



GE Energy Management

## Functional Testing Specification

*Industrial Repair Services  
Louisville, KY*

**LOU-GEF-IC800SSI420RD2xx**

### Test Procedure for a IC800SSI420RD2xx

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## 1. SCOPE

1.1 This is a functional testing procedure for a S2K Series IC800SSI420RD2Exx.

## 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)
1	H190150	T1106 Power Supply Fixture
1	H190152	S2K Burn In Station
1	H190151	S2K Final Test Station
1	H190145	Logic Card Programming Station

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## 6. Testing Process

### 6.1 Notes

- 6.1.1 IT IS HIGHLY RECOMMENDED THAT YOU FAMILIARIZE YOURSELF WITH THE TEST IF YOU HAVE NEVER EXECUTED IT BEFORE DUE TO THE FACT THAT THERE ARE SEVERAL NOTES ALONG THE WAY THAT MAY SAVE YOU SOME TIME.**
- 6.1.2** The IC800 S2K series product line is tested at several different test benches using multiple fixtures. The purpose is to test the circuit cards individually and calibrate the power supply. After successful pretest the UUT is then put on a burn in station for no less than 2 hours. After the UUT has passed the burn in tests it is checked one final time to ensure the burn in did not create a problem and/or determine if the unit fails after it has been in operation for a period of time
- 6.1.3** This procedure is written as a UUT would progress thru the different benches and fixtures to successful final test.
- 6.1.4** Each Sub Procedure is in **Bold** for reference purposes only. Even if you just need to test one card, and not a complete unit, the entire test needs to be executed. They are as follows: **Power Supply Tests, Firing/Filter and Logic Tests, Pre-Burn In, Burn In, Final Test, and Completion of UUT.**
- 6.1.5** Replace all Electrolytic Capacitors before beginning the procedure. You can find a spreadsheet that details the Quantity, Location, and Part Number in the following location [IC800SSI Elec Caps](#)

### 6.2 Testing Procedure

- 6.2.1** Disassemble the unit entirely and, using the guide referenced above, replace all electrolytic capacitors.
- 6.2.2** Megger the Intelligent Power Module and Three Phase Diode Module mounted on the heat sink. **If questionable replace. These can cause catastrophic failures.**
- 6.2.3** Verify the fuse mounted to the case is not blown.
- 6.2.4** Visually inspect the clamp resistors for cracks and verify they are 50 Ohms +/-5%
- 6.2.5 Test the Power Supply**
- 6.2.5.1** Connect the Power Supply, PWB 5607 or 5608, to the Power Supply Tester.  
(H190150, T1106)
- 6.2.5.2** Connect the Grey Cable from the power supply test fixture to the Power Supply Switch Box.

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**6.2.5.3** Connect DMM to Jacks on back of Power Supply Switch Box

**6.2.5.4** Connect Purple lead to D9 Cathode

**6.2.5.5** Set switch on switch box fully CCW

**6.2.5.6** Apply power by closing the appropriate switch on the power strip

**6.2.5.7** Verify the Green Power On indicator illuminates on the Switch Box

**6.2.5.8** Adjust R19 for a reading between 5.08VDC and 5.10VDC

**6.2.5.9** Move switch CW one position

**6.2.5.10** Verify DMM reads 4.8VDC to 5.2VDC

**6.2.5.11** Move switch CW one position

**6.2.5.12** Verify DMM reads 11.75VDC to 12.25VDC

**6.2.5.13** Move switch CW one position

**6.2.5.14** Verify DMM reads 4.8VDC to 5.2VDC

**6.2.5.15** Move switch CW one position

**6.2.5.16** Verify DMM reads -11.75VDC to -12.25VDC

**6.2.5.17** Move switch CW one position

**6.2.5.18** Verify DMM reads 11.75VDC to 12.25VDC

**6.2.5.19** Move switch CW one position

**6.2.5.20** Verify DMM reads 4.8VDC to 5.2VDC

**6.2.5.21** Move switch CW one position (this should be the last position)

**6.2.5.22** Verify DMM reads 8.5VDC to 10.5VDC

**6.2.5.23** Seal Pot R19 and remove power from test fixture by opening the appropriate switch on the power strip

**6.2.5.24** The power supply is now tested which is the end of this sub procedure

## **6.2.6 Test the Firing/Filter and Logic Cards**

**6.2.6.1** Connect the Firing/Filter card to the shop known good heat sink assembly. Make sure to connect all wires properly to the Diode block and Intelligent Power Module being sure to include the short, 3 pos. white Molex adapter cable to the same points on the Firing/Filter card, which is the power to the UUT.

**6.2.6.2** Connect the Logic card to the Firing/Filter card via the two black connectors on the Firing/Filter card and the pins on the Logic card.

**6.2.6.3** Close the lid to the programming station

**6.2.6.4** On the PC Desktop open the program CCSWIN32, if not already open.

**6.2.6.5** Apply power by flipping the Main Power switch on the small box located directly above the programming station to On

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- 6.2.6.6 Press the ENTER key on the keyboard and verify the unit echoes back what it is
- 6.2.6.7 On the keyboard type “firmware” you will be prompted with “Are you sure you want to erase the current firmware and load a new firmware version”
- 6.2.6.8 Press Y for yes then Enter. The screen should start scrolling random characters as if the communication settings are wrong. This is OK.
- 6.2.6.9 Wait 30 seconds before continuing to be sure the task is completed. The random characters won’t stop until you load the new firmware
- 6.2.6.10 Using the Firmware/Flash Information sheet, found below the monitor on the test bench, identify what version firmware need to be programmed to the Logic Card.
- 6.2.6.11 Click Tools, then, Send Firmware
- 6.2.6.12 Click OK on the dialog box that opens
- 6.2.6.13 Locate and Double Click the file you identified earlier.
- 6.2.6.14 A dialog box should open that shows the percentage transferred, Once completely loaded the bottom of the CCSWIN32 screen will read “Operation Completed Successfully!”
- 6.2.6.15 Turn the main power Switch to the Programming Station to the “Off” position and remove the Logic card and Firing/Filter card.
- 6.2.6.16 Reassemble the shop known good heat sink assembly.
- 6.2.6.17 The Logic card and Firing/Filter card are now tested which is the end of this sub procedure
- 6.2.7 Reassemble the entire unit for the remaining tests.
- 6.2.8 **Pre-Burn In**
  - 6.2.8.1 **NOTE: This test uses only 24VDC**
  - 6.2.8.2 Connect all cables as marked (See picture at end of procedure for reference)
  - 6.2.8.3 On the desktop double-click **XmjTest**, It’s a tree icon
  - 6.2.8.4 Follow the instructions that appear on screen
  - 6.2.8.5 When prompted choose “3-Skip Configuration”
  - 6.2.8.6 When asked if you want to store burn-in program type “N” and return for No
  - 6.2.8.7 When test is complete the window will close automatically, disconnect all connections between UUT and Tester. This is the end of this sub procedure
- 6.2.9 **Burn-in**
  - 6.2.9.1 **NOTE: Hazardous voltages exist within the equipment, on the cable connectors, and on the UUT. USE EXTREME CAUTION!!!**

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**6.2.9.2** Verify the 460VAC disconnect switch is in the “**OFF**” position. Make sure 460VAC plug is unplugged.

**6.2.9.3** Place UUT on benchtop at Burn-In Station T1005 (H190152)

**6.2.9.4** Connect the Special Connector that contains the External Clamp Resistors, Motor Power, Incoming Voltage, and Logic Power

**6.2.9.5** Connect Position Feedback to UUT Position Feedback connector

**6.2.9.6** Connect the serial communication cable from the mobile laptop to the UUT Serial Port

**6.2.9.7** Switch the 24V Logic Power ON. Verify the UUT's display is illuminated.

**6.2.9.8** On the mobile laptop double click CCSWin32

**6.2.9.9** If prompted, "Controller settings do not match, do you want to keep the changes ?", click "Yes".

**6.2.9.10** At the computer, from CCS, type [Enter][Enter] and verify "GE Fanuc S2K Series" is displayed

**6.2.9.11** From CCS do the following:

- Type **KLALL**[Enter]
- Type **CLM**[Enter] (If asked "...are you sure..." type “**Y**”)
- Click **Tools | Send File...** | Navigate to and double click “**MyDocuments\Burn-In\JR\ssi420bn.txt**”
- If prompted, “Do you want to save program and motion blocks?” Click “**No**”
- Wait for the store process to complete successfully

**6.2.9.12** Switch the 24V Logic Power OFF

**6.2.9.13** Plug the Small. Black, connector labeled “**LOAD ENABLE**” to the UUT

**6.2.9.14** Plug the 460VAC into the disconnect box.

**6.2.9.15** Switch the 460VAC power disconnect to the “**ON**” Position. **!!!WATCH FOR CATASTROPHIC FAILURE!!!**

**6.2.9.16** These steps MUST be executed within about a ten second window for proper operation of UUT with respect to Load Unit:

- Switch the 24VDC Logic Power ON
- If faults are displayed, power off and troubleshoot. If no faults proceed to next step

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- Pull the “Enable Bypass” switch on the Bypass Box and press the “Start” button

**6.2.9.17** Verify motors are running smoothly with a noticeable, rhythmic, momentary hesitation.

**6.2.9.18** Verify UUT Displays “OK”

**6.2.9.19** Push the “Enable Bypass” button in so it is no longer illuminated.

**6.2.9.20** Place a fan to blow air across the motors while running

**6.2.9.21** Allow unit to Burn-In for a minimum of Two Hours

**6.2.9.22** After successful burn-in power down the system in the following order

- Switch off 24VDC Logic Power
- Switch off the 460VAC UUT Power
- Press the “Stop” button on the Enable Bypass Box for the Load Unit.

**6.2.9.23** Wait 5 minutes to allow the UUT’s power circuitry to discharge

**6.2.9.24** Disconnect all connections to the UUT. This is the end of this sub procedure

#### **6.2.10 Final Test**

**6.2.10.1 NOTE: This test uses only 24VDC**

**6.2.10.2** Connect all cables as marked (See picture at end of procedure for reference)

**6.2.10.3** On the desktop double-click **XmjTest**, It’s a tree icon

**6.2.10.4** Follow the instructions that appear on screen

**6.2.10.5** When prompted choose “3-Skip Configuration”

**6.2.10.6** When asked if you want to store burn-in program type “N” and return for No

**6.2.10.7** When test is complete the window will close automatically, disconnect all connections between UUT and Tester. This is the end of this sub procedure

**6.2.11** If the UUT has successfully completed all the above procedures it is ready for completion.

#### **6.3 \*\*\*TEST COMPLETE \*\*\***

### **7. Notes**

**7.1** See Procedure

### **8. Attachments**

**8.1** Final Test Pictures. Ctrl + Click on the following Hyperlinks

[Pic 1](#)

[Pic 2](#)

[Pic 3](#)