g GE Energy	**Functional Testing Specification**
Parts & Repair Services ***Louisville, KY***	**LOU-GED-IS200ECTBG2**

Test Procedure for an IS200ECTBG2xxx Card

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1. SCOPE

1.1 This is a functional testing procedure for an IS200ECTBG2xxx.

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
1		Fluke 87 DMM (or Equivalent)
2		Tenma Laboratory DC Power Supplies

6. TESTING PROCESS

6.1 Setup

6.1.1 Connect 1st power supply +24 VDC to pin 13 of J405.

6.1.2 Connect 24 VDC Return (PCOM) to pin 25 of J405.

6.1.3 Connect 2nd 5 VDC Return (PCOM) to pin J405.

6.1.4 Connect Multimeter common to 24 VDC Return (PCOM) to pin 25 of J405.

Note: When testing for logic outputs on this card, use a 10 K Ohm pull-up resistor. Put resistor in series with +5 VDC power supply, and connect Multimeter positive lead to opposite side of resistor that the +5 VDC is connected to. Readings will be taken using the side the meter lead is connected to.

6.2 Testing Procedure

6.2.1 Power up unit using above listed connections.

6.2.2 The following points will need to be checked using +5 VDC to energize each relay. When the relay is energized, an LED will illuminate inside the corresponding relay. Also, there is a corresponding logic output to be checked for each relay using the positive meter lead with pull-up resistor (see Note above). When the relay is de-energized, the logic output will be low. When the relay is energized, the logic output will be high. Check the following points in both states, relay energized and de-energized:

Relay Name	Relay Energizing Connection	Relay Logic Output Connection
K1M1 (K5)	J405-17	J405-16
K2M1 (K6)	J405-15	J405-14

6.2.3 After checking the above connections successfully, perform a resistance check between TB1-1 and TB1-5, should read shorted initially. Energize relay K1M1 and perform a resistance check between TB1-1 and TB1-5. Should read open with relay energized. De-energize relay K1M1 and perform a resistance check between TB1-1 and TB1-5. Should return to shorted reading.

6.2.4 After checking the above connections successfully, perform a resistance check between TB1-11 and TB1-15, should read shorted initially. Energize relay K2M1 and perform a resistance check between TB1-11 and TB1-15. Should read open with relay energized. De-energize relay K2M1 and perform a resistance check between TB1-11 and TB1-15. Should return to shorted reading.

6.2.5 The following points will need to be checked by taking the corresponding Relay Energizing Connection to PCOM (24 VDC return) to energize each relay. When the relay is energized, an LED will illuminate inside the corresponding relay. Also, there is a corresponding logic output to be checked for each relay using the positive meter lead with pull-up resistor (see Note above). When the relay is de-energized, the logic output will be high. When the relay is energized, the logic output will be low. Check the following points in both states, relay energized and de-energized:

Relay Name	Relay Energizing Connection	Relay Logic Output Connection
K1GP (K1)	J405-10	J405-11
K2GP (K2)	J405-23	J405-22
K3GP (K3)	J405-21	J405-20
K4GP (K4)	J405-19	J405-18

6.2.6 Using the table in step 6.2.5 to energize the appropriate relay, check connections in the following table using the resistance function of the Multimeter:

Relay Name	Relay State	Point Positive Meter Lead Connected to	Point Negative Meter Lead Connected To	Expected Reading on Multimeter
K1GP (K1)	De-Energized	TB1-17	TB1-18	Open
K1GP (K1)	Energized	TB1-17	TB1-18	Shorted
K1GP (K1)	De-Energized	TB1-19	TB1-18	Shorted
K1GP (K1)	Energized	TB1-19	TB1-18	Open
K2GP (K2)	De-Energized	TB1-21	TB1-22	Open
K2GP (K2)	Energized	TB1-21	TB1-22	Shorted
K2GP (K2)	De-Energized	TB1-23	TB1-22	Shorted
K2GP (K2)	Energized	TB1-23	TB1-22	Open
K3GP (K3)	De-Energized	TB2-25	TB2-26	Open
K3GP (K3)	Energized	TB2-25	TB2-26	Shorted
K3GP (K3)	De-Energized	TB2-27	TB2-26	Shorted
K3GP (K3)	Energized	TB2-27	TB2-26	Open
K4GP (K4)	De-Energized	TB2-29	TB2-30	Open
K4GP (K4)	Energized	TB2-29	TB2-30	Shorted
K4GP (K4)	De-Energized	TB2-31	TB2-30	Shorted
K4GP (K4)	Energized	TB2-31	TB2-30	Open

6.2.7 Connect +70 VDC to J13M1-1. Do **NOT** exceed 70 Volts on these connections as it will cause damage to these circuits.

6.2.8 Connect 70 VDC Return to J13M1-3.

6.2.9 Use the following chart for testing. Connect jumper to the points specified on TB2, and look for the indicated LED to illuminate.

6.2.10

+5 VDC Connection	Jumper Points on TB2	LED That Should Illuminate
J405-1	33 to 34	DS11
J405-2	35 to 36	DS21
J405-3	37 to 38	DS31
J405-4	39 to 40	DS41
J405-5	41 to 42	DS51
J405-6	43 to 44	DS61
J405-9	45 to 46	DS71

6.2.11 Use the same 70 VDC connections listed in steps 6.2.7 and 6.2.8.

6.2.12 Connect positive Multimeter lead to TB2-47 and negative Multimeter lead to TB2-48, should read approximately 40% of 70 VDC input voltage.

6.2.13 Jumper together J405-7 and J405-8. Should measure 70 VDC input voltage.

6.2.14 ******TEST COMPLETE***

7. NOTES

7.1 None at this time?

8. ATTACHMENTS

8.1 None at this time?