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**Date:** 27 SEPTEMBER 2017

**Customer:**  
Pro V&V, Inc.  
700 Boulevard South Suite 102  
Huntsville, AL 35802

**Purchase Order Number:** 2017-007

- A. TEST(S): Bench Handling, High Temp, Humidity, Low Temp, Temperature/Power Variation, Transportation Vibration
  
- B. TEST ITEMS: One (1) each of the following:  
Dell All-In-One monitor, Oki Printer, Brother Printer, Dell Laptop, HP Printer. \*\*Additional test items for Temperature/Power Variation testing are noted on page 2 and in with the respective test data\*\*  
See page 2 for Test Item Identification
  
- C. SPECIFICATIONS:
  - 1. Pro V&V SOW
  - 2. ISO 17025:2005
  - 3. MIL-STD 810D
  
- D. RESULTS:

This is to certify that the UUTs (Unit Under Test) were subjected to the tests described above, according to the above specifications.

See Page 2 for Summary of Test Results. The UUTs were returned to Pro V&V for post tests and final evaluation.

Test data, an equipment list, and photographs are attached.

Kellie Barnes,  
Preparer

Bob Polverari,  
Technical Reviewer

John Radman,  
Independent Reviewer

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**REVISIONS**

<b>Revision</b>	<b>Reason for Revision</b>	<b>Date</b>
NR	Initial Release	10/06/2017
Rev 1	Corrections to test items and test description	10/06/2017
Rev 2	Correction to serial number per customer request	10/10/2017



**TEST ITEM IDENTIFICATION**

Quantity	Sample Description	Serial Number
1	Dell All-In-One monitor Model 5250	6PW4GK2
2	Oki Printer Model B432DNserial number	AK5B007647A0
3	Brother Printer Model HL-L2340DW	U63879M4N628617
4	Dell Laptop Model Inspiron I5 7000	8051YD2
5	HP Printer Model HP200	TH74P4810X

**TEMPERATURE/POWER VARIATION TEST SAMPLE LISTING:**

**CBG Temp Power Hardware Testing Equipment**

Component	Model #	Serial #	
Server	Dell T330	5712JK2	
Server	Dell T330	5RRFGK2	
Monitor	Dell	HPWD072	
Monitor	Dell	7818672	
TP-Link Router	TL-R600VPN	2166306000413	
Cisco 24 Port Switch	WS-C2960X-24PS-L	FCW2110A1E0	
TP-Link 8 Port Switch	TL-SG108E	216C319009010	
Laptop	Dell 5580	BDH46H2	
Laptop	Dell 5580	8TM46H2	
Laptop	Dell 5580	4PM46H2	
Laptop	Dell 5580	3CH46H2	
Laptop	Dell 5580	FPM46H2	
Laptop	Dell 5580	4QM46H2	
Laptop	Dell 5580	90356H2	
Laptop	Dell Inspiron 15	7TT1YD2	
Laptop	Dell Inspiron 15	80S1YD2	
Laptop	Dell Inspiron 15	22S1YD2	
Central Count Scanner	Fujitsu 6800	A9HCC00543	
Central Count Scanner	Fujitsu 6800	A9HCC00535	
Central Count Scanner	Fujitsu 6400	AKHCC00609	
Central Count Scanner	Fujitsu 6400	AKHCC00337	
Central Count Scanner	Fujitsu 7180	A20DC10302	
Central Count Scanner	Fujitsu 7180	A20DC10378	
Precinct Scanner	ClearCast	Cast00014	FAILED REMOVED FROM CHAMBER
Precinct Scanner	ClearCast	Cast00015	FAILED REMOVED FROM CHAMBER
Oki Printer	B432	AK5B007647A0	
Oki Printer	B432	AK76030928A0	
Brother Printer	HL-L2340-DW	U63879M4N628617	
Brother Printer	HL-L2340-DW	U63879A7N416353	
HP Printer	OFFICE JET 200	TH74P48110	FAILED REMOVED FROM CHAMBER
Minitower	Dell 3620	HOP2FK2	
Optiplex AIO	Dell 5250	6PW4GK2	
Optiplex AIO	Dell 5250	HGCMGK2	
Optiplex AIO	Dell 7440	JXDFDH2	
UPS	APC SMT1500	3S1525X07421	
UPS	APC SMT1500	3S1525X07452	
UPS	APC SMT2200	AS1721132721	
UPS	APC SMT2200	AS1638230963	



## **SUMMARY OF TEST RESULTS**

Upon completion of testing, the test samples were removed from the corresponding test fixtures/chambers and subjected to a visual inspection. No anomalies were noted. The Test Samples were returned to Pro V&V Inc.

### **Bench Handling Testing**

Testing was started and completed on 09 August 2017 by exposing one (1) of each test sample (see Test Item Identification table above), to Bench Handling testing. The samples were subjected to this testing in accordance with Pro V&V Inc. SOW.

The Test Samples were set on a bench and were subjected to 6 – 4” drops as follows:

- 1<sup>st</sup> – Drop on front edge
- 2<sup>nd</sup> – Drop on right edge
- 3<sup>rd</sup> – Drop on left edge
- 4<sup>th</sup> – Drop on back edge



### **High Temperature Testing**

Testing was started and completed on 08 August 2017 by exposing one (1) of each test sample (see Test Item Identification table above), to High Temperature testing. The samples were subjected to this testing in accordance with MIL-STD 810D.

The test samples were packaged in their shipping boxes and placed in the thermal chamber. Temperature was ramped to 60C with a 6 hour dwell. Temperature was then returned to ambient.

### **Humidity Testing**

Testing was started and completed on 07 August 2017 by exposing one (1) of each test sample (see Test Item Identification table above), to Humidity testing. The samples were subjected to this testing in accordance with MIL-STD 810D.

The test samples were packaged in their shipping boxes, placed in the thermal chamber and exposed to 10 humidity cycles.

### **Low Temperature Testing**

Testing was started and completed on 08 August 2017 by exposing one (1) of each test sample (see Test Item Identification table above), to Low Temperature testing. The samples were subjected to this testing in accordance with MIL-STD 810D.

The test samples were packaged in their shipping boxes and placed in the thermal chamber. Temperature was ramped to -20C with a 6 hour dwell. Temperature was then returned to ambient.



### **Temperature /Power Variation Testing**

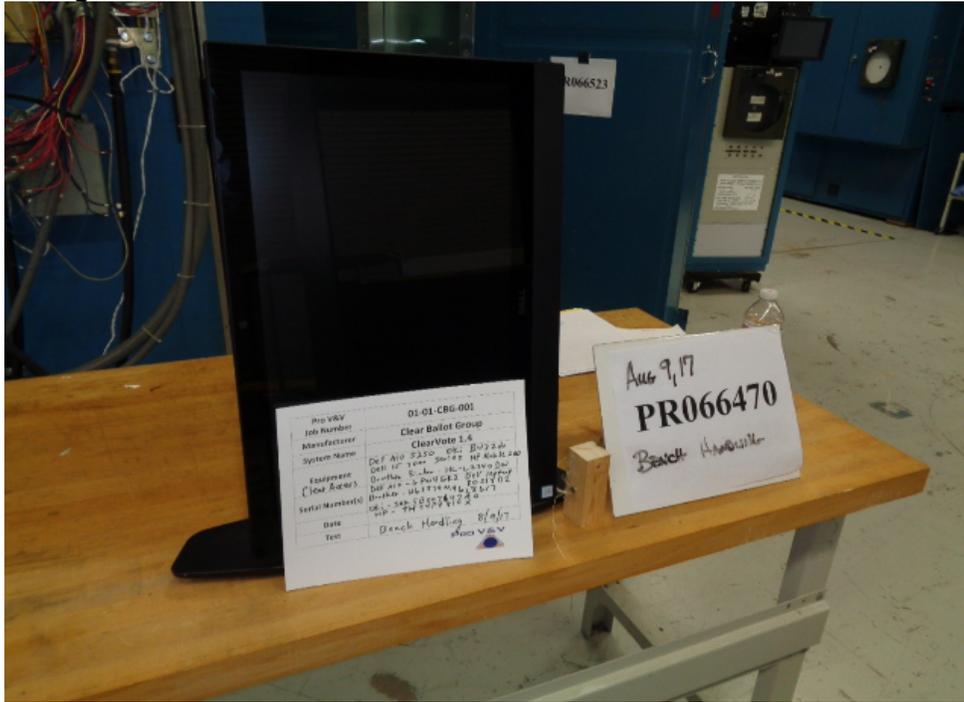
Testing was started on 28 August and completed on 01 September 2017 by exposing one (1) of each test sample (see Test Item Identification table above), to Power Variation testing. The samples were subjected to this testing in accordance with MIL-STD 810D.

The test samples were placed in the chamber at 10C and were exposed to voltage and temperature variances with a 4 hour dwell per sequence noting that the power varies every 4 hours for two (2) 24 hour cycles, with the temperature varying every 12 hours for two (2) 24 hour cycles. Sequence: start at 105 Vac, raise to 129 Vac, lower to 117 Vac and 23C, raise chamber to 35C, dwell 4 hours, repeat sequence.

### **Transportation Vibration Testing**

Testing was started and completed on 15 August 2017 by exposing one (1) of each test sample (see Test Item Identification table above), to Transportation Vibration testing. The samples were subjected to this testing in accordance with MIL-STD 810D.

The Test Samples were packaged in their shipping boxes, secured to an electro-dynamic shaker and exposed to the random vibration test in each of the three (3) axes (Vertical, Transverse and Longitudinal). Vertical was exposed to 1.044 gRMS random vibration, Transverse was exposed to 0.2 gRMS random vibration and Longitudinal was exposed to 0.74 gRMS random vibration, each for a duration of 30 minutes.

**Bench Handling**


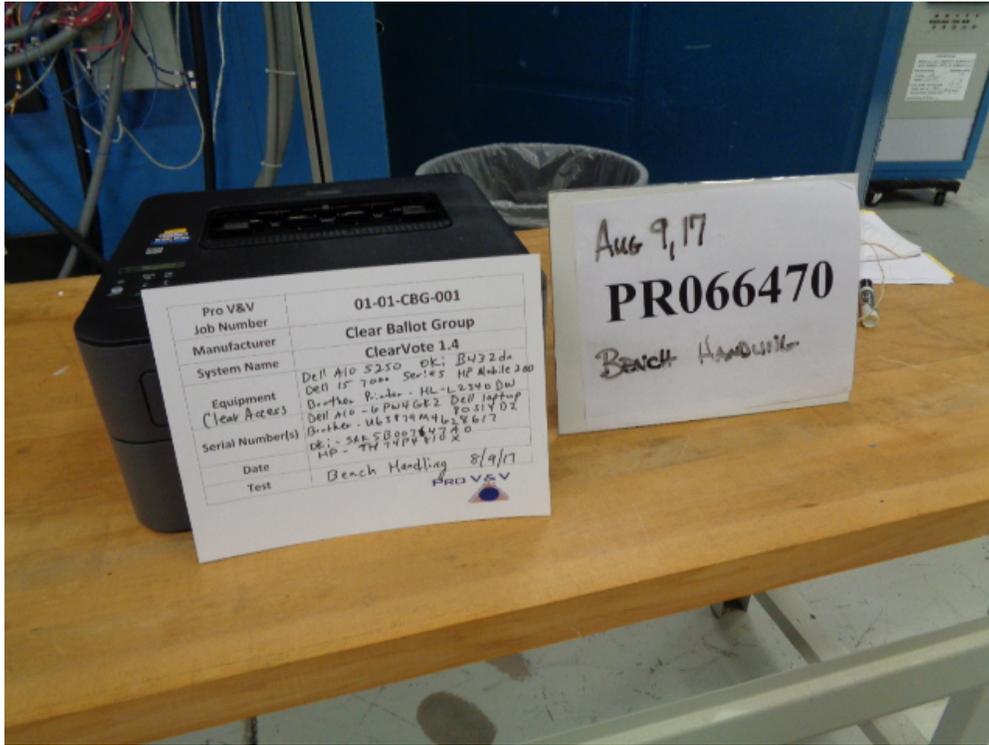
Test Setup Dell All-In-One monitor Model 5250



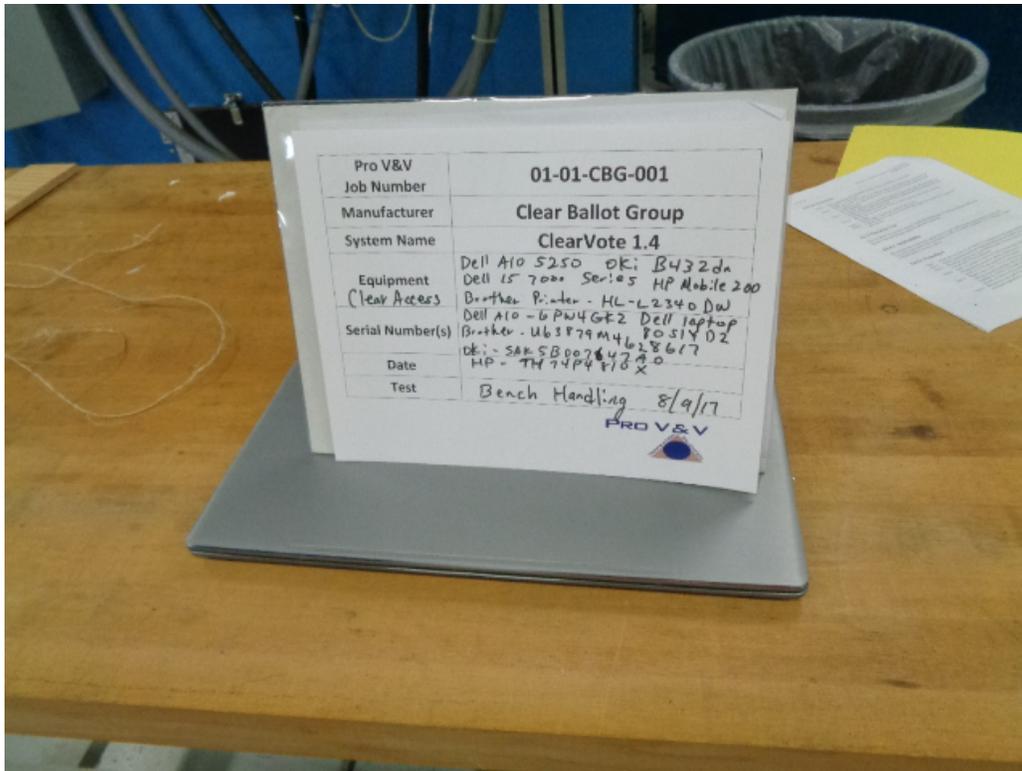
Drop fixture block



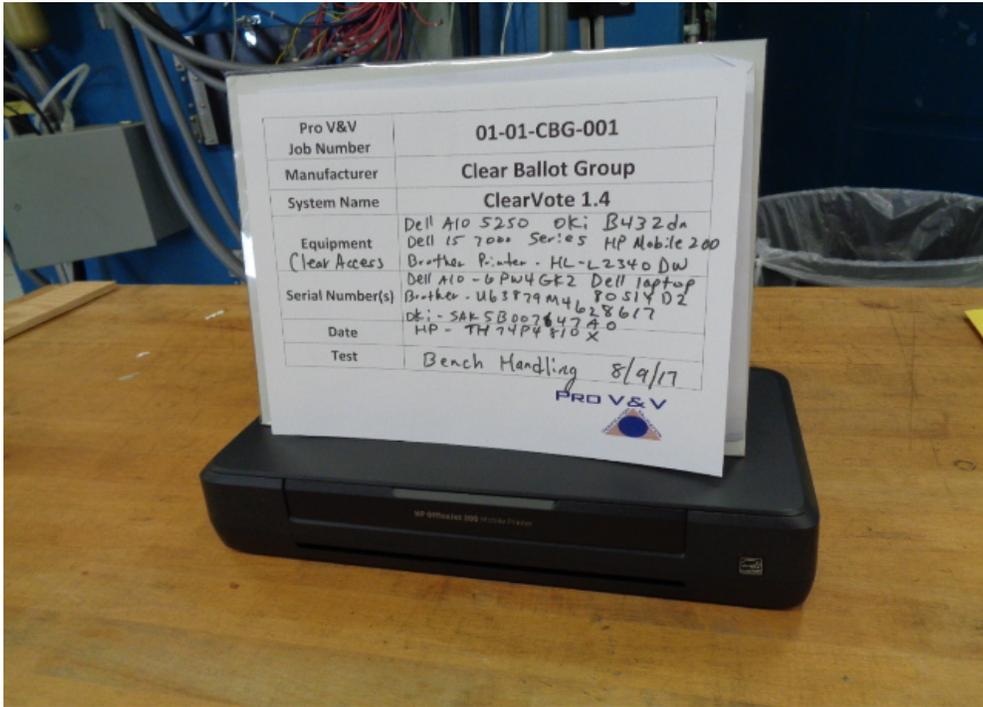
Test Setup Oki Printer Model B432DN



Test Setup Brother Printer HL-L2340DW



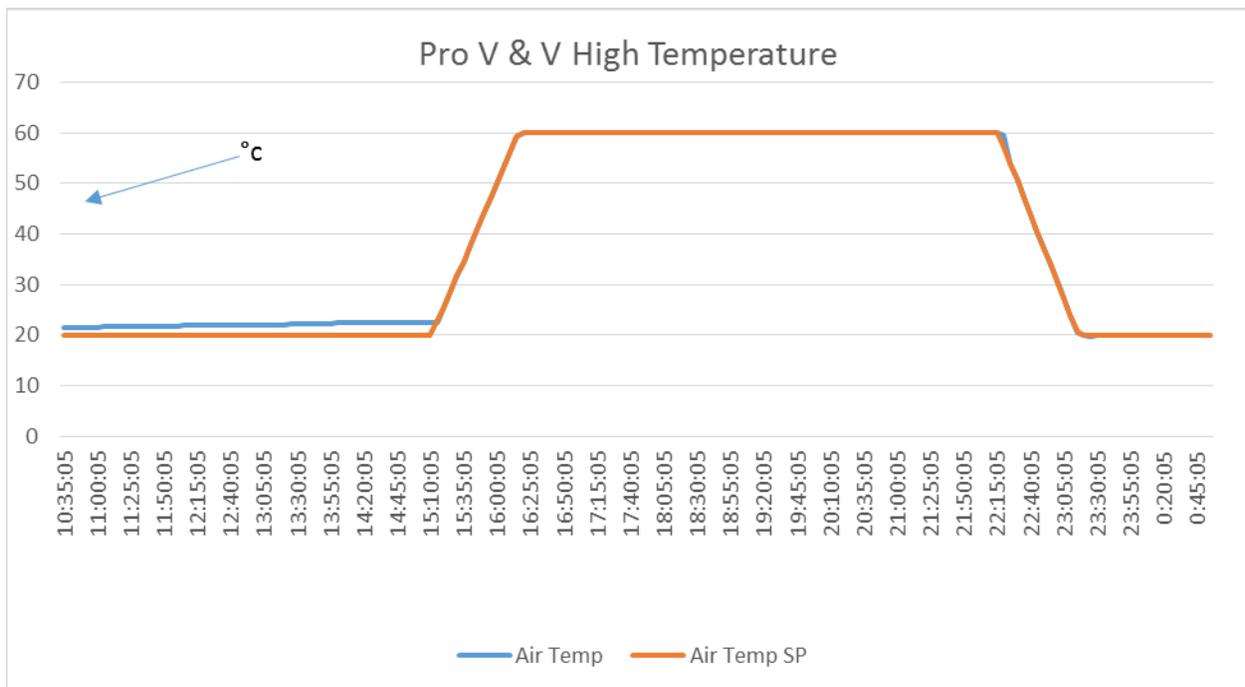
Test Setup Dell Laptop Inspiron I5 7000



Test Setup HP Printer Model HP200

**High Temperature**


Test Setup – High Temp.



**Humidity**

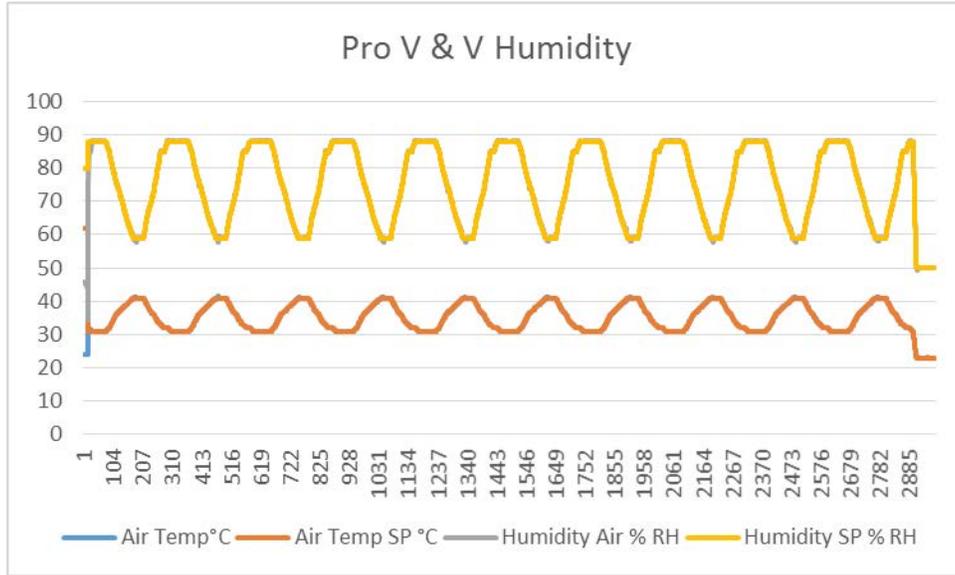
Test Setup - Humidity

MIL-STD-810D  
19 July 1983

TABLE 507.2-I. High-humidity diurnal categories-1/

Time	Hot-Humid (Cycle 1)		
	Temp °F	°C	RH %
0000	88	31	88
0100	88	31	88
0200	88	31	88
0300	88	31	88
0400	88	31	88
0500	88	31	88
0600	90	32	85
0700	93	34	80
0800	96	36	76
0900	98	37	73
1000	100	38	69
1100	102	39	65
1200	104	40	62
1300	105	41	59
1400	105	41	59
1500	105	41	59
1600	105	41	59
1700	102	39	65
1800	99	37	69
1900	97	36	73
2000	94	34	79
2100	91	33	85
2200	90	32	85
2300	89	32	88

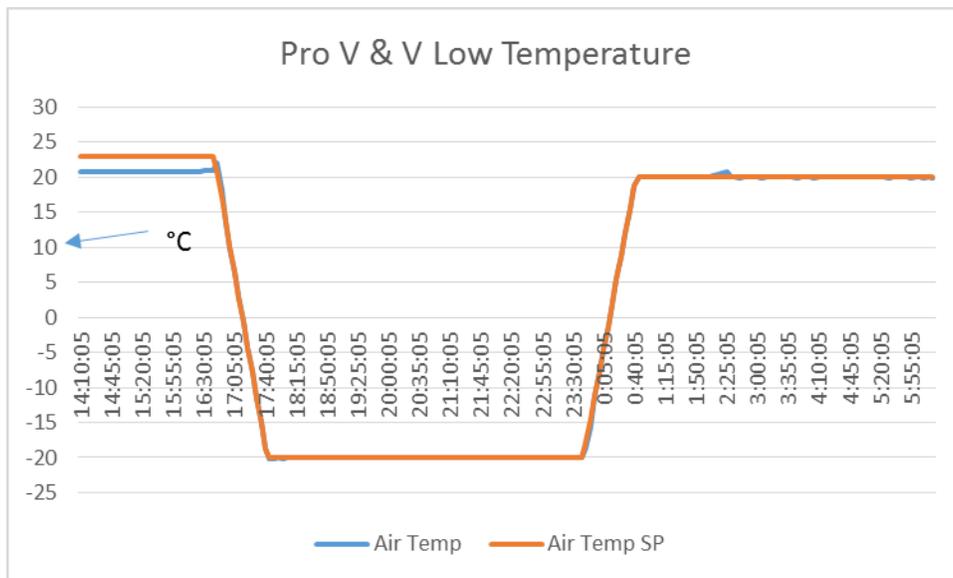
Humidity Profile



Humidity Graph

**Low Temperature**


Test Setup Low Temp.

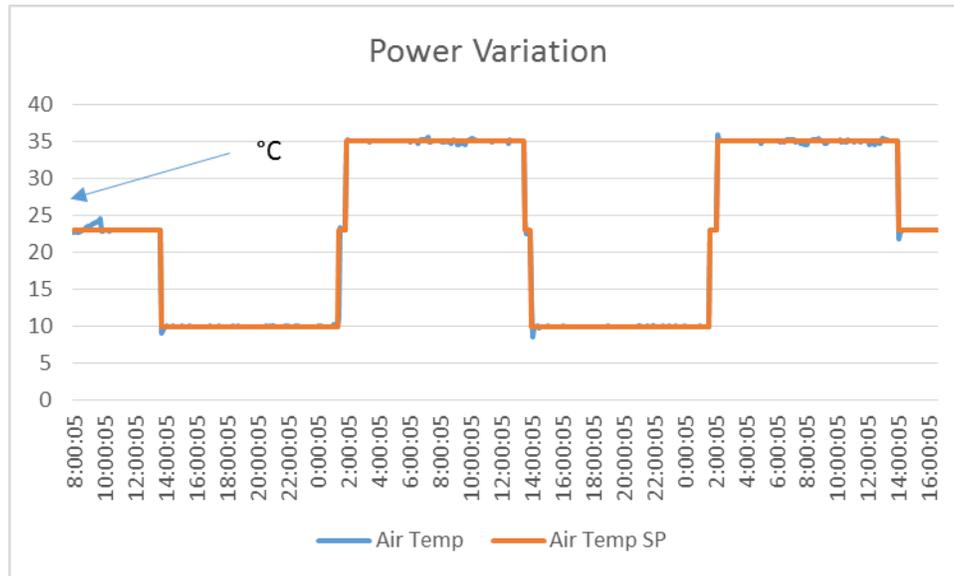


Low Temp Graph

**Temperature/Power Variation**

Test Setup

Temperature/Power Variation Test



### CBG Temp Power Hardware Testing Equipment

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Server	Dell T330	5712JK2	
Server	Dell T330	5RRFGK2	
Monitor	Dell	HPWD072	
Monitor	Dell	7818672	
TP-Link Router	TL-R600VPN	2166306000413	
Cisco 24 Port Switch	WS-C2960X-24PS-L	FCW2110A1E0	
TP-Link 8 Port Switch	TL-SG108E	216C319009010	
Laptop	Dell 5580	BDH46H2	
Laptop	Dell 5580	8TM46H2	
Laptop	Dell 5580	4PM46H2	
Laptop	Dell 5580	3CH46H2	
Laptop	Dell 5580	FPM46H2	
Laptop	Dell 5580	4QM46H2	
Laptop	Dell 5580	90356H2	
Laptop	Dell Inspirion 15	7TT1YD2	
Laptop	Dell Inspirion 15	80S1YD2	
Laptop	Dell Inspirion 15	22S1YD2	
Central Count Scanner	Fujitsu 6800	A9HCC00543	
Central Count Scanner	Fujitsu 6800	A9HCC00535	
Central Count Scanner	Fujitsu 6400	AKHCC00609	
Central Count Scanner	Fujitsu 6400	AKHCC00337	
Central Count Scanner	Fujitsu 7180	A20DC10302	
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Optiplex AIO	Dell 5250	6PW4GK2	
Optiplex AIO	Dell 5250		
Optiplex AIO	Dell 7440	JXDFDH2	
UPS	APC SMT1500	3S1525X07421	
UPS	APC SMT1500	3S1525X07452	
UPS	APC SMT2200	AS1721132721	
UPS	APC SMT2200	AS1638230963	

**Transportation Vibration**

Vertical Axis



Longitudinal Axis

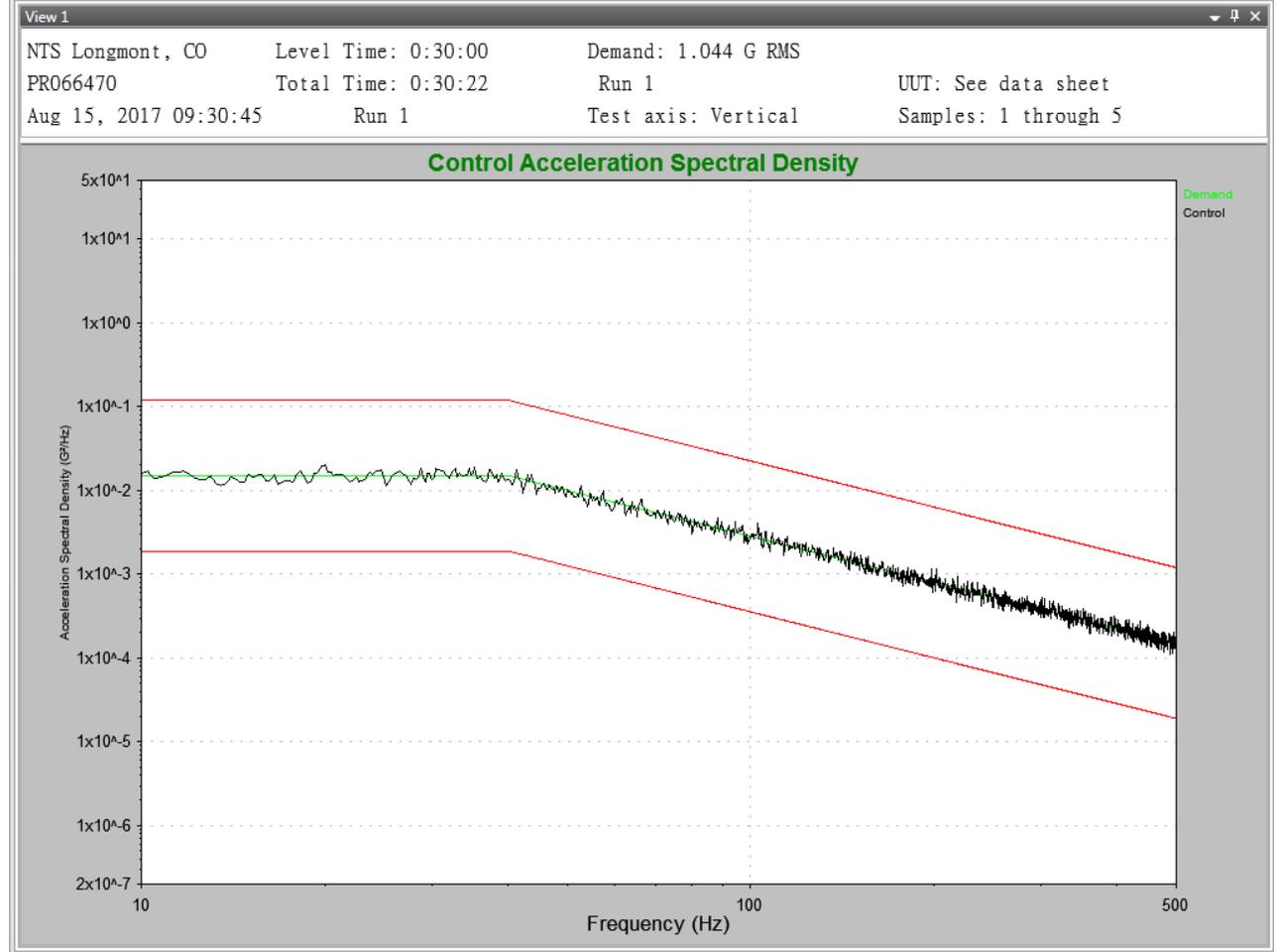


Transverse Axis

Pro V&V	
Number	01-01-CBG-001
Manufacturer	Clear Ballot Group
Item Name	ClearVote 1.4
Equipment	ClearAccess: Dell Inspiron 15 7000 series, Dell AIO 5250, Brother Printer HL-L2340DW, Oki Printer B432, HP Printer Mobile 200
Number(s)	Dell 5250 - 7TT1YD2, Dell 7000 - 8051YD2 Brother - U63879M4N628612, Oki - AK5B007647A0, HP - TH74P4810X
Date	08/15/17
Test	Vibration
<b>PRO V&amp;V</b> 	

Setup the UUT's in the Vertical axis.

Begin the 1.044 gRMS random vibration for 30 minutes.



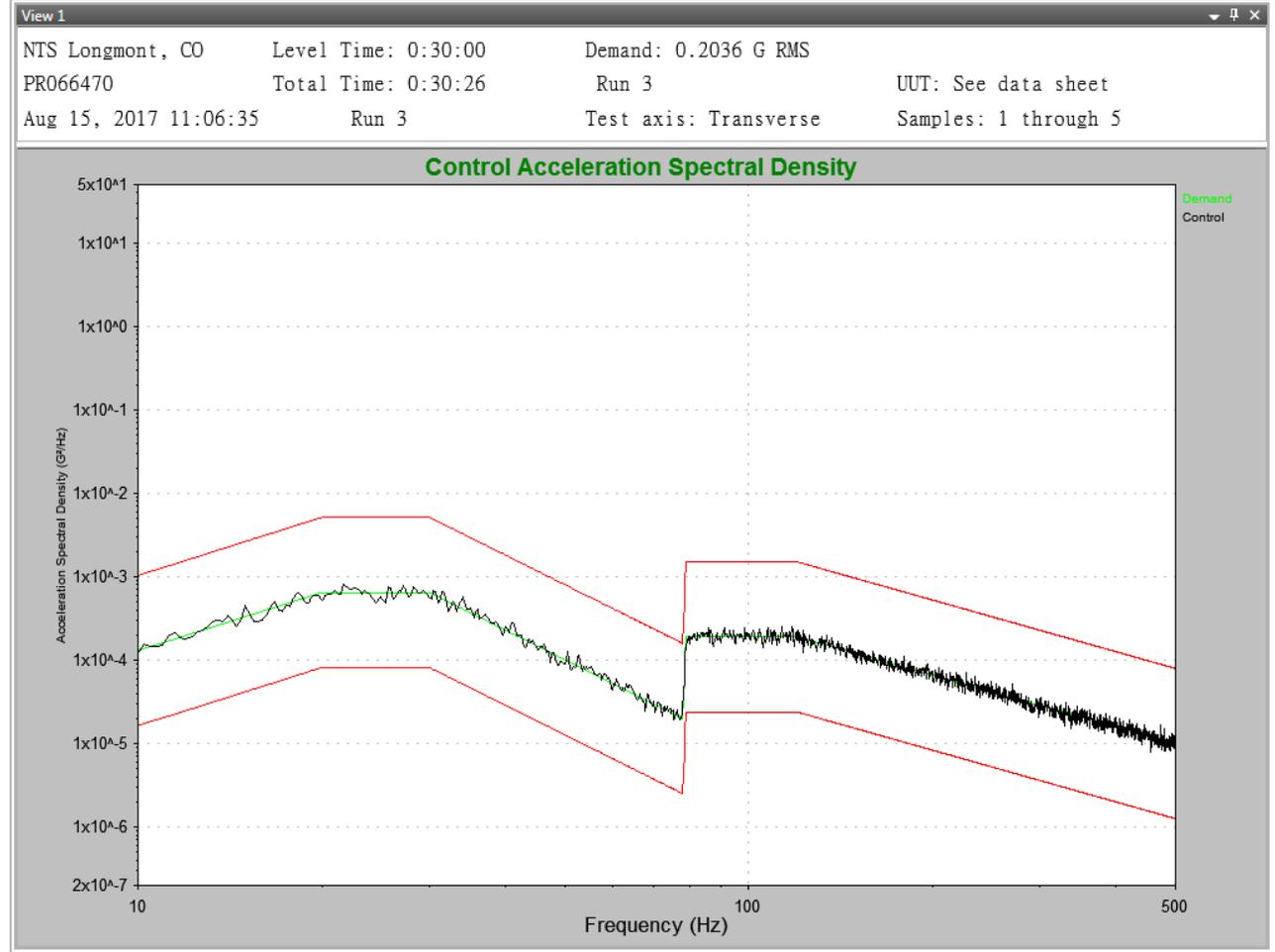
Change the test axis to Longitudinal.

Begin the 0.74 gRMS random vibration for 30 minutes



Change the test axis to Transverse.

Begin the 0.2 gRMS random vibration for 30 minutes



Vibration Test



**EQUIPMENT LIST**

**Test Equipment List**

<b>ID Number</b>	<b>Manufacturer</b>	<b>Model #</b>	<b>Serial #</b>	<b>Description</b>	<b>Cal Date</b>	<b>Cal Due</b>
<b>Bench Handling Test</b>						
n/a	n/a	n/a	n/a	Wood block table		n/a
n/a	n/a	n/a	n/a	Ruler		n/a
<b>High Temp Test</b>						
1642	Thermotron	8800		Controller	8/17/16	8/17/18
<b>HumidityTest</b>						
1642	Thermotron	8800		Controller	8/17/16	8/17/18
<b>Low Temp Test</b>						
1642	Thermotron	8800		Controller	8/17/16	8/17/18
<b>Power Variation Test</b>						
1642	Thermotron	8800		Controller	8/17/16	8/17/18
112204	HP	34401A		Volt Meter	12/19/16	12/19/17
<b>Transportation Vibration Test</b>						
1705	VR	9500	9521CE01	Vibe controller	8/22/16	8/22/17
1697	PCB	353B34	Lw204221	Control Accelerometer	10/7/16	10/7/17
1698	PCB	353B34	Lw204222	Control Accelerometer	10/7/16	10/7/17



END OF REPORT