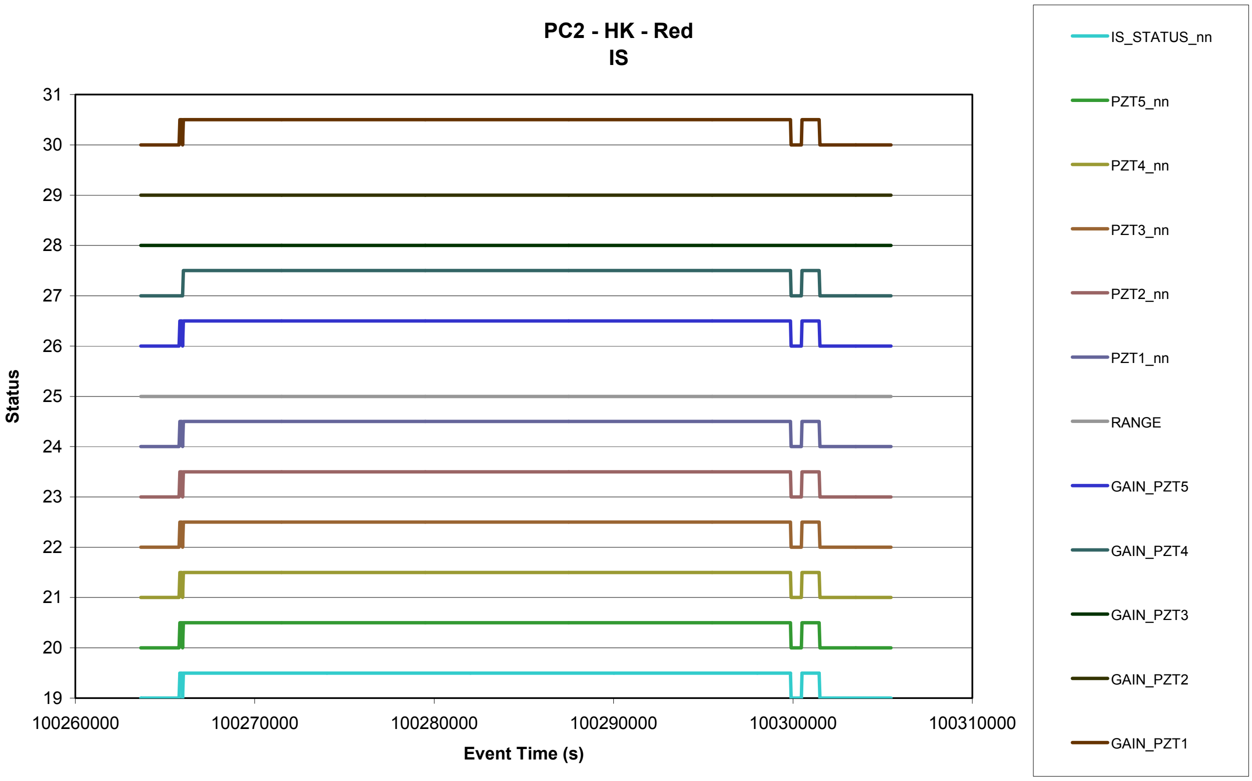


Figure 8.4-2. IS PZT 3 Thresholds change vs. time - Red

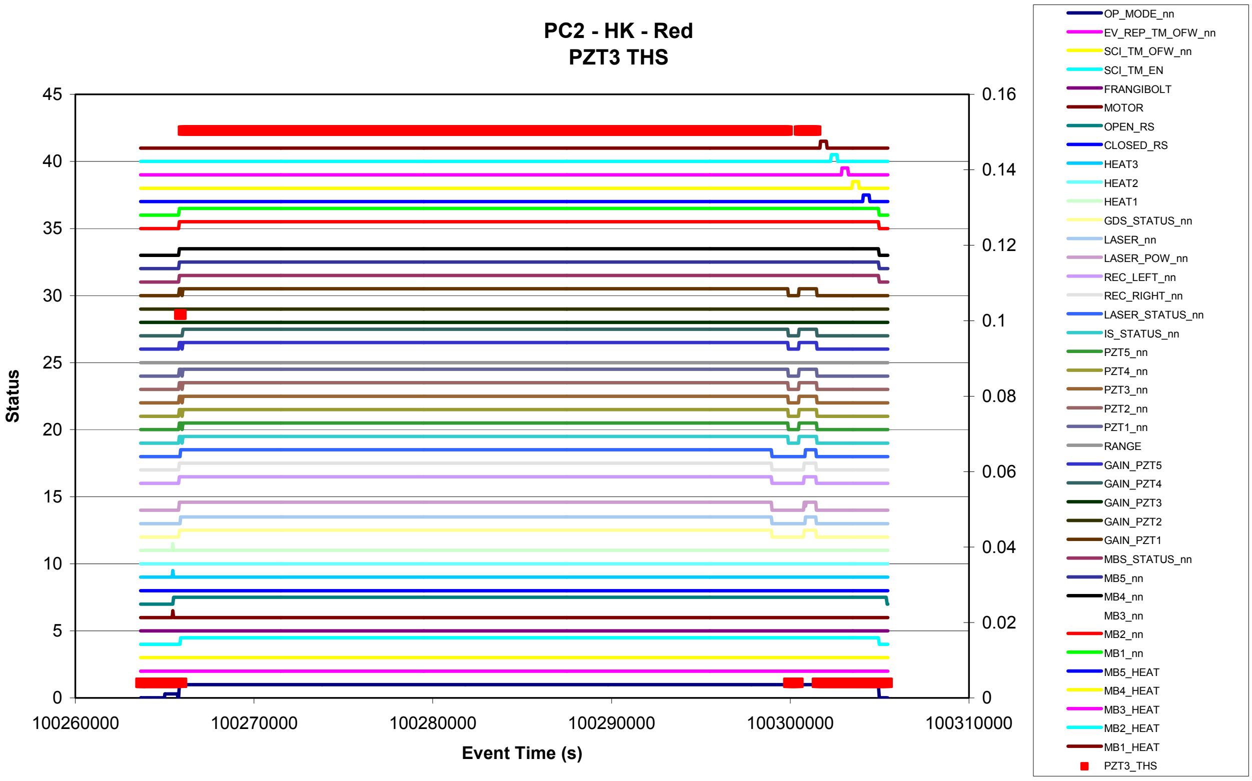


Figure 8.4-3. IS PZT 5 Thresholds change vs. time - Red

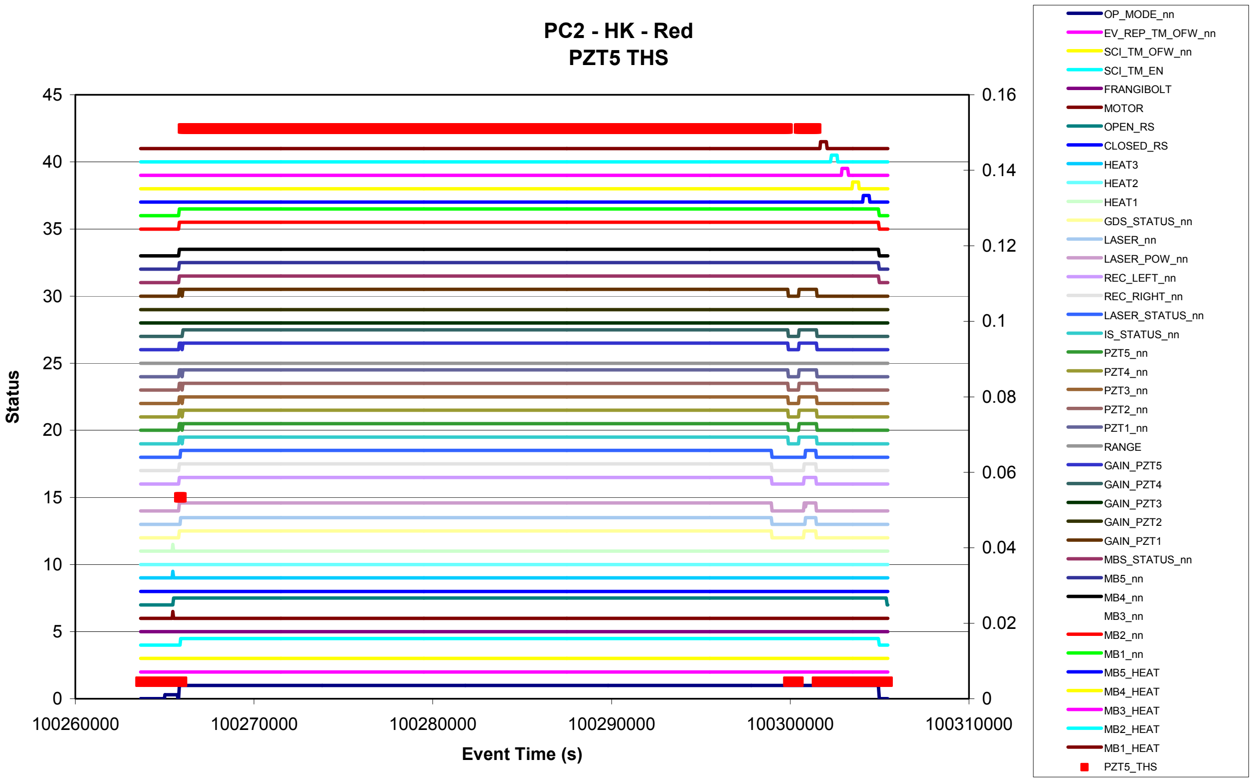
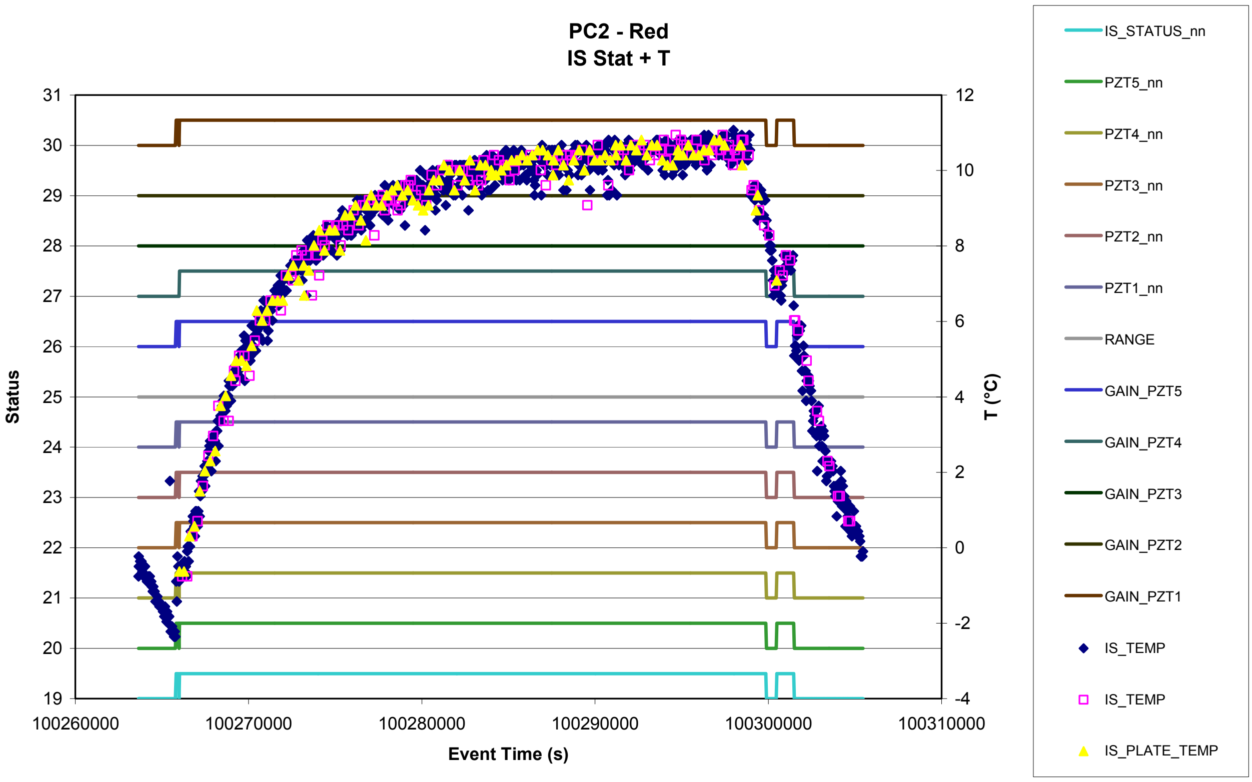


Figure 8.4-4. IS Temperature vs. time (HK, HK-SCI, SCI) - Red



8.4.2 <u>IS – Behaviour</u>

8.4.2.1 Science Events

Figure 8.4-5. All PZT (det. and non-det.) events vs. time - Red

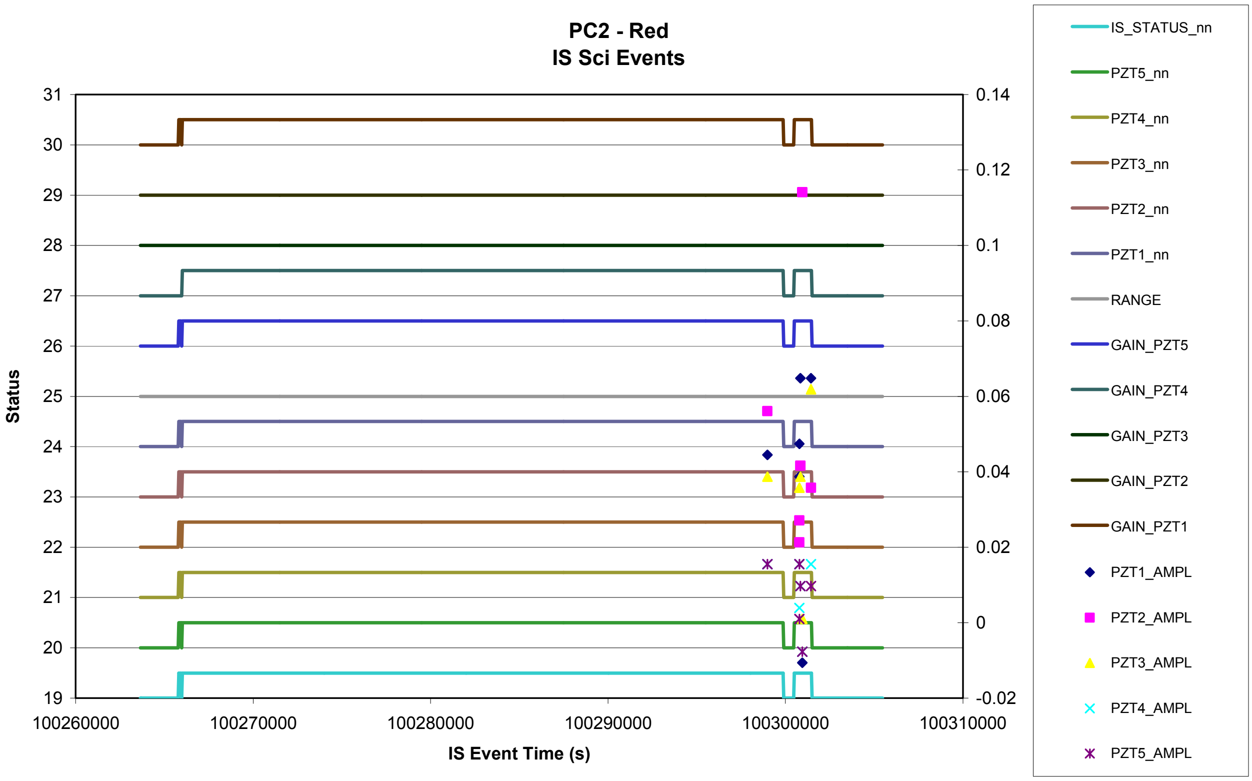


Figure 8.4-6. PZT 1-2 Detected Events vs. time - Main

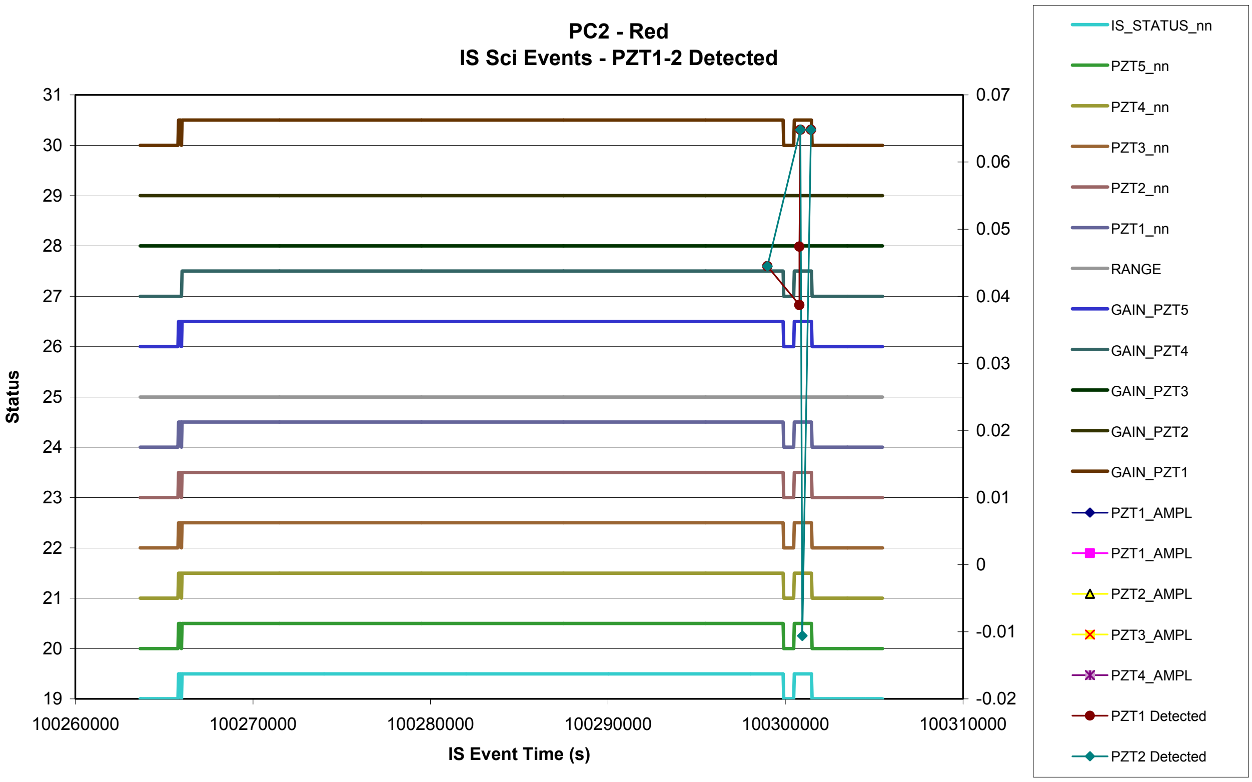


Figure 8.4-7. PZT 1 Detected Events vs. time - Red

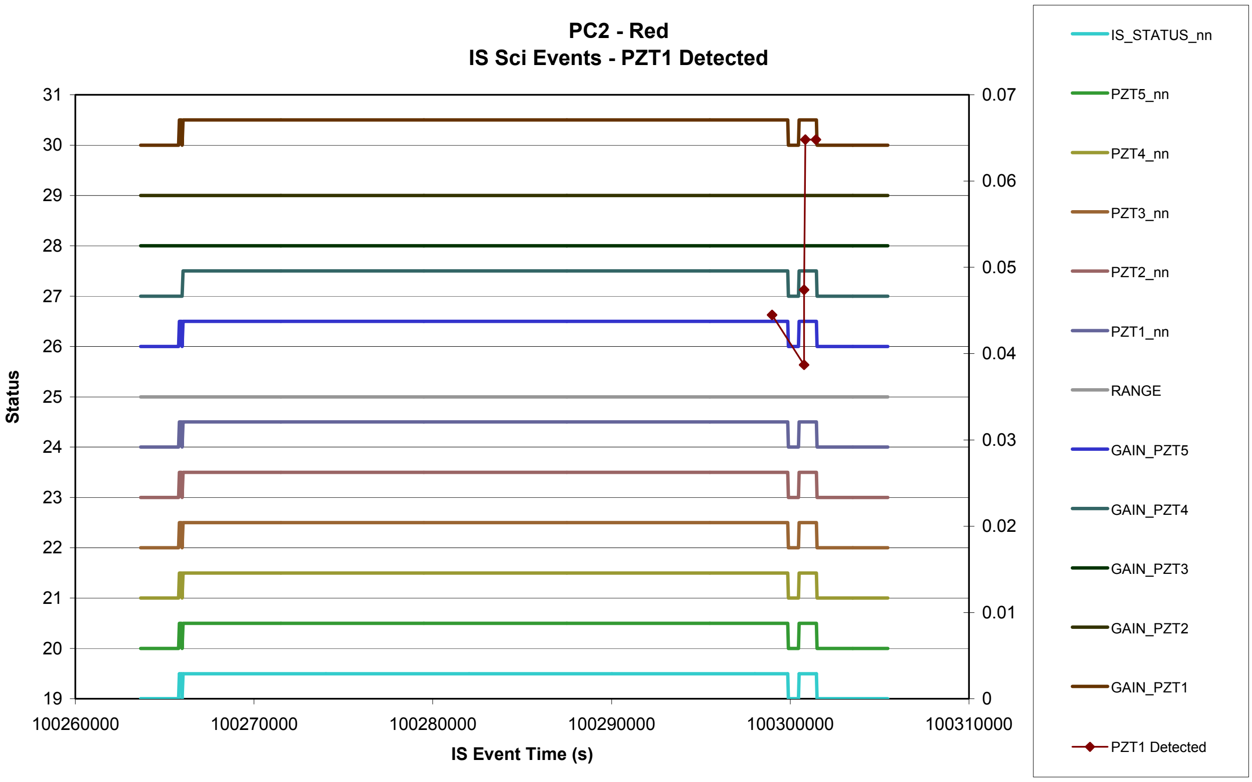


Figure 8.4-8. PZT 2 Detected Events vs. time - Red

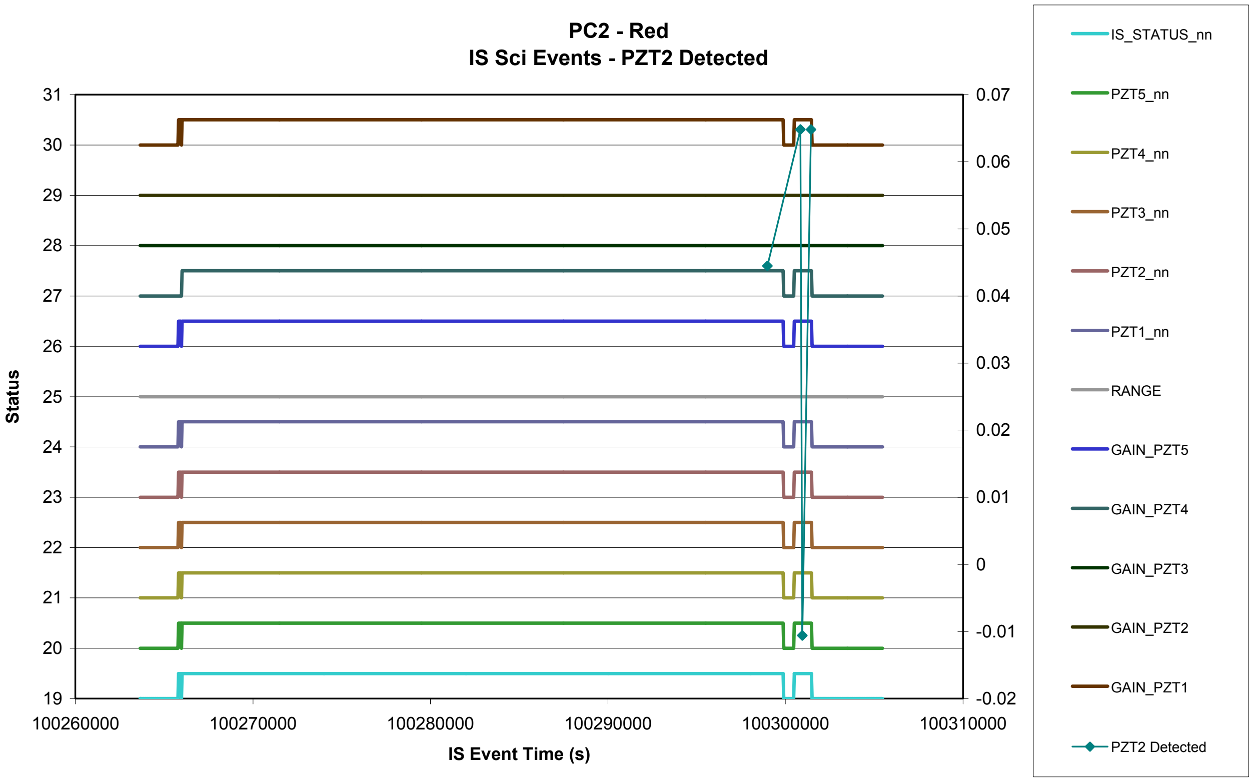
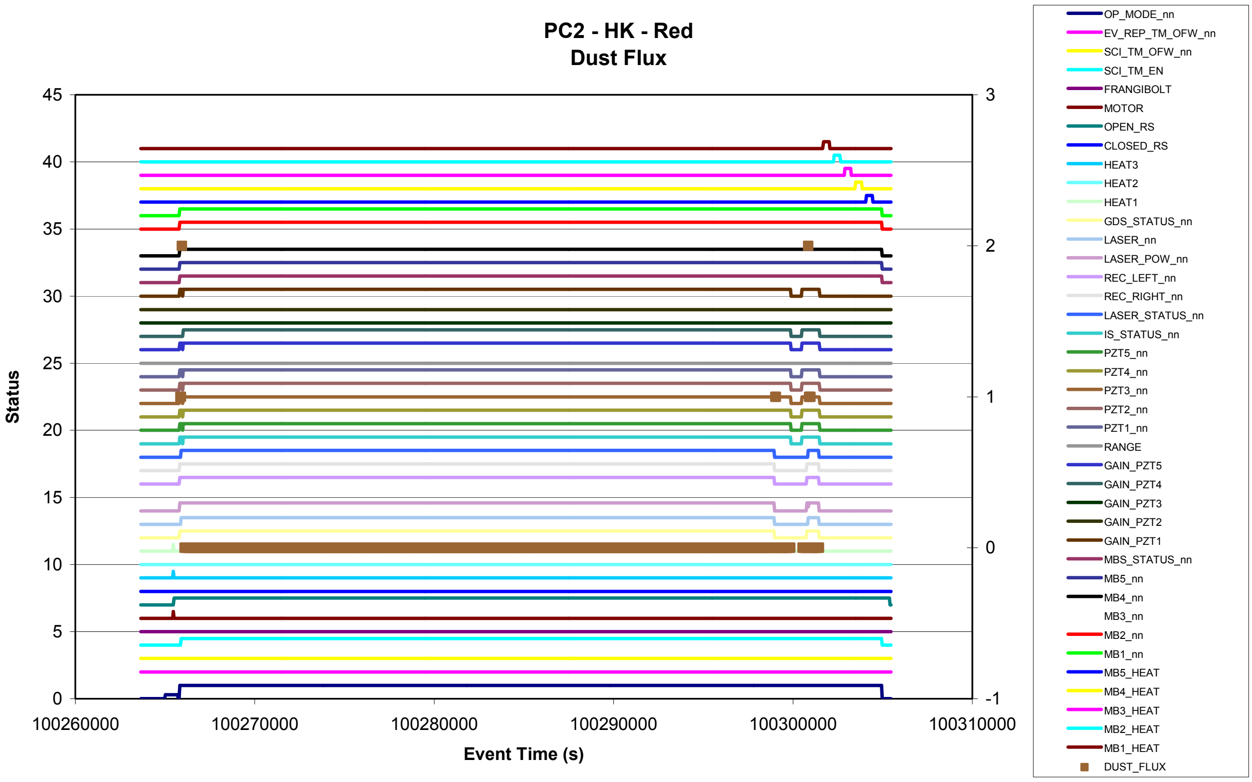


Figure 8.4-9. Dust Flux vs. time - Red



8.4.2.2 Event Rates

Not applicable

8.4.2.3 CAL

Figure 8.4-10. PZT 1 Mean and St Dev. CAL vs. time - Red

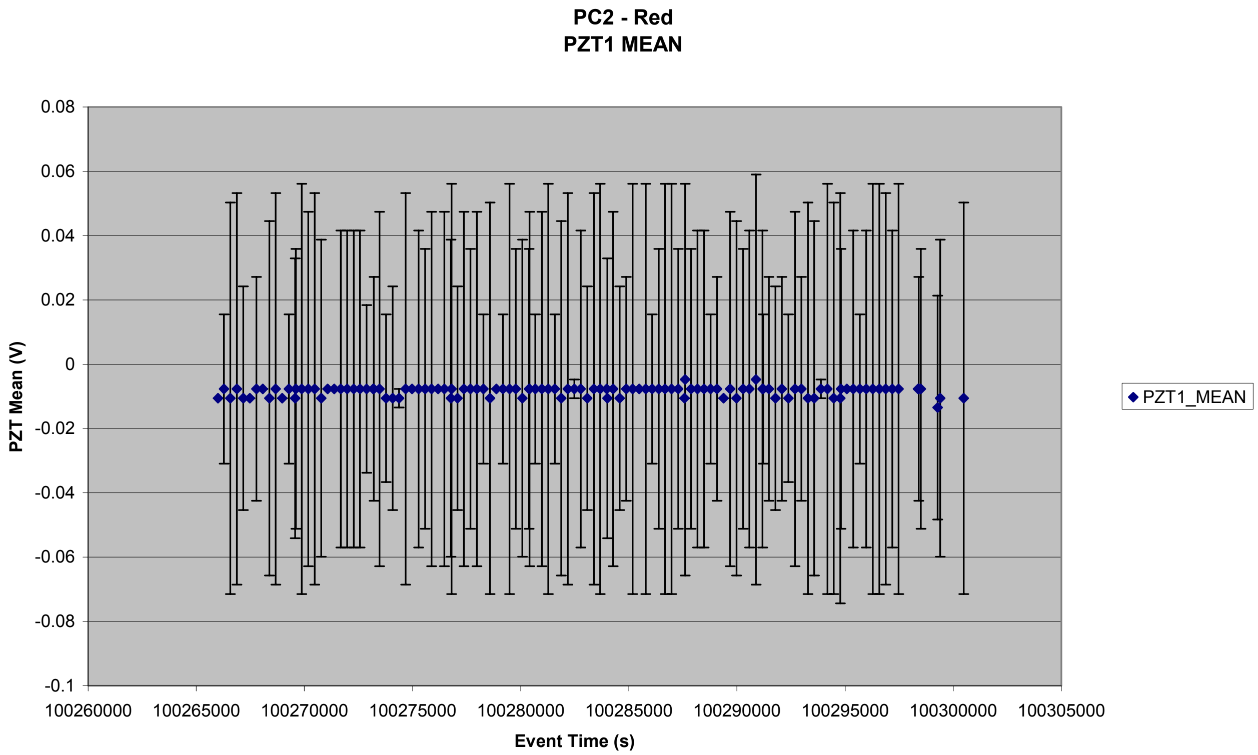


Figure 8.4-11. PZT 2 Mean and St Dev. CAL vs. time - Red

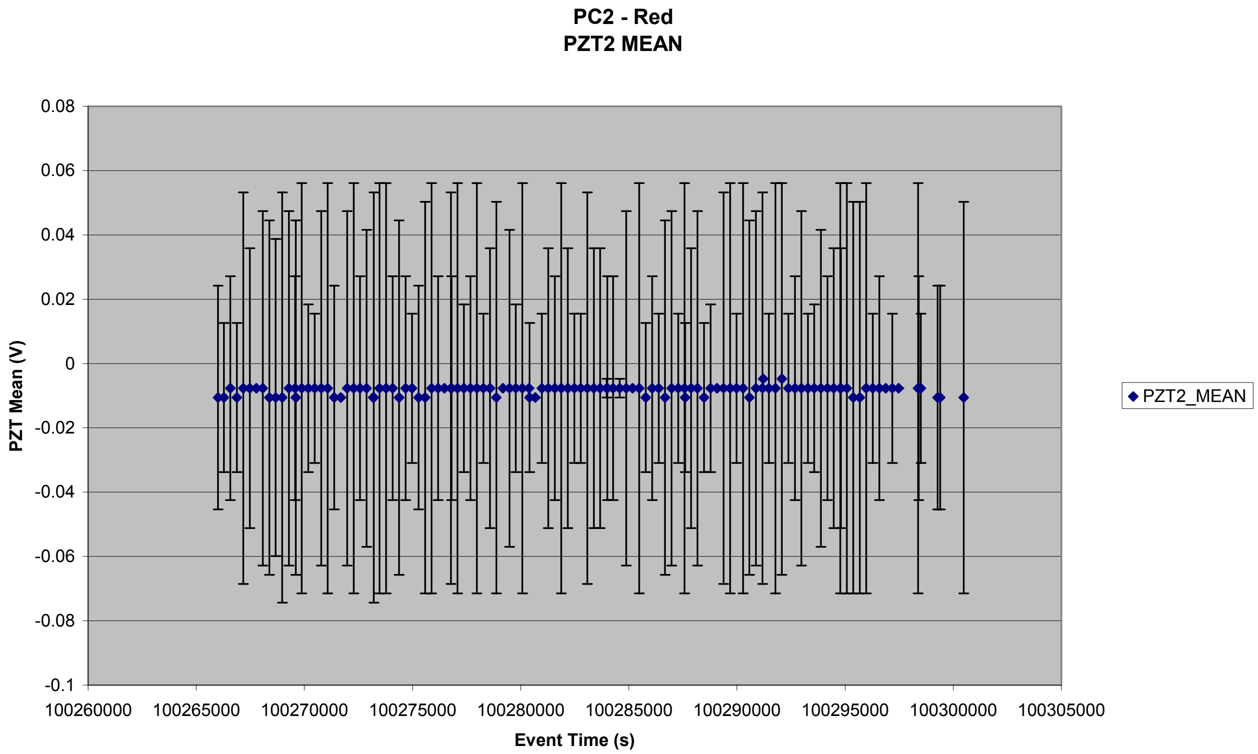


Figure 8.4-12. PZT 3 Mean and St Dev. CAL vs. time - Red

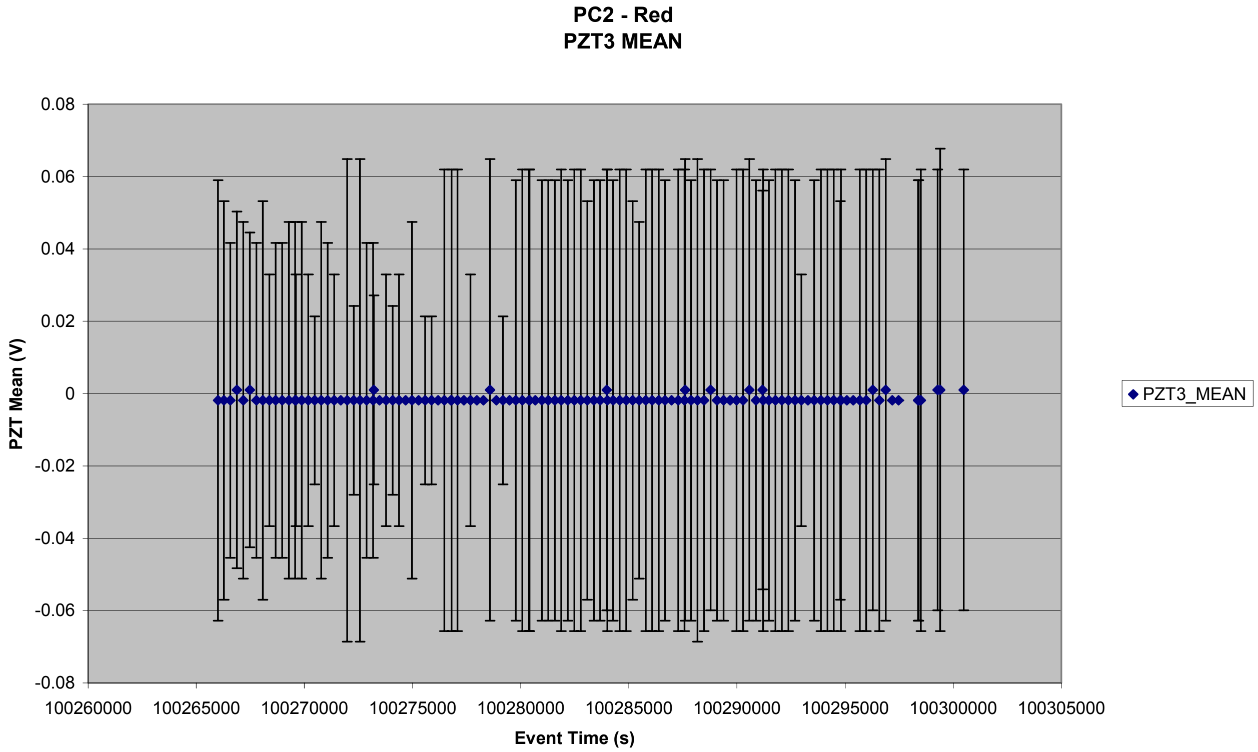


Figure 8.4-13. PZT 4 Mean and St Dev. CAL vs. time - Red

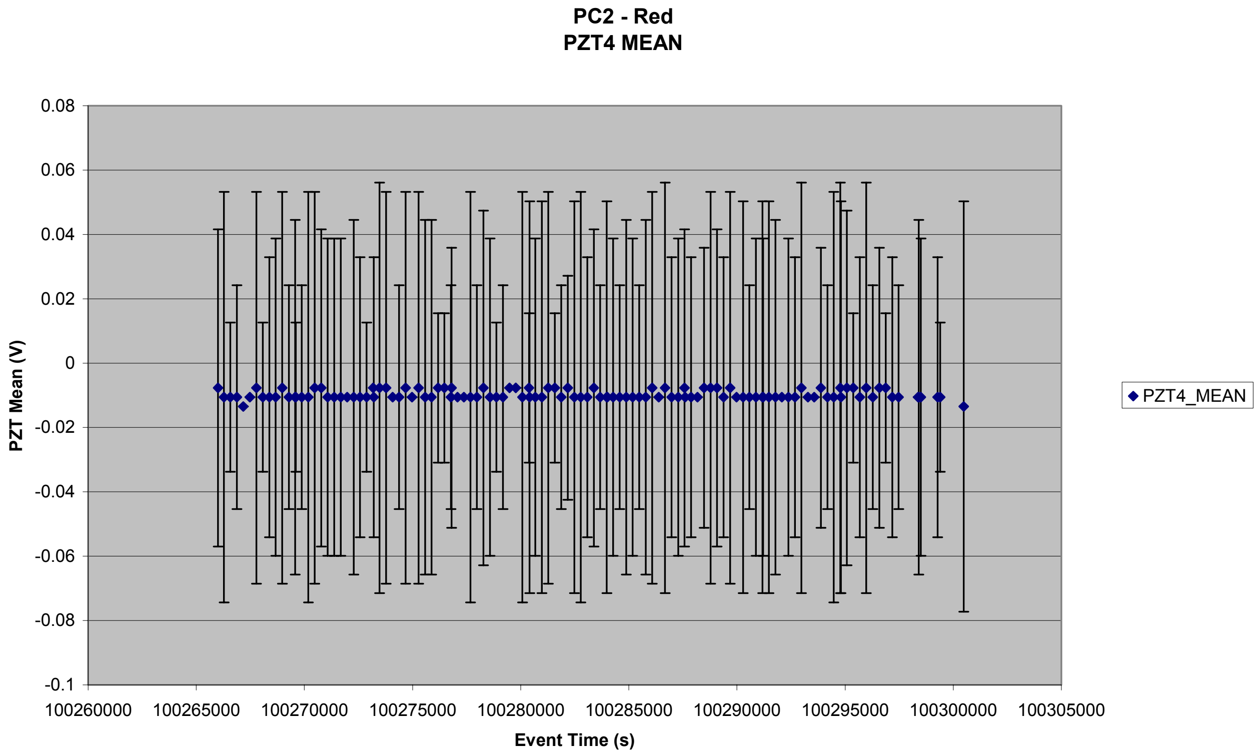


Figure 8.4-14. PZT 5 Mean and St Dev. CAL vs. time - Red

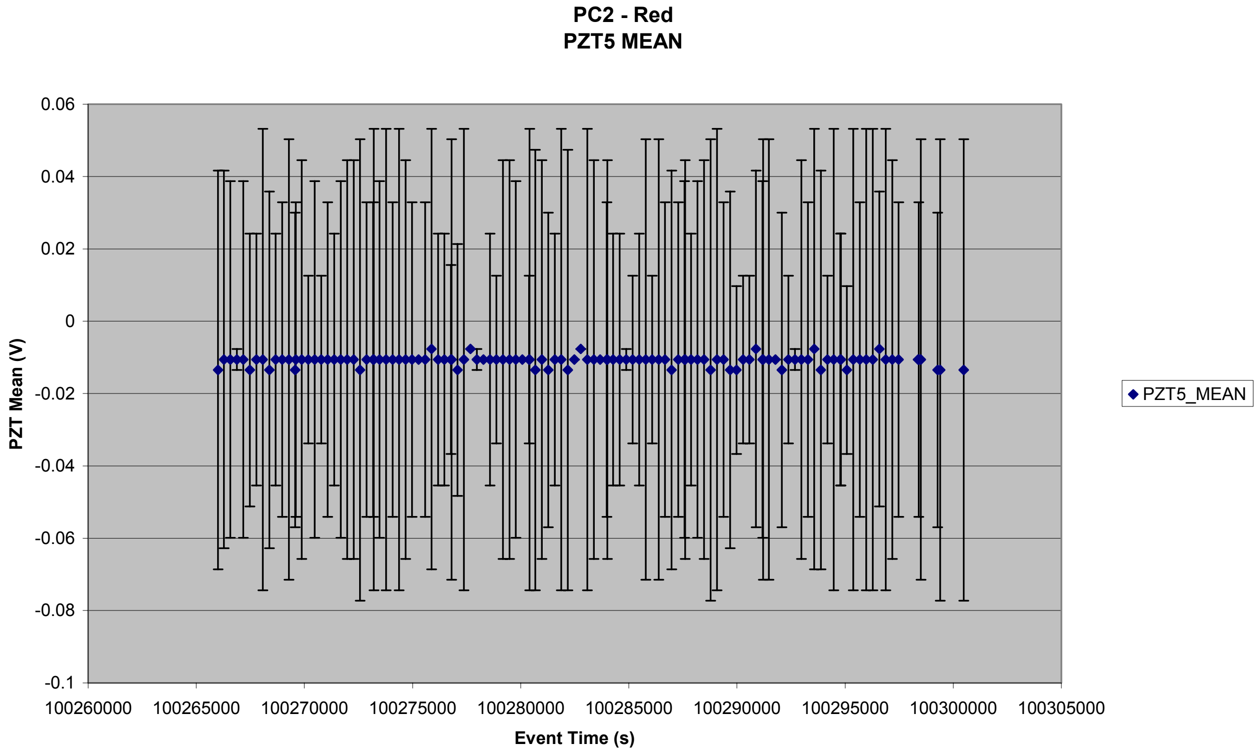


Figure 8.4-15. Reference Voltages for IS calibration vs. time - Red

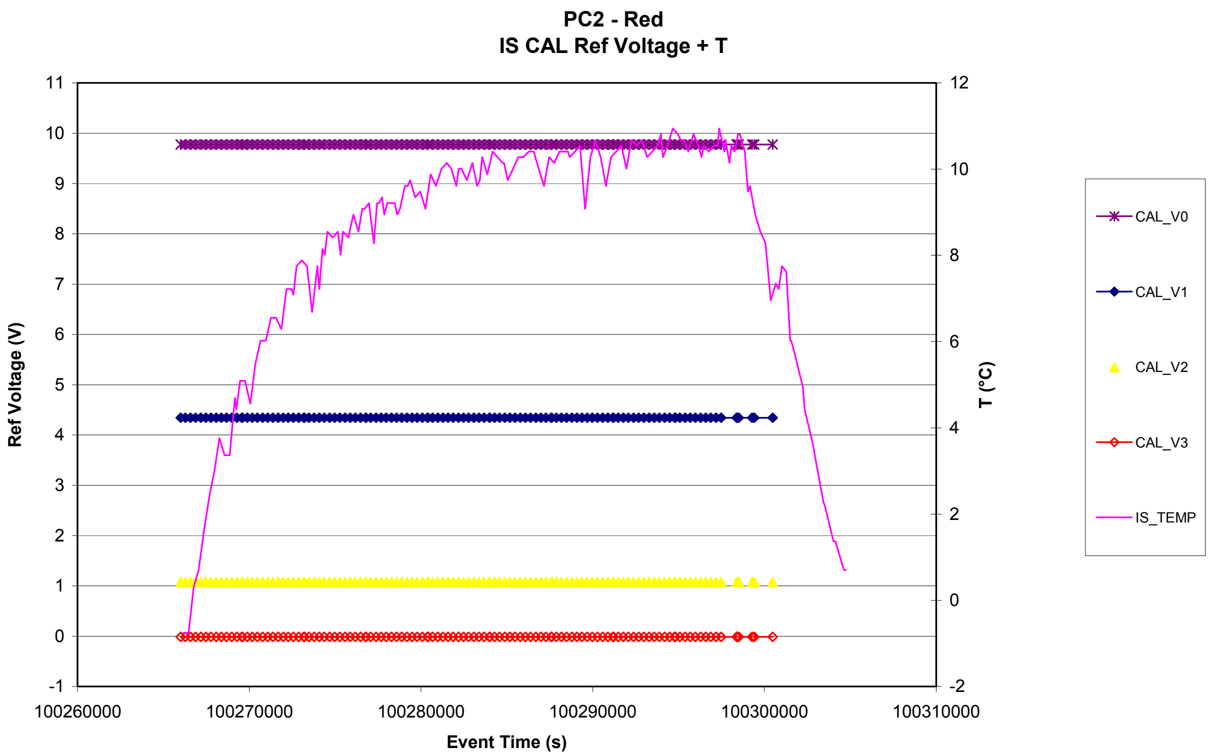


Figure 8.4-16. PZT 1 CAL Signal vs. time - Red

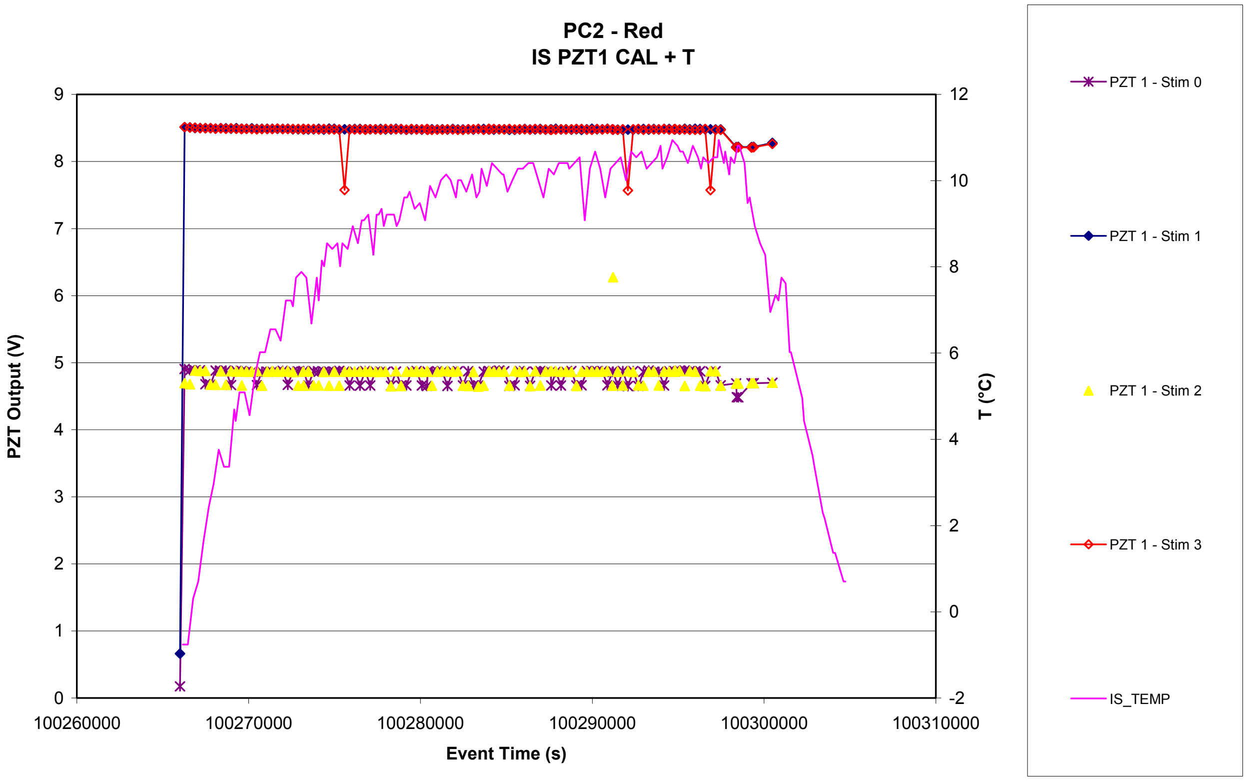


Figure 8.4-17. PZT 2 CAL Signal vs. time - Red

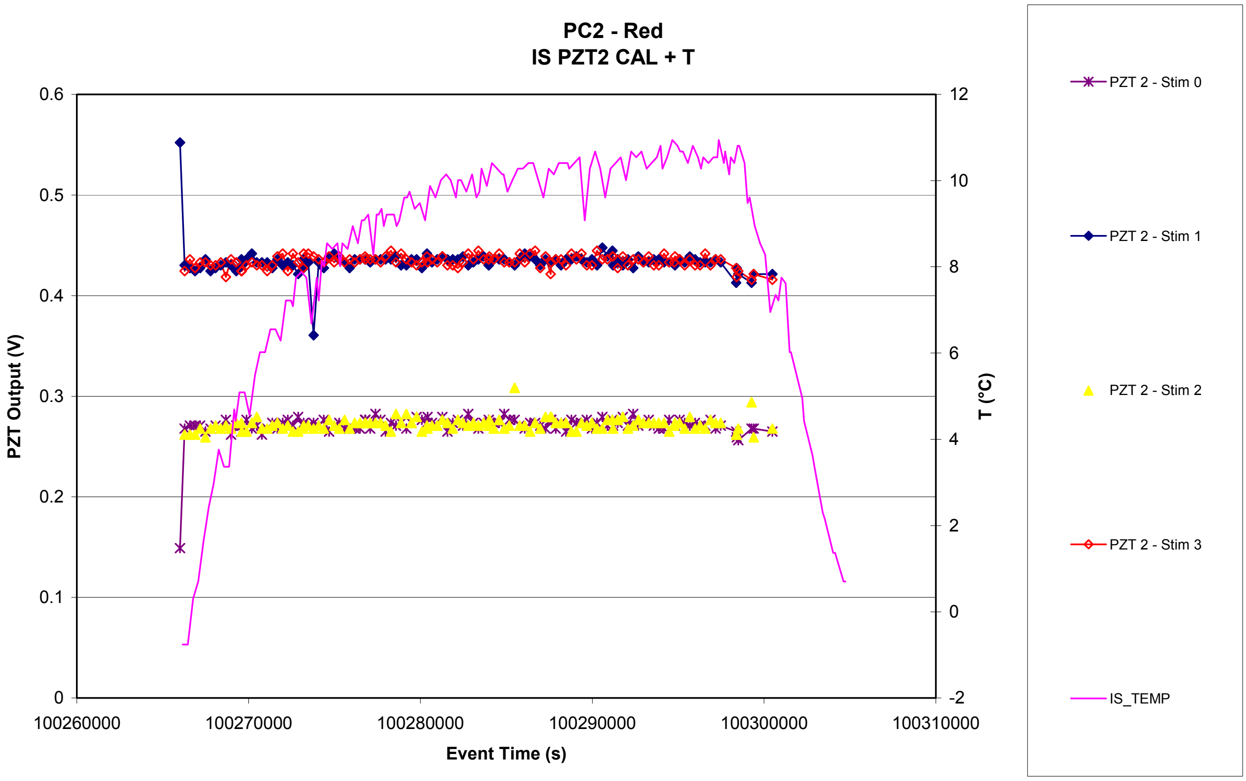


Figure 8.4-18. PZT 3 CAL Signal vs. time - Red

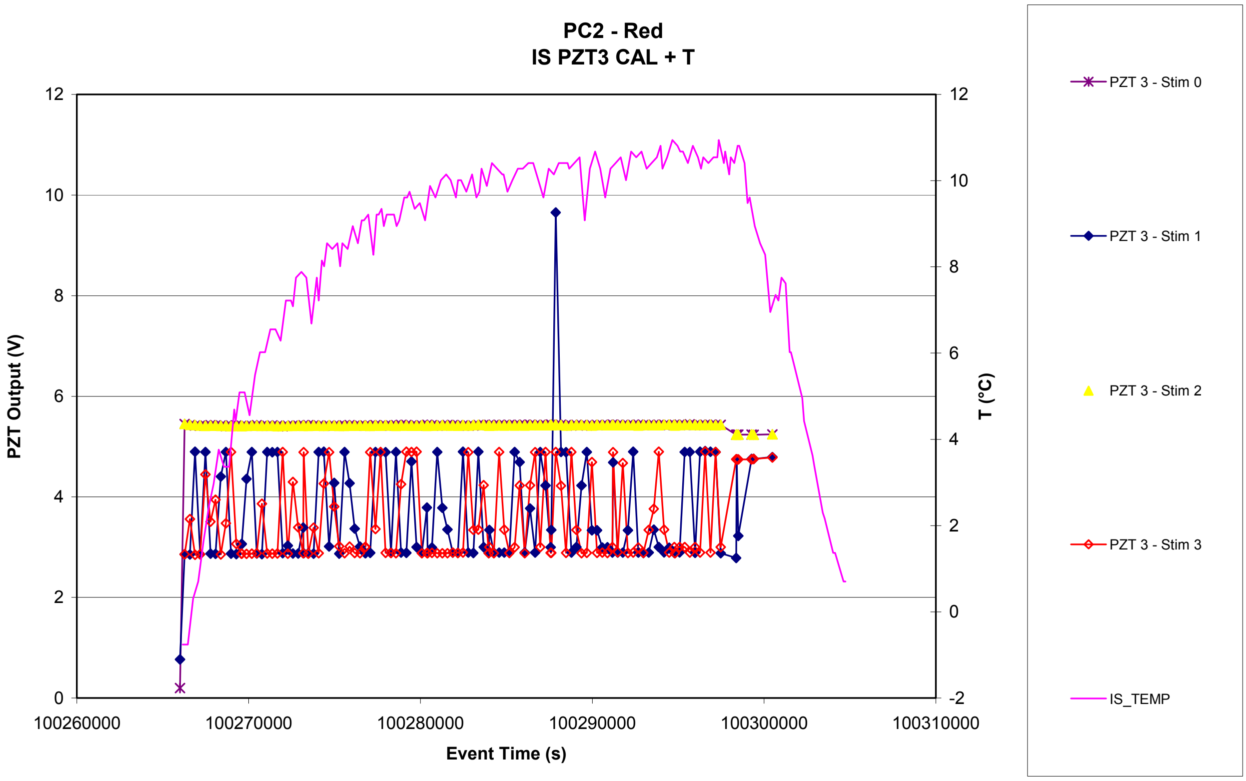


Figure 8.4-19. PZT 4 CAL Signal vs. time - Red

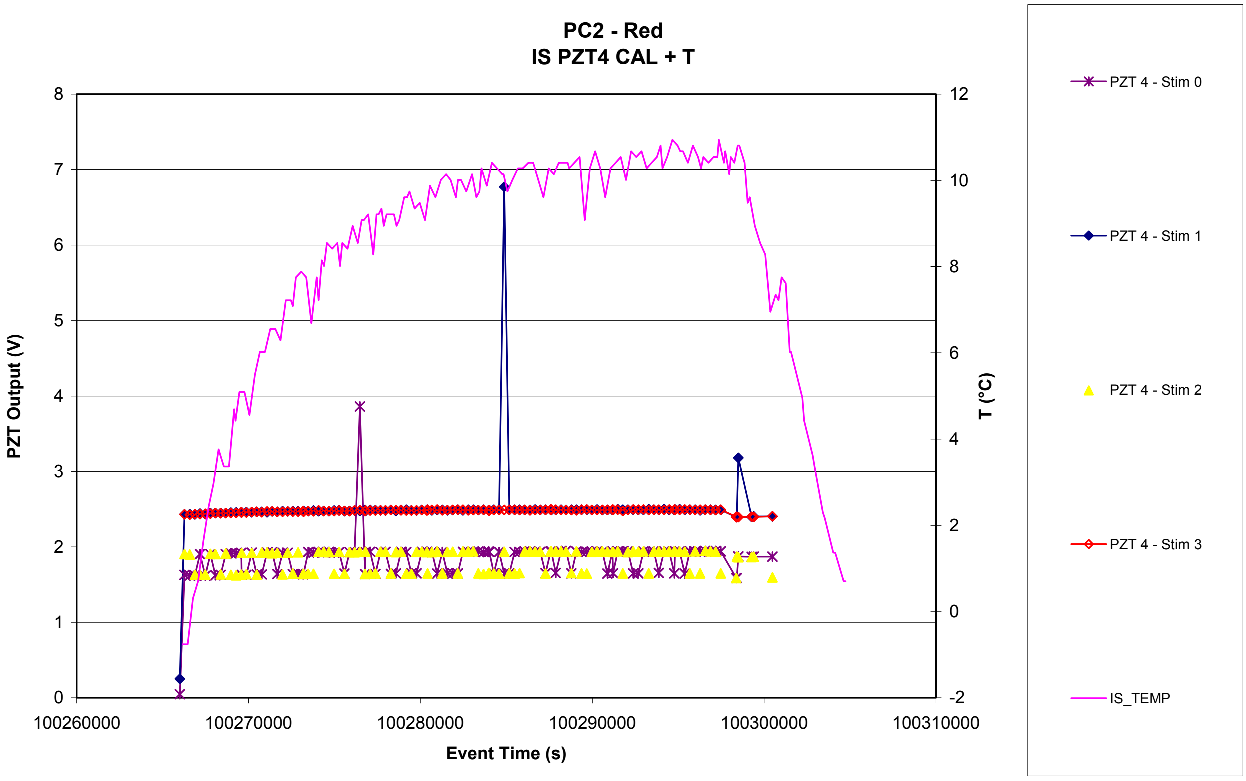


Figure 8.4-20. PZT 5 CAL Signal vs. time - Red

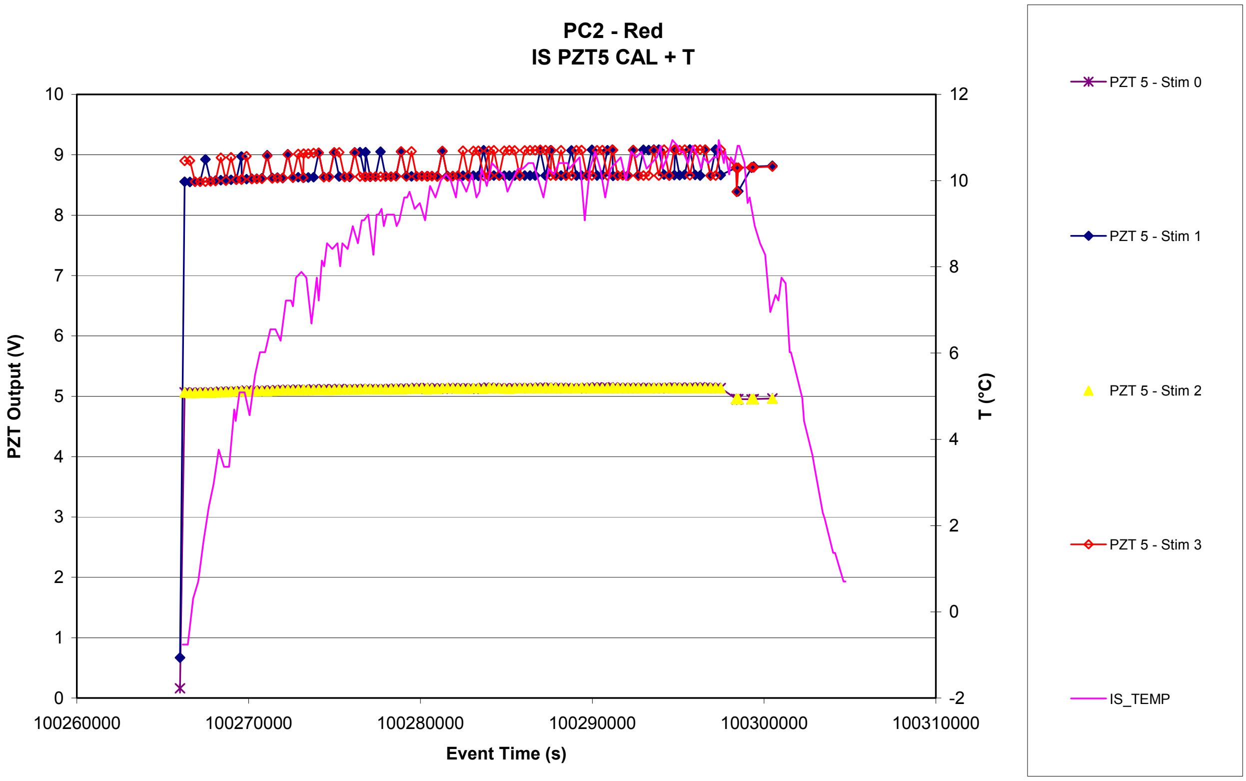


Figure 8.4-21. PZT 1 CAL Time delay vs. time - Red

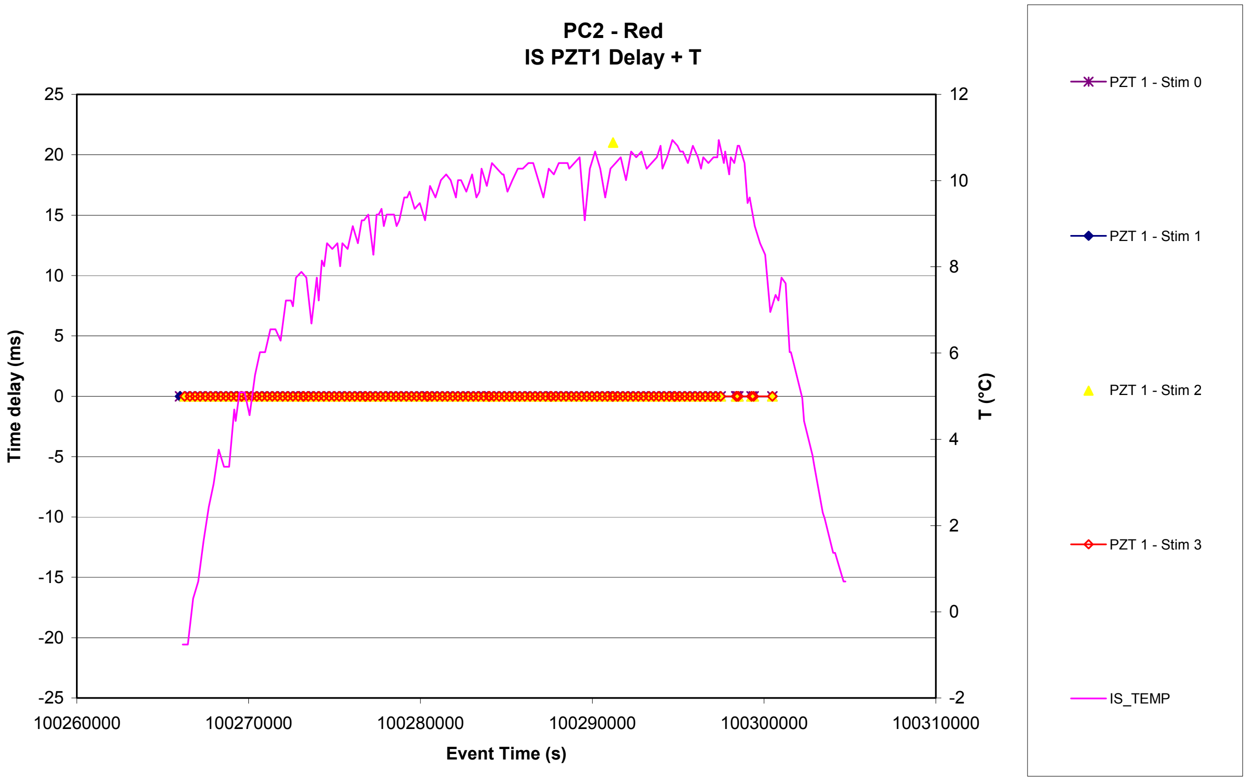


Figure 8.4-22. PZT 2 CAL Time delay vs. time - Red

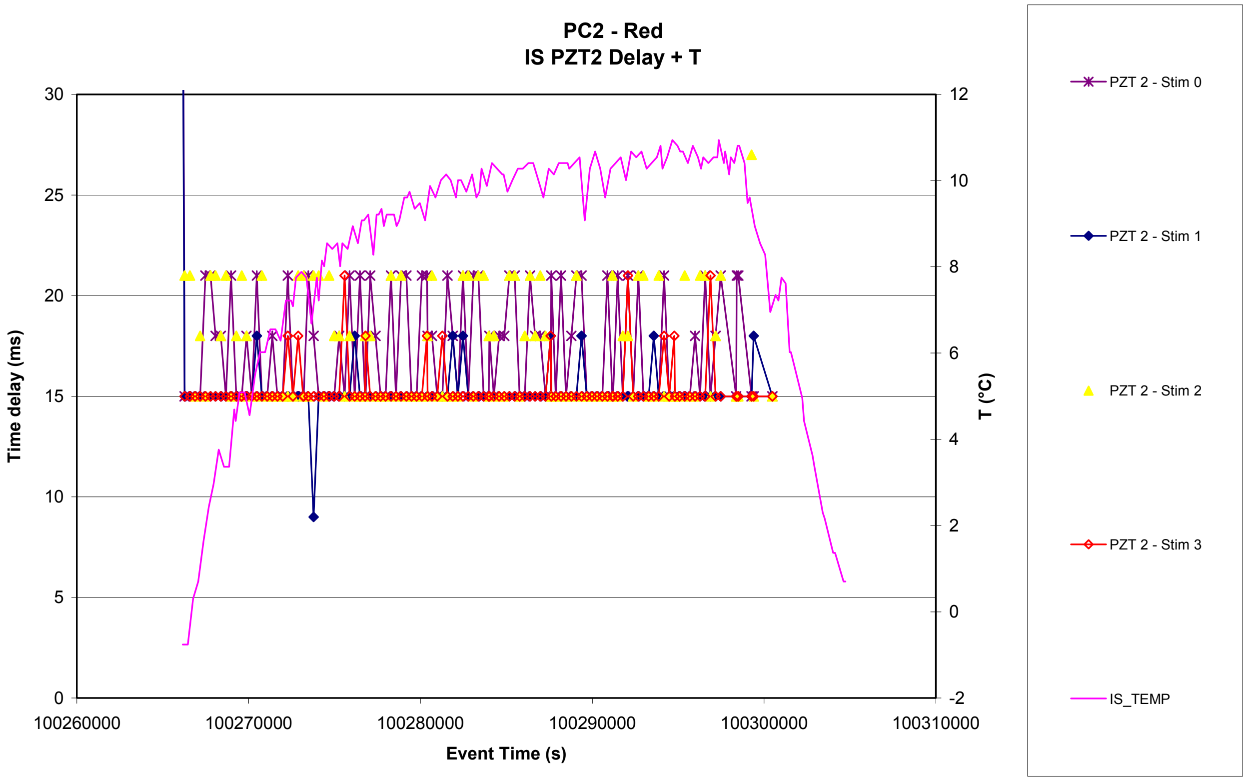


Figure 8.4-23. PZT 3 CAL Time delay vs. time - Red

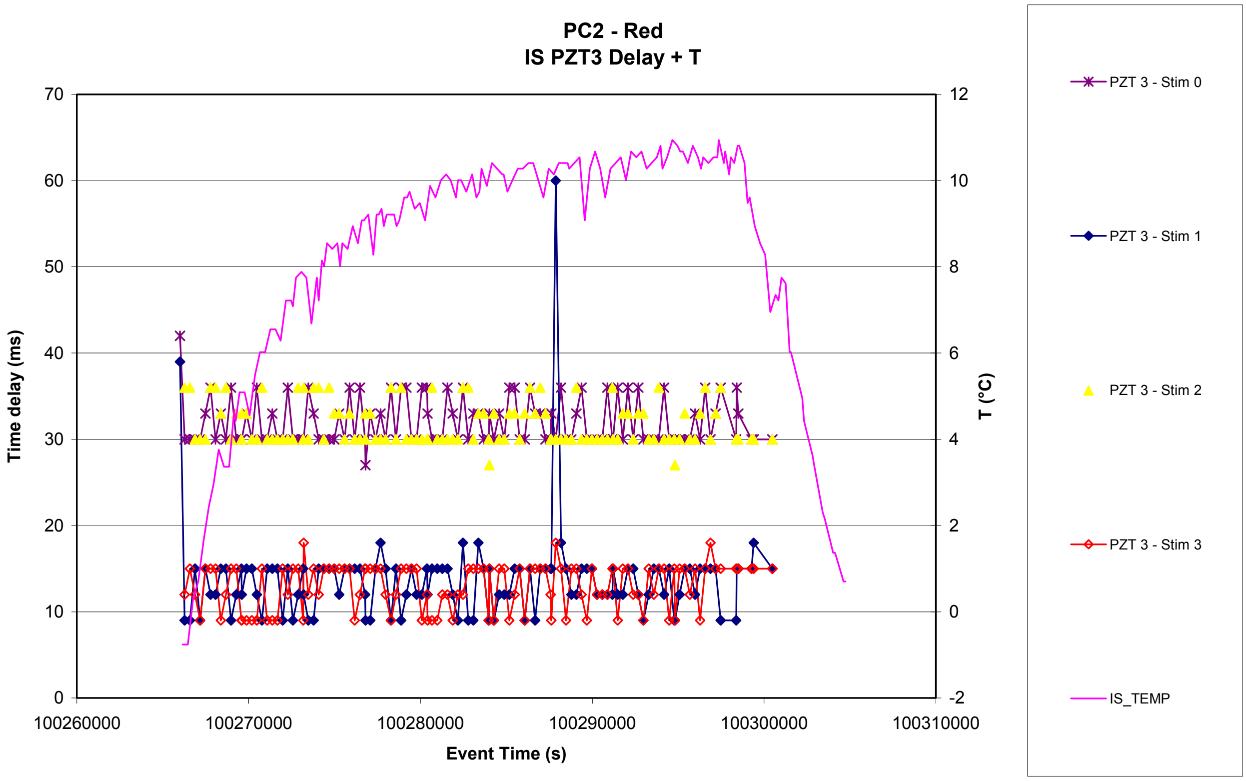


Figure 8.4-24. PZT 4 CAL Time delay vs. time - Red

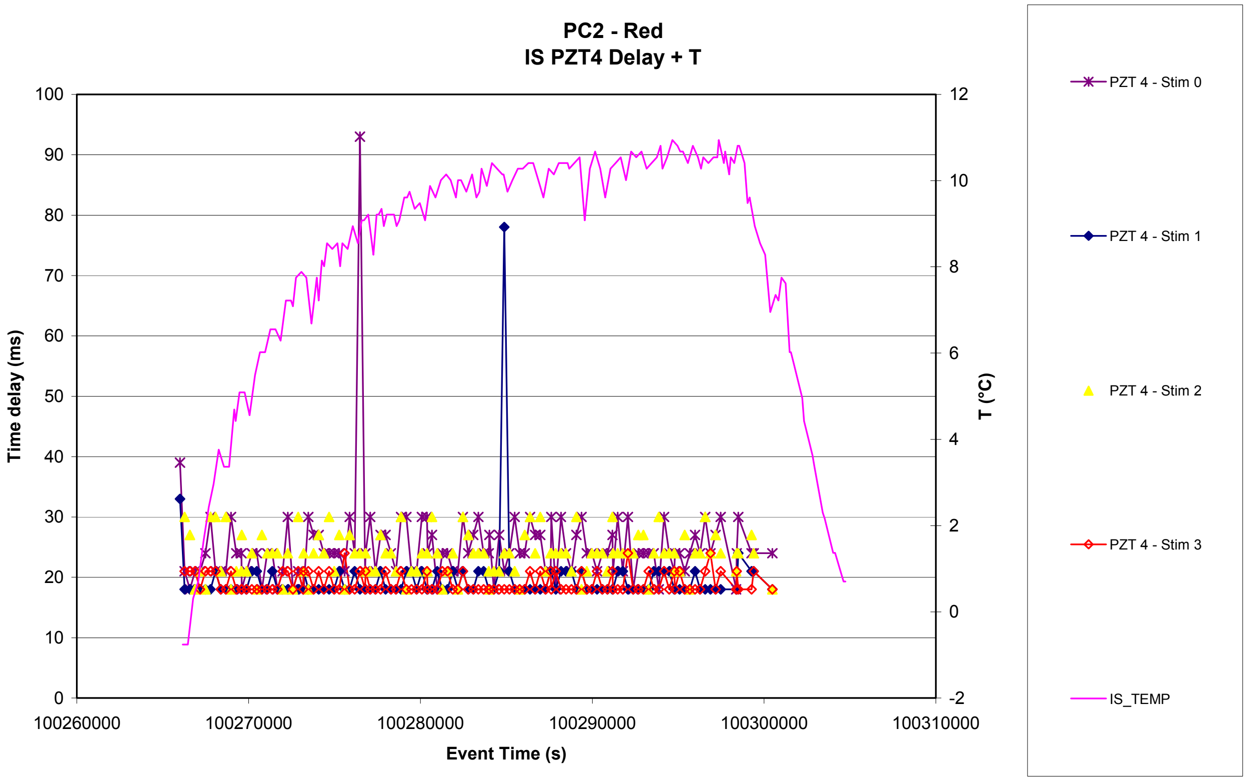


Figure 8.4-25. PZT 5 CAL Time delay vs. time - Red

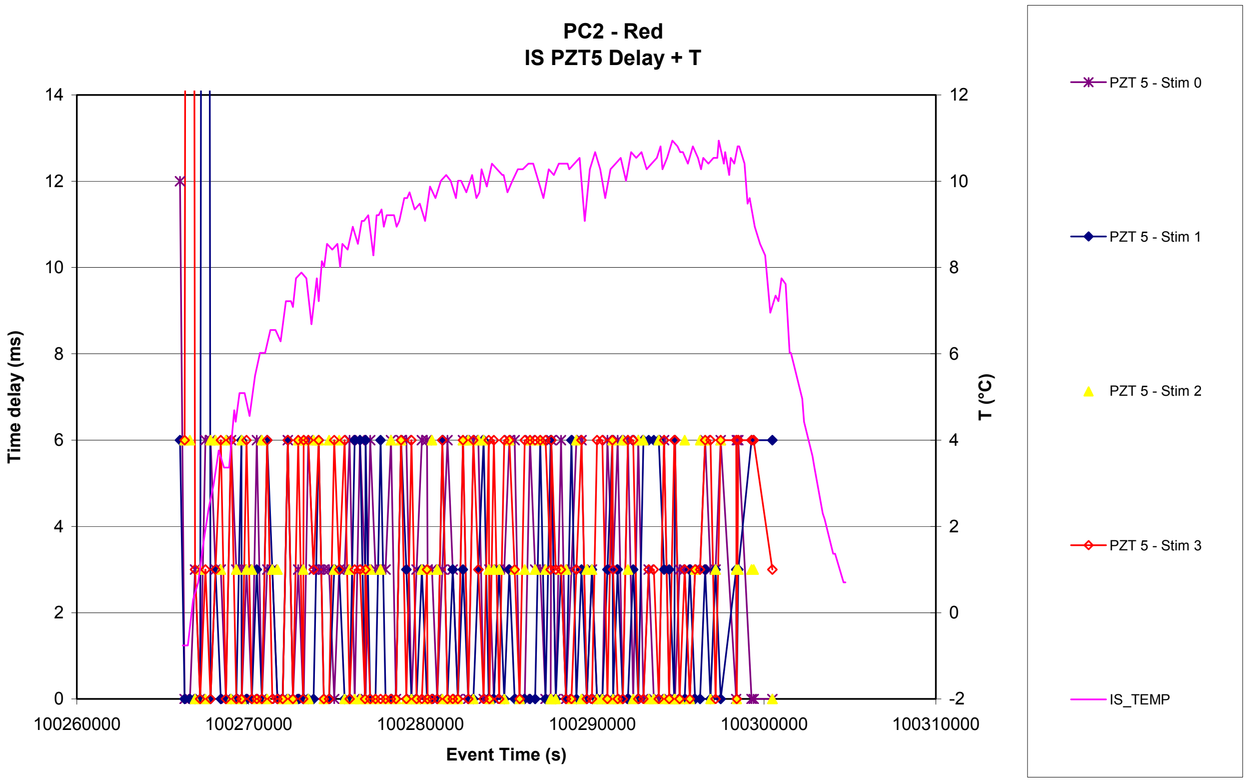


Figure 8.4-26. PZT 1 CAL Signal vs. stimulus – Red

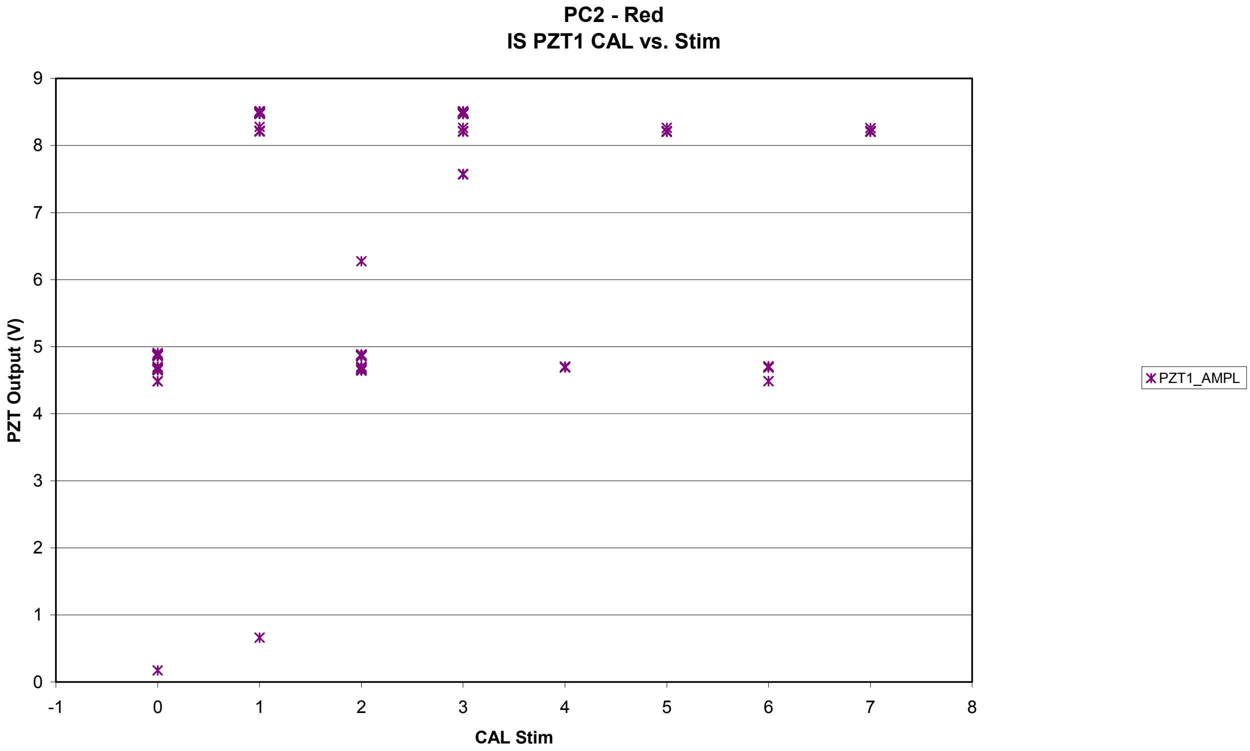


Figure 8.4-27. PZT 2 CAL Signal vs. stimulus – Red

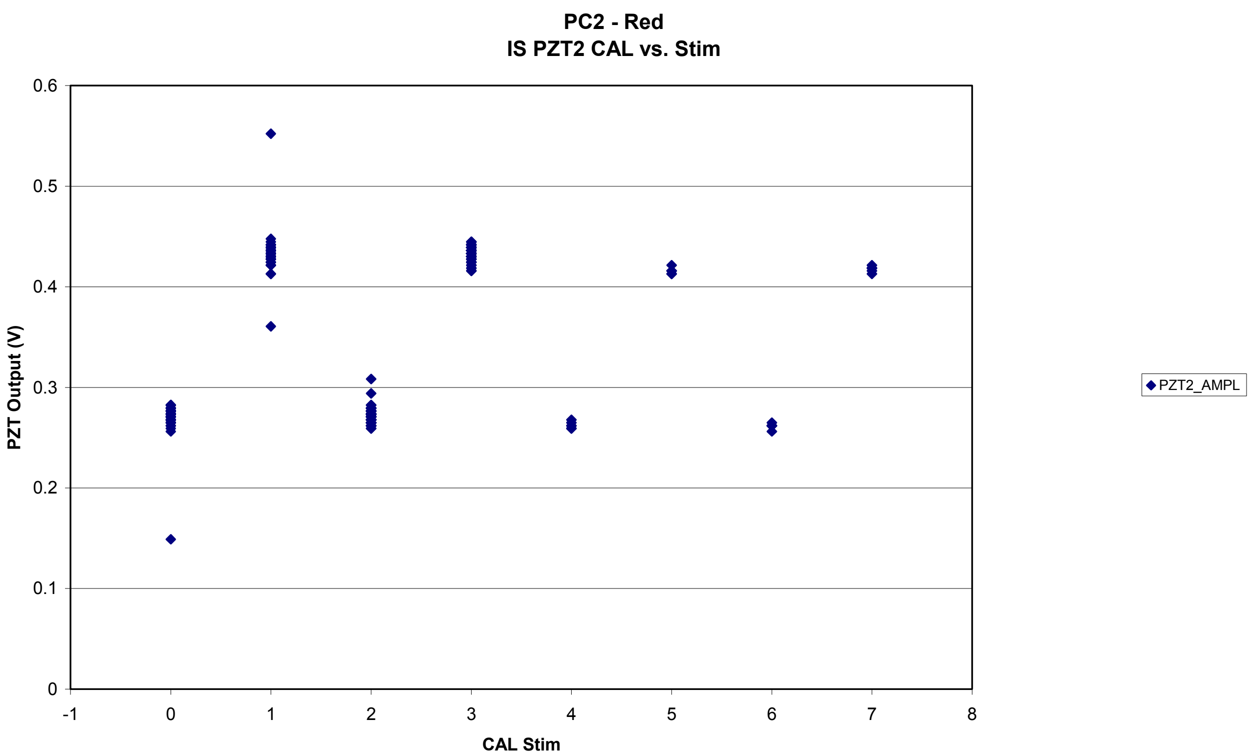


Figure 8.4-28. PZT 3 CAL Signal vs. stimulus – Red

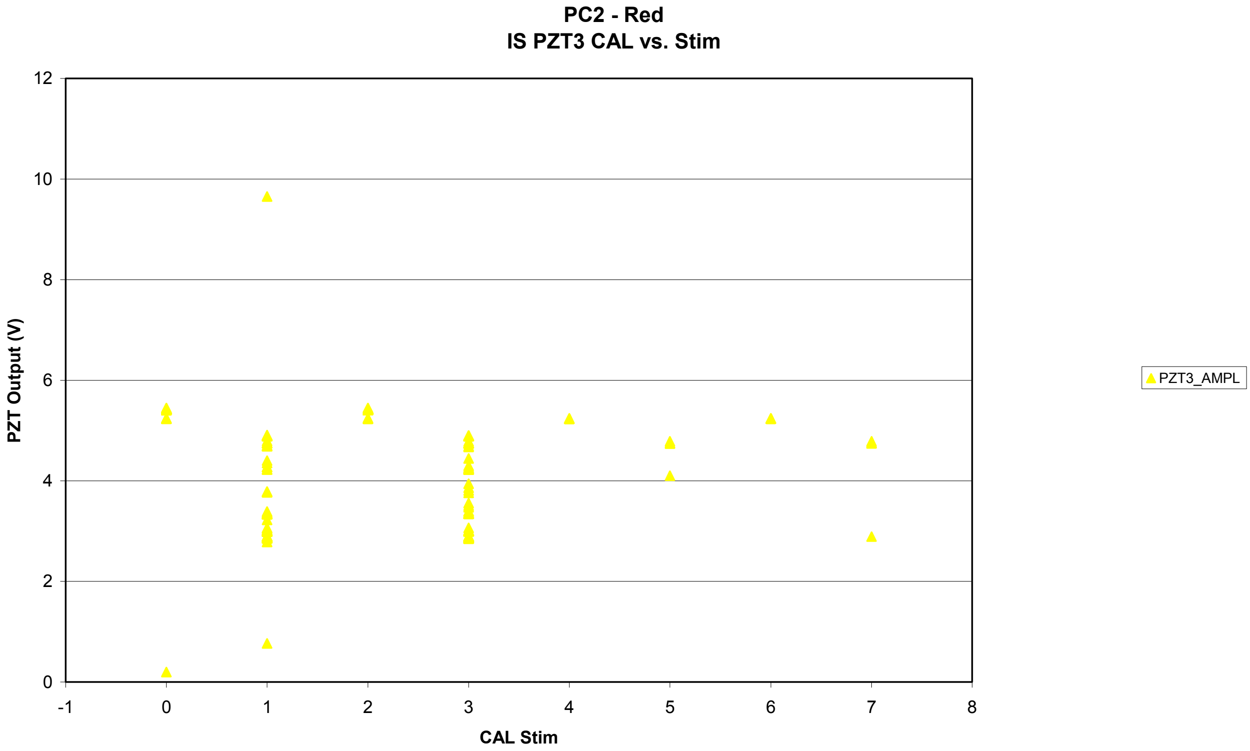


Figure 8.4-29. PZT 4 CAL Signal vs. stimulus – Red

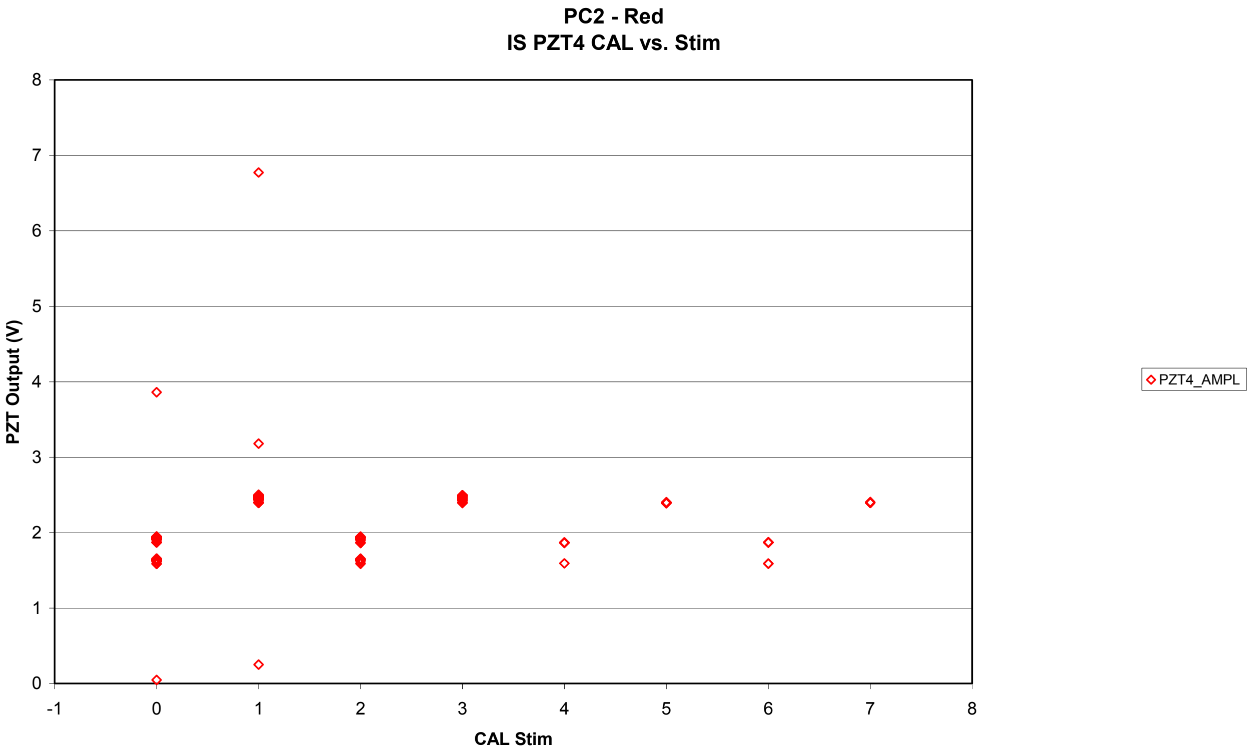


Figure 8.4-30. PZT 5 CAL Signal vs. stimulus – Red

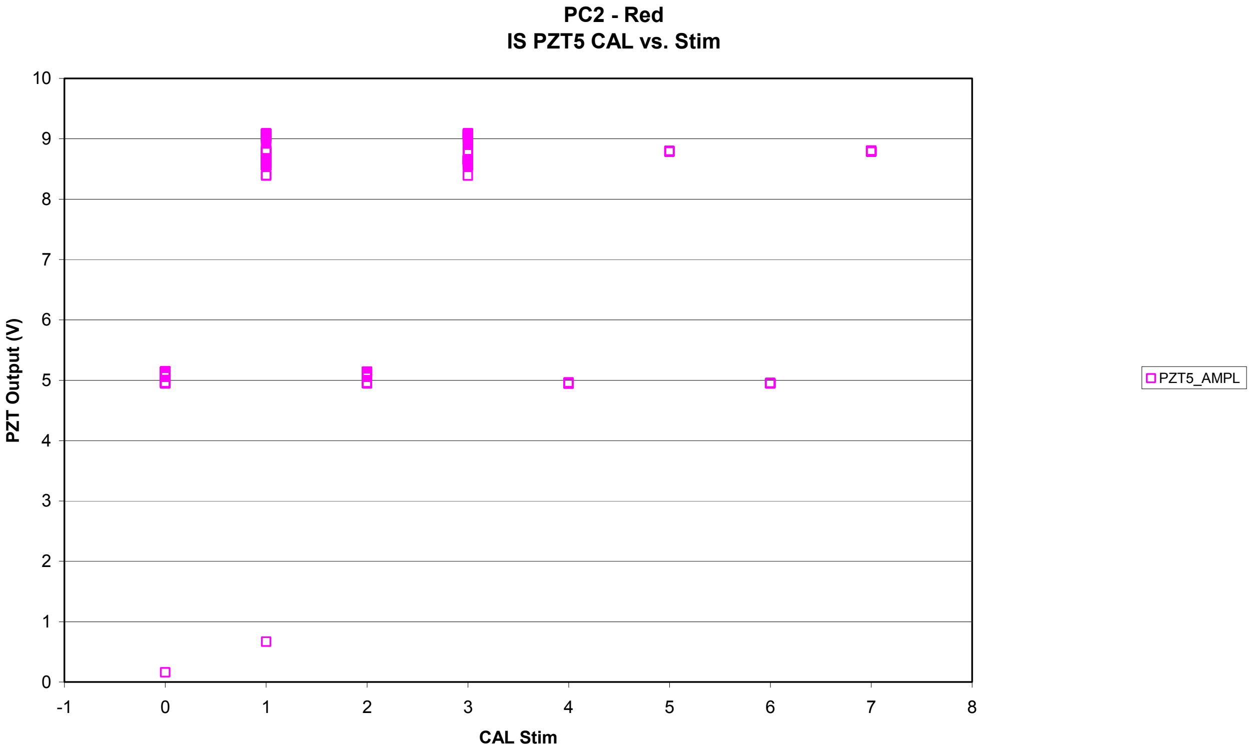


Figure 8.4-31. PZT 1 CAL Time delay vs. stimulus – Red

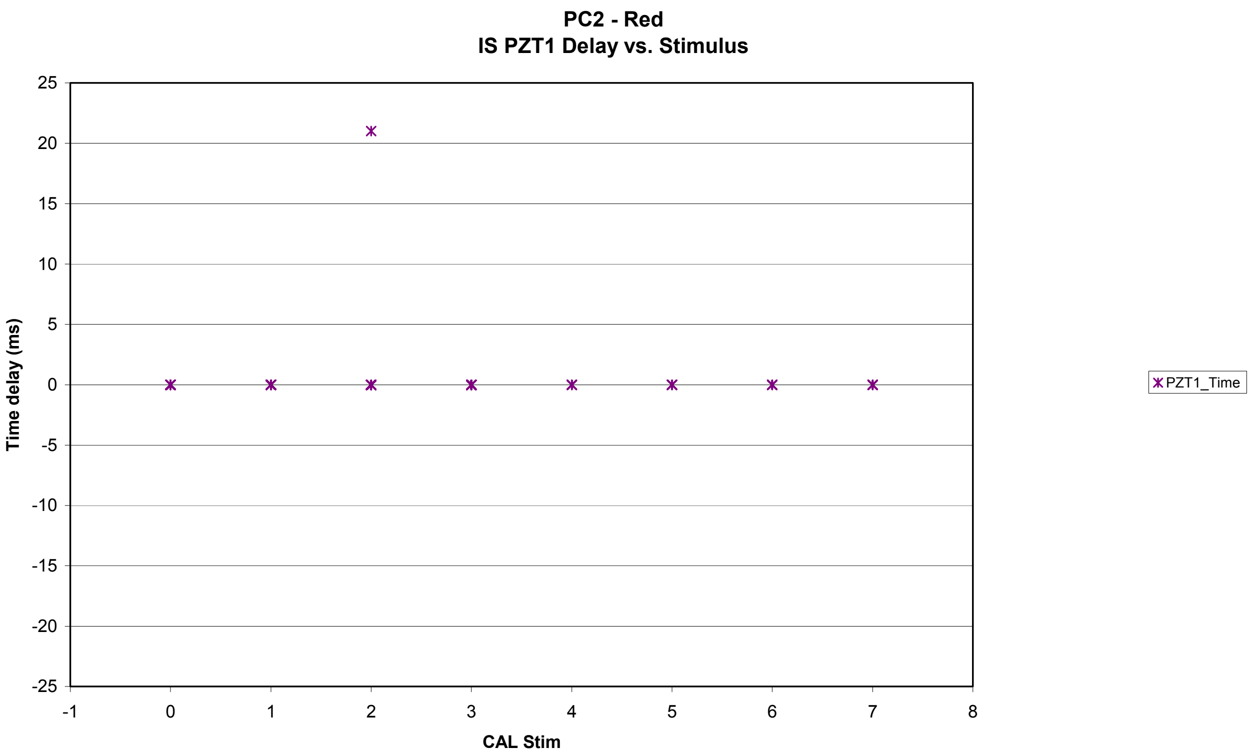


Figure 8.4-32. PZT 2 CAL Time delay vs. stimulus - Red

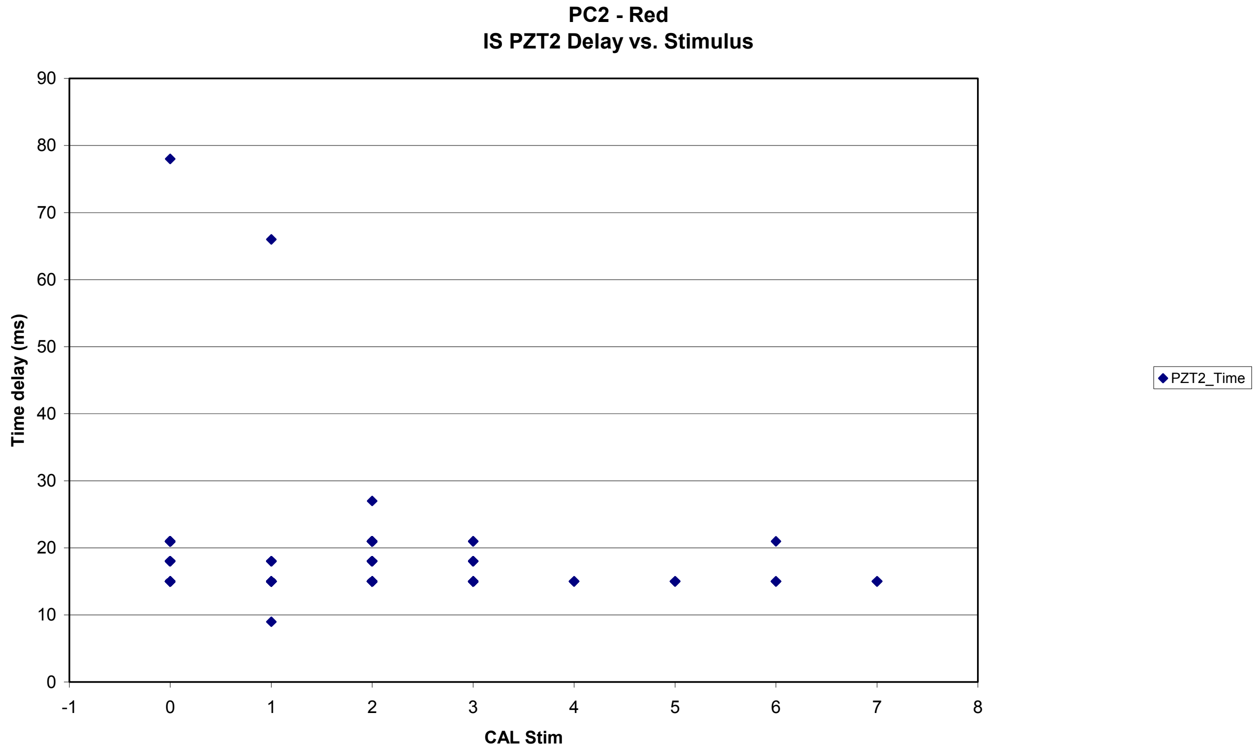


Figure 8.4-33. PZT 3 CAL Time delay vs. stimulus - Red

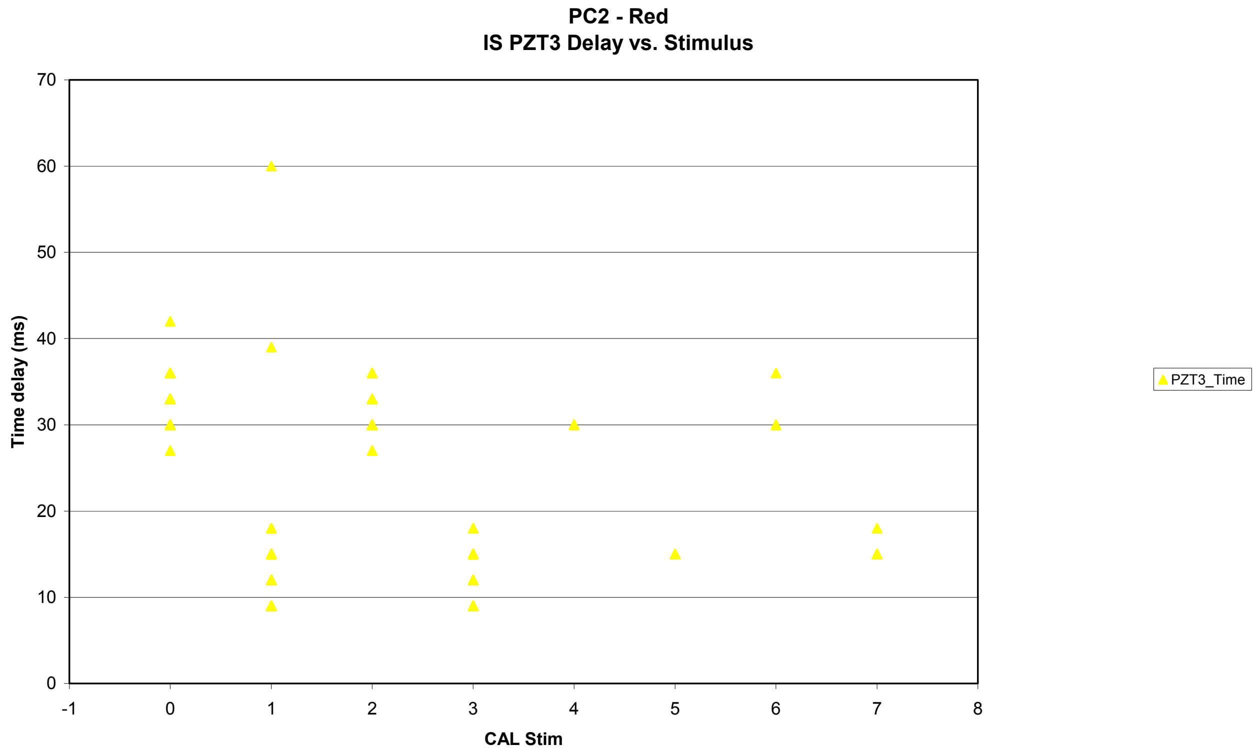


Figure 8.4-34. PZT 4 CAL Time delay vs. stimulus - Red

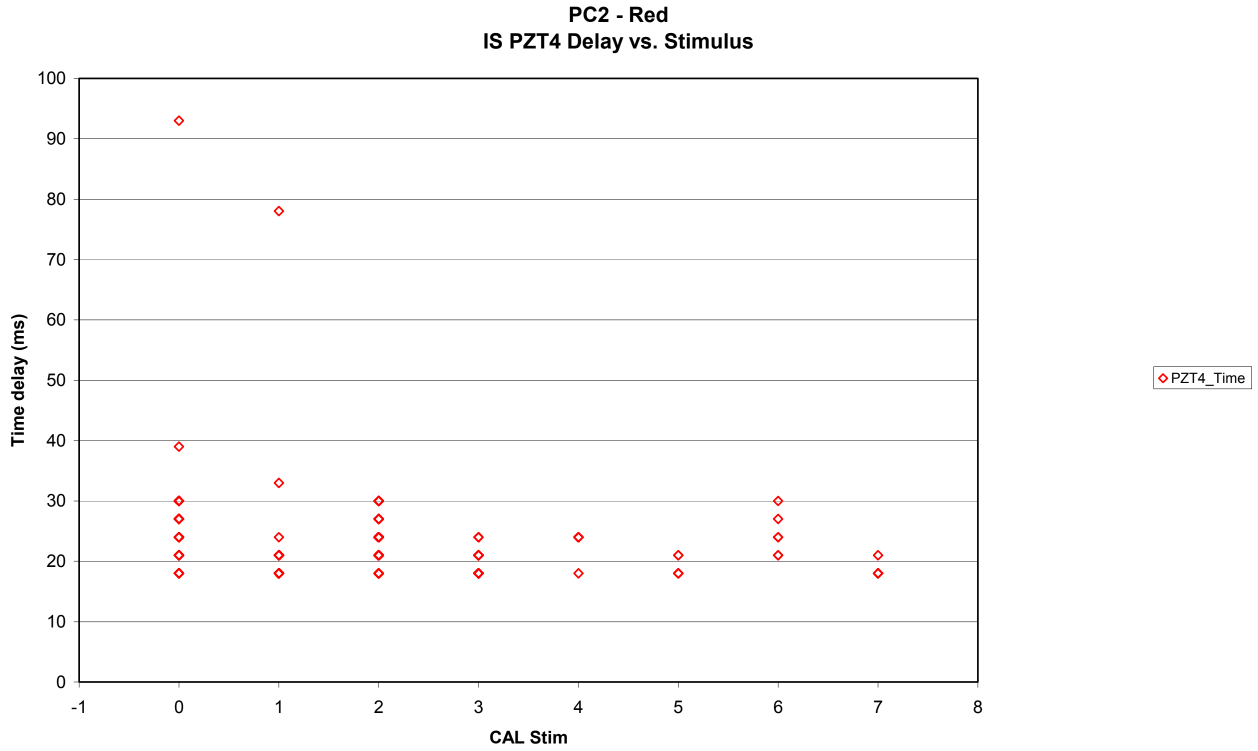
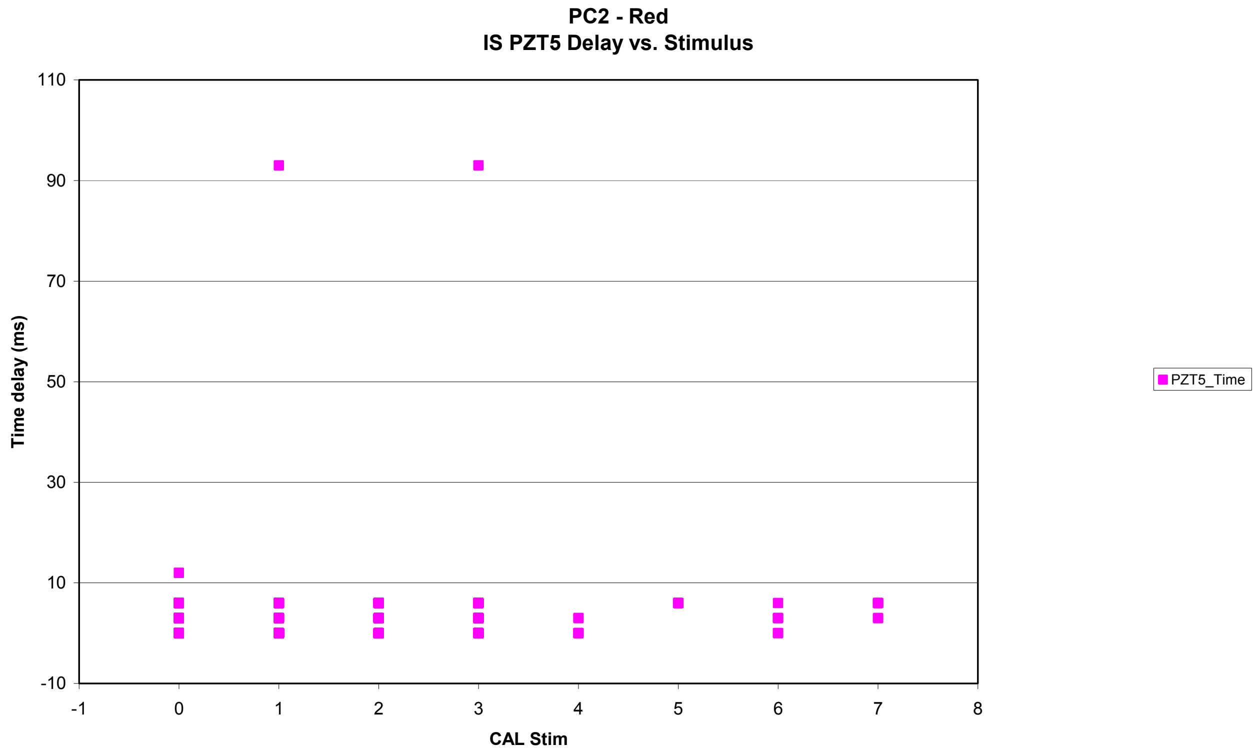


Figure 8.4-35. PZT 5 CAL Time delay vs. stimulus - Red



8.5 MICRO BALANCE SYSTEM (MBS)

8.5.1 MBS – Status

Figure 8.5-1. MBS Operation Status vs. time - Red

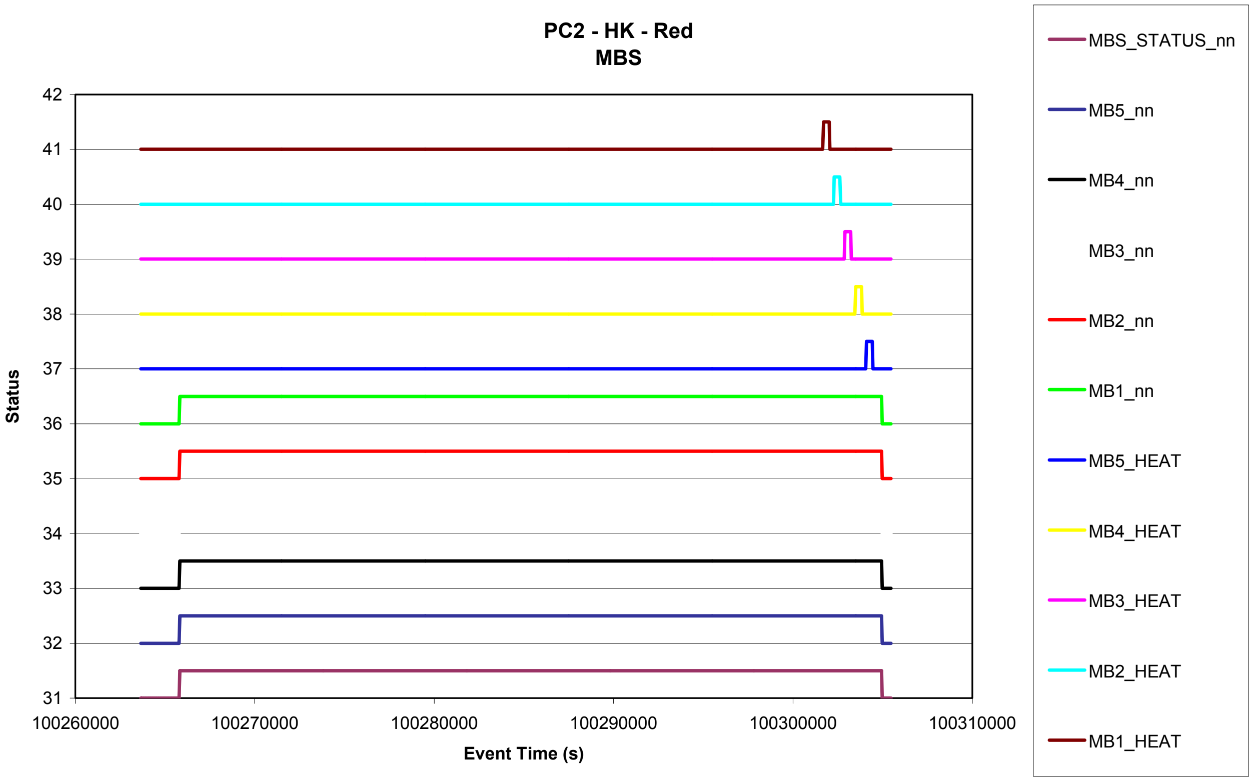


Figure 8.5-2. MBS 1 Temperature vs. time (HK, HK-SCI, SCI) – Red

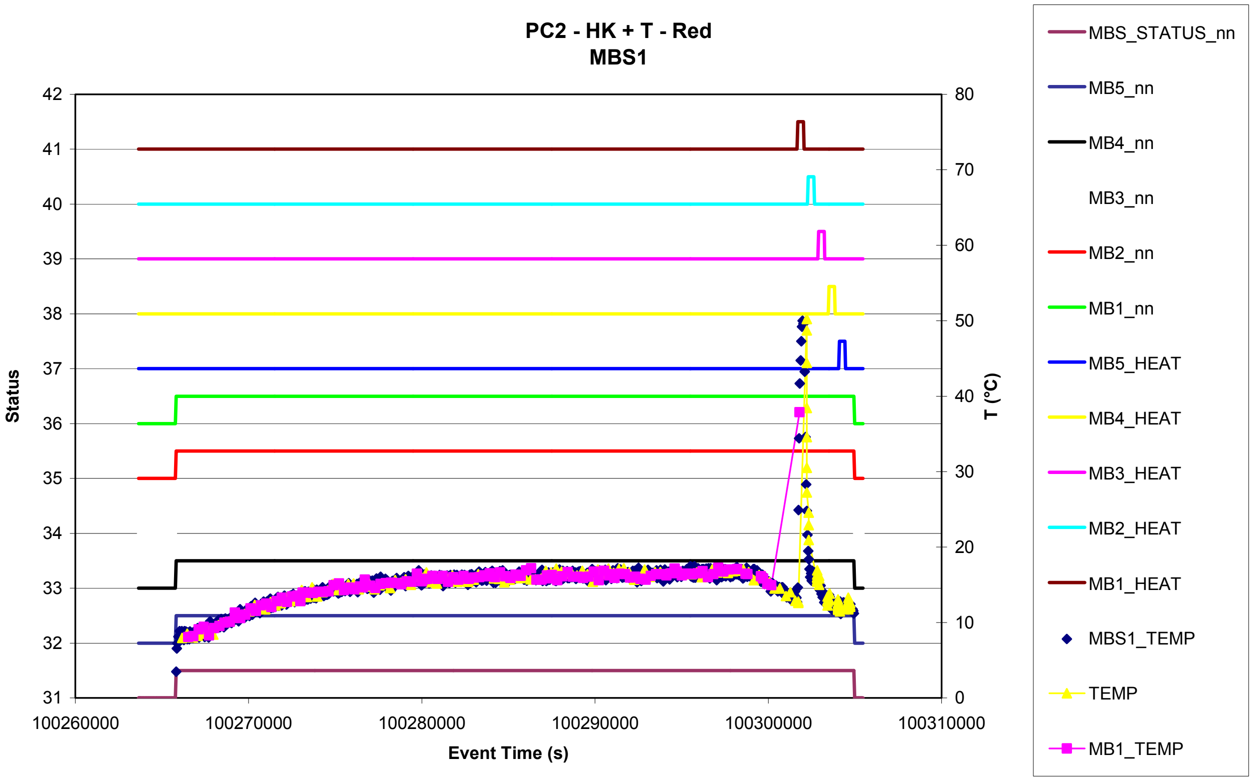


Figure 8.5-3. MBS 2 Temperature vs. time (HK, HK-SCI, SCI) - Red

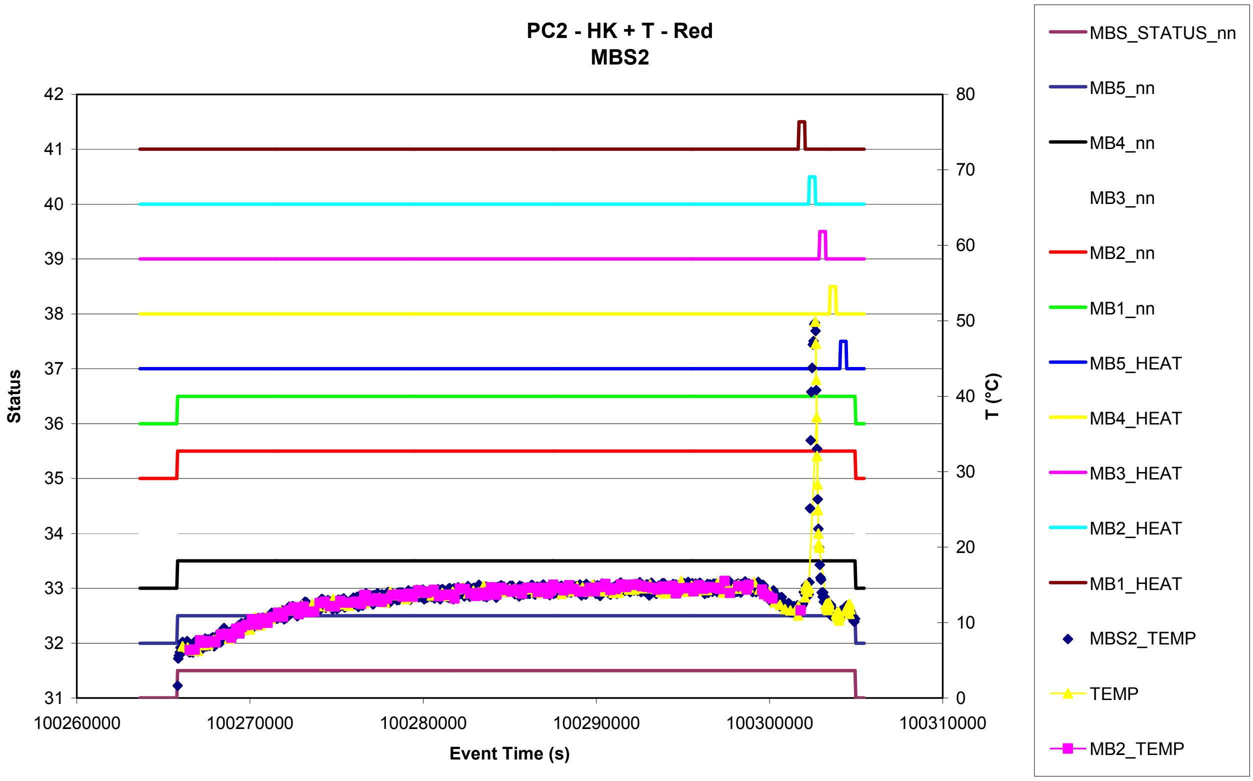


Figure 8.5-4. MBS 3 Temperature vs. time (HK, HK-SCI, SCI) - Red

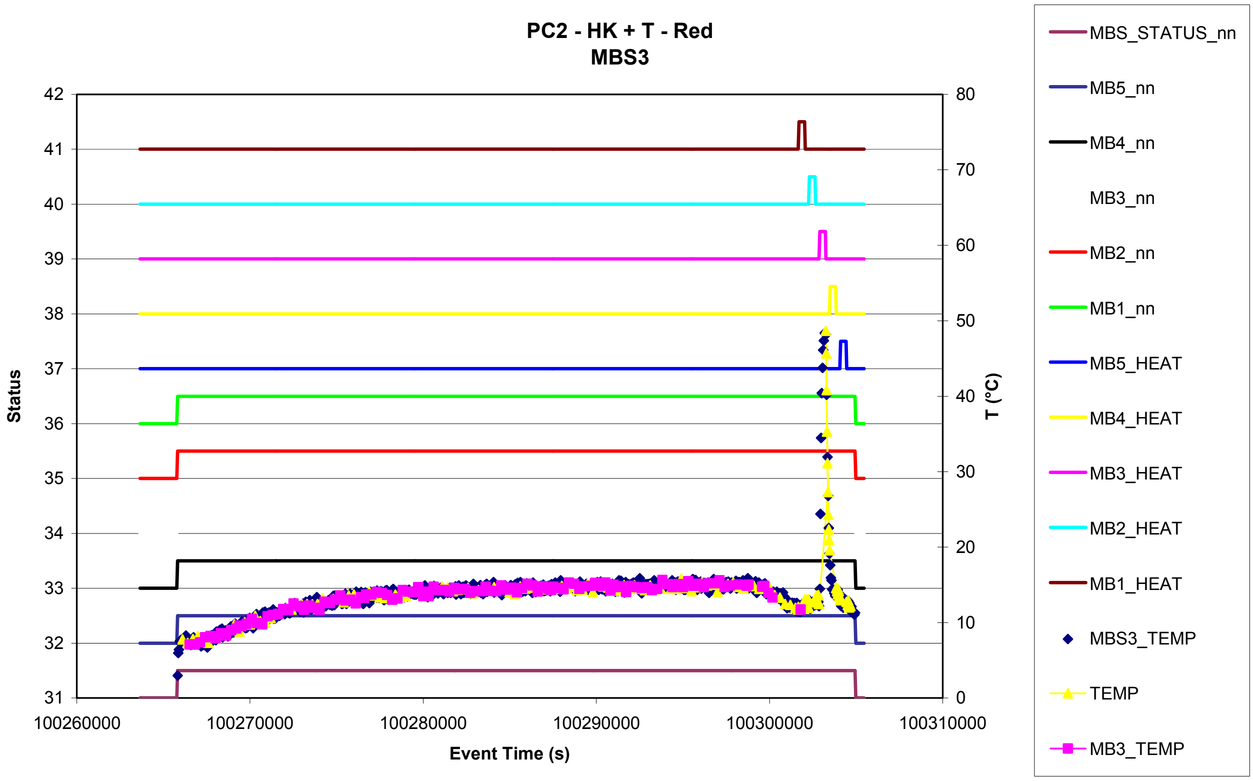


Figure 8.5-5. MBS 4 Temperature vs. time (HK, HK-SCI, SCI) - Red

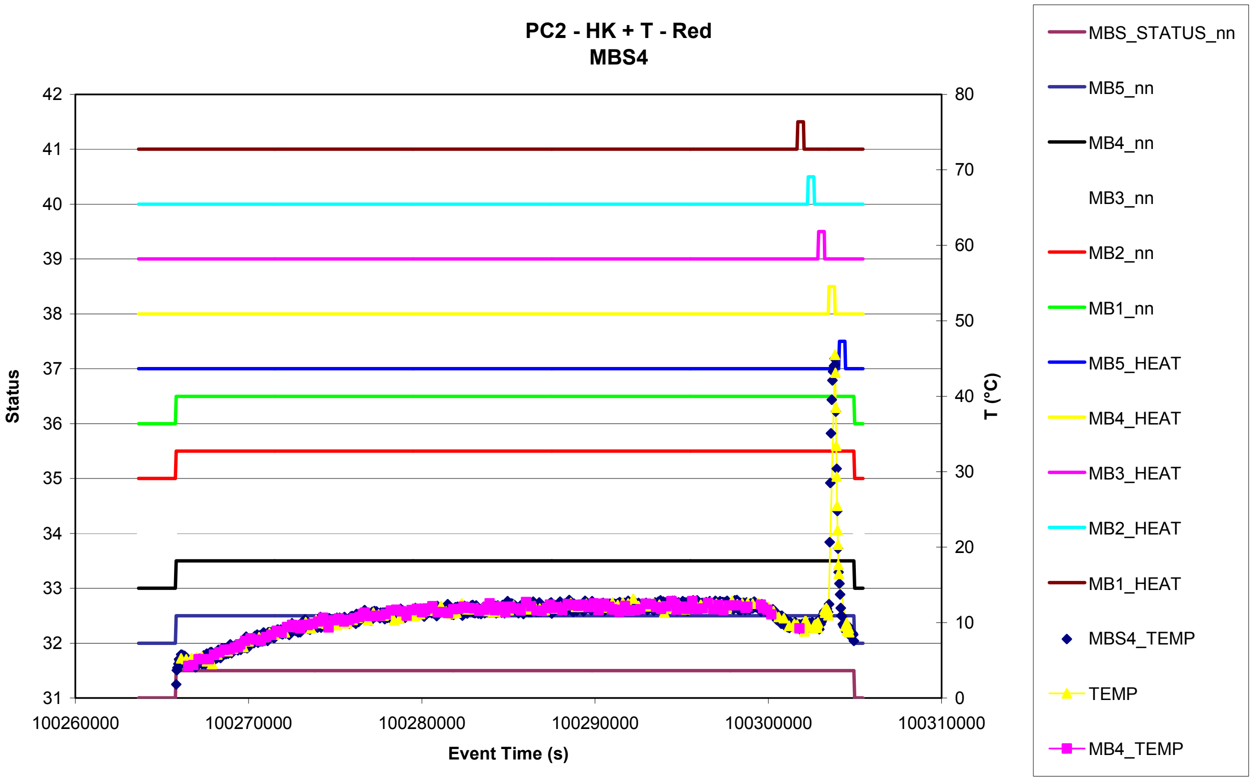
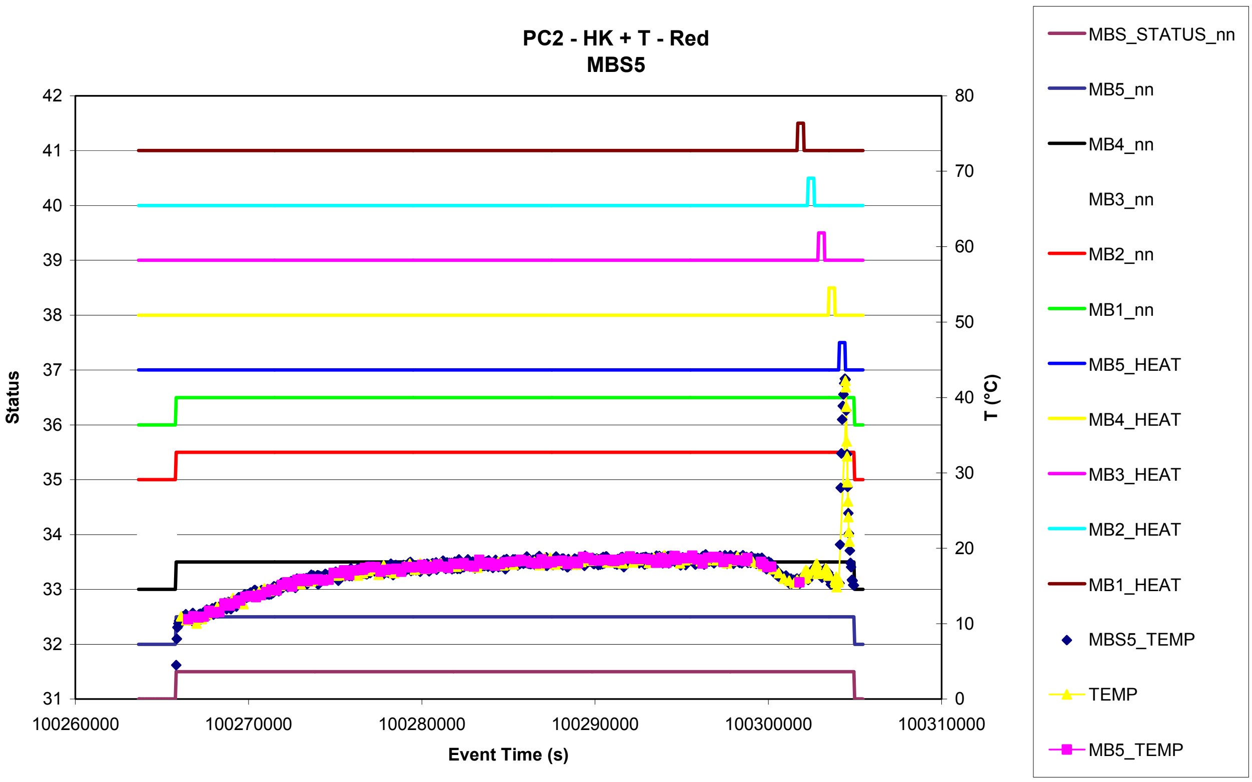


Figure 8.5-6. MBS 5 Temperature vs. time (HK, HK-SCI, SCI) - Red



8.5.2 MBS – Behaviour

8.5.2.1 Science Events (Normal + Heating)

Figure 8.5-7. MBS 1 Frequency and Temperature vs. time - Red

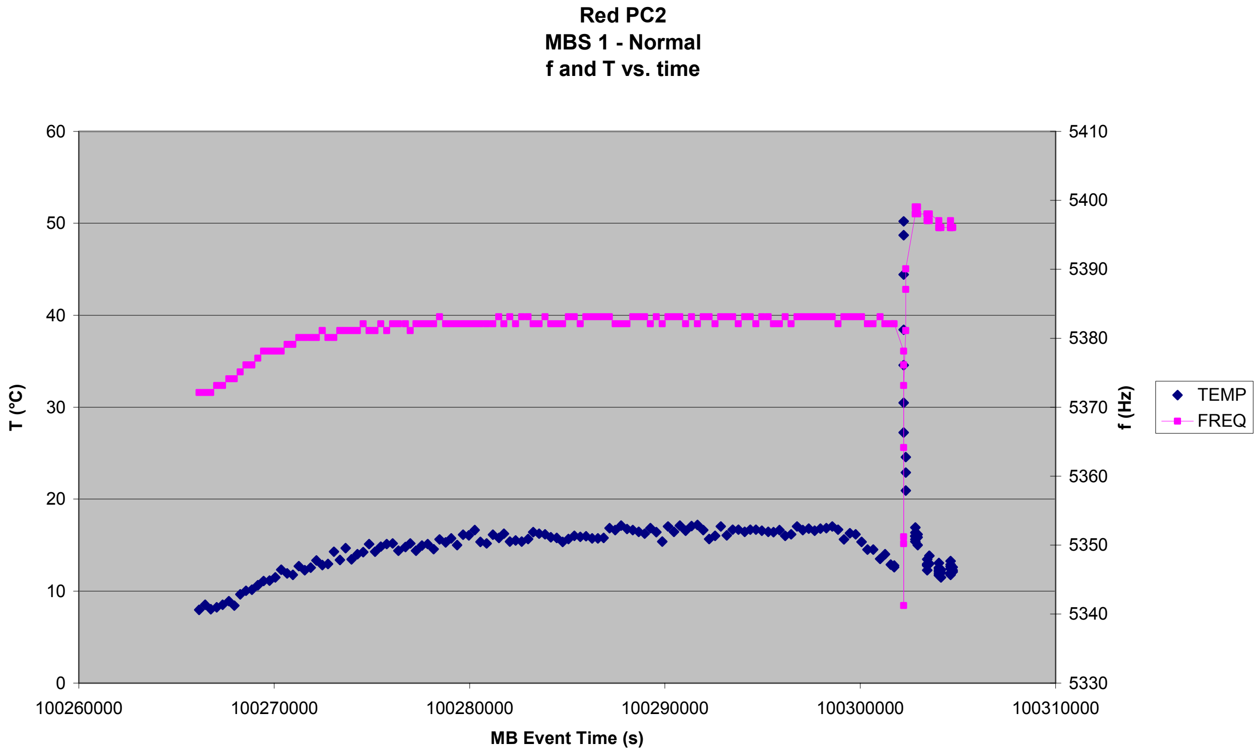


Figure 8.5-8. MBS 2 Frequency and Temperature vs. time - Red

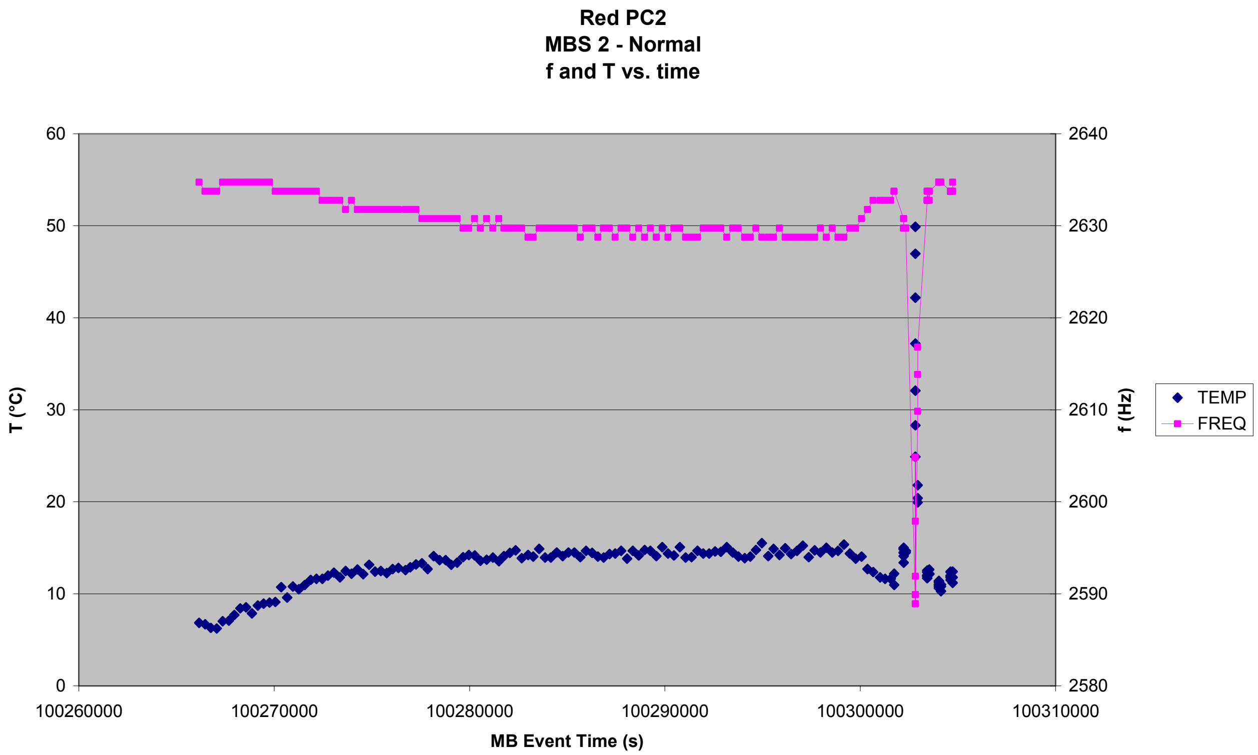


Figure 8.5-9. MBS 3 Frequency and Temperature vs. time - Red

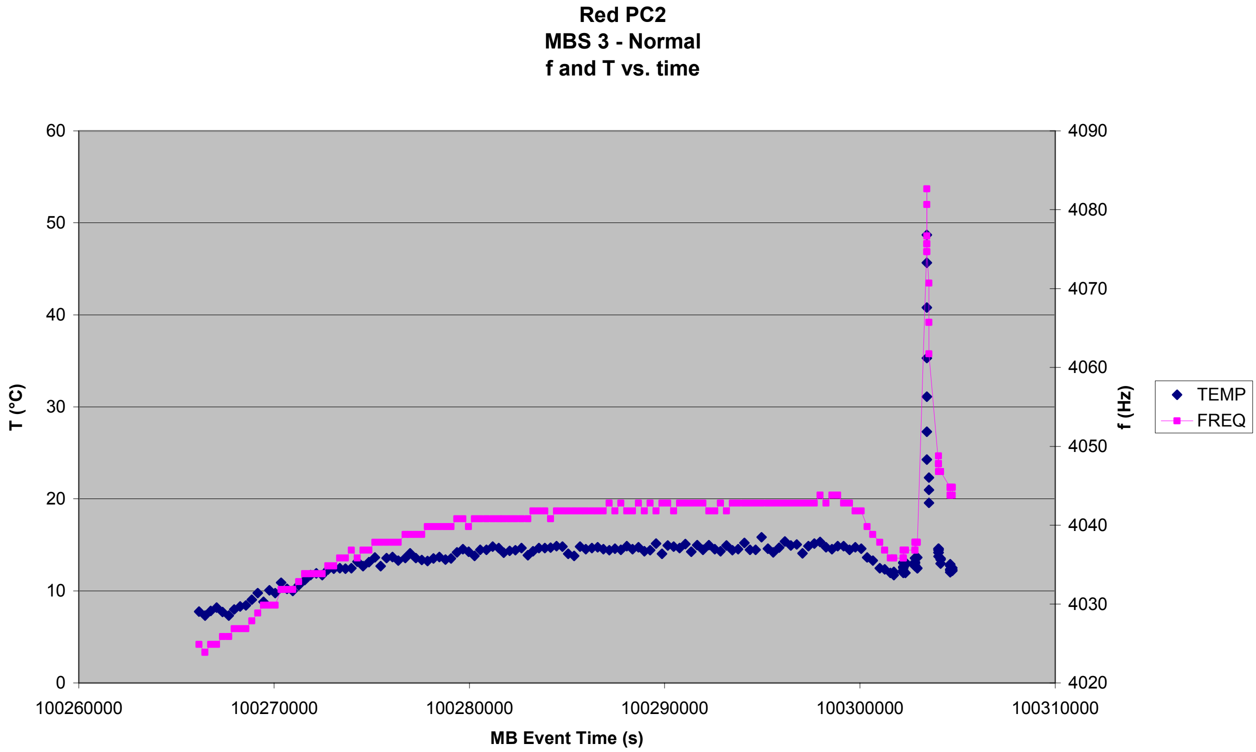


Figure 8.5-10. MBS 4 Frequency and Temperature vs. time - Red

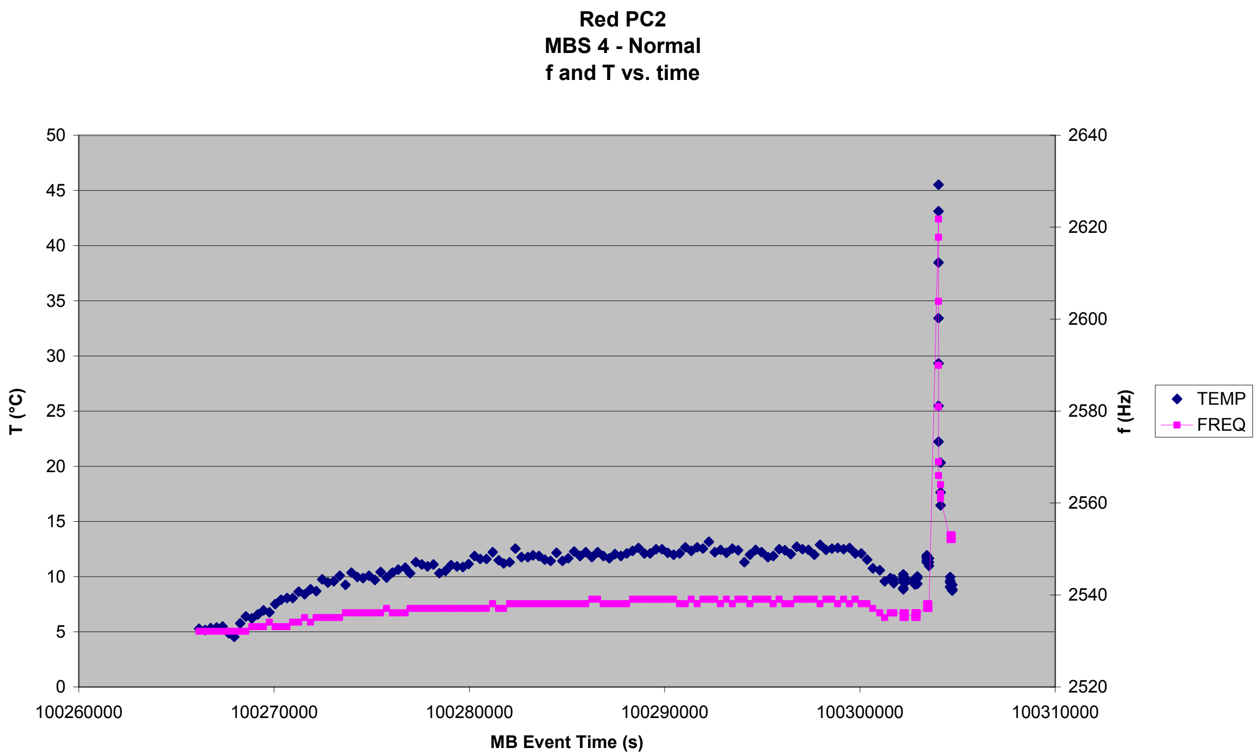


Figure 8.5-11. MBS 5 Frequency and Temperature vs. time - Red

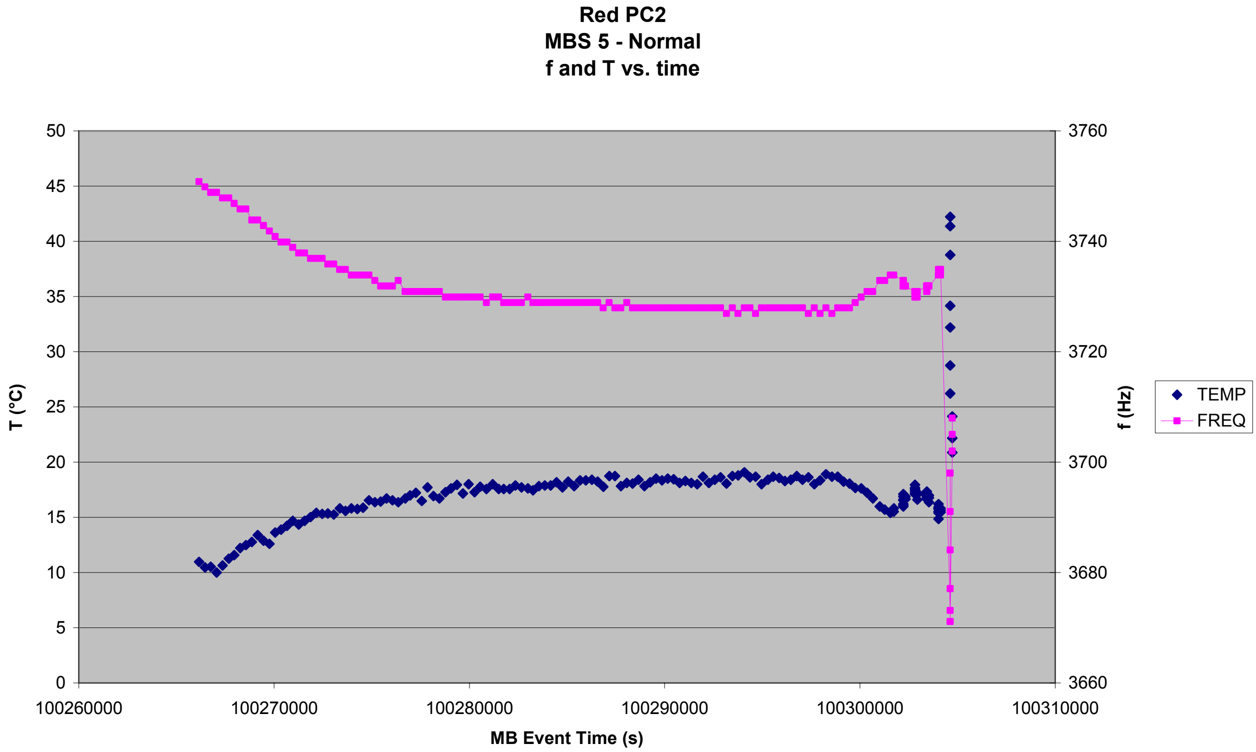


Figure 8.5-12. MBS 1 Frequency vs. Temperature - Red

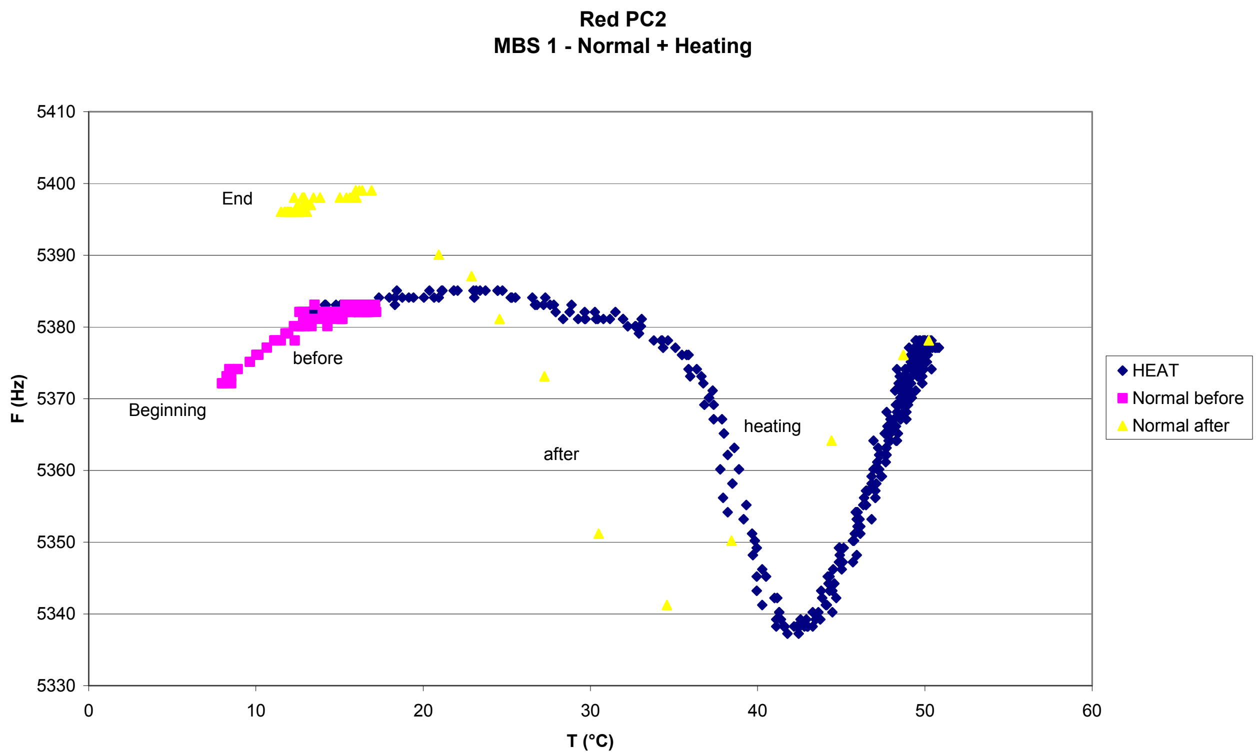


Figure 8.5-13. MBS 2 Frequency vs. Temperature - Red

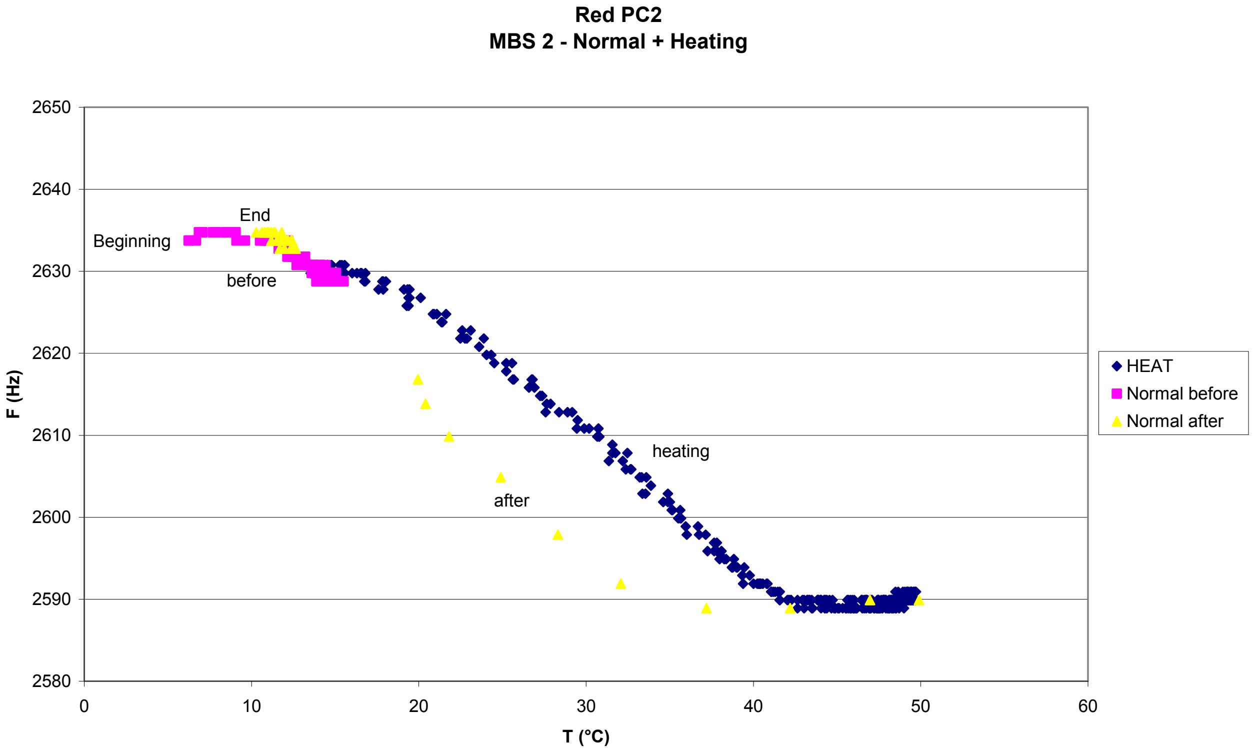


Figure 8.5-14. MBS 3 Frequency vs. Temperature - Red

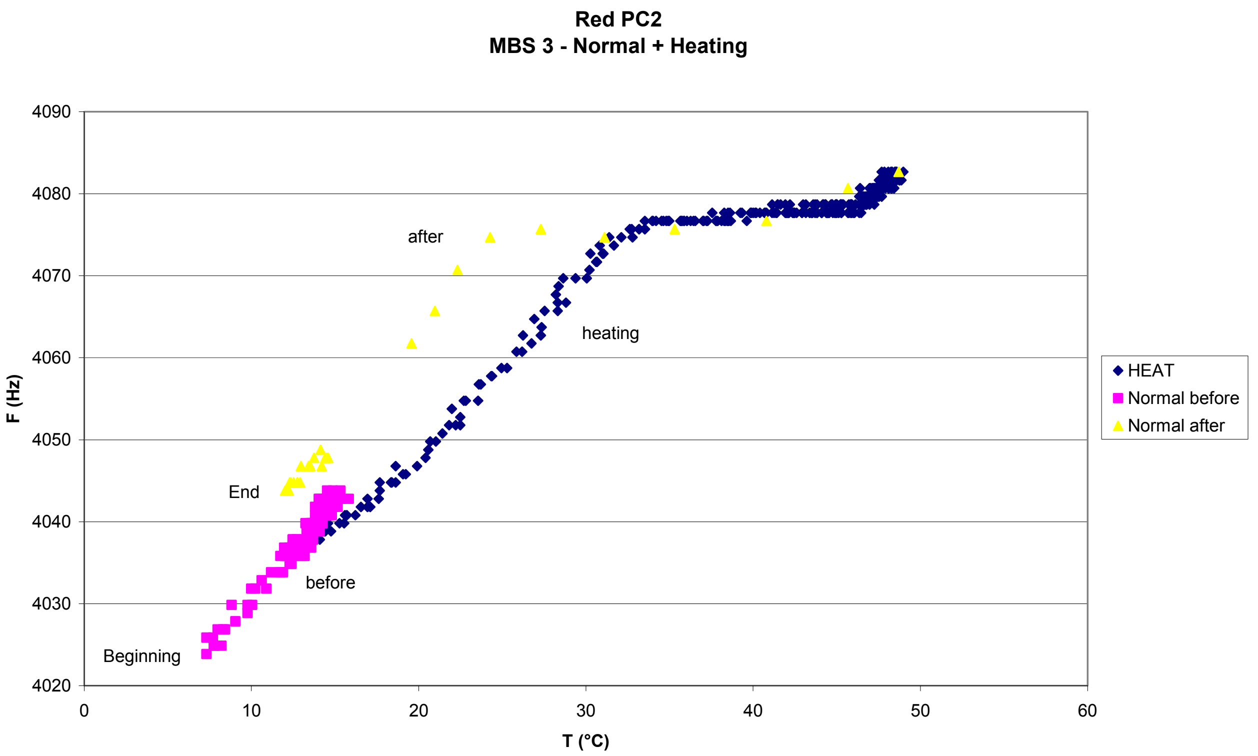


Figure 8.5-15. MBS 4 Frequency vs. Temperature - Red

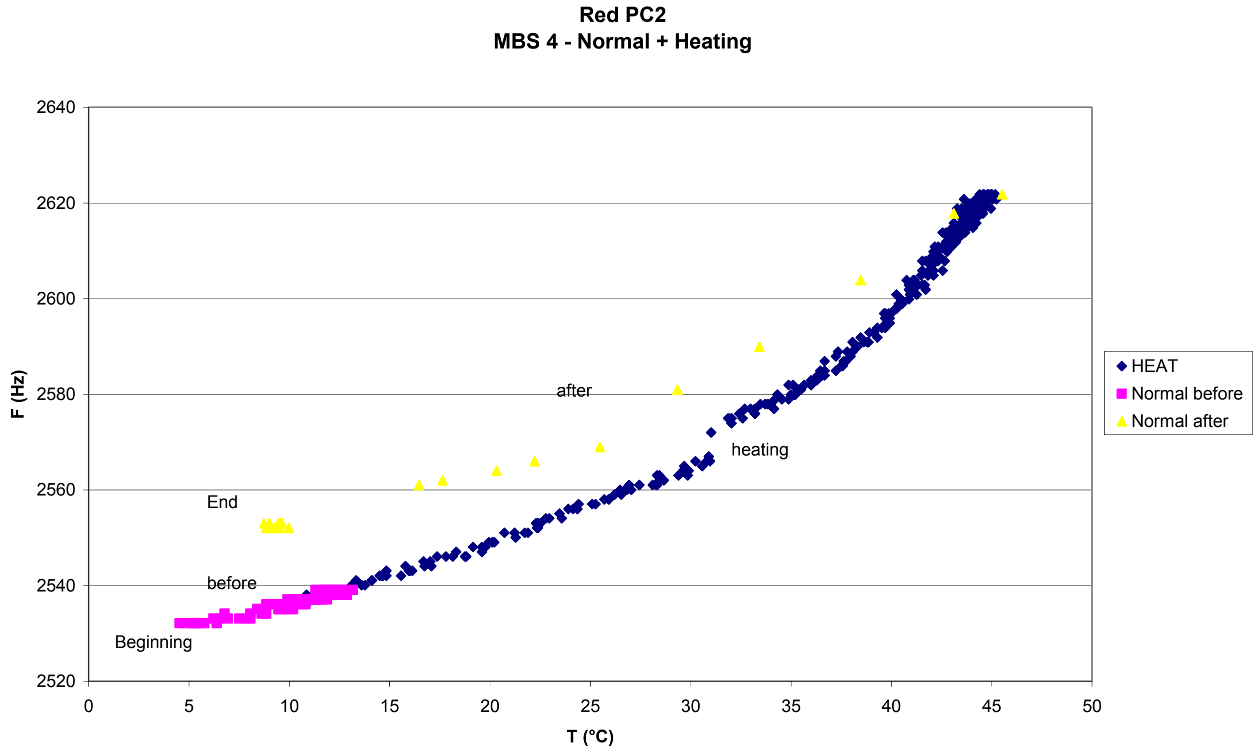
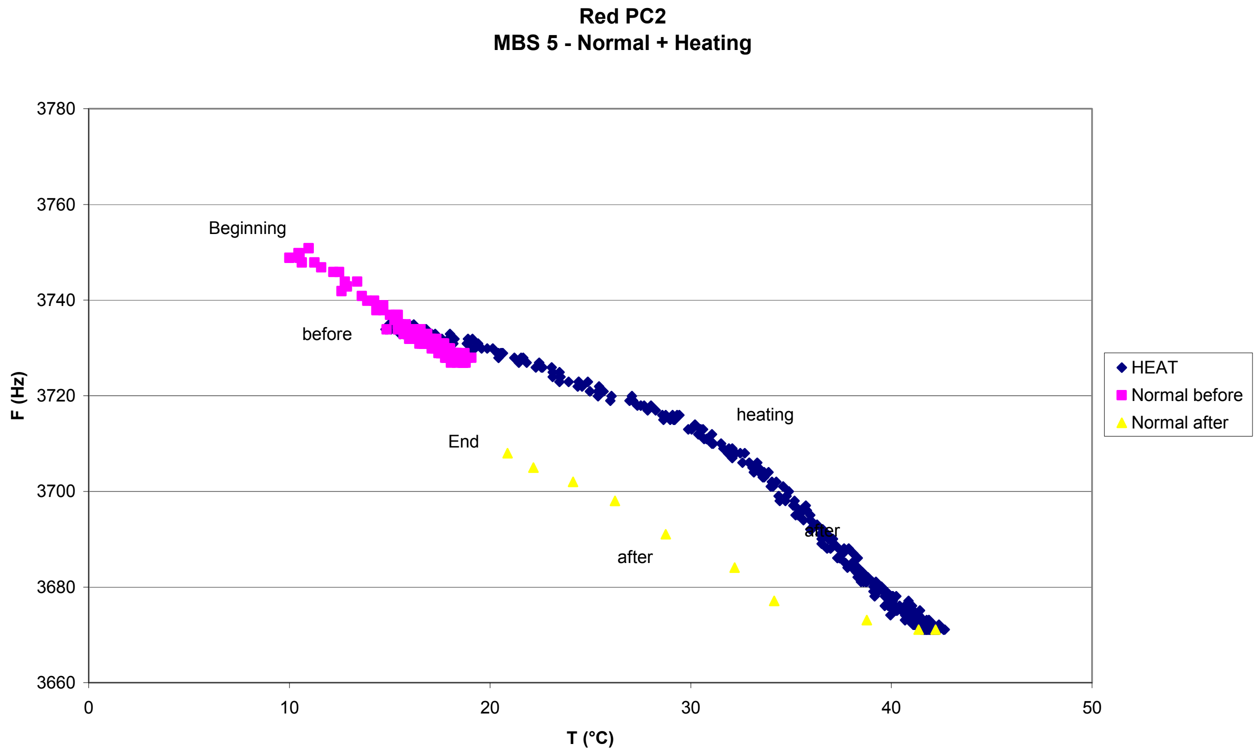


Figure 8.5-16. MBS 5 Frequency vs. Temperature - Red



9. COMPARISIONS WITH PREVIOUS TESTS

9.1 GRAIN DETECTION SYSTEM (GDS)

9.1.1 Laser Light Mon vs. Temperature

Figure 9.1-1. GDS Laser 1 Light Mon vs. Temperature (PC2 in fuchsia)

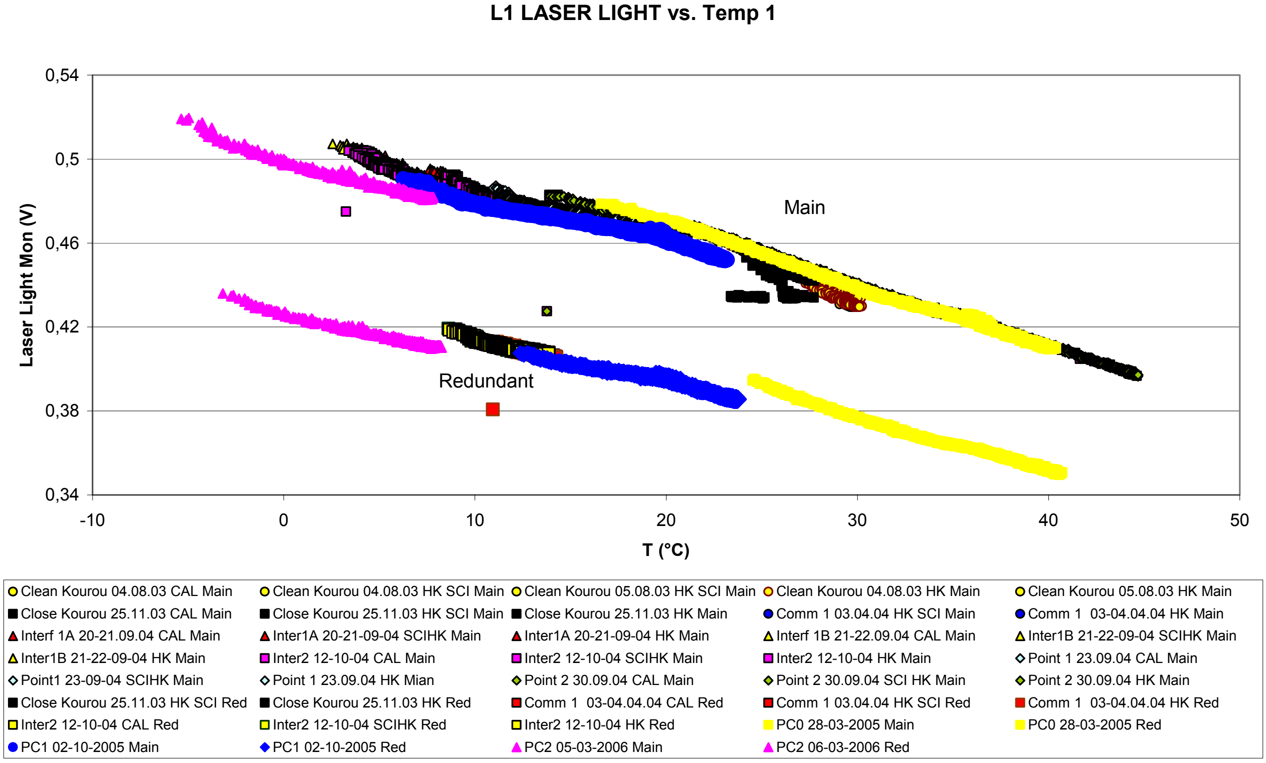


Figure 9.1-2. GDS Laser 2 Light Mon vs. Temperature (PC2 in fuchsia)

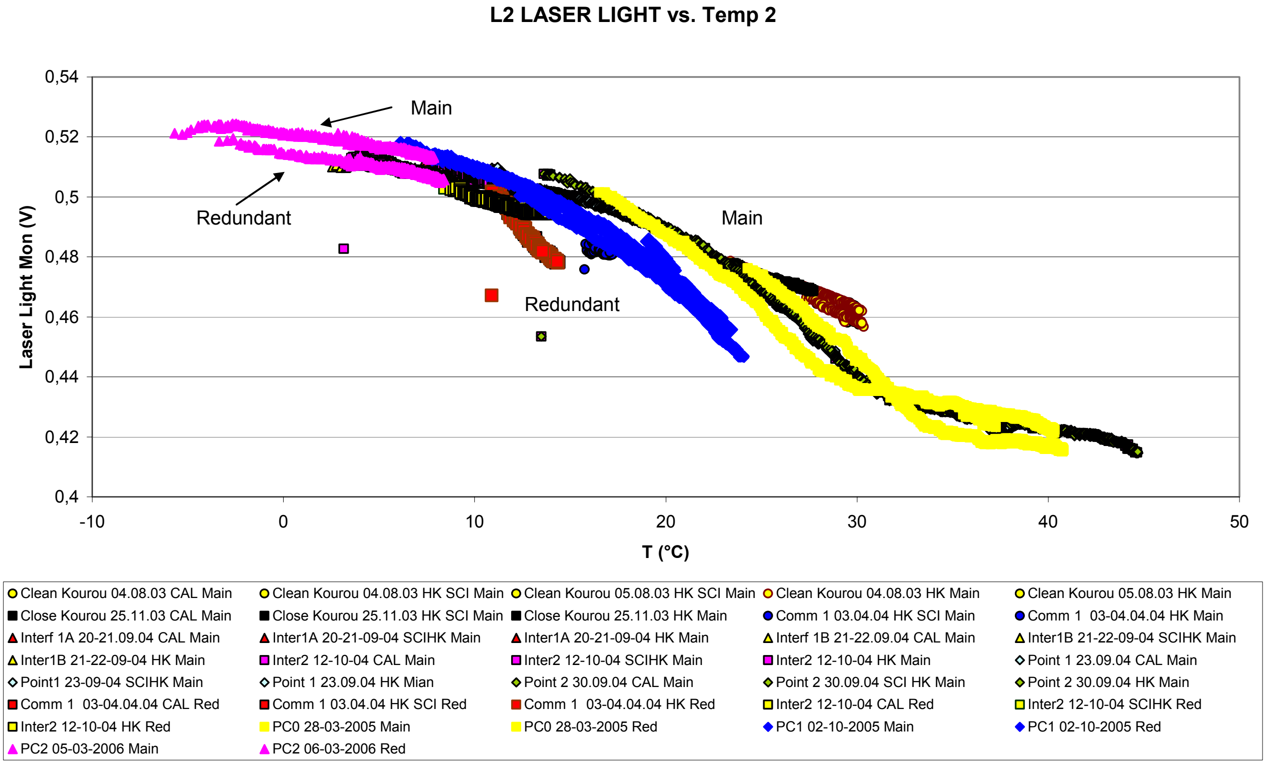


Figure 9.1-3. GDS Laser 3 Light Mon vs. Temperature (PC2 in fuchsia)

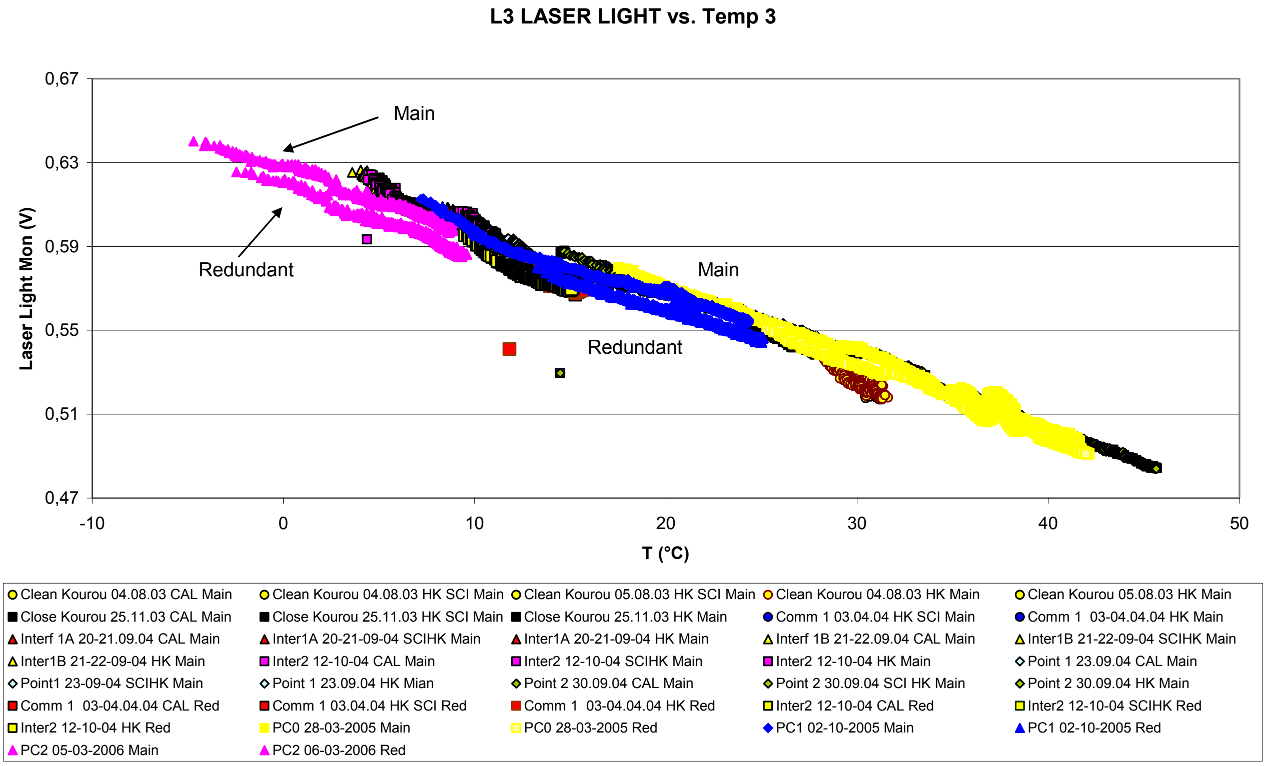
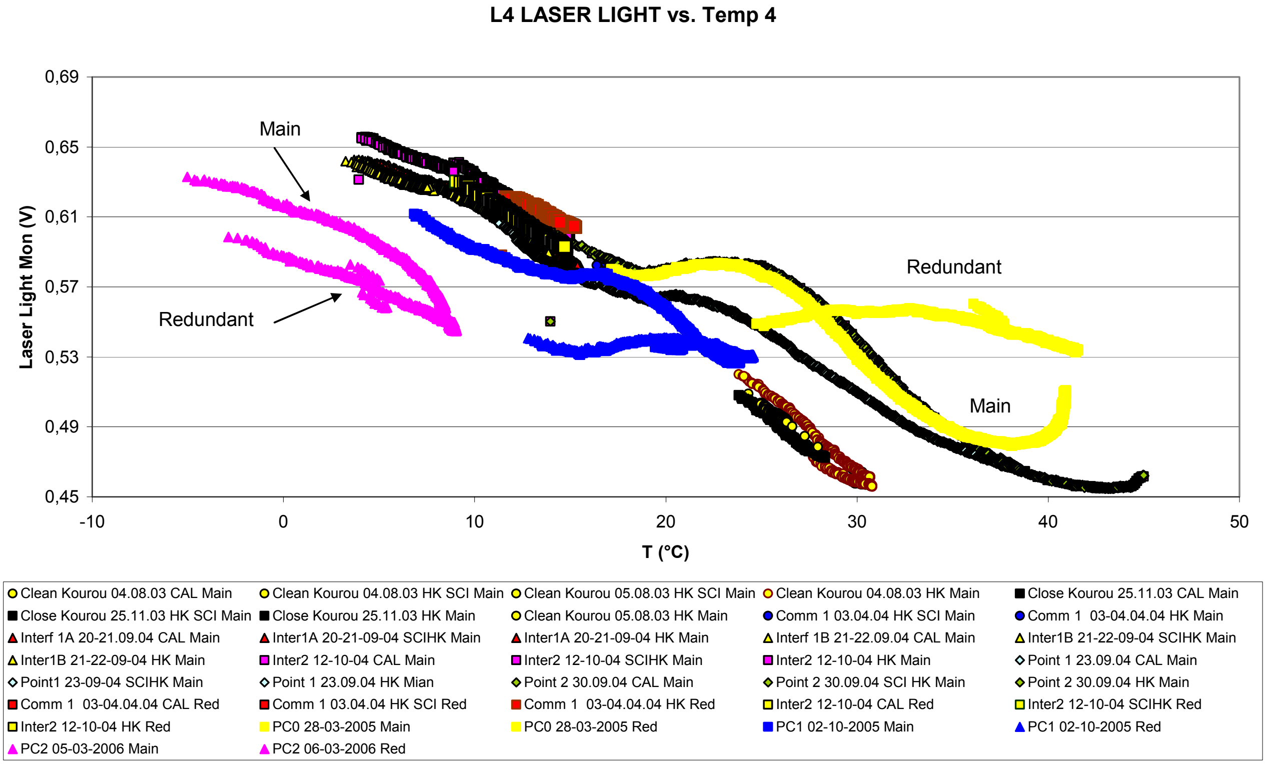


Figure 9.1-4. GDS Laser 4 Light Mon vs. Temperature (PC2 in fuchsia)



9.2 IMPACT SENSOR (IS)

9.2.1 CAL Amplitude vs. Temperature

Figure 9.2-1. IS PZT-1 CAL Amplitude vs. T – High Voltage

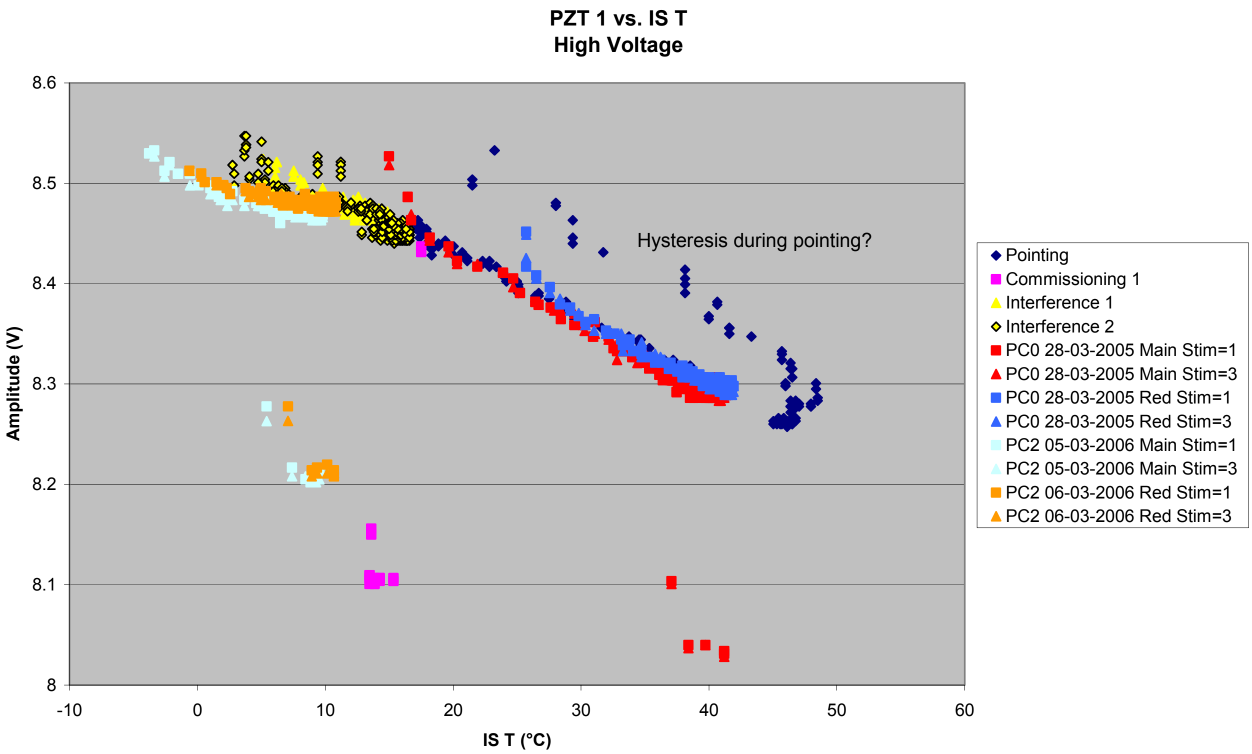
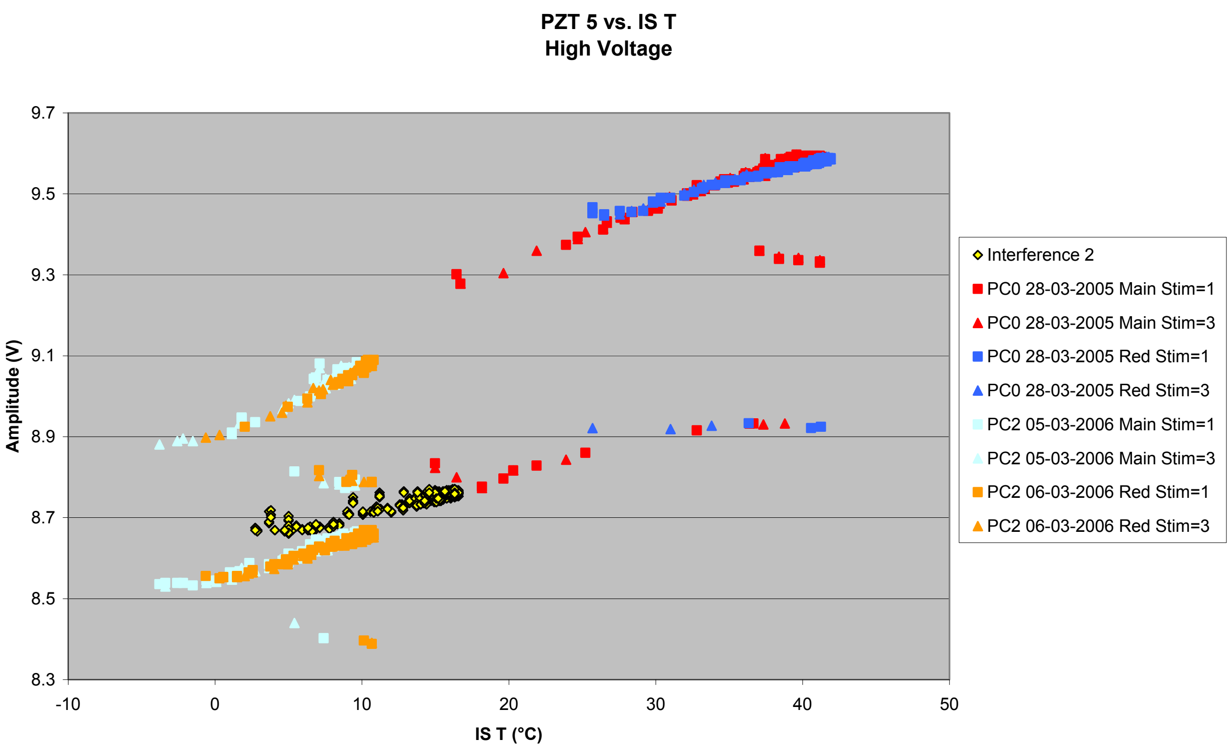


Figure 9.2-2. IS PZT-5 CAL Amplitude vs. T – High Voltage



9.3 MICRO BALANCE SYSTEM (MBS)

9.3.1 Frequency vs. Temperature

Figure 9.3-1. MBS 1 Frequency vs. Temperature

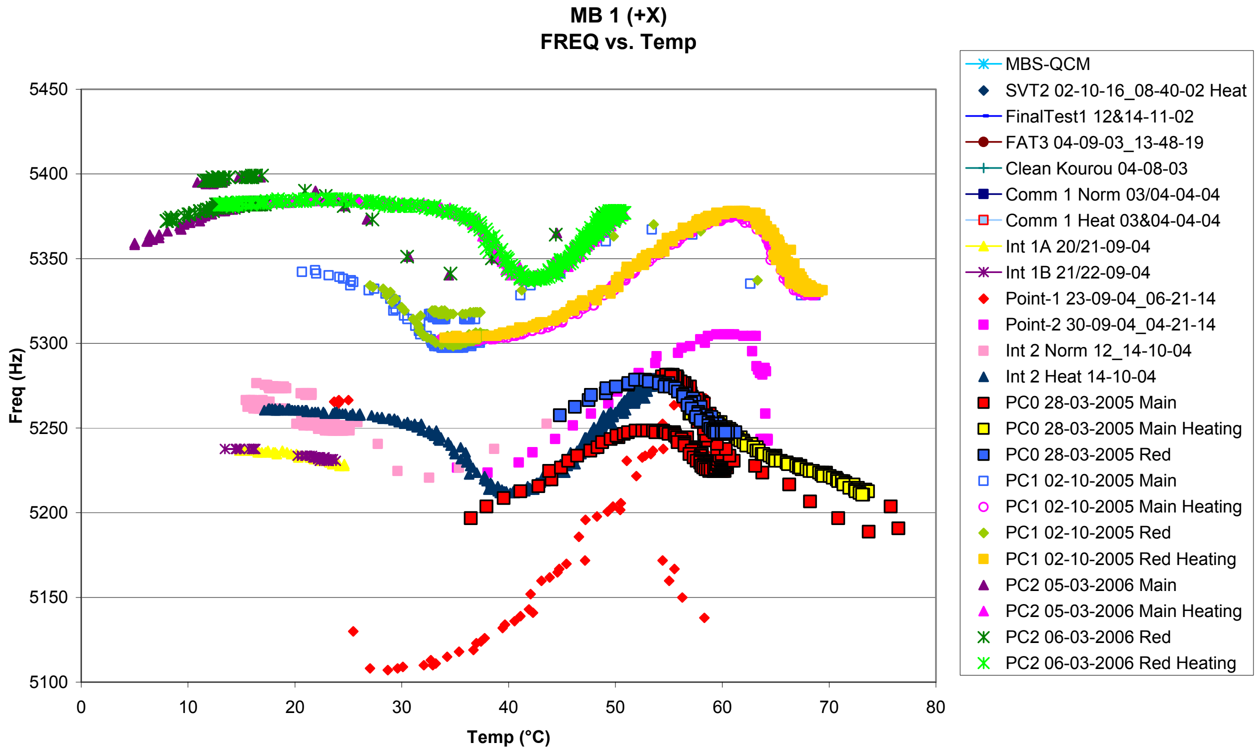


Figure 9.3-2. MBS 2 Frequency vs. Temperature

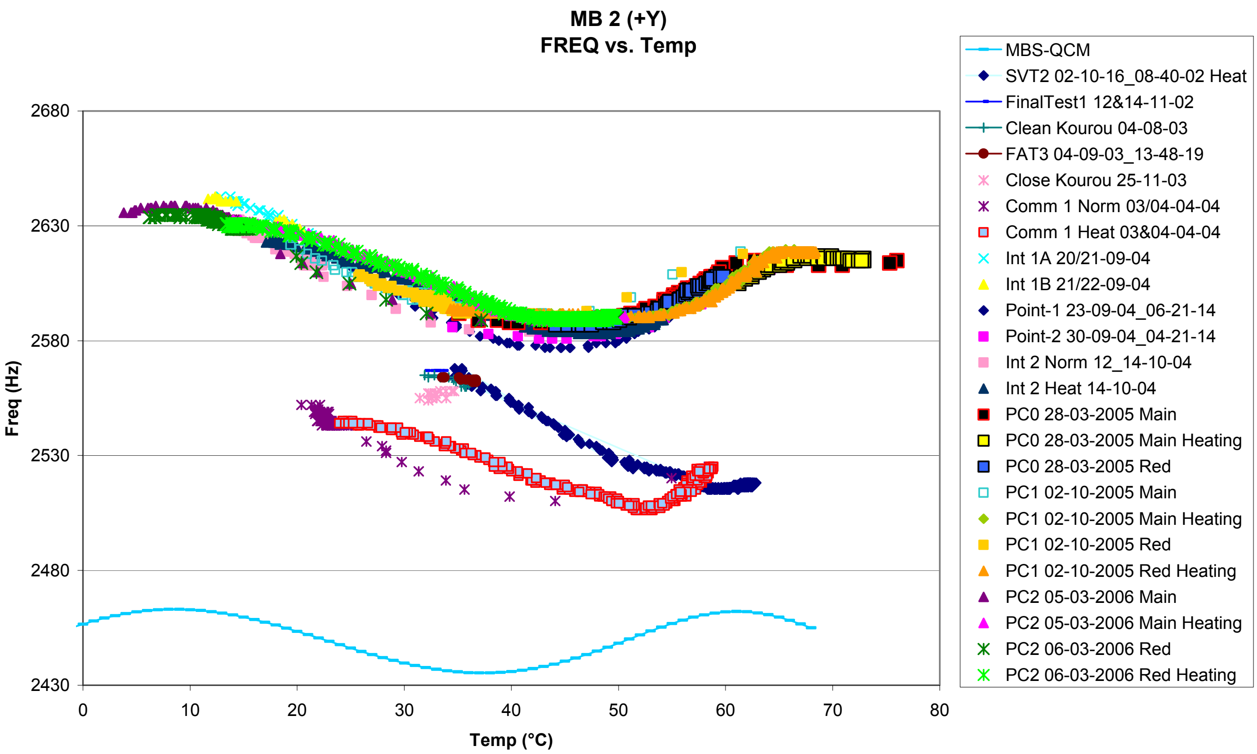


Figure 9.3-3. MBS 3 Frequency vs. Temperature

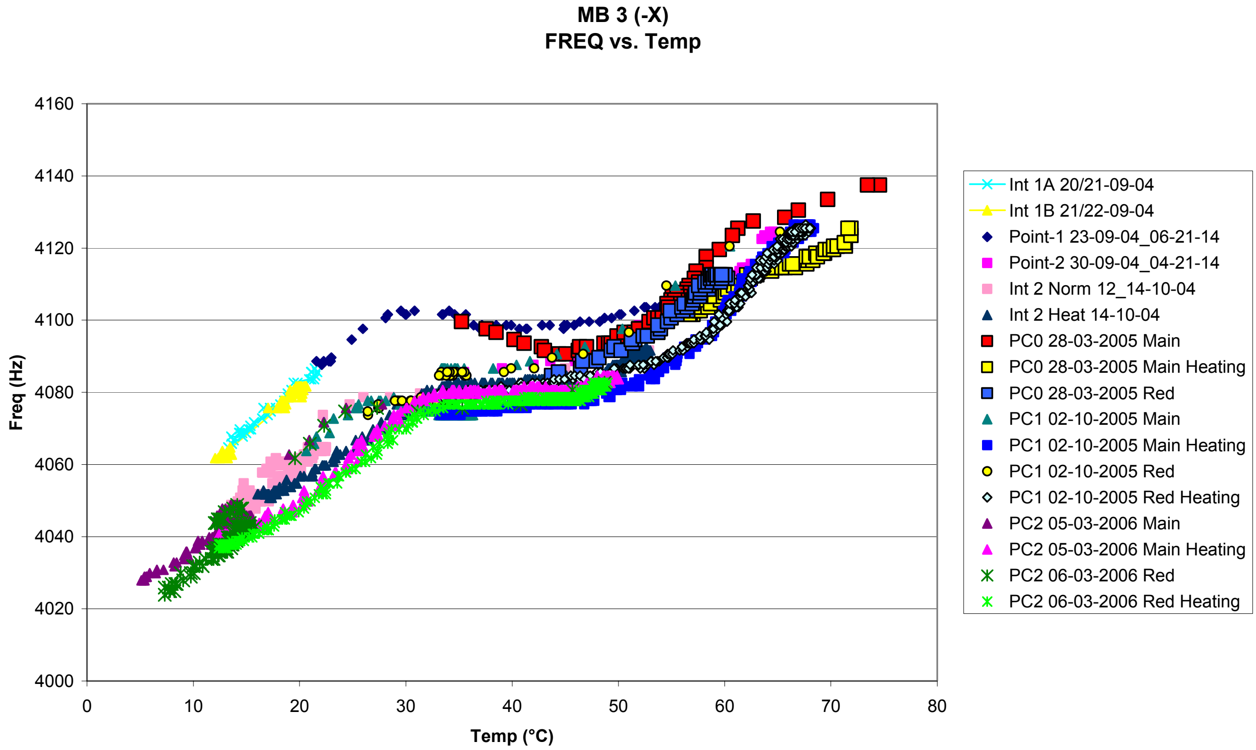


Figure 9.3-4. MBS 4 Frequency vs. Temperature

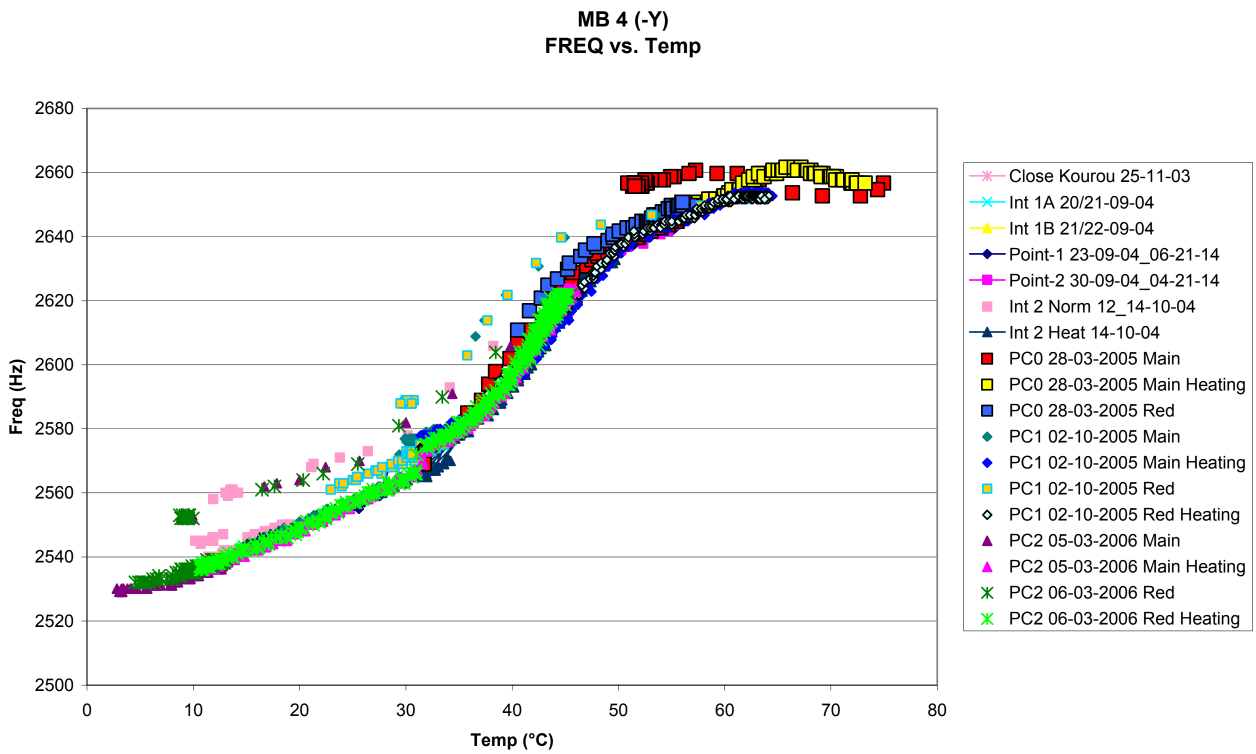
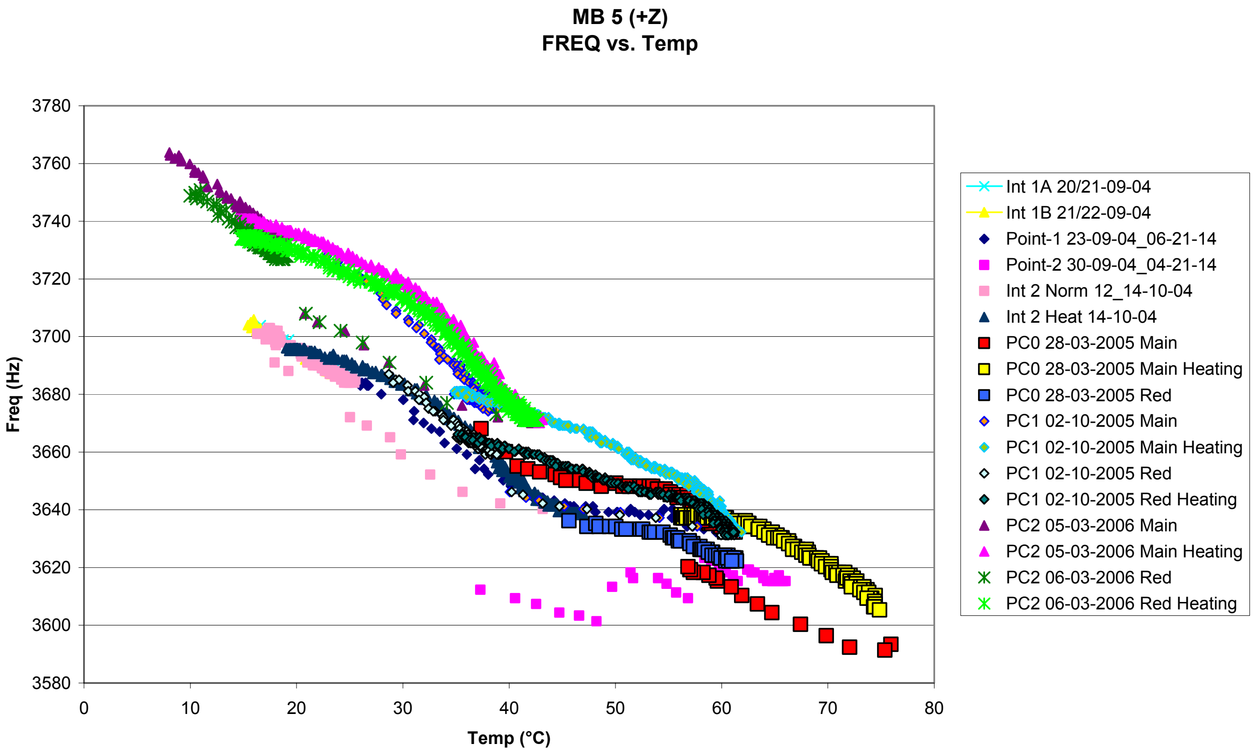


Figure 9.3-5. MBS 5 Frequency vs. Temperature



10. TIMELINES FOR GIADA PC2

10.1 TIMELINE FOR MAIN INTERFACE

```
# $Log: OIOR_PIHRSO_D_0000_GD_PCA1_300013.ROS,v $
# 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_0000_GD_PCA1_300013.ROS
# Type:     Input Timeline file
#
# Description:    Passive Check-Out GD adapted to sequences updating
#
#
# Author:   PP
#
#           GIADA
#
# Date:           19 December 2005
#
#
# Proposed by GIADA team
# 19 December 2005
#
# (c) ESA/Estec
#
#-----------------------------------------------------------------------------------------#
#=========================================================================================#

Version: 00001

Ref_date: 03-Mar-2006
Start_time: 000_00:00:00
End_time: 005_00:00:00

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

```
#==================================================================================#

PC_START (COUNT=001004)    +00:00:00     GIADA   OFF AGDS001A ( \
                                         VGD0001B = "nom. branch" [ENG] \ # GIADA on Main IF
                                         VGD0001A = "YES" [ENG]) # Context exists

PC_START (COUNT=001004)    +00:01:00     GIADA SAFE  AGDS002A # Patch CT v.flight 1

PC_START (COUNT=001004)    +00:06:00     GIADA SAFE  AGDS003A # Patch SW v.2.3

PC_START (COUNT=001004)    +00:24:00     GIADA SAFE  AGDS035A # Go to Cover Mode

PC_START (COUNT=001004)    +00:26:00     GIADA COVER AGDF090A # Open cover

PC_START (COUNT=001004)    +00:36:00     GIADA COVER AGDS065A # Go to Safe mode

PC_START (COUNT=001004)    +00:37:00     GIADA SAFE  AGDS110A # Go to Normal mode

Description: "GIADA operative in normal mode"

PC_START (COUNT=001004)    +00:39:00     GIADA NORMAL      AGDS038A( \
                                               VGDS038A = 35 \
                                               VGDS038B = 20 )   # Set GDS L and R thresholds

PC_START (COUNT=001004)    +00:39:30     GIADA NORMAL      AGDS037A(\
                                               VGDS037A = Off [ENG])   # Set IS On/Off

PC_START (COUNT=001004)    +00:40:00     GIADA NORMAL      AGDS036A ( \
                                         VGDS0031 = 0x5 \
                                         VGDS0032 = 0x5 \
                                         VGDS0033 = 0xf \
                                         VGDS0034 = 0x5 \
                                         VGDS0035 = 0xf \
                                         VGDS0018 = Enabled [ENG] \
                                         VGDS0019 = Enabled [ENG] \
                                         VGDS0020 = Enabled [ENG] \
                                         VGDS0021 = Enabled [ENG] \
                                         VGDS0022 = Enabled [ENG] \
                                         VGDS0023 = Low [ENG] \
                                         VGDS0025 = High [ENG] \
```

```
                                              VGDS0026 = High [ENG] \
                                              VGDS0027 = High [ENG] \
                                              VGDS0028 = High [ENG] \
                                              VGDS0029 = High [ENG])  # Set IS status and thresholds

PC_START (COUNT=001004)    +00:40:30     GIADA NORMAL      AGDS037A(\
                                                   VGDS037A = On [ENG])    # Set IS On/Off

PC_START (COUNT=001004)    +00:45:00     GIADA NORMAL      AGDS120A ( \
                                              VGDS0010 = 0xF8 \
                                              VGDS0011 = 0x04 \ # Calibrate IS, GDS, MBS
                                              REPEAT = 105 \
                                              SEPARATION = 00:05:00 )

Description: "change GIADA setting and check effects"

PC_START (COUNT=001004)    +09:30:00     GIADA NORMAL      AGDF100A # Self-interference test

PC_START (COUNT=001004)    +10:30:00     GIADA NORMAL      AGDF055A # MBS heating

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

PC_START (COUNT=001004)    +11:30:00     GIADA NORMAL      AGDF060A # go to safe mode & off

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

10.2 TIMELINE FOR REDUNDANT INTERFACE

```
# $Log: OIOR_PIHRSO_D_0000_GD_PCB1_300014.ROS,v $
# 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_0000_GD_PCB1_300014.ROS
# Type:     Input Timeline file
#
# Description:    Passive Check-Out GD adapted to sequences updating
#
#
# Author:   PP
#
#           GIADA
#
# Date:           19 December 2005
#
#
# Proposed by GIADA team
# 19 December 2005
#
# (c) ESA/Estec
#
#------------------------------------------------------------------------------------------#
#==========================================================================================#

Version: 00001

Ref_date: 03-Mar-2006
Start_time: 000_00:00:00
End_time: 005_00:00:00

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

```
PC_START (COUNT=001004)    +12:00:00     GIADA   OFF AGDS001A ( \
                                         VGD0001B = "red. branch" [ENG] \ # GIADA on Red IF
                                         VGD0001A = "YES" [ENG]) # Context exists

PC_START (COUNT=001004)    +12:01:00     GIADA SAFE  AGDS002A # Patch CT v.flight 1

PC_START (COUNT=001004)    +12:06:00     GIADA SAFE  AGDS003A # Patch SW v.2.3

PC_START (COUNT=001004)    +12:24:00     GIADA SAFE  AGDS035A # Go to Cover Mode

PC_START (COUNT=001004)    +12:26:00     GIADA COVER AGDF090A # Open cover

PC_START (COUNT=001004)    +12:36:00     GIADA COVER AGDS065A # Go to Safe mode

PC_START (COUNT=001004)    +12:37:00     GIADA SAFE  AGDS110A # Go to Normal mode

Description: "GIADA operative in normal mode"

PC_START (COUNT=001004)    +12:39:00     GIADA NORMAL      AGDS038A( \
                                               VGDS038A = 35 \
                                               VGDS038B = 20 )   # Set GDS L and R thresholds

PC_START (COUNT=001004)    +12:39:30     GIADA NORMAL      AGDS037A(\
                                               VGDS037A = Off [ENG])   # Set IS On/Off

PC_START (COUNT=001004)    +12:40:00     GIADA NORMAL      AGDS036A ( \
                                         VGDS0031 = 0x5 \
                                         VGDS0032 = 0x5 \
                                         VGDS0033 = 0xf \
                                         VGDS0034 = 0x5 \
                                         VGDS0035 = 0xf \
                                         VGDS0018 = Enabled [ENG] \
                                         VGDS0019 = Enabled [ENG] \
                                         VGDS0020 = Enabled [ENG] \
                                         VGDS0021 = Enabled [ENG] \
                                         VGDS0022 = Enabled [ENG] \
                                         VGDS0023 = Low [ENG] \
                                         VGDS0025 = High [ENG] \
                                         VGDS0026 = High [ENG] \
                                         VGDS0027 = High [ENG] \
```

```
                                          VGDS0028 = High [ENG] \
                                          VGDS0029 = High [ENG])  # Set IS status and thresholds

PC_START (COUNT=001004)    +12:40:30      GIADA NORMAL      AGDS037A(\
                                                VGDS037A = On [ENG])    # Set IS On/Off

PC_START (COUNT=001004)    +12:45:00      GIADA NORMAL      AGDS120A ( \
                                          VGDS0010 = 0xF8 \
                                          VGDS0011 = 0x04 \ # Calibrate IS, GDS, MBS
                                          REPEAT = 105 \
                                          SEPARATION = 00:05:00 )

Description: "change GIADA setting and check effects"

PC_START (COUNT=001004)    +21:30:00      GIADA NORMAL      AGDF100A # Self-interference test

PC_START (COUNT=001004)    +22:30:00      GIADA NORMAL      AGDF055A # MBS heating

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

PC_START (COUNT=001004)    +23:30:00      GIADA NORMAL      AGDF060A # go to safe mode & off

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