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Fusion Embedded Development Kit

Manufacturing Test Instructions

Actel
POWER MATTERS

Actel Corporation, Mountain View, CA 94043

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Table of Contents

Introduction 5
Development Kit Contents 5
Document Assumptions 5
Getting Started 5
Online Resources 5

1 Test Setup 7

2 Testing Procedures 11
Testing the Board 11
Testing the Board Power Supply 20

3 M1AFS-EMBEDDED-KIT Board Failures 21

A Product Support 23
Customer Service 23
Actel Customer Technical Support Center 23
Actel Technical Support 23
Website 23
Contacting the Customer Technical Support Center 23

Index 25

Introduction

Development Kit Contents

The Fusion Embedded Development Kit includes the following:

- Board with ARM® Cortex™-M1-enabled Fusion M1AFS1500-FGG484 device
- FlashPro3-compatible, low-cost programming stick (LCPS)
- Libero® Integrated Design Environment (IDE) v8.5 DVD
- 5 V power supply with international adapters
- Two USB 2.0 high-speed cables
- This printed quickstart guide

Document Assumptions

This quickstart guide assumes:

- You intend to use Actel Libero IDE software.
- You have installed and are familiar with Actel Libero IDE v8.5 SP1 or later software.
- You are familiar with PCs and Windows® operating systems.

Getting Started

- Install Libero IDE v8.5 from the DVD to create your own designs.
- Request a Libero IDE license from www.actel.com/products/software/libero/licensing.aspx.
- Check for any software updates at www.actel.com/downloads.
- Install SoftConsole v2.2 from www.actel.com/downloads. Use SoftConsole to create the application code for your processor.
- When you receive this kit, it is programmed with the manufacturing test design. If you wish to repeat the manufacturing test, follow the manufacturing test instructions described in this document. Design files for this document can be downloaded from the Actel website: www.actel.com/documents/Fusion_Embedded_DevKit_Test_DF.zip.
- You can program your board with the design example and go straight to SoftConsole to play with the embedded design on the Fusion mixed-signal FPGA.

Online Resources

Fusion Embedded Development Kit page on the Actel website: www.actel.com/products/hardware/devkits_boards/fusion_embedded.aspx.

This page contains the following information about this kit

- Development kit user's guide
- Tutorials
- Design examples with design guides
- Programming guides
- Layout and schematic files

1 Test Setup

This document defines and describes the specific M1AFS-EMBEDDED-KIT board testing procedures.

Step 1 – Installing the M1AFS-EMBEDDED-KIT Board USB-Serial Driver

1. Extract all files stored in the *CP210x_Drivers.zip* archive.
2. Double-click the *CP210x_Drivers.exe* file.
3. Choose the install option in the install wizard and select **Yes** to accept the licensing agreement.
4. Restart the computer. After restart, the driver can be used to communicate with the M1AFS-EMBEDDED-KIT board.

Step 2– Connecting the M1AFS-EMBEDDED-KIT Board and the Low-Cost Programming Stick

1. Connect the Actel M1AFS-EMBEDDED-KIT board to the Actel low-cost programming stick. This is done by connecting the J10 pins on the M1AFS-EMBEDDED-KIT board to the programmer, as shown in Figure 1-1.

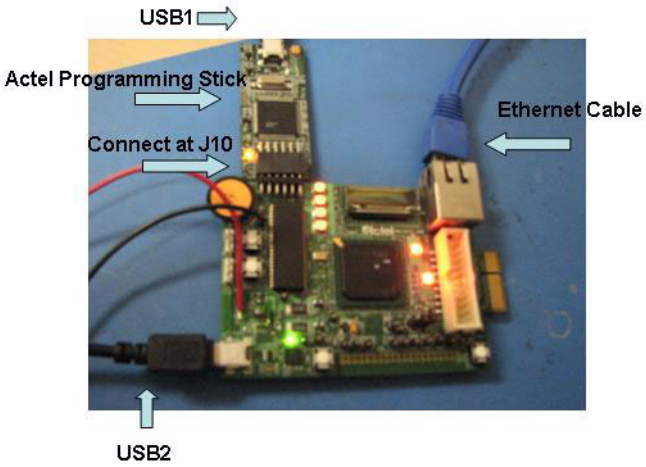

Figure 1-1 · M1AFS-EMBEDDED-KIT Connections

2. Connect one end of USB miniB cables to the USB connections on the M1AFS-EMBEDDED-KIT board and the Actel low-cost programming stick. These connections are labeled USB 1 and USB 2 in Figure 1-1.
3. Connect the USB cables to the PC.
4. The LED labeled D5 on the M1AFS-EMBEDDED-KIT board will light up. The LED labeled D3 on the low-cost programming stick will light up.

Step 3 – Connecting the M1AFS-EMBEDDED-KIT Board and the Ethernet Cable

Connect an ethernet cable from the local area network to J9, the M1AFS-EMBEDDED-KIT Ethernet jack.

Note: The local network must be running a DHCP server that assigns a web server on the board with an IP address. Network firewalls must allow the board web server.

Step 4 – Programming the M1AFS-EMBEDDED-KIT Board (optional)

If setting up the test terminal fails, or if you have previously programmed the board with a different design, reprogram the board with the manufacturing test design STAPL, available from the Actel website: www.actel.com/documents/Fusion_Embedded_DevKit_Test_DF.zip.

1. Start the FlashPro programming software.
2. Click the **New Project** button to create a new programming project. Enter the project name and select **Single Device** as the programming mode (Figure 1-2).

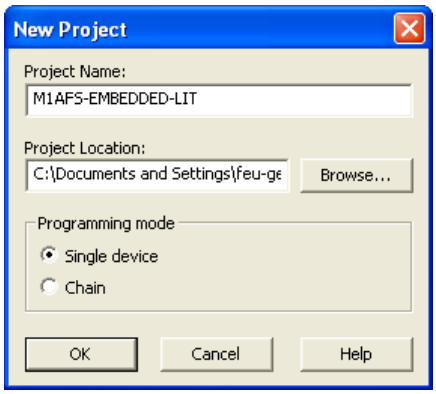

Figure 1-2 · New Project

3. Click **OK**.
4. Click the **Configure Device** button in the FlashPro GUI. This opens the Load Programming File window.
5. Click the **Browse** button to find the M1AFS-EMDEDDED-KIT.stp programming file and click **Open**.
6. Click the **Program** button to program the M1AFS-EMBEDDED-KIT board.

Step 5 – Setting up the Test Terminal

1. Open the Windows® **Start** menu and choose **All Programs** > **Accessories** > **Communications** > **HyperTerminal**. This will open HyperTerminal.
2. In the Connection Description window, type *M1-AFS-EMBEDDED-KIT* as the name of the new HyperTerminal session, and click the **OK** button. This opens the Connect To window.
3. Select the COM3 serial connection. This opens the COM3 Properties window.

4. Select the following settings:
   - Bits per second: 19200
   - Data bits: 8
   - Parity: None
   - Stop bits: 1
   - Flow Control: None (Figure 1-3).

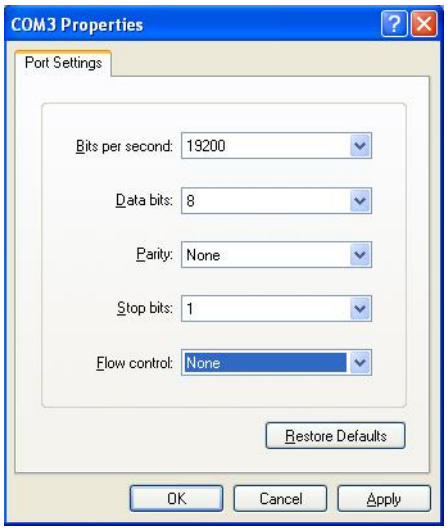

Figure 1-3 · COM3 Properties

5. Click **OK** to keep the settings.
6. From the **File** menu in the HyperTerminal window, select **Properties**, and click the **Settings** tab.
7. Click the **ASCII Setup** button. Check the **Append line feeds to incoming line ends** box and click **OK**.

Testing Procedures

Testing the Board

You must set up the testing environment correctly in order to do the M1AFS-EMBEDDED-KIT board test. Refer to the "Test Setup" on page 7 for more information about setting up the board and HyperTerminal.

1. Press the SW1 button on the M1AFS-EMBEDDED-KIT board to start the test program. The menu (Figure 2-1) appears on the terminal.

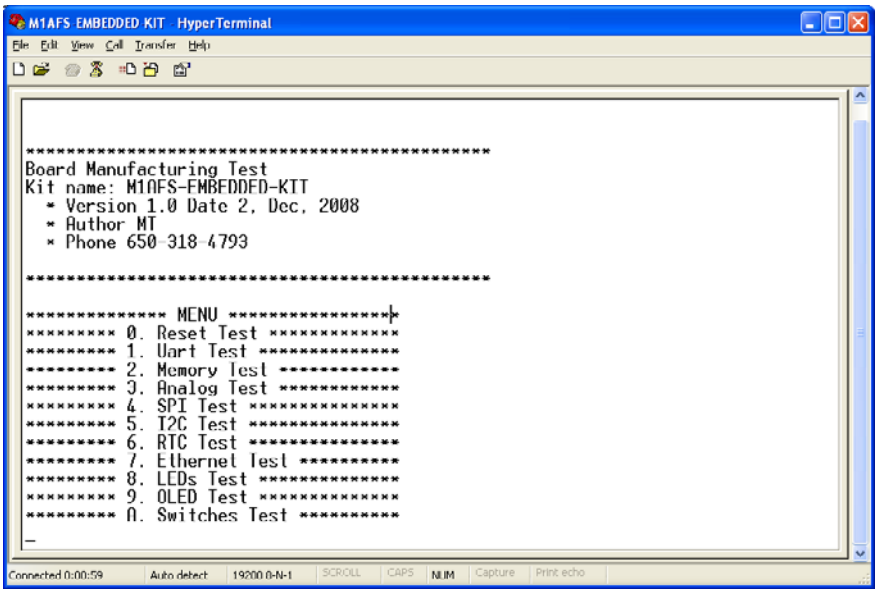

Figure 2-1 · HyperTerminal Menu

Note: If this message does not appear, pressSW1 again. If the above message still does not appear, make sure HyperTerminal has been set up properly.

2. Enter '0' into the terminal to begin the board reset test. If successful, the test results appear (Figure 2-2).

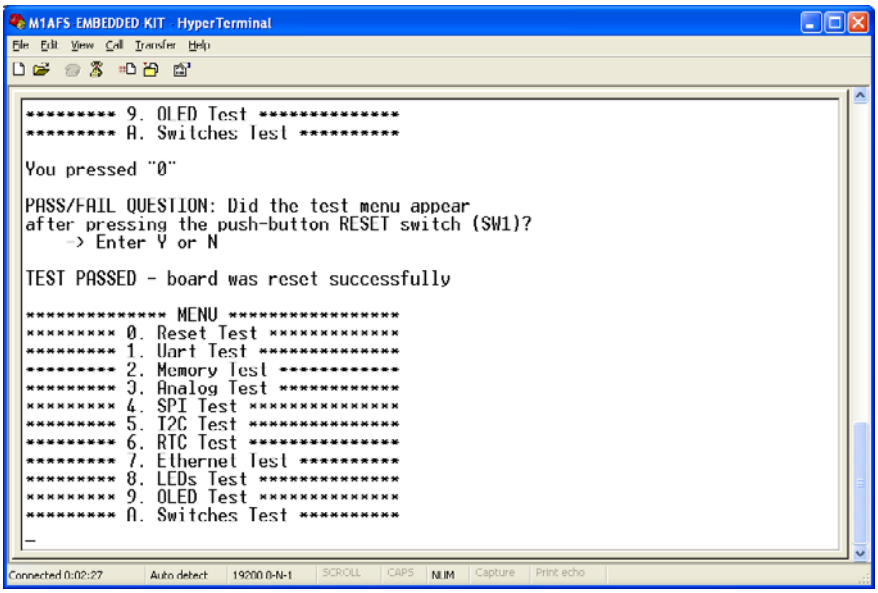

Figure 2-2 · Board Reset Test Results

3. If the menu appears correct, enter the character 'Y' into the terminal.

4. Enter '1' into the terminal to begin the UART test. Type the character 'Y' into the terminal. If successful, the test results appear on the screen (Figure 2-3).

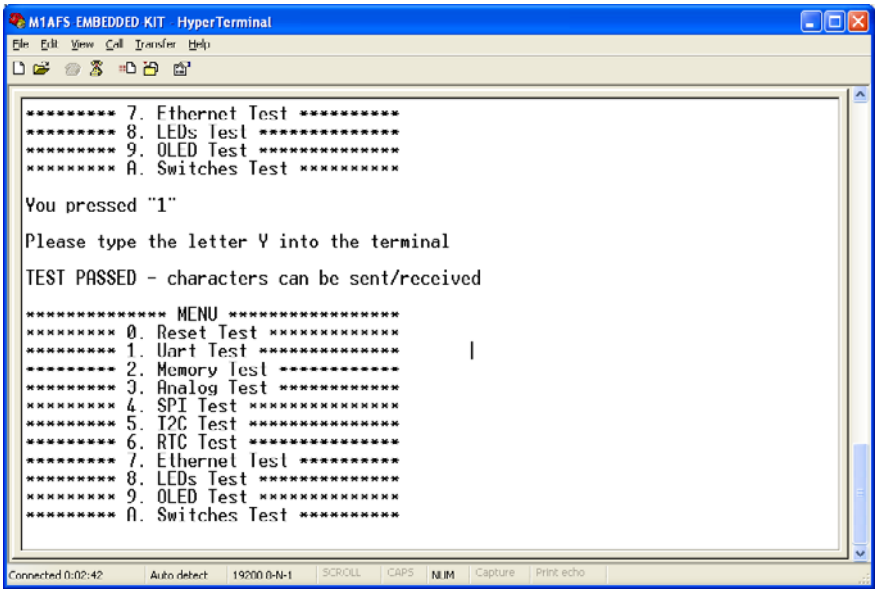

Figure 2-3 · UART Test Results

5. Enter '2' into the terminal to begin the memory test. If successful, the test results appear on the screen (Figure 2-4).

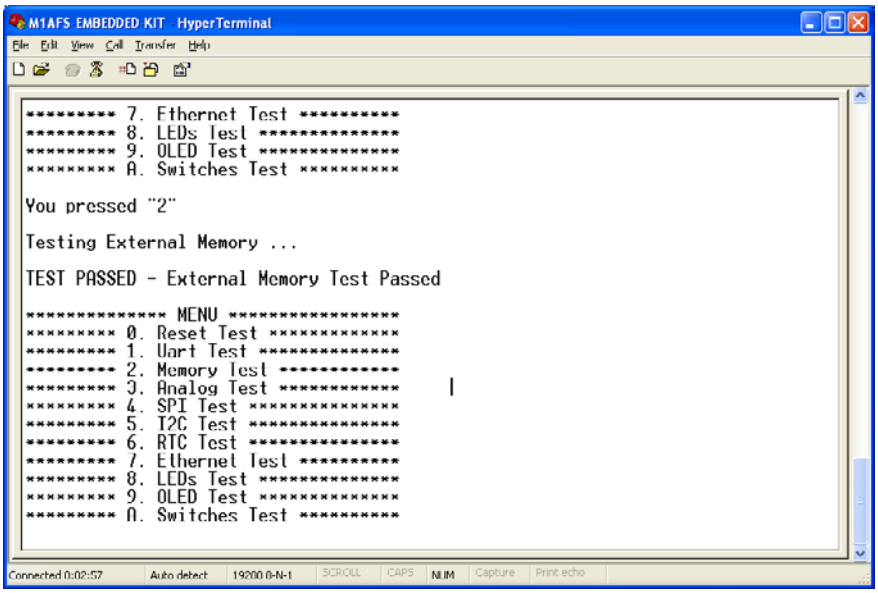

Figure 2-4 · Memory Test Results

6. Enter '3' into the terminal to begin the analog test. If successful, the test results appear on the screen (Figure 2-5).

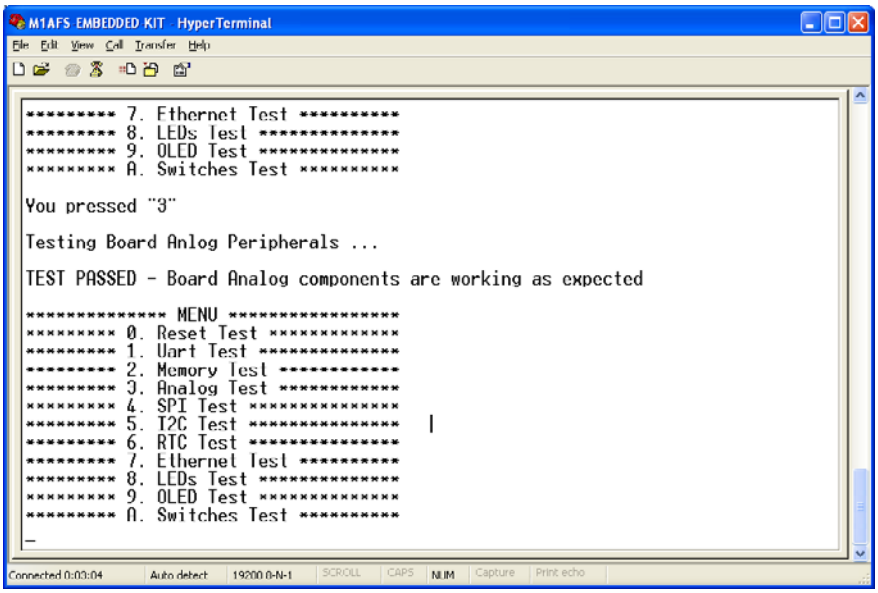

Figure 2-5 · Analog Test Results

7. Enter '4' into the terminal to begin the SPI test. If successful, the test results appear on the screen (Figure 2-6).

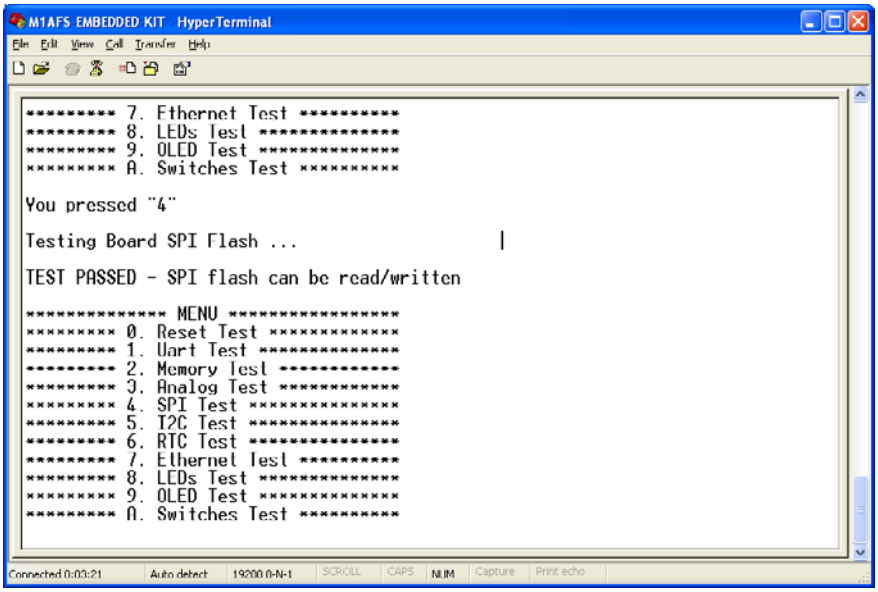

Figure 2-6 · SPI Test Results

8. Enter '5' into the terminal to begin the I2C test. If successful, the test results appear on the screen (Figure 2-7).

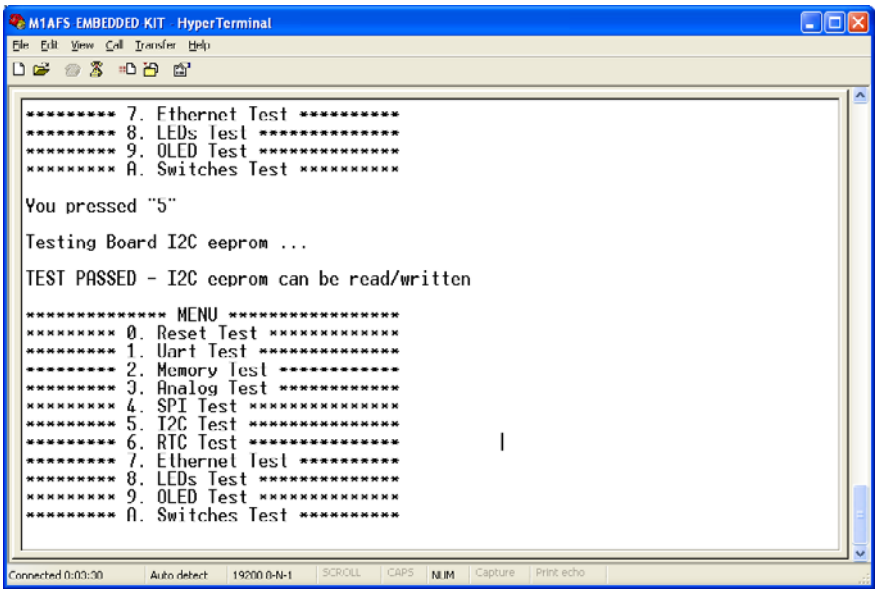

Figure 2-7 · I2C Test Results

9. Enter '6' into the terminal to begin the RTC test. If successful, the test results appear on the screen (Figure 2-8).

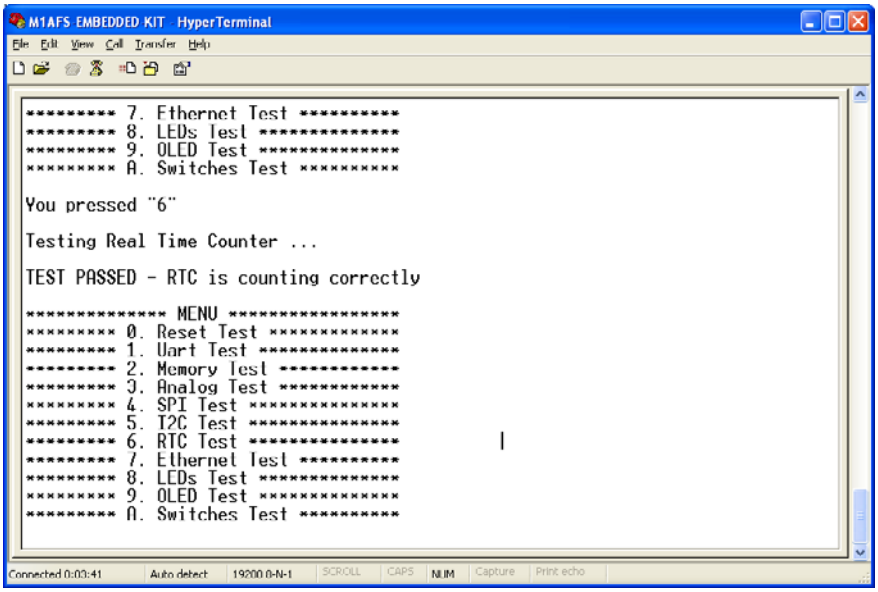

Figure 2-8 · RTC Test Results

10. Enter '7' into the terminal to begin the ethernet test. If successful, the test results appear on the screen (Figure 2-9).

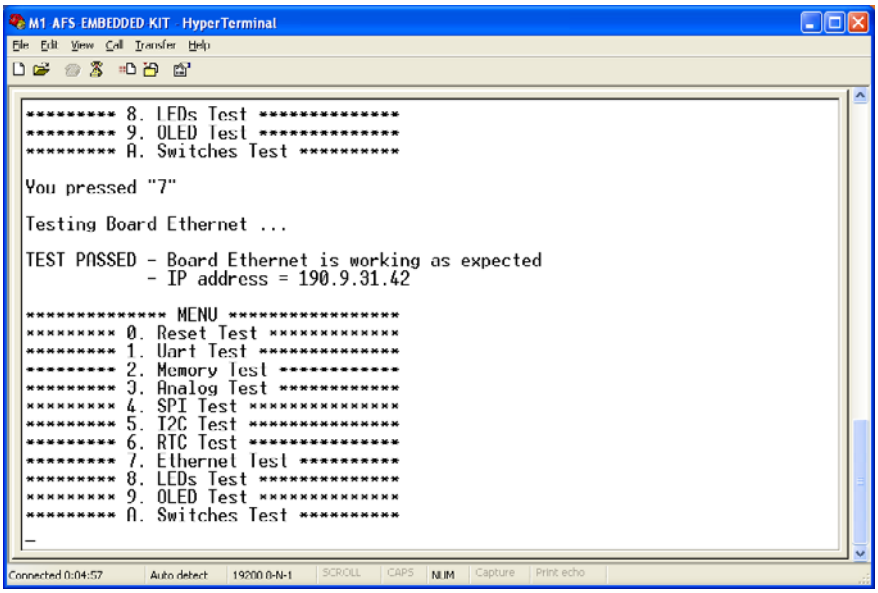

Figure 2-9 · Ethernet Test Results

Note: The IP address of your board can be different from the one shown in Figure 2-9.

11. Enter '8' into the terminal to begin the LEDs test. If successful, the test results appear on the screen (Figure 2-10).

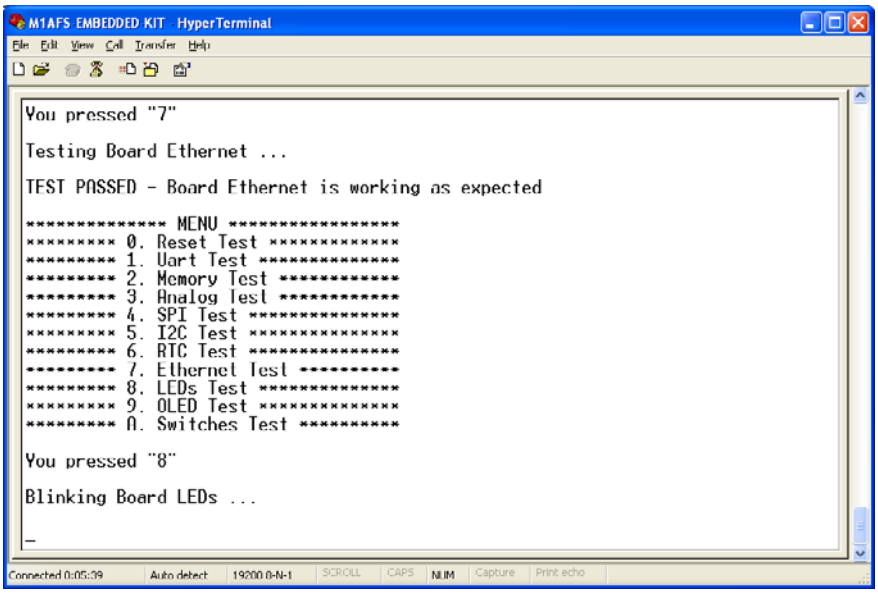

Figure 2-10 · LEDs Test Results

12. Watch the board LEDs. They will blink on and off several times. Figure 2-11 shows the LEDs off; Figure 2-12 shows the LEDs on.

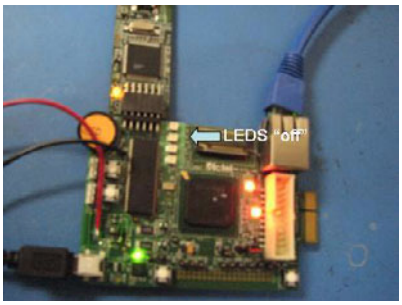

Figure 2-11 · LEDs Off

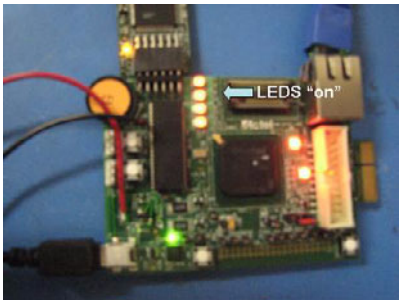

Figure 2-12 · LEDs On

13. If the LEDs are blinking, then enter 'Y' in the terminal. Otherwise enter 'N'. If 'Y' was entered, the results appear on the screen (Figure 2-13).

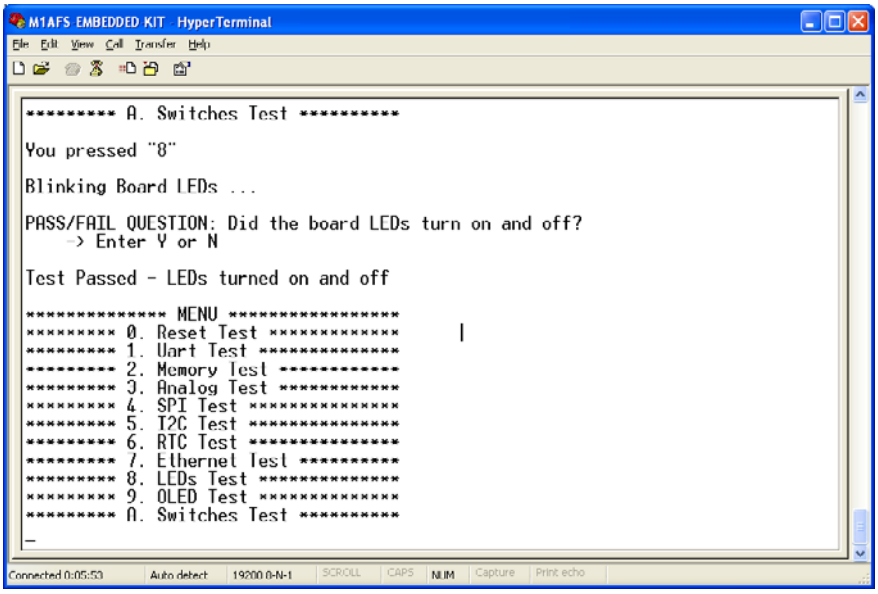

Figure 2-13 · Blinking Board LEDs Test Results

14. Enter '9' into the terminal to begin the OLED test. The results appear on the screen (Figure 2-14).

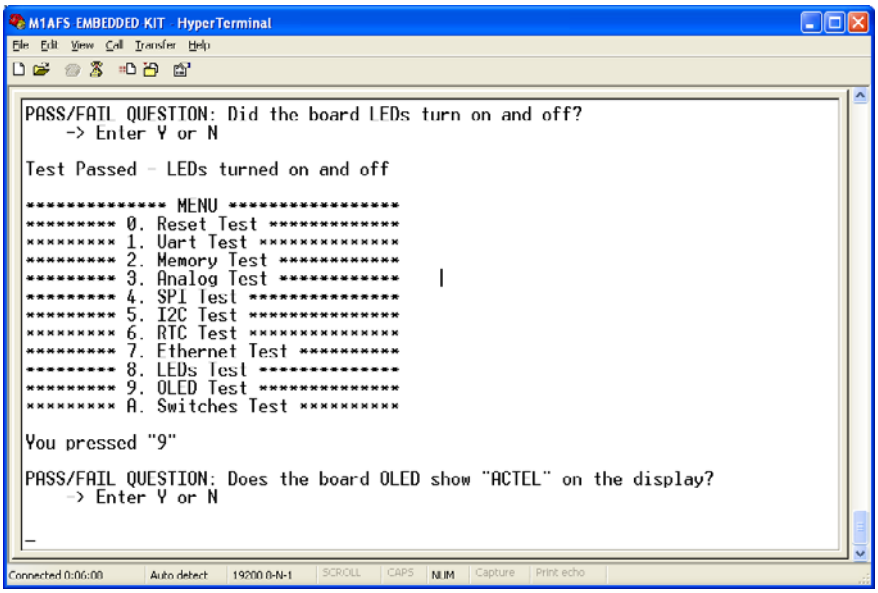

Figure 2-14 · OLED Test Results

15. Check the board OLED display. If "ACTEL" is displayed in the OLED, then enter 'Y' in the terminal; otherwise, enter 'N'. If 'Y' was entered, the results appear on the screen (Figure 2-15).

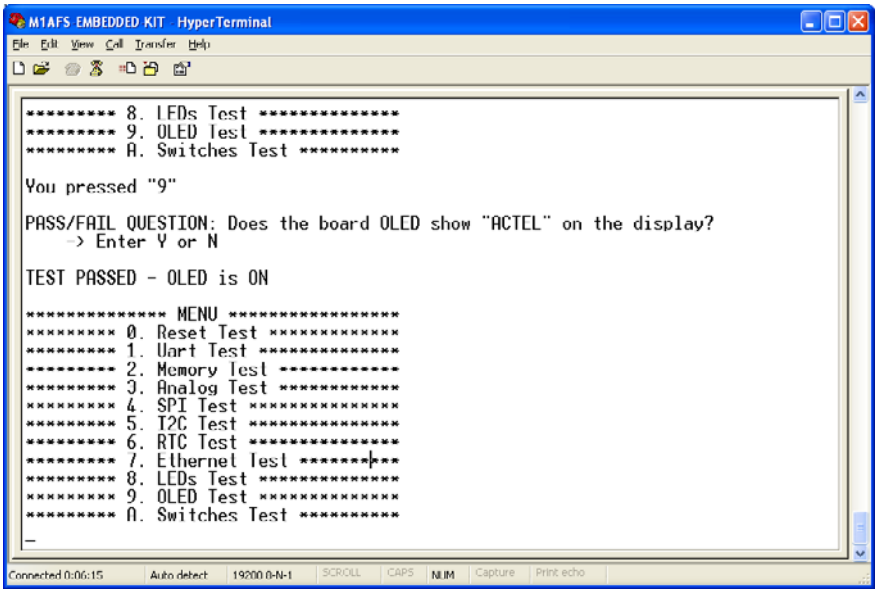

Figure 2-15 · OLED Test Results

16. Enter 'A' into the terminal to begin the switches test. The results appear on the screen (Figure 2-16).

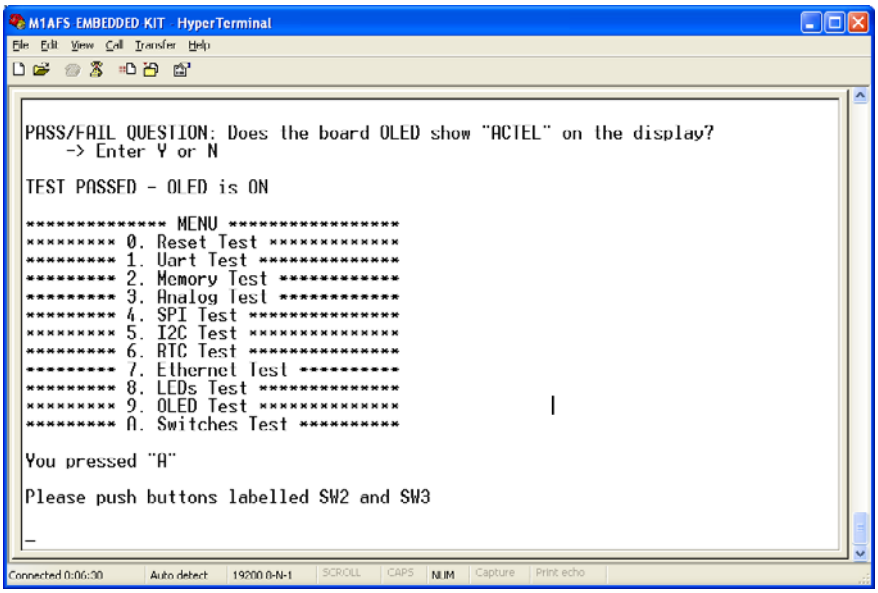

Figure 2-16 · Switches Test Results

17. Press the SW2 and SW3 switches on the board. The test results appear on the screen (Figure 2-17.)

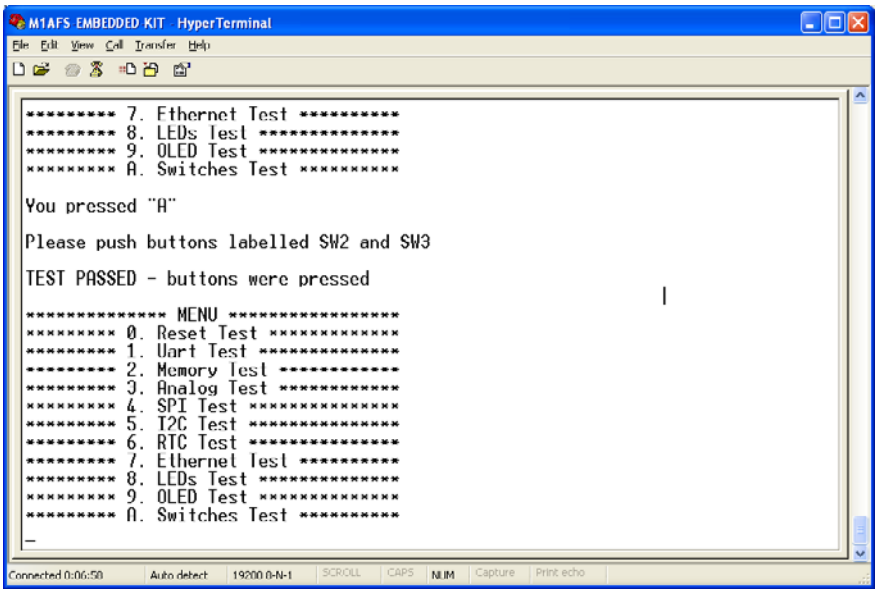

Figure 2-17 · SW2 and SW3 Test Results

Testing the Board Power Supply

1. Unplug the USB cable from the board.
2. Change the position of jumper J40 from pins 1-2 to pins 2-3. Jumper J40 is near the side labeled V5IN.

3 M1AFS-EMBEDDED-KIT Board Failures

All Tests described in "Testing Procedures" on page 11 should result in the words "TEST PASSED" printed on the terminal. If this does not happen, or the words "TEST FAILED" are printed, the test has failed.

If the M1AFS-EMBEDDED-KIT board fails any of the tests in "Testing Procedures", then the board being tested is not functional.

Board Failure Action for Test Operators

Put this non-functional board in an area separate from the boards which have passed testing and those which are yet to be tested. Keep these nonfunctional M1AFS-EMBEDDED-KIT boards for further investigation.

Board Failure Action for Actel Customers

Contact Actel Customer Service:

From Northeast and North Central U.S.A., call **650.318.4480**
From Southeast and Southwest U.S.A., call **650. 318.4480**
From South Central U.S.A., call **650.318.4434**
From Northwest U.S.A., call **650.318.4434**
From Canada, call **650.318.4480**
From Europe, call **650.318.4252** or **+44 (0) 1276 401 500**
From Japan, call **650.318.4743**
From the rest of the world, call **650.318.4743**
Fax, from anywhere in the world **650.318.8044**.

For additional technical support information, refer to "Product Support" on page 23.

A

Product Support

Actel backs its products with various support services including Customer Service, a Customer Technical Support Center, a web site, an FTP site, electronic mail, and worldwide sales offices. This appendix contains information about contacting Actel and using these support services.

Customer Service

Contact Customer Service for non-technical product support, such as product pricing, product upgrades, update information, order status, and authorization.

From Northeast and North Central U.S.A., call **650.318.4480**
From Southeast and Southwest U.S.A., call **650. 318.4480**
From South Central U.S.A., call **650.318.4434**
From Northwest U.S.A., call **650.318.4434**
From Canada, call **650.318.4480**
From Europe, call **650.318.4252** or **+44 (0) 1276 401 500**
From Japan, call **650.318.4743**
From the rest of the world, call **650.318.4743**
Fax, from anywhere in the world **650.318.8044**

Actel Customer Technical Support Center

Actel staffs its Customer Technical Support Center with highly skilled engineers who can help answer your hardware, software, and design questions. The Customer Technical Support Center spends a great deal of time creating application notes and answers to FAQs. So, before you contact us, please visit our online resources. It is very likely we have already answered your questions.

Actel Technical Support

Visit the Actel Customer Support website (www.actel.com/custsup/search.html) for more information and support. Many answers available on the searchable web resource include diagrams, illustrations, and links to other resources on the Actel web site.

Website

You can browse a variety of technical and non-technical information on Actel's home page, at www.actel.com.

Contacting the Customer Technical Support Center

Highly skilled engineers staff the Technical Support Center from 7:00 A.M. to 6:00 P.M., Pacific Time, Monday through Friday. Several ways of contacting the Center follow:

Email

You can communicate your technical questions to our email address and receive answers back by email, fax, or phone. Also, if you have design problems, you can email your design files to receive assistance. We constantly monitor the email account throughout the day. When sending your request to us, please be sure to include your full name, company name, and your contact information for efficient processing of your request.

The technical support email address is tech@actel.com.

Phone

Our Technical Support Center answers all calls. The center retrieves information, such as your name, company name, phone number and your question, and then issues a case number. The Center then forwards the information to a queue where the first available application engineer receives the data and returns your call. The phone hours are from 7:00 A.M. to 6:00 P.M., Pacific Time, Monday through Friday. The Technical Support numbers are:

650.318.4460
800.262.1060

Customers needing assistance outside the US time zones can either contact technical support via email (tech@actel.com) or contact a local sales office. Sales office listings can be found at www.actel.com/contact/offices/index.html.

Index

A

Actel
  electronic mail 23
  telephone 24
  web-based technical support 23
  website 23

B

board failures 21

C

contacting Actel
  customer service 23
  electronic mail 23
  telephone 24
  web-based technical support 23
customer service 23

K

kit contents 5

N

non-functional board 21

P

product support 23–24
  customer service 23
  electronic mail 23
  technical support 23
  telephone 24
  website 23

T

technical support 23

W

web-based technical support 23

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