

INTERMODAL MATERIÉL
AND
NAUTICAL/NUCLEAR ANALYSIS
IMANNA
LABORATORY INC.

CERTIFICATION TEST REPORT

515 Gus Hipp Boulevard
Rockledge, Florida 32955
Telephone (321) 632-2008
http://www.imanna.com

Post Office Box 560933
Rockledge, Florida 32956-0933
FAX (321) 690-3360
E-mail: imanna@yourlink.net

TEST REPORT
16838-1
THERMAL EVALUATION
OF
PME MODULES
FOR
DNA GROUP

CUSTOMER:

DNA Group, Inc.
P.O. BOX 31727
RALEIGH, NC 27622

MANUFACTURER
OF TEST ARTICLE: DNA Group, Inc

REPORT NO.: 16838-1

IMANNA JOB NO.: 16838

CUSTOMER P.O. NO.: 616

CONTRACT: N/A

DATE: June 6, 2005

PAGES IN REPORT: 8

STATE OF FLORIDA

ROBERT L. WHITE, being duly sworn, deposes and says: The information contained in this report is the result of complete and carefully conducted tests and is to the best of his knowledge true and correct in all respects.

Robert L. White

SUBSCRIBED and sworn to before me this _____ day of _____,

Imanna shall have no liability for damages of any kind to person or property, including special or consequential damages resulting from Imanna's providing the service covered by the report.

IMANNA LABORATORY, Inc.

TEST BY

Charles Herhold

PROJ. ENGINEER

1. TEST ARTICLE

Representative samples of the following Atmel device components were received for test. The test articles were submitted for test by the DNA Group, Inc. of Raleigh North Carolina.

- PME (Electrical mechanical)
 - #1 PME - 91YY5017 (supply voltage 12vdc)
 - #2 PME - 91YY5018 (supply voltage 12vdc)
- Keypad
 - #1 Keypad - 91YY5084-1B
 - #2 Keypad - 91YY5085-2B

2. REQUIREMENTS

The electromechanical PME units are to be subjected to electrical load tests at the predetermined temperature and humidity levels shown below.

Test Conditions:

PME 1 and 2 will be placed in a heat chamber and tested under the following conditions:

- Condition A: Room temperature with relative humidity at or above 30%
- Condition B: Elevated and stabilized to 50 Deg C and 50% humidity
- Condition C: Elevated and stabilized to 70 Deg C and 50% humidity

3. PROCEDURES

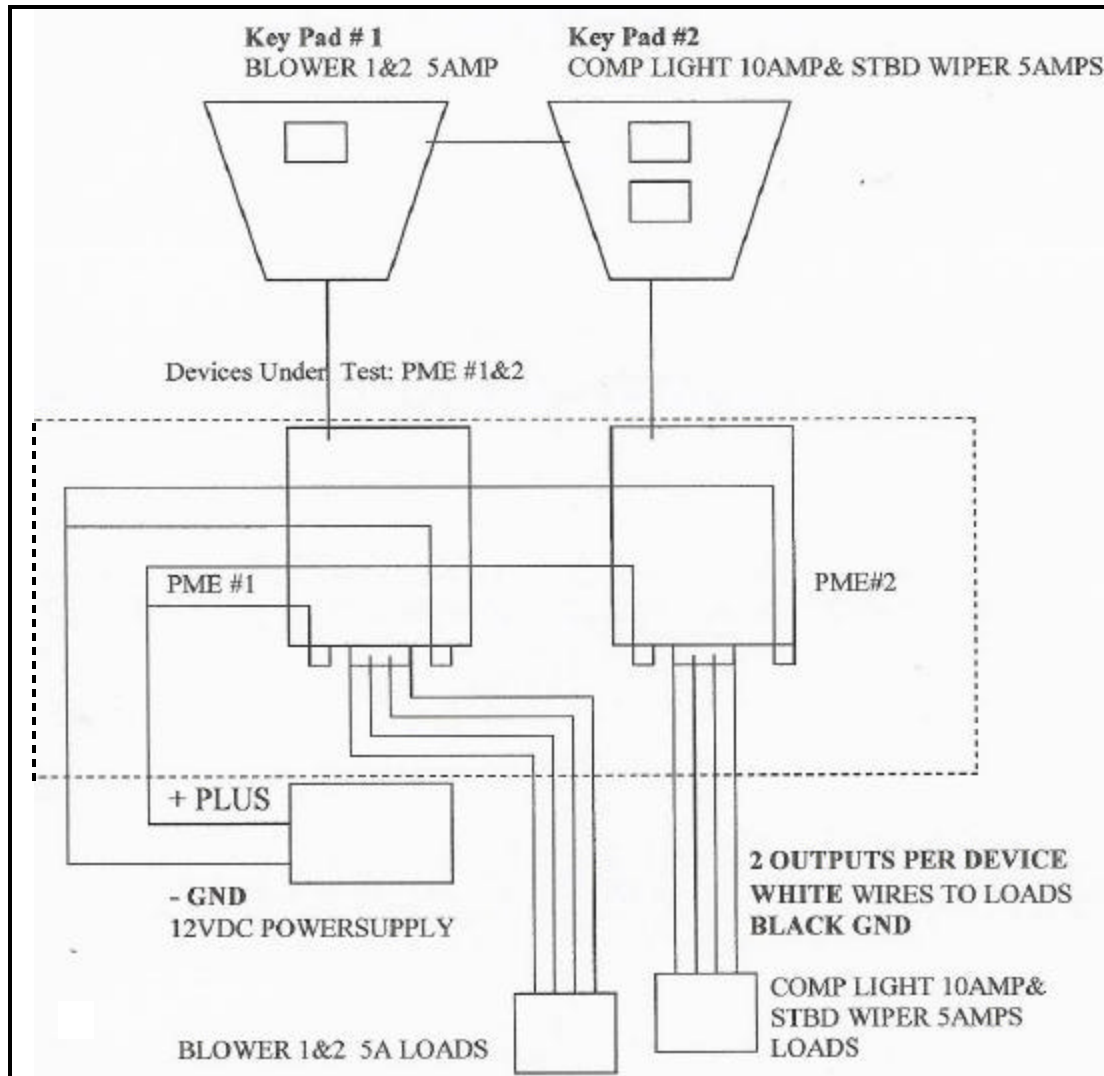
The testing will involve increasing the ambient temperature and then running a series of electrical load tests on the PME assemblies at the prescribed temperatures. The output load applied to the PMEs will be 3 amp and 7 amp loads as described, initiate power to the system (both PMEs).

At each of the test conditions, perform the following sequence of operations:

1. Depress (turn on): blower button on keypad 1, compartment lights and starboard wiper button on keypad 2. Allow function to draw load for 1 minute. Turn of the circuits in the same sequence.
2. Repeat the sequence in reverse order (wiper, lights, and blower) for the same period of operation.
3. Repeat the entire operation under each test condition 20 times (total of 60 sequences).

Record the results. Pass is considered to be 100% successful operation.

Electrical Connections and Loads for the Test Articles; drawing courtesy of DNA engineering.



Notes:

- The dashed line above describes the boundary of the Environmental Chamber.
- Each Load (5A, 5A, 3A, and 7A) was individually “trimmed” for the application. The incremental and total current was monitored with a 50Amp/50mV shunt in the power supply return lead. The test load current was monitored with a digital microvolt meter.
- The load for “Blower 1&2” was 10 Amps total.
- The load for “Comp Light” was 7 Amps per Procedures provided by DNA engineering, the drawing shows the circuit breaker rating of “10AMP”.
- The load for “Stbd Wiper” was 3 Amps per Procedures provided by DNA engineering, the drawing shows the circuit breaker rating of “5AMP”.

4. RESULTS SUMMARY

At 25°C, under Test Condition A, all switches, loads, and circuit breakers performed as expected. No Circuit Breakers in the PMEs under test tripped. No anomalies were noted during the required 20 operations. Operation was 100% successful.

At 50°C, under Test Condition B, all switches, loads, and circuit breakers performed as expected. No Circuit Breakers in the PMEs under test tripped. No anomalies were noted during the required 20 operations. Operation was 100% successful.

At 70°C, under Test Condition C, all switches, loads, and circuit breakers performed as expected. No Circuit Breakers in the PMEs under test tripped. Two anomalies were noted during the required 20 operations.

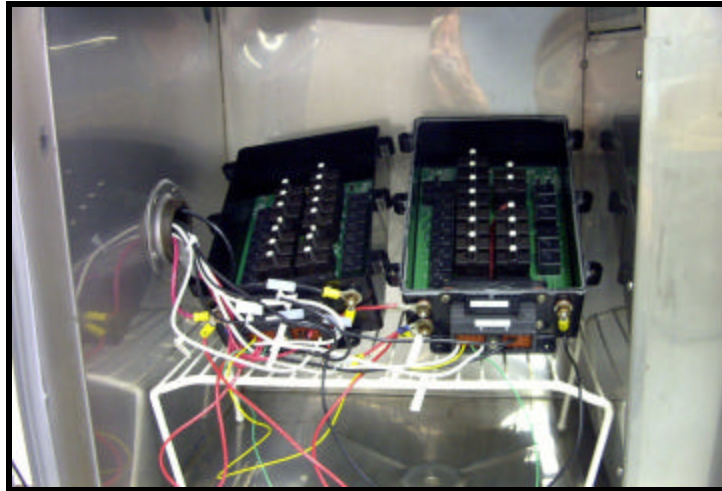
1. During operation #4 (of 20), a 10 Amp fluctuation was occasionally noted during the one minute load test. This fluctuation was attributed to the Blower Circuit Breaker, but this device never tripped OFF or OPEN.

2. During operation #20, a 10 Amp fluctuation was occasionally noted during the one-minute load test. This fluctuation was also attributed to the Blower Circuit Breaker, but it never tripped OFF or OPEN.

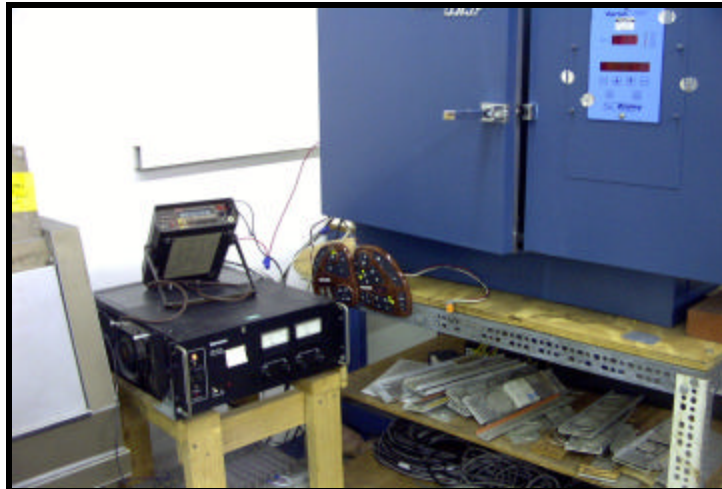
The results of the test are presented in the data sheet appended to this report. Photographs of the test articles, setup, and loads are included. DNA Group's engineering team was advised of the anomalies during the course of the test. All requested Test Procedures were completed.

6. OBSERVATIONS AND COMMENTS

The results presented herein apply only to the test specimens as prepared and tested. All equipment used in the performance of these tests was calibrated to standards traceable to the N.I.S.T.



Test Articles in Environmental Chamber.



Overview of Chamber, Power Supply, and digital Microvolt Meter.



Detail of Key Pad #1 and Key Pad #2.

INSTRUMENTATION EQUIPMENT SHEET

Date: Jun 5, 2005

Job No.: 16838-1

Customer: DNA Group, Inc.

Technician: W.A. Bell

Test Area: Electrical Lab

Test Items: Two PME units

INSTRUMENT	MFG	MODEL	RANGE	ACCURACY	CAL DATE	CAL DUE
Environmental Temperature & Humidity Chamber	Tenney Engineering Inc.	TH.JR	-12°C to +93°C 0%RH to 99%RH	+/- 1°C +/- 2%RH	08-12-04	08-12-05
Power Source	Sorensen Electronics	SRL 40-50	0 - 40 Volts 0 - 50 Amps	0.1% Reg. 10mVoltrms Ripple	Note 1	Note 1
Current Monitor Shunt	Empro	50 / 50	50Amps (50mV)	0.1%	Note 1	Note 1
Digital Microvolt Multimeter	Keithley	197	261305	+/- 0.017% + 3 Counts	11-03-04	11-03-05

Note 1. = Calibrated prior to test or monitored with a calibrated instrument.


Instrumentation Information Verified by: *Alan Bell*

APPENDIX
SUPPORTING DATA

COMPANY: DNA Group
TEST ITEMS: Power Management Electrical (PME) Boxes
IDENTIFICATION: #1 PME-91YY5017 #2PME-91YY5018
SPECIFICATION: DNA Functional Test Procedure
TYPE OF TEST: Cycle selected loads ON/OFF at selected ambient temperature & humidity
TEST EQUIPMENT: per Instrumentation List
TEST SET-UP: per DNA Electrical Diagram and photographs
TEST MODE: Normal ON/OFF Operation. Load applied for one minute, each step.
TEST DATE: May 20, 2005
NOTE 1: Test Condition A = 25°C and Humidity = 50%RH
NOTE 2: Test Condition B = 50°C and Humidity = 50%RH
NOTE 3: Test Condition C = 70°C and Humidity = 50%RH

Step	Test Condition	Total Load	Response to ON/OFF Cycling	Step	Test Condition	Total Load	Response to ON/OFF Cycling	Step	Test Condition	Total Load	Response to ON/OFF Cycling
1	A	20 Amps	Normal	1	B	20 Amps	Normal	1	C	20 Amps	Normal
2	A	20 Amps	Normal	2	B	20 Amps	Normal	2	C	20 Amps	Normal
3	A	20 Amps	Normal	3	B	20 Amps	Normal	3	C	20 Amps	Normal
4	A	20 Amps	Normal	4	B	20 Amps	Normal	4	C	20 Amps	Note 4
5	A	20 Amps	Normal	5	B	20 Amps	Normal	5	C	20 Amps	Normal
6	A	20 Amps	Normal	6	B	20 Amps	Normal	6	C	20 Amps	Normal
7	A	20 Amps	Normal	7	B	20 Amps	Normal	7	C	20 Amps	Normal
8	A	20 Amps	Normal	8	B	20 Amps	Normal	8	C	20 Amps	Normal
9	A	20 Amps	Normal	9	B	20 Amps	Normal	9	C	20 Amps	Normal
10	A	20 Amps	Normal	10	B	20 Amps	Normal	10	C	20 Amps	Normal
11	A	20 Amps	Normal	11	B	20 Amps	Normal	11	C	20 Amps	Normal
12	A	20 Amps	Normal	12	B	20 Amps	Normal	12	C	20 Amps	Normal
13	A	20 Amps	Normal	13	B	20 Amps	Normal	13	C	20 Amps	Normal
14	A	20 Amps	Normal	14	B	20 Amps	Normal	14	C	20 Amps	Normal
15	A	20 Amps	Normal	15	B	20 Amps	Normal	15	C	20 Amps	Normal
16	A	20 Amps	Normal	16	B	20 Amps	Normal	16	C	20 Amps	Normal
17	A	20 Amps	Normal	17	B	20 Amps	Normal	17	C	20 Amps	Normal
18	A	20 Amps	Normal	18	B	20 Amps	Normal	18	C	20 Amps	Normal
19	A	20 Amps	Normal	19	B	20 Amps	Normal	19	C	20 Amps	Normal
20	A	20 Amps	Normal	20	B	20 Amps	Normal	20	C	20 Amps	Note 4

Note 4 = Total load current observed to fluctuate between 20A and 10A, but breaker does not trip.
 This anomaly to be evaluated by DNA Group engineering.

Checked By: 
 Charles E. Herhold, NCE