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GE Energy

**Functional Testing Specification***Parts & Repair Services  
Louisville, KY***LOU-GED-531X213DIOAFG1****Test Procedure for a 531X213DIOAFG1****DOCUMENT REVISION STATUS:** Determined by the last entry in the "REV" and "DATE" column

REV.	DESCRIPTION	SIGNATURE	REV. DATE
A	Developed test	Steve Pharris	08/15/2011
B	Modified LOU-GED-531X213DIOAEG1 to work with a higher card	G. Chandler	5/22/2013
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## 1. SCOPE

1.1 This is a functional testing procedure for an I/O Terminal Board.

## 2. STANDARDS OF QUALITY

2.1 Refer to the current revision of the IPC-A-610 standard for workmanship standards.

## 3. APPLICABLE DOCUMENTS

3.1 The following document(s) shall form part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue shall apply.

3.1.1 Check board's electronic folder for more information

## 4. ENGINEERING REQUIREMENTS

### 4.1 Equipment Cleaning

4.1.1 Equipment should be clean and free of debris prior to applying power unless performing an initial check. Refer to site specific SRA's for cleaning guidelines.

### 4.2 Equipment Inspection

4.2.1 Equipment should be visually inspected for any defects prior to applying power. This inspection should include the following as a minimum:

4.2.1.1 Wires - broken, cracked, or loosely connected

4.2.1.2 Terminal strips / connectors - broken or cracked

4.2.1.3 Components - visually damaged

4.2.1.4 Capacitors - bloated or leaking

4.2.1.5 Solder joints - damaged or cold

4.2.1.6 Circuit board - burned or de-laminated

4.2.1.7 Printed wire runs / Traces - burned or damaged

## 5. EQUIPMENT REQUIRED

5.1 The following equipment is required to perform the process requirements. Equipment may be substituted provided that all accuracy's and test ratios are equivalent or better.

Qty	Reference #	Description
2		Tenma Power Supplies
2		Multimeter Fluke 85 or equivalent
1		4.7K resistor

## 6. Modifications/Upgrades

6.1 Check Orange Book for any modifications or upgrades.



**Note: This Test used on REV 'F' or later.**

## 7. Testing Process

### 7.1 Setup

7.1.1 Set power supply 1 for 24VDC. Set power supply 2 for 30VDC. Must have independent control of each supply.

7.1.2 Connect common from PS1 to 10PL17 and to DMM common.

7.1.3 Connect +24VDC from PS1 to 10PL1 and to 4.7K resistor. Connect 4.7K resistor to + on DMM. Connect from + on DMM to 10PL18.



Note: Once set-up only inputs have to move. Power supply 2 will turn on and off with each respective circuit.

### 7.2 Testing Procedure

#### 7.2.1 Driver tests

7.2.1.1 Apply power from power supply 1. DMM should read 24VDC (+/-0.5VDC).

7.2.1.2 Start observing proper polarity from points in table below on your DMM. Apply PS2 to input.

INPUT	OUTPUT	Results		INPUT	OUTPUT	Results
IN1	10PL18	<2 VDC		IN9	10PL9	<2 VDC
IN2	10PL2	<2 VDC		IN10	10PL10	<2 VDC
IN3	10PL3	<2 VDC		IN11	10PL11	<2 VDC
IN4	10PL4	<2 VDC		IN12	10PL12	<2 VDC
IN5	10PL5	<2 VDC		IN13	10PL13	<2 VDC
IN6	10PL6	<2 VDC		IN14	10PL14	<2 VDC
IN7	10PL7	<2 VDC		IN15	10PL15	<2 VDC

7.2.1.3 Verify corresponding LED for each circuit tested is illuminated. Power down power supply 2 between each input. The only connection that needs to be moved is the output of the circuit and the input to drive that circuit (3 wires, 2 from Power supply 2).

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## 7.2.2 Relay tests

**7.2.2.1** Remove all connections except 10PL1 and 10PL17.

**7.2.2.2** Verify (< 1 ohm) at the following points:

**7.2.2.2.1** X2 and X3

**7.2.2.2.2** X3 and X4

**7.2.2.2.3** FX1 and FX2

**7.2.2.2.4** FX2 and X1

**7.2.2.2.5** X1 and RPL1

**7.2.2.3** Apply power from power supply 1.

**7.2.2.4** Verify open between X2 and RPL3, (should be infinity).

**7.2.2.5** Connect a common from power supply1 to 10PL19. Verify the following:

**7.2.2.5.1** X2 and RPL3 < 1 ohms,

**7.2.2.5.2** RX1-1 and RX1-3 < 1 ohms.

**7.2.2.5.3** LED 17 is on and an open (should be infinity) between RX1-1 and RX1-2

**7.2.2.6** Remove common and verify the following:

**7.2.2.6.1** RX1-1 and RX1-2 should be < 1 ohms

**7.2.2.6.2** RX1-1 and RX1-3, is open (should be infinity)

**7.2.2.7** Repeat the above steps using the table below to verify relay operation.

Common	LED	Output	Resistance readings
10PL20	18	RPL5	Infinity
10PL21	19	RPL7	Infinity
10PL22	20	RPL9	Infinity
10PL23	21	RPL11	Infinity
10PL24	22	RPL13	Infinity
10PL25	23	RPL15	Infinity

Auxiliary contacts					
Common	Normally open	Resistance readings		Normally closed	Resistance readings
RX2-1	RX2-3	< 1 ohm		RX2-2	Infinity
RX3-1	RX3-3	< 1 ohm		RX3-2	Infinity
RX4-1	RX4-3	< 1 ohm		RX4-2	Infinity
RX5-1	RX5-3	< 1 ohm		RX5-2	Infinity
RX6-1	RX6-3	< 1 ohm		RX6-2	Infinity
RX7-1	RX7-3	< 1 ohm		RX7-2	Infinity

### **7.3 \*\*\*TEST COMPLETE\*\*\***

## **8. Notes and Attachments**

**8.1** None at this time.