



660-400-800

PCBM uMATRIX-S CONTROLLER (PRIMARY)

Test Procedure

Version Control

Issue	Date	Summary of Changes	Author
A	30/3/2009	Initial Release	MVL
B	25/6/2009	Update for new uMatrix-S Jig 240 and Jig 241	MVL
C	24/05/2011	Update for 2V164 personality module upgrade	MVL

Author	Checked and Registered	.pdf file created	Released
MVL	DW	DW	



ASSOCIATED DOCUMENTS

Item	Description	Document ID
1	PC 161: 678040 SMPS TESTS	
2	PC 164: VISUAL INSPECTION OF PCBs	
3	PC 165: INSTALLING or REPLACING SYSTEM BIOS	

PREREQUISITES

Item	Description
1	PCB wiring and assembly completed
2	

Test Summary and Checklist

Test Step	Section	Status	Check
VISUAL INSPECTION	5	VI	
SMPS TEST	6	PS	
SERIAL NUMBER DEFAULT	7	PT	
USB SOFTWARE LOADING	8	PT	
BIOS LOADING	9	PT	
IO TEST SETUP	10	PS	
START WINCAL & RELAY OUTPUTS	11	PT	
FRONT PANEL LED OUTPUTS	12	PT	
FRONT PANEL BUTTON INPUTS	13	PT	
ANALOG OUTPUTS	14	PT	
STATUS INPUTS	15	PT	
ANALOG INPUTS	16	PT	

1 OVERVIEW

This document describes the series of production tests required for the PCB level pretests performed on the 660-400-40x series of products.

This board is a subassembly used in the uMatrix-S range of products (2V164, 2V165, 2V067, 2H034, 2SY212) and it is required that the individual assemblies are pretested before testing as a complete product. Note that the relevant (personality) X-Module to suit the product being tested should be utilised.

There are two variants of this product:

660400401: 40-300V Aux Power Supply version.

660400402: 20-70V Aux Power Supply version

This document covers both variants.

2 TEST EQUIPMENT

The following equipment is required to perform tests:

Item	Description
JIG 036P	Matrix module extension plug/ socket set (Primary board)
JIG 240	uMatrix-S I/O Test Module
2V164 X-Module or 2V165 X-Module or 2V67/ 2H34/ 2SY212 X-Module	2V164 Personality Module or 2V165 Personality Module or 2V67/ 2H34/ 2SY212 Personality Module
KIT-uMATRIX	Display board (660-401) / Comms auxiliary board (660-411) / 660-402 (System Bus Board)
Agilent Multimeter	DC Voltage
Various Test Leads	
USB cable x2	
Serial Cable	
MProg	USB EEPROM Software Application
WINCAL	uMATRIX Test / Calibration Application

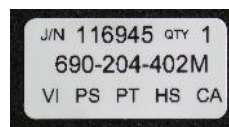
3 ASSOCIATED DOCUMENTS

Item	Description
660400401	Circuit Diagram with 40-300V Aux Power Supply
660400402	Circuit Diagram with 20-70V Aux Power Supply

4 PRODUCT ID /STATUS LABEL

The generic Product ID/Status label is used to identify the various stages of the product test process.

See Test Summary and Check List in the "Status" column for the symbols to be crossed off for each step.



5 VISUAL INSPECTION

Visually inspect incoming board. Refer to PC-164: VISUAL INSPECTION OF PCBs.

6 SMPS TEST

Test the switch mode power supply section of the board. Refer to PC-161: 678040 SMPS TEST



7 SERIAL NUMBER DEFAULT

1. Connect USB cable to connector J119 on the 660-400 PCB.
2. Open MProg (EEPROM Programming Software)
3. Write default USB serial number = 'FTMATRIX' to unit's USB chip (U106).
4. Read back serial number = 'FTMATRIX' to confirm correct loading.

8 USB SOFTWARE LOADING


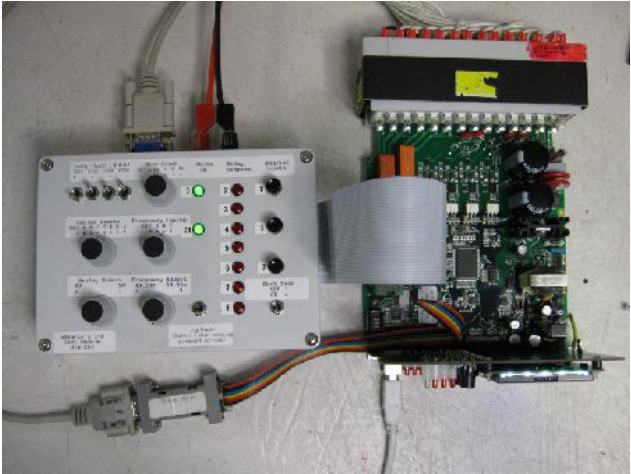
5. Refer to PC-147: Factory Programming AVR Devices.
6. The AVR Programming cable should be connected to J120 on the 660-400 PCB. Orient pin 1 away from the bottom edge of PCB.
7. Note that connection of the USB cable from PC to connector J119 provides power for USB software loading.
8. When selecting the firmware file, for example "674-300_x_M008_vvvv.HEX", "x" is the usb code type and "vvvv" is the current version of firmware to be loaded.
9. When "CPU PROGRAMMED OK" is displayed, remove the USB cable, then remove the AVR Programming cable. The device is now loaded with the USB firmware.

9 BIOS LOADING

1. Connect 660-402 (System Bus Board) to connector J115 of 660-400 board under test.
2. Connect 660-401 (Display Board) to the connectors J117 and J118 of 660-400 board.
3. Place link on J807 on 660-402 board to enable boot loading.
4. The Programming cable should be connected to J808 on the 660-402 board.
5. Power on DUT Auxiliary supply. (Pins 1(+) and 3 (-)).
6. When selecting the bios file, for example "BIOS_0550.MOT", "0550" is the current version of Bios to be loaded.
7. Upload BIOS to 660-400 board, using M16C Flasher. Refer to PC 165: INSTALLING or REPLACING SYSTEM BIOS.
8. Remove link on J807.
9. Power off DUT Auxiliary supply.

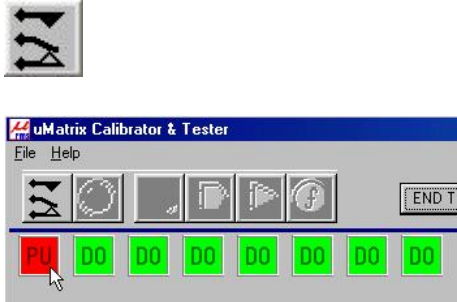
10 IO TEST SETUP

Action	Comments
<ol style="list-style-type: none"> 1. Ensure the following links are assigned to CONFIG links 5-8 on the 660-400 board under test: <ul style="list-style-type: none"> • If no 660-411 Auxiliary board to be fitted: CFG 5-8 = OMIT, OMIT, FIT, OMIT • If 660-411 Auxiliary board to be fitted: CFG 5-8 = OMIT, FIT, FIT, OMIT 2. Add links to J805 & J806 of 660-402 System Bus Board to enable USB communications. 3. If used, connect 660-411 Auxiliary board to J802 of System Bus board (660-402), and the terminal slots of the 660-400 board under test. 	


<p>4. Insert Jig 036P extension module in the Test Rack to 28-way plug of 660-400 controller board under test.</p>	<p>Location: S4-28</p>
<p>5. Insert the relevant personality X-Module in the Test Rack</p>	<p>Location X</p> 
<p>6. Connect JIG 240 (uMatrix-S I/O Test Module) to 660-402 board as follows:</p> <ol style="list-style-type: none"> 7. Connect ribbon cable "660-402 Secondary" to J803 (48-way connector) 8. Connect ribbon cable "660-402 AUX board" to J809 (24-way connector) 9. Connect black and red "Meter" terminals on rear of JIG 240 to DC Voltmeter. <p>10. On Jig 240, switch in configure ID jumpers CFG 1-4 to the test configuration settings: 1-0-0-0.</p>	 <p>Connect JIG 240 as shown.</p>
<p>11. Power On Aux supply</p>	
<p>12. Power on DUT</p>	
<p>13. Set Meter Output on Jig240 from OFF to "5", then to "24"</p>	<p>Check that voltage as read by meter is $5V \pm 0.1V$ and $24V \pm 0.3V$. Also Check 5 and 24 "Volts OK" Green LEDs on Jig 240 are enabled.</p>

11 START WINCAL & RELAY OUTPUTS


Action	Comments
1. Start WinCal application and ensure correct Com port is selected.	
2. Press [CONNECT] button	
3. Confirm relay is now connected. Select [TEST] to access test options	
4. The following screen should appear	
5. Press [B/L on] button.	Display Backlight should turn on.
6. Press [B/L off] button.	Display Backlight should turn off.

<p>7. Select [Test Relay Outputs] one at a time.</p> <p>8. Enable 1st relay output button using mouse click</p> <p>9. Enable relay output buttons 2, 3 5 and 6.</p> <p>10. Select [END TEST]</p>	 <p>As first screen button is pressed, observe operation of the <u>first</u> loaded relay output on the relevant <u>X-Module</u>.</p> <p>As screen buttons 2, 3, 5 and 6 are pressed, observe operation of corresponding loaded relay outputs 2, 3, 5 and 6 on the <u>Jig 240 "Relay Outputs"</u>.</p>
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12 FRONT PANEL LED OUTPUTS

<p>1. Select [FRONT PANEL LEDs]</p> <p>2. Enable each of the 8 LEDs on the 660-401 front panel reference board in turn</p> <p>3. Select [END TEST]</p>	 <p>As each screen button is pressed (red to green), observe operation of corresponding front panel LED on the the 660-305 front panel board.</p>
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13 FRONT PANEL BUTTON INPUTS

Action	Comments
<p>1. Select [FRONT PANEL BUTTON Inputs]</p> <p>2. Enable each of the 5 front panel buttons on the 660-401 front panel board (connected to the 660-400 DUT) in turn.</p> <p>3. Select [END TEST]</p>	 <p>As each button is pressed, corresponding images on the screen change accordingly.</p>

14 ANALOG OUTPUTS

Action	Comments
<p>1. Select [Analog Outputs]</p>	

<p>3. Operate each status input toggle button on the relevant X-Module (personality) in turn <u>at the next selectable voltage below the minimum status input voltage</u>.</p> <p>4. Select [END TEST]</p>	<p>Ensure that as each status input is switched, none of the indicators respond.</p>
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16 ANALOG INPUTS

<p>1. Select [Test Analog Inputs]</p>	
<p>2. Switch In “Analog Inputs” multi-pole switch on Jig 240, starting with position “A”.</p> <p>3. Adjust “Analog Adjust” 0-5V rotary switch on Jig 240 and note corresponding change in “AN-A” status on right.</p>	<p>AN-A AN-B AN-C AN-D AN-E AN-F AN-G TEMP 0.004 0.004 0.001 0.015 0.004 0.001 0.015 22.61</p> <p>First channel increases and decreases as rotary switch is adjusted.</p>
<p>4. Move multi-pole switch to position “B”.</p> <p>5. Adjust “Analog Adjust” 0-5V rotary switch and note corresponding change in “AN-B” status on right.</p> <p>6. Repeat for Analog inputs C-G. Note that channels AN-C & AN-F as well as AN-D & AN-G should sense simultaneously.</p> <p>7. Select [END TEST] + [TEST EXIT] + [DISCONNECT].</p>	<p>AN-A AN-B AN-C AN-D AN-E AN-F AN-G TEMP 0.004 0.004 0.001 0.015 0.004 0.001 0.015 22.61</p> <p>Second channel increases and decreases as rotary switch is adjusted.</p>