GE Energy	**Functional Testing Specification**
Parts & Repair Services ***Louisville, KY***	**LOU-GED-ISx15UCVH-B**

Test Procedure for a Universal Controller Assembly, ISx15UCVH

DOCUMENT REVISION STATUS: Determined by the last entry in the "REV" and "DATE" column

REV.	DESCRIPTION	SIGNATURE	REV. DATE
A	Initial release	J.Francis	06/09/2017
B	Added Burn In instructions at Step 6.4	F.Howard	03/22/2019

PREPARED BY	REVIEWED BY	REVIEWED BY	QUALITY APPROVAL
James Francis			L. Groves
DATE	**DATE**	**DATE**	**DATE**
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1. SCOPE

1.1 This is a functional testing procedure for an ISx15UCVH 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
1		Fluke 87 or equivalent
1	H188788	Mark VI Test Rack
1		UC Interface for M09x tests

6. TESTING PROCESS

6.1 Setup

6.1.1 Setup is called out in each step.

Note: This test currently covers only IS215UCVH and IS415UCVH with M09x ArcNet option.

If you are testing a UCVH with the M09x option, first test the board as a standard ISx15UCVH, then follow M09x instructions at the end of this procedure.

Replace 3V Lithium battery with new before testing board. Disable battery jumper before replacing battery.

6.2 Testing Procedure

6.2.1 Initial Inspection:

6.2.1.1 Look the card over very closely. Physical damage & corrosion have been found on these units, along with missing hardware.

6.2.1.2 **(**GE Control Systems Solutions Toolbox, compact flash Core and TCP/IP. Remove the compact flash from the board, and set it up in the card reader. With UCVH9C.ucb file of Toolbox opened up, select Device in the left of the upper toolbar, then Download, and Compact Flash. This sets up the TCP/IP address and core load for the next test step.

6.2.2 GE Control Systems Solutions Toolbox, card testing:

6.2.2.1 With rack power OFF, slide in the UCVH and connect the 1st Ethernet cable to Lan1, connect the 2nd Ethernet cable to Lan2 then connect the mini D-shell connector to COM1. Power up the rack, and wait for it to finish booting up.

6.2.2.2 Once it boots up, click on Device, then Download, and Product Code. When it's done, it will prompt you for a reboot.

6.2.2.3 Click NO and then cycle power to the rack. Once unit has finished booting up again, click on the button in the upper toolbar that has a checkmark on it. The window below should ultimately reflect "Validation complete with 0 errors & 0 warnings".

6.2.2.4 Next, click on the Build button, which has a hammer and ruler on it, and the lower window should display "xx records with 0 errors-SUCCESS" (xx records can be any number).

6.2.2.5 Go online by clicking the button on the upper right of the toolbar with two mating yellow plugs. You should see two small windows on the lower right side of the screen, one with UNKN and the other with NO CODE.

6.2.2.6 Now go to the Download button, the one with the red arrow pointing downward, click OK, then look for Download Complete.

6.2.2.7 Go Offline with the same button you went online with, cycle power to the unit, and wait for the reboot.

6.2.2.8 Once rebooted, look for the two windows in the lower right to now be Green and showing Control and Equal.

6.2.3 ETHERNET TEST LAN1 and LAN2.

6.2.3.1 Once toolbox has **CONTROL, EQUAL**, this verifies that LAN1 is connected and working. To test LAN2 open the command Prompt and type the following. Ping 192.168.101.75 this pings LAN2.

6.2.4 COM1 TEST

6.2.5 Power off the Rack then open the serial2 connection, power up the rack, on the Hyper Terminal the data on the screen will be similar to the example below.

```
CVG-7666 BIOS Revision 1.00
Copyright 2005 GE Fanuc Embedded Systems
Uuild Time: 03/08/05 16:49:24

Mobile Intel(R) Celeron(TM) CPU 650MHz
639K System RAM Passed
11M Extended RAM Passed
```

```
126M Extended RAM Pa sed

                        roc output to serial port 3f8 at 9600 baud
Press RETURN key within 2 SECONDS to ABORT uc2k startup
'platform' found - NORMAL startup

cd /usr/bin
platform -u &
platform   V02_04_01C - Apr 15 2010 02:22:54
ifconfig: ioctl (SIOCAIFADDR): File exists
UC2K_Start: Platform Registration After 6 Seconds.
en1: flags=8863<UP,BROADCAST,NOTRAILERS,RUNNING,SIMPLEX,MULTICAST>
      inet 192.168.101.73 netmask ffffff00 broadcast 192.168.101.255

cd /usr/binto enter SETUP
sys &
    ********************************************************************
        MARK VI Runtime Version V05_13_04C
    ********************************************************************

sys_mk6    V05_13_04C - Apr 15 2010 02:26:33
V070300C FEB 2010

uc_idle    V05_00_01C - Apr 15 2010 02:18:17
bgnd       V06_06_00C - Apr 15 2010 02:14:03
heartbeat  V06_04_01C - Apr 15 2010 02:21:39
diag       V06_00_05C - Apr 15 2010 02:14:34
sdi        V05_02_03C - Apr 15 2010 02:20:10
adl        V07_00_10C - Apr 15 2010 02:22:37
diag_alarm V01_00_01C - Apr 15 2010 02:23:11

dpm_mgr    V01_10_01C - Apr 15 2010 02:23:32 - ECL 3.5 beta-D
login:          *** Expansion begun ***
mapper     V06_00_00C - Apr 15 2010 02:21:03
data_init_slave entering init loop...
data_init_slave found designated mode, exiting...
data_init_slave() completed successfully.
fgnd       V06_16_00C - Apr 15 2010 02:15:07   (40.0 mS)
fgnd       V06_16_00C - Apr 15 2010 02:15:07   (320.0 mS)
        *** Expansion completed successfully ***

  ******* Mark VI Initialization Completed *******
```

When the unit has completed the Initialization hit the Enter key

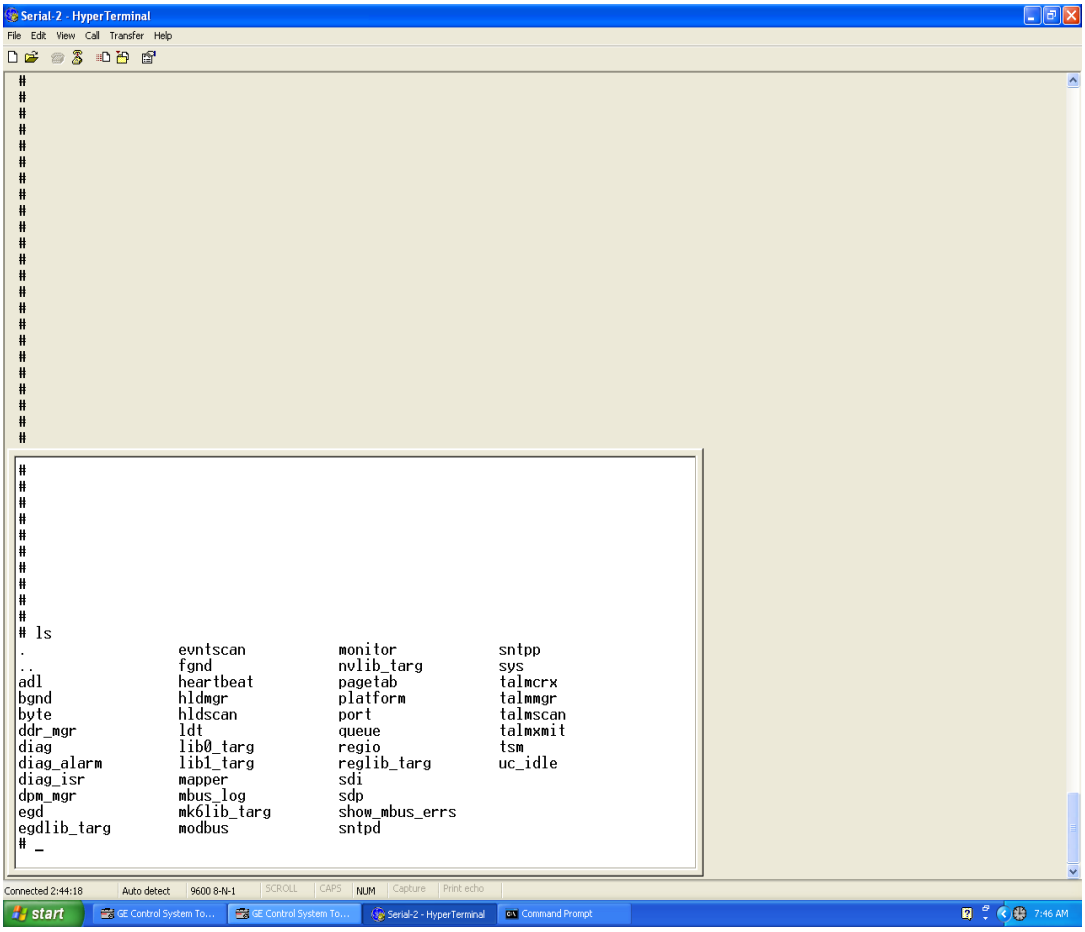
The Login prompt will appear. Type root hit enter then type ge all lower case

Login: root

Password: ge

The command prompt will now be displayed on the screen. Type ls this is lower case LS.

#ls hit enter the screen will now display similar to the example below:



6.2.6 **Setting for Battery:** S11-1 shall be disabled for shipment.

6.2.7 ******UCVG BASE BOARD TEST COMPLETE CONTINUE FOR M09A/B/C OPTION ******

6.3 IS200UCVH W/M09A/B/C OPTION TEST

6.3.1 After completing the UCVG base board test, turn off rack power and remove the UCVG from the rack.

6.3.2 Install applicable ArcNet DLAN+ card in unit. Place unit in test rack Slot 2.

6.3.3 For M09A (TMPC815-11 Ver. 1), for M09B (TMPC815-11 Ver. 2) and for M09C (IS200EARC).

6.3.4 In ToolBox and open SIMULATORS / UCVHM09(A/B/C) / UCVH9(A/B/C).UCB. Set the privilege level to 4. There will be a password box appear; type “gesalem9” and enter. In the next box type any three characters, initials or whatever.

6.3.5 Remove the CompactFlash from the UCVH and place it in the Flash Writer. In ToolBox select DEVICE / DOWNLOAD / COMPACTFLASH select WRITE and wait for the flash to write and verify. Place the CompactFlash back into the UCVH. Connect COM1 cable of computer, using the mini D shell adapter to COM1 on the UCVH. Insert the Ethernet cable into LAN 1.

6.3.6 Apply rack power and allow controller to boot. You can watch the boot process by opening the “SERIAL 1” HyperTerminal on the desktop.

6.3.7 Once controller has rebooted, download “Product Code (Runtime). When complete, reboot controller.

6.3.8 Once controller has rebooted, go online. You should see a No Code at the bottom right of the ToolBox screen. Download the Application code. (Red down arrow) When Application Code has finished downloading, reboot controller.

6.3.9 Once controller has rebooted, go online; you should now have “GREEN” CONTROL and EQUAL boxes at the bottom right of the ToolBox screen.

6.3.10 Connect a BNC cable from the BNC connector on the UCVH card, to the BNC connector on the OC1 unit above SIM31 rack.

6.3.11 In ToolBox, in the SIMULATORS / UCVHM09A/B/C Directory open UCVH9C.OCB and UCVG9B.GRW. Go to the UCVH9C.OC1 window and download the Application code. You should see the download as it occurs on the OC1 screen.

6.3.12 After download is complete, open the UCVH9B.GRW window. All buttons on this graphics screen should be green. Under DLAN+ TEST, click on the Start Test button. Follow the instructions.

6.3.13 Click on the NVRAM TEST, Start Test button and follow the instructions. Go back online to complete the test. If DLAN+ TEST and NVRAM TEST pass, test is complete.

6.4 BURN IN REQUIRED

6.4.1 Testing of new cards will require a 100 hour burn and is also preferred for repairs. If time constraints on repairs will not allow for 100 hours, a minimum of 48 hours with customer notification will be permitted.

6.5 Always re-flash Compact Flash with Core Load before returning to customer.

7. ATTACHMENTS AND NOTES

7.1 None at this time.