



GE Energy

Functional Testing Specification

Parts & Repair Services
Louisville, KY

LOU-GED-531X213DIOAEG1

Test Procedure for a 531X213DIOAEG1

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| REV. | DESCRIPTION | SIGNATURE | REV. DATE |
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| A | Developed test | Steve Pharris | 08/15/2011 |
| B | | | |
| C | | | |
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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 | | 1K resistor |
| | | |

6. Modifications/Upgrades

6.1 Check Orange Book for any modifications or upgrades.



Note: This Test used on REV 'E' or earlier.

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 1K resistor. Connect 1K 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.

| INPUT | OUTPUT | Results | INPUT | OUTPUT | Results |
|-------|--------|--------------|-------|--------|--------------|
| IN1 | 10PL18 | 2VDC (+1VDC) | IN9 | 10PL9 | 2VDC (+1VDC) |
| IN2 | 10PL2 | 2VDC (+1VDC) | IN10 | 10PL10 | 2VDC (+1VDC) |
| IN3 | 10PL3 | 2VDC (+1VDC) | IN11 | 10PL11 | 2VDC (+1VDC) |
| IN4 | 10PL4 | 2VDC (+1VDC) | IN12 | 10PL12 | 2VDC (+1VDC) |
| IN5 | 10PL5 | 2VDC (+1VDC) | IN13 | 10PL13 | 2VDC (+1VDC) |
| IN6 | 10PL6 | 2VDC (+1VDC) | IN14 | 10PL14 | 2VDC (+1VDC) |
| IN7 | 10PL7 | 2VDC (+1VDC) | IN15 | 10PL15 | 2VDC (+1VDC) |

- 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.