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GE Energy

Functional Testing Specification*Parts & Repair Services
Louisville, KY***LOU-GED-IS200VSCA****Test Procedure for a Serial Modbus communications I/O board: VSCA****DOCUMENT REVISION STATUS:** Determined by the last entry in the "REV" and "DATE" column


| REV. | DESCRIPTION | SIGNATURE | REV. DATE |
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| A | Initial release | R. Johnson | 8/17/2012 |
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| DATE May 29 2012 | DATE | DATE | DATE 8/17/2012 |

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1. SCOPE

1.1 This is a functional testing procedure for a Mark VI Serial Modbus communications I/O 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 N:\Design Folders\IS2\IS215\UCVG

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 the local documented procedures 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 | | Mark VI test rack Sim72 |
| 1 | H190035 | RS232 De-mux cable |
| 1 | H190036 | RS485 Port De-mux Switch (see picture in section 8) |
| 1 | | RS485 Cross-over Cable (see picture in section 8) |
| 1 | | RS485 Converter Box (see picture in section 8) |

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6. TESTING PROCESS

6.1 Testing

- 6.1.1 Set all jumpers to RS232 for all six ports.
- 6.1.2 TRM/THR/PRK they are not needed for RS232 operation. TRM means with termination resistors installed used with RS485. THR means no termination pass thru to J7 connector. PRK means park position no termination.
- 6.1.3 Set jumper JPU1 to X1 position this enables the 12Mhz clock for ports 1 and 2.
- 6.1.4 Ports 3 thru 6 uses the 1.8432Mhz clock.
- 6.1.5 Now install the IS200VSCA into slot 5 of rack 72.
- 6.1.6 Connect the 37 pin to six 9 pin D-shell cable to J6.
- 6.1.7 Next connect port 1 of the six 9 pin D-shell cable to COMM port 2 of the computer.
- 6.1.8 Open toolbox and then find the program SIM72_UCVG.m6b file. Open this file.
- 6.1.9 Power up the rack and click go on-line.
- 6.1.10 Download the configuration for the VSCA UUT when the rack completes the boot process. At the bottom right of the screen there should be a GREEN CONTROL EQUAL.
- 6.1.11 Next click on the VSCA to highlight it this should display all the I/O points for all 6 ports.
- 6.1.12 Locate in toolbox slot 5 VSCA and navigate down to **J6:**
IS200DSCB/PORT1/MODBUS/CONFIGURATION.
- 6.1.13 Open this and locate the PHYCONNECT variable and verify this is set to RS232. Verify RS232 is set for all six ports.
- 6.1.14 Minimize toolbox and locate on the desktop the icon called MOD_Rsim.exe.
- 6.1.15 Open this program.
- 6.1.16 Ensure the VSCA has established communications. At the top left on the program the received/sent counter should be counting and both red indicators should be blinking.
- 6.1.17 Now at the bottom left of the program port 1 should have a RED boarder around it. This means port 1 is the active port, this should change to port 2 when port 2 cable is connected and each additional port that is connected.
- 6.1.18 All the digital inputs should be set to a 1 on all six registers. Digital input 1 on all six registers is the master input to start the counter if set to zero the coil outputs will not count.
- 6.1.19 Ensure the I/O drop down is set to display the COIL OUTPUTS.

6.1.20 The coil outputs should be counting on address 1-16 for port 1. They will count BCD to 32767 the re-start the count.

| <u>PORT NUMBER</u> | <u>MOD BUS ADDRESS</u> |
|--------------------|------------------------|
| 1 | 1-16 |
| 2 | 17-32 |
| 3 | 33-48 |
| 4 | 49-64 |
| 5 | 65-80 |
| 6 | 81-96 |

- 6.1.21** If port 1 is communicating ok go back to toolbox and verify that the digital inputs are all high and the coil outputs are counting. Also verify the port 1 I/O is healthy.
- 6.1.22** Run this port for a while to ensure communications is ok.
- 6.1.23** Next unplug port 1 from COMM port 2 and plug the port 2 in and verify communications.
- 6.1.24** Repeat this until all six ports are verified.
- 6.1.25** Close the Modbus software.
- 6.1.26** Now power down the rack and unplug the RS232 cable and remove the VSCA UUT.
- 6.1.27** The VSCA needs to be setup for RS485 communications.
- 6.1.28** Move all the jumpers over from RS232 to RS485.
- 6.1.29** Ensure that the termination resistor jumpers are set to TRM.
- 6.1.30** Install the card back in the rack and power up.
- 6.1.31** Now connect the PORT DEMUX SWITCH to J6 of the VSCA UUT, (ENSURE ALL SIX SWITCHES ARE IN THE OFF POSITION).
- 6.1.32** Next connect the RS485 converter with cross over cable to COMM port 2 of the computer.
- 6.1.33** Turn on port 1 switch and open the Modbus software again.
- 6.1.34** When the rack completes the boot process.
- 6.1.35** Locate in toolbox slot 5 VSCA and navigate down to J6:
IS200DSCB/PORT1/MODBUS/CONFIGURATION.
- 6.1.36** Open this and locate the PHYCONNECT variable change this to RS485.
- 6.1.37** All six ports need to be changed to RS485 comm.
- 6.1.38** When all six ports are changed to RS485 the configuration needs to be downloaded.
- 6.1.39** Port 1 at the bottom left of the program the number 1 should highlight in RED showing that port is the active port.

6.1.40 Confirm that communications is scanning and the red led's are blinking.

6.1.41 Repeat this for all six ports turn off port 1 switch and wait 5 seconds then turn on port 2 turn off port 2 switch and wait 5 seconds then turn on port 3 switch repeat this for all six ports.

6.1.42 Verify all six ports communicate ok.

6.2 ***TEST COMPLETE ***

7. NOTES

7.1 None at this time.

8. ATTACHMENTS

8.1 Picture of cables used during testing.

