



GE Energy

Functional Testing Specification

*Parts & Repair Services
Louisville, KY*

LOU-GED-IS200TRLYH2Cxx

Test Procedure for a

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1. SCOPE

1.1 This is a functional testing procedure for a Card.

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		Fluke 87 DMM (or Equivalent)
1		Tenma Dual output supply

6. Testing Procedure

6.1 Initial Testing

- 6.1.1** Begin testing by inspecting the card for damaged components such as blown fuses, shorted MOV's, missing parts (such as jumpers or fuse caps), or any other visible defects.
- 6.1.2** Verify continuity at the following points illustrated below in **Table 1**.

From	To	And
TB3-1	JF1-1	JF2-1
TB3-2	TB3-3	TB3-4
TB2-46	JG1-1	----
TB2-48	JG1-3	-----

Table 1

- 6.1.3** Be sure to read the ID chips using the Card ID PC.

6.2 Test Procedure

- 6.2.1** Connect positive 28V DC to pin 1 of JT1, JS1, JR1, and JA1 individually (each connector is an independent circuit and requires its own 28V input) using one output of the Tenma power supply.
- 6.2.2** Connect the COM from that supply to pin 2 of JT1, JS1, JR1, and JA1.
- 6.2.3** Apply power to the card at this time.
- 6.2.4** Using a multimeter, verify 28V between pin 23 and pins 15, 16, and 22 (individually) for connectors JR1, JS1, JT1, and JA1.
- 6.2.5** Verify simplex operation by firing relays K1 through K12. Do so by connecting 5V DC with a 10K Ohm pull-up resistor to the positive lead of your multimeter. Connect the negative of the 5V supply and your meter to com. Connect the positive lead of your meter to pin 24 of JA1. Energize relay K1 by grounding pin 3 of JA1. Use **Table 2** (below) to fire the rest of the relays.

Input	Relay	Output
JA1-3	K1	JA1-24
JA1-4	K2	JA1-25
JA1-5	K3	JA1-26
JA1-6	K4	JA1-27
JA1-7	K5	JA1-28
JA1-8	K6	JA1-29
JA1-9	K7	JA1-30
JA1-10	K8	JA1-31
JA1-11	K9	JA1-32
JA1-12	K10	JA1-33
JA1-13	K11	JA1-34
JA1-14	K12	JA1-35

Table 2

- 6.2.6** The “TMR” relay circuits will test the same way. The only difference being that they require multiple inputs to be fired for each individual output and there will be three outputs for each circuit. During this test relay operation will also be verified on the corresponding TB outputs.
- 6.2.7** Connect a second multimeter, set to measure resistance, to TB1-1 and TB1-2. This meter should read as a short until the relay is fired resulting in the meter reading an open circuit. Connect your meter with the 5V pull-up to either JR1-24, JS1-24, or JT1-24. Energize relay K1 by grounding at least two of the following JR1-3, JS1-3, or JT1-3. De-energize the relay and repeat this step for the other two outputs, also move the inputs to test TMR function on all connections. Follow **Table 3** (below) to test TMR functions on the remaining relays.

Input	Relay	Output	2 nd Meter
JR1-3, JS1-3, JT1-3	K1	JR1-24, JS1-24, JT1-24	TB1-1 & TB1-2
JR1-4, JS1-4, JT1-4	K2	JR1-25, JS1-25, JT1-25	TB1-5 & TB1-6
JR1-5, JS1-5, JT1-5	K3	JR1-26, JS1-26, JT1-26	TB1-9 & TB1-10
JR1-6, JS1-6, JT1-6	K4	JR1-27, JS1-27, JT1-27	TB1-13 & TB1-14
JR1-7, JS1-7, JT1-7	K5	JR1-28, JS1-28, JT1-28	TB1-17 & TB1-18
JR1-8, JS1-8, JT1-8	K6	JR1-29, JS1-29, JT1-29	TB1-21 & TB1-22
JR1-9, JS1-9, JT1-9	K7	JR1-30, JS1-30, JT1-30	TB2-25 & TB2-26
JR1-10, JS1-10, JT1-10	K8	JR1-31, JS1-31, JT1-31	TB2-29 & TB2-30
JR1-11, JS1-11, JT1-11	K9	JR1-32, JS1-32, JT1-32	TB2-33 & TB2-34
JR1-12, JS1-12, JT1-12	K10	JR1-33, JS1-33, JT1-33	TB2-37 & TB2-38
JR1-13, JS1-13, JT1-13	K11	JR1-34, JS1-34, JT1-34	TB2-41 & TB2-42
JR1-14, JS1-14, JT1-14	K12	JR1-35, JS1-35, JT1-35	TB2-45 & TB2-46

Table 3

6.2.8 Post Testing Burn-in **Required** ☐ Yes ☒ No



Note: DO NOT INSTALL THIS CARD INTO THE TMR TEST RACK!!!

The TRLYH1 cards , which are currently installed in the TMR test rack, have voltage monitoring circuits designed for 125V DC, whereas the TRLYH2 cards have voltage monitoring circuits designed for only 24V DC. Any burn-in testing performed should only be saturation testing on the bench at this time.

6.3 ***TEST COMPLETE ***

7. Notes

7.1 None at this time?

8. Attachments

8.1 None at this time?