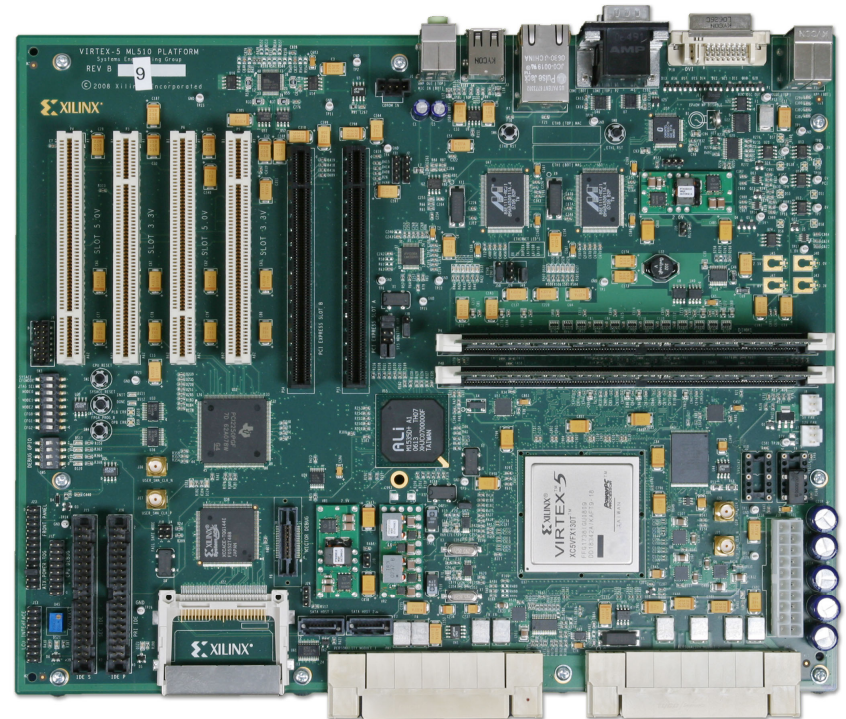




ML510 QuickStart

August 2008

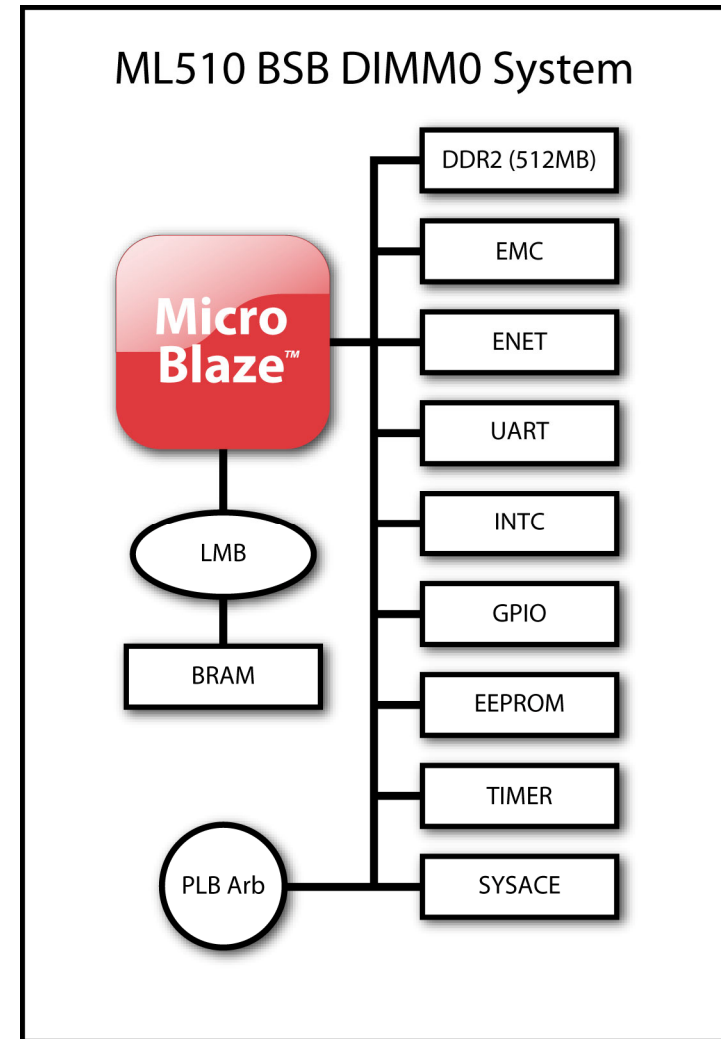


Overview

- Setup
- Boot with ACE-loader ACE File
- Observe LCD and Terminal messages
- Load new Configuration
- Re-load ACE-loader

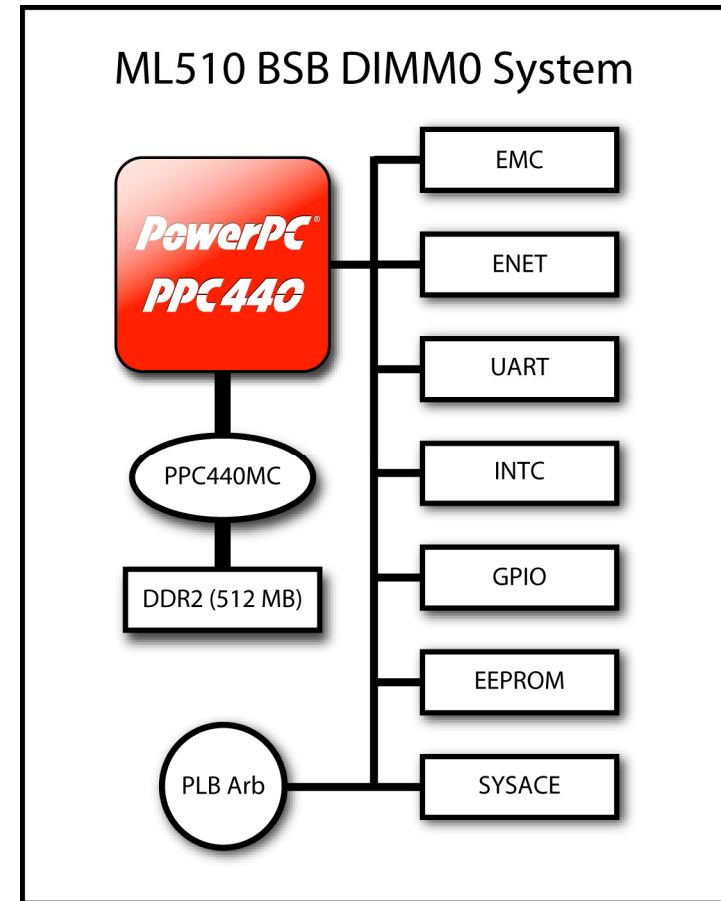
ML510 BSB DIMM0 Hardware

- The ML510 MicroBlaze design hardware includes:
 - DDR2 Interface (512 MB)
 - BRAM
 - External Memory Controller (EMC)
 - Networking
 - UART
 - Interrupt Controller
 - GPIO
 - EEPROM (IIC and SPI)
 - Timer
 - System ACE CF Interface
 - PLB Arbiter



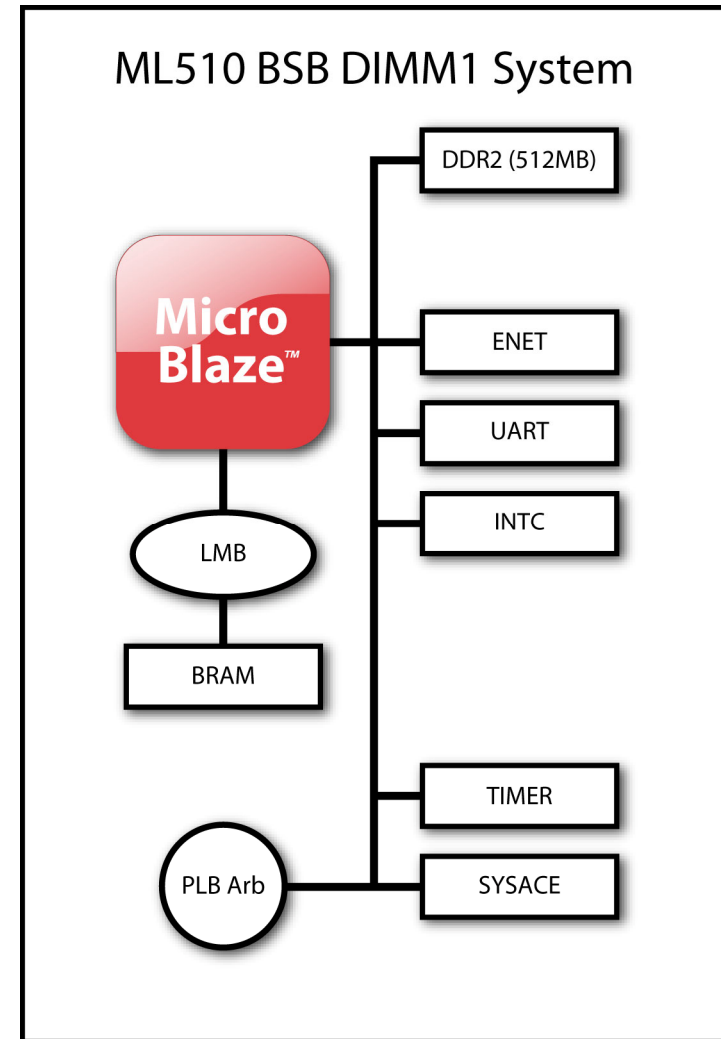
ML510 BSB DIMM0 Hardware

- The ML510 PPC440 design hardware includes:
 - DDR2 Interface (512 MB)
 - BRAM
 - External Memory Controller (EMC)
 - Networking
 - UART
 - Interrupt Controller
 - GPIO
 - EEPROM (IIC and SPI)
 - Timer
 - System ACE CF Interface
 - PLB Arbiter



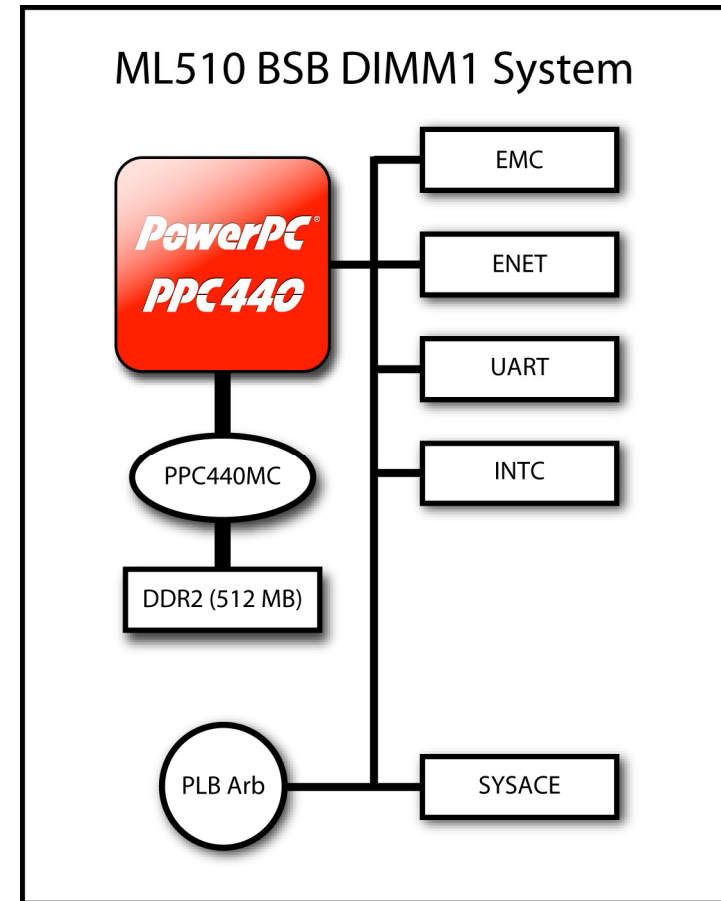
ML510 BSB DIMM1 Hardware

- The ML510 MicroBlaze design hardware includes:
 - DDR2 Interface (512 MB)
 - BRAM
 - Networking
 - UART
 - Interrupt Controller
 - Timer
 - System ACE CF Interface
 - PLB Arbiter



ML510 BSB DIMM1 Hardware

- The ML510 PPC440 design hardware includes:
 - DDR2 Interface (512 MB)
 - BRAM
 - External Memory Controller (EMC)
 - Networking
 - UART
 - Interrupt Controller
 - GPIO
 - EEPROM (IIC and SPI)
 - Timer
 - System ACE CF Interface
 - PLB Arbiter



ML510 Dual Processor Hardware

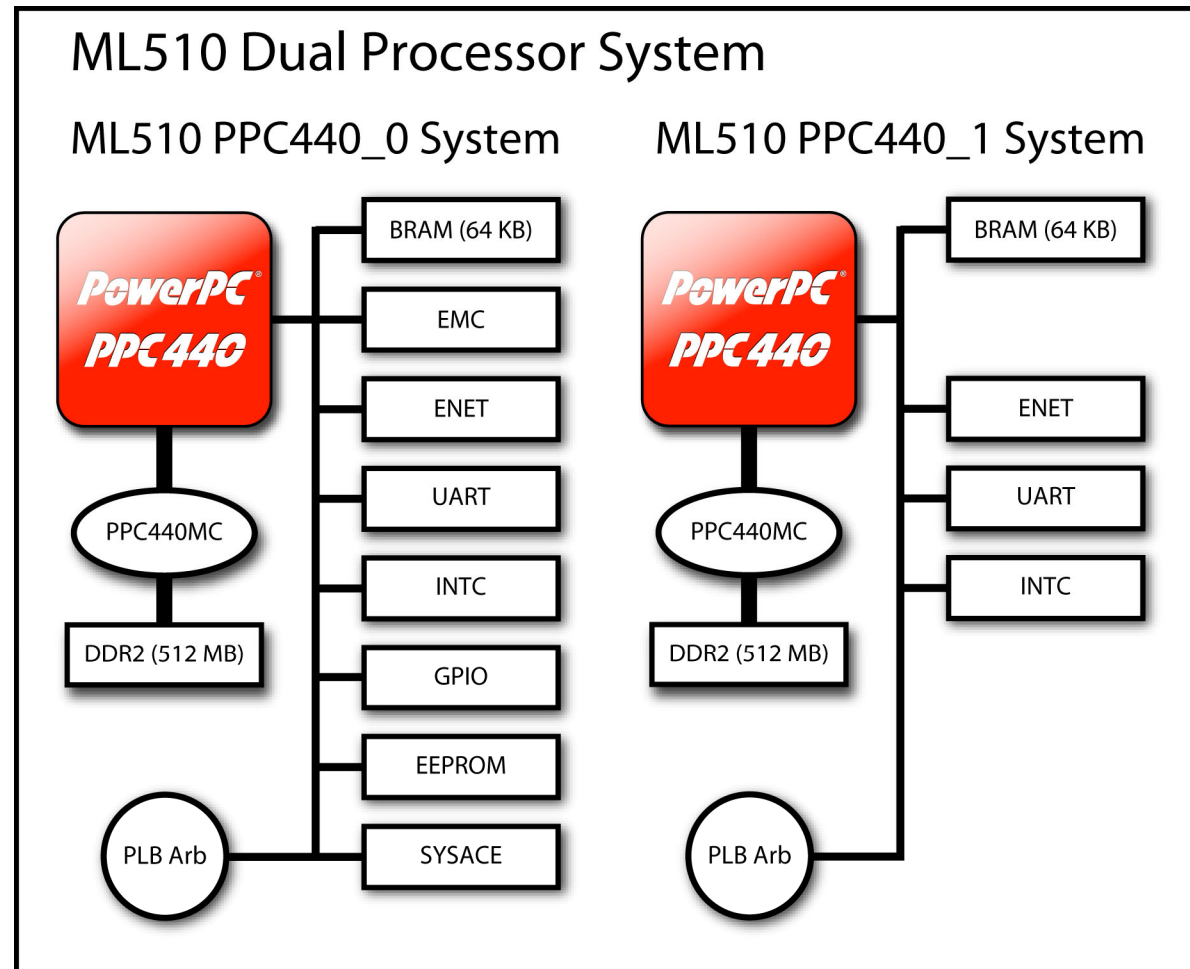
- The ML510 Dual Processor design hardware includes:

- PPC440_0:

- DDR2 Interface (512 MB)
- BRAM (64 KB)
- External Memory Controller
- Networking
- UART
- Interrupt Controller
- GPIO
- EEPROM (IIC and SPI)
- System ACE CF Interface
- PLB Arbiter

- PPC440_1:

- DDR2 Interface (512 MB)
- BRAM (64 KB)
- Networking
- UART
- Interrupt Controller
- PLB Arbiter



Additional Setup Details

- Refer to ml510_overview_setup.ppt for details on:
 - Software Requirements
 - ML510 Board Setup
 - **Equipment and Cables**
 - **Software**
 - **Network**
 - Terminal Programs
 - **This presentation requires the 9600-8-N-1 Baud terminal setup**



Hardware Setup

- Connect the Xilinx Parallel Cable IV (PC4) to the ML510 board
- Connect the RS232 null modem cable to the ML510 board



Hardware Setup

- The ML510 uses a DVI video interface
- Connect a DVI monitor
or
- Use a DVI/VGA adapter to connect a VGA monitor
 - <http://www.belkin.com>



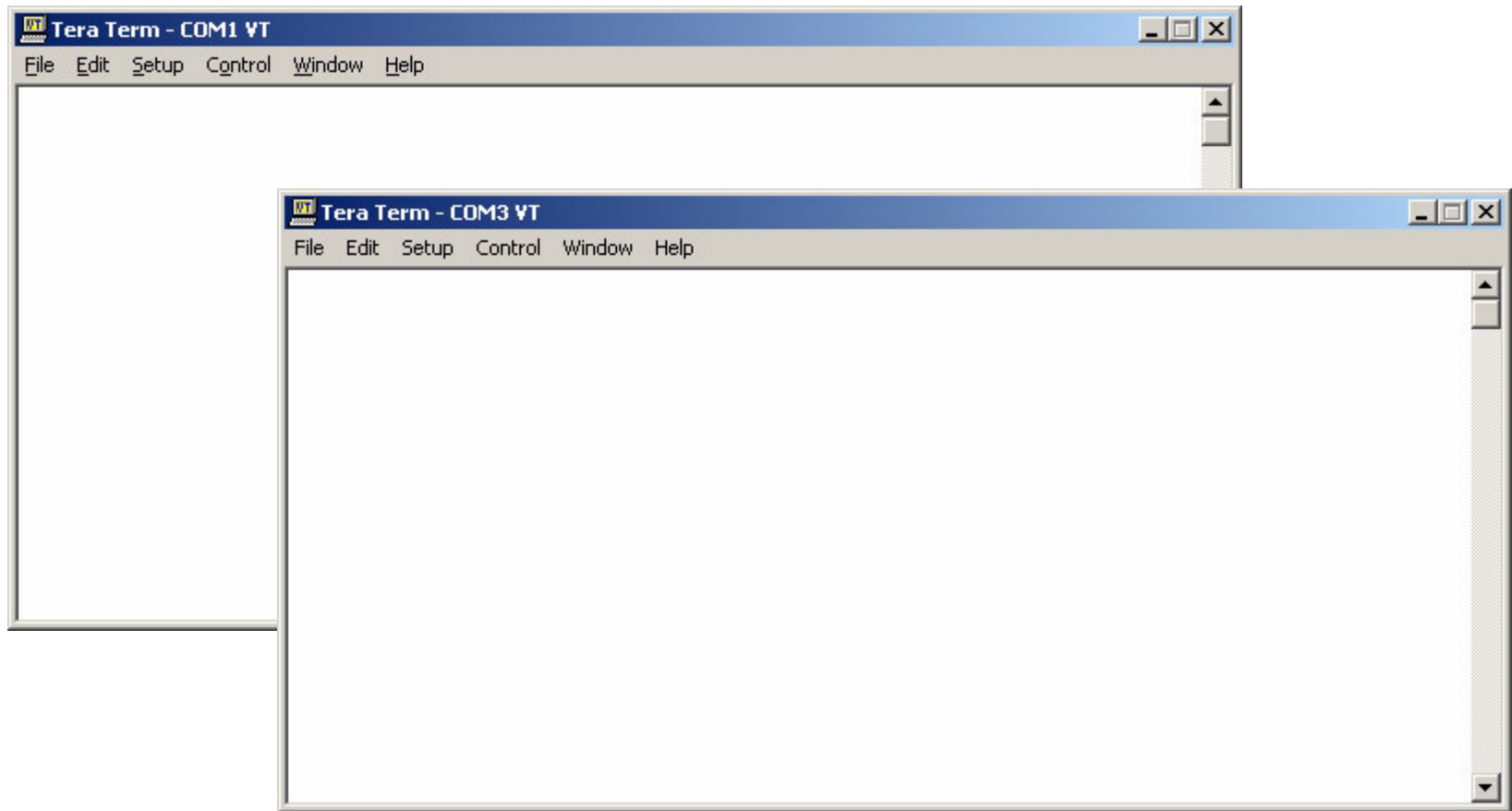
Hardware Setup

- USB Keyboard
 - www.dell.com



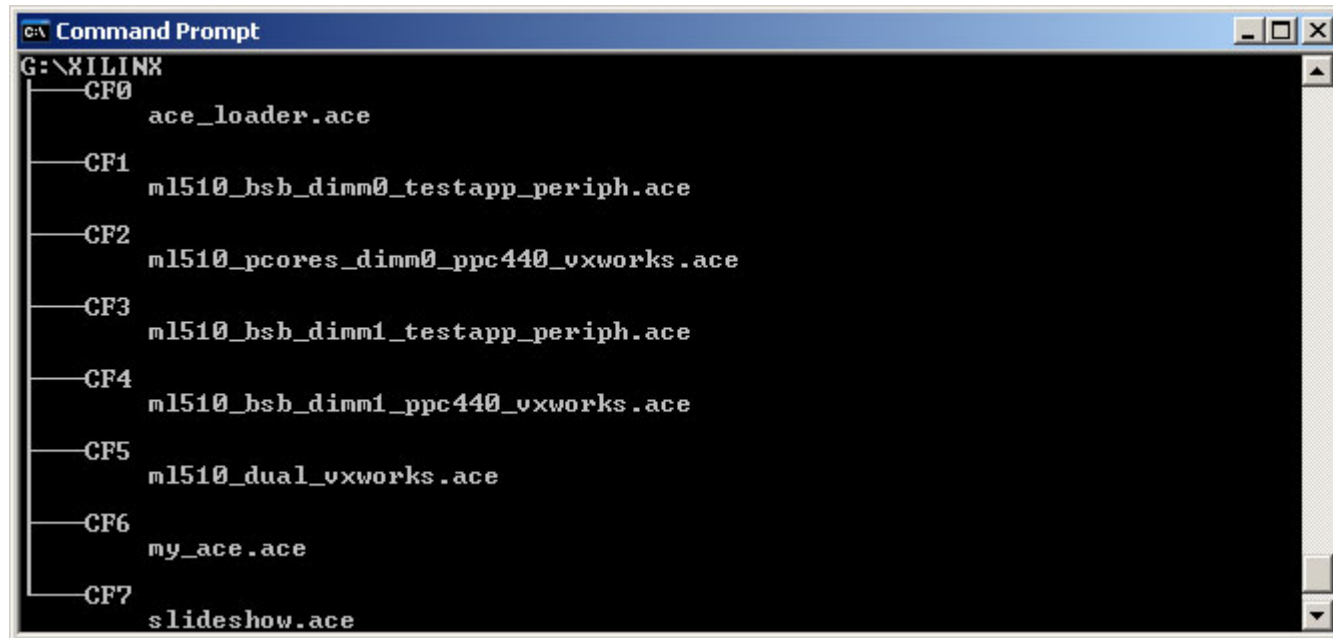
Software Setup

- Start a Terminal Program for each UART:



Factory CompactFlash

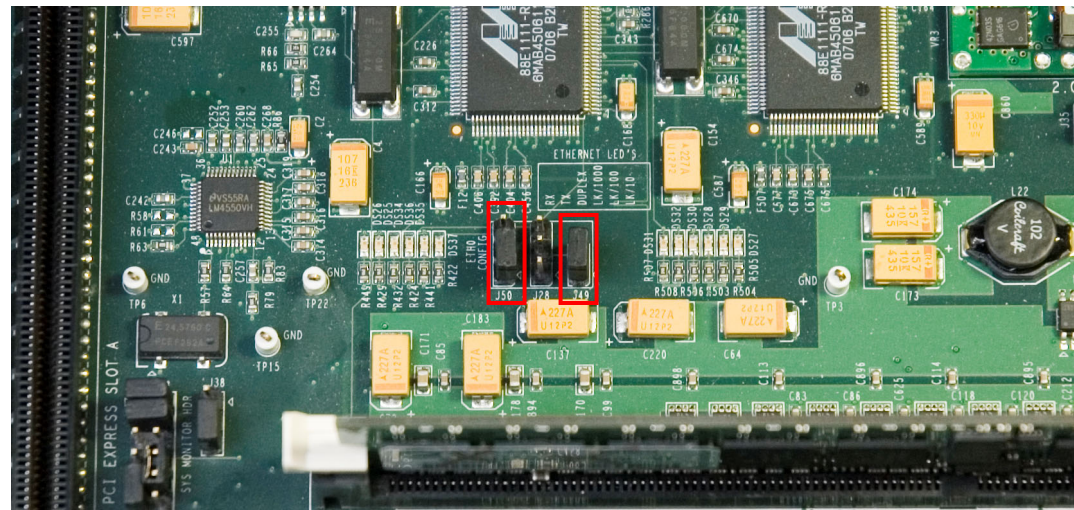
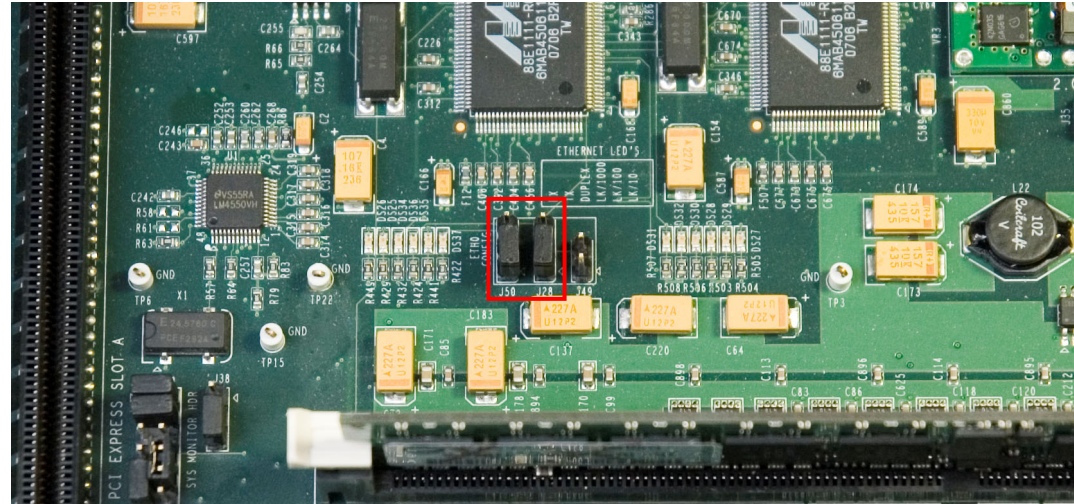
- The CompactFlash shipped with the ML510 board has the following ace files preloaded:



```
G:\XILINX
├── CF0
│   └── ace_loader.ace
├── CF1
│   └── ml510_bsb_dimm0_testapp_periph.ace
├── CF2
│   └── ml510_pcores_dimm0_ppc440_vxworks.ace
├── CF3
│   └── ml510_bsb_dimm1_testapp_periph.ace
├── CF4
│   └── ml510_bsb_dimm1_ppc440_vxworks.ace
├── CF5
│   └── ml510_dual_vxworks.ace
├── CF6
│   └── my_ace.ace
└── CF7
    └── slideshow.ace
```


Network Setup

- Set PHY0 Jumpers
- MII – Connect pins 1 & 2 on J50 and J28
- RGMII – Connect pins 1 & 2 on J50; connect J49



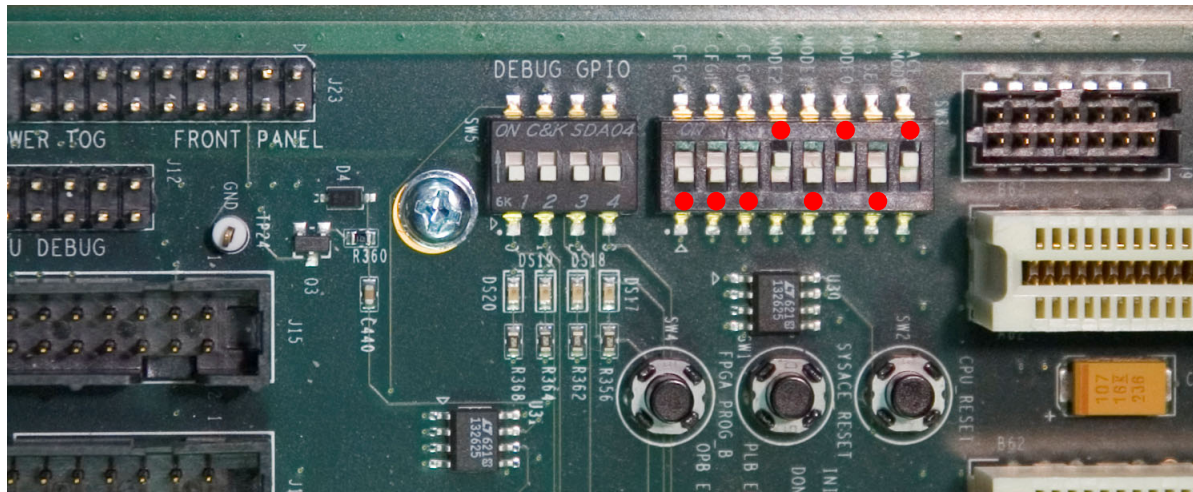
CompactFlash Setup

- Insert the CompactFlash provided with the ML510 fully into the CompactFlash slot on the ML510 board



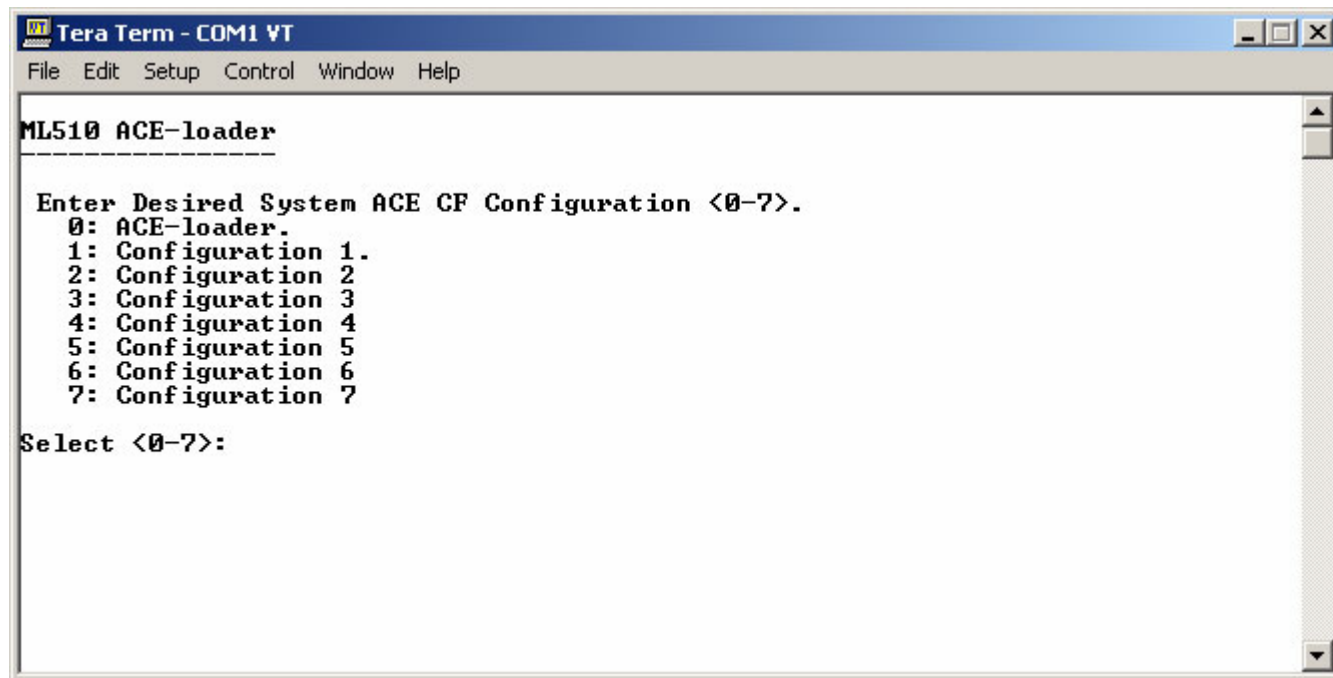
Equipment Setup

- Set SW3 DIP Switches to 00010101 (1 = ON)
- Power-up the ML510 board



ACE-Loader

- The terminal window also reflects the ACE-loader application
- Type the desired number in the terminal window to choose an application
- After each demo, push the SysACE reset to return to bootload



```
Tera Term - COM1 VT
File Edit Setup Control Window Help

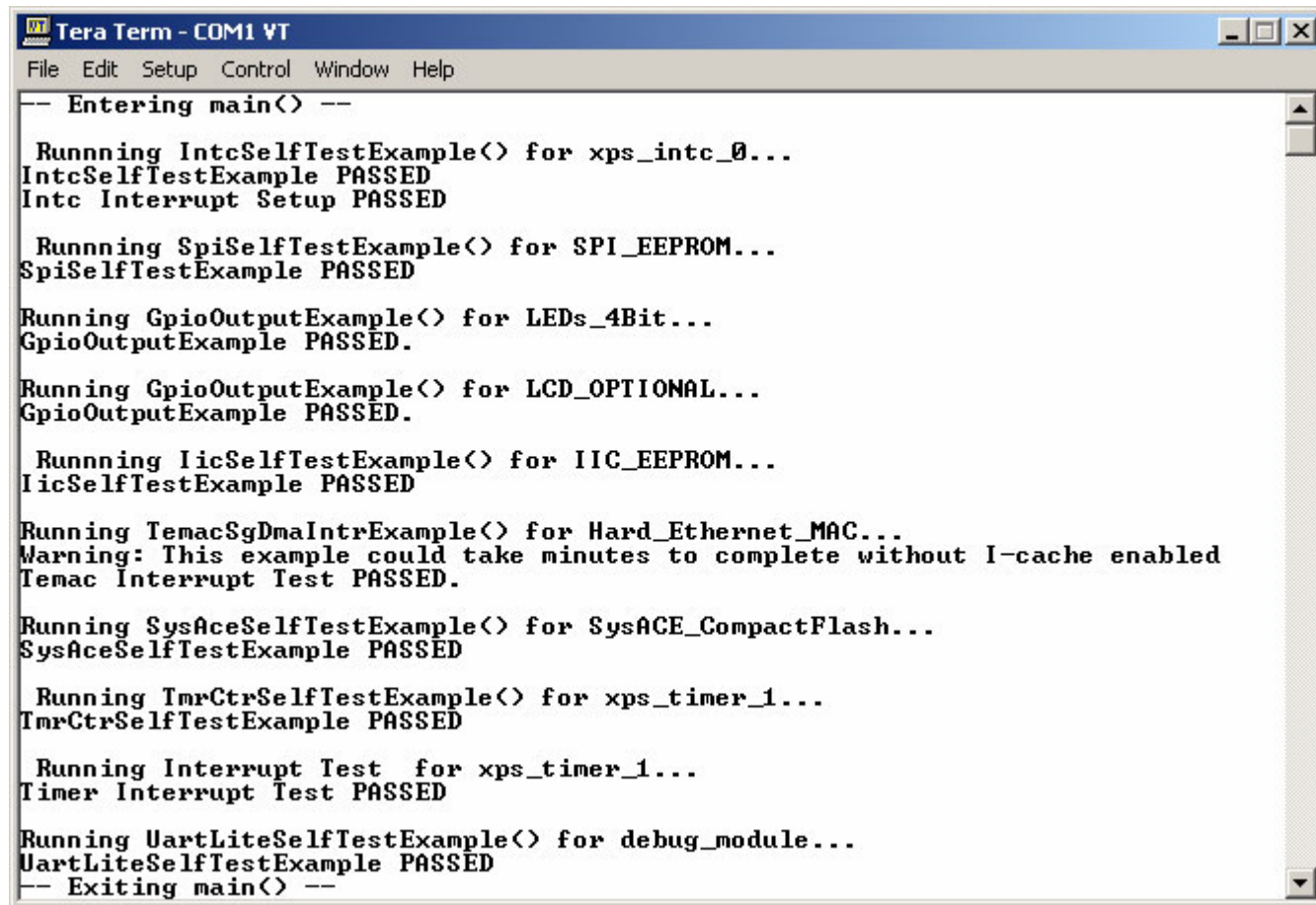
ML510 ACE-loader
-----

Enter Desired System ACE CF Configuration <0-7>.
0: ACE-loader.
1: Configuration 1.
2: Configuration 2
3: Configuration 3
4: Configuration 4
5: Configuration 5
6: Configuration 6
7: Configuration 7

Select <0-7>:
```

CF1 – TestApp Peripheral

- Type 1, to launch the TestApp Peripheral DIMM0 design
 - Set jumpers for MII; takes several minutes to complete



```
Tera Term - COM1 VT
File Edit Setup Control Window Help
-- Entering main() --

Running IntcSelfTestExample() for xps_intc_0...
IntcSelfTestExample PASSED
Intc Interrupt Setup PASSED

Running SpiSelfTestExample() for SPI_EEPROM...
SpiSelfTestExample PASSED

Running GpioOutputExample() for LEDs_4Bit...
GpioOutputExample PASSED.

Running GpioOutputExample() for LCD_OPTIONAL...
GpioOutputExample PASSED.

Running IicSelfTestExample() for IIC_EEPROM...
IicSelfTestExample PASSED

Running TemacSgDmaIntrExample() for Hard_Ethernet_MAC...
Warning: This example could take minutes to complete without I-cache enabled
Temac Interrupt Test PASSED.

Running SysAceSelfTestExample() for SysACE_CompactFlash...
SysAceSelfTestExample PASSED

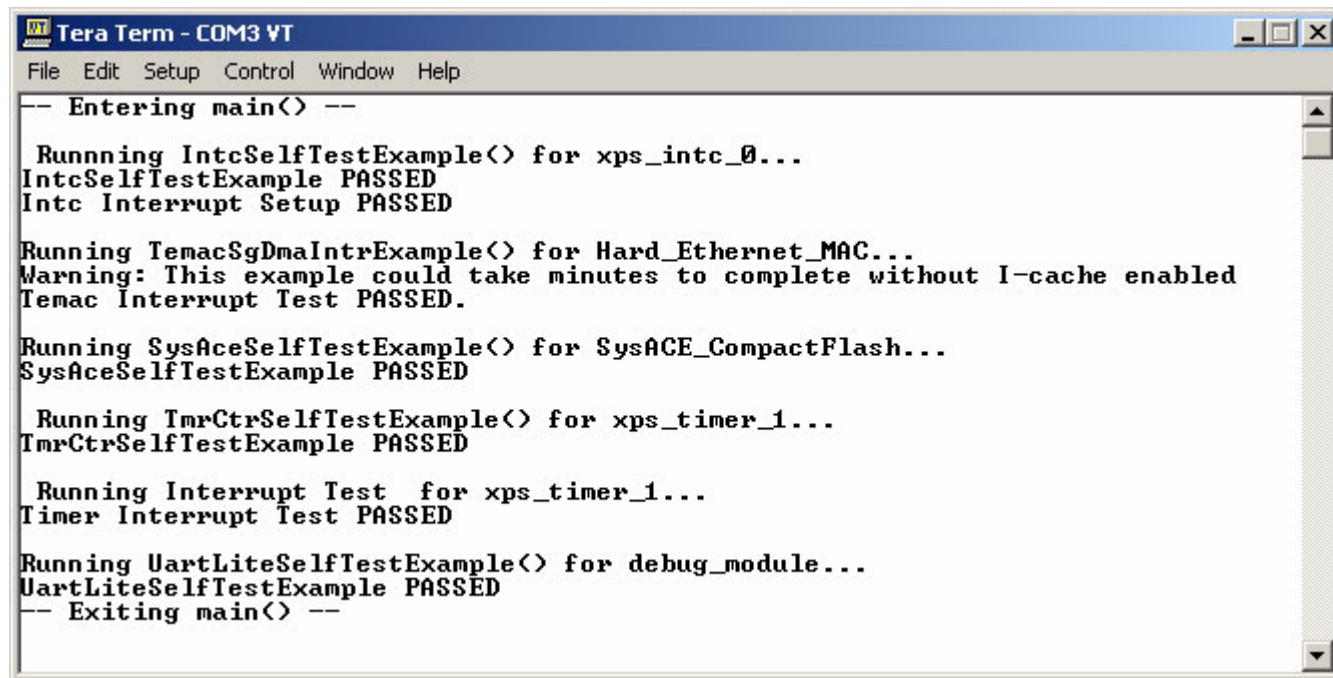
Running TmrCtrSelfTestExample() for xps_timer_1...
TmrCtrSelfTestExample PASSED

Running Interrupt Test for xps_timer_1...
Timer Interrupt Test PASSED

Running UartLiteSelfTestExample() for debug_module...
UartLiteSelfTestExample PASSED
-- Exiting main() --
```


CF3 – TestApp Peripheral

- Type 3, to launch the TestApp Peripheral DIMM1 design
 - View on COM2; takes several minutes to complete



```
Tera Term - COM3 VT
File Edit Setup Control Window Help
-- Entering main() --

Running IntcSelfTestExample() for xps_intc_0...
IntcSelfTestExample PASSED
Intc Interrupt Setup PASSED

Running TemacSgDmaIntrExample() for Hard_Ethernet_MAC...
Warning: This example could take minutes to complete without I-cache enabled
Temac Interrupt Test PASSED.

Running SysAceSelfTestExample() for SysACE_CompactFlash...
SysAceSelfTestExample PASSED

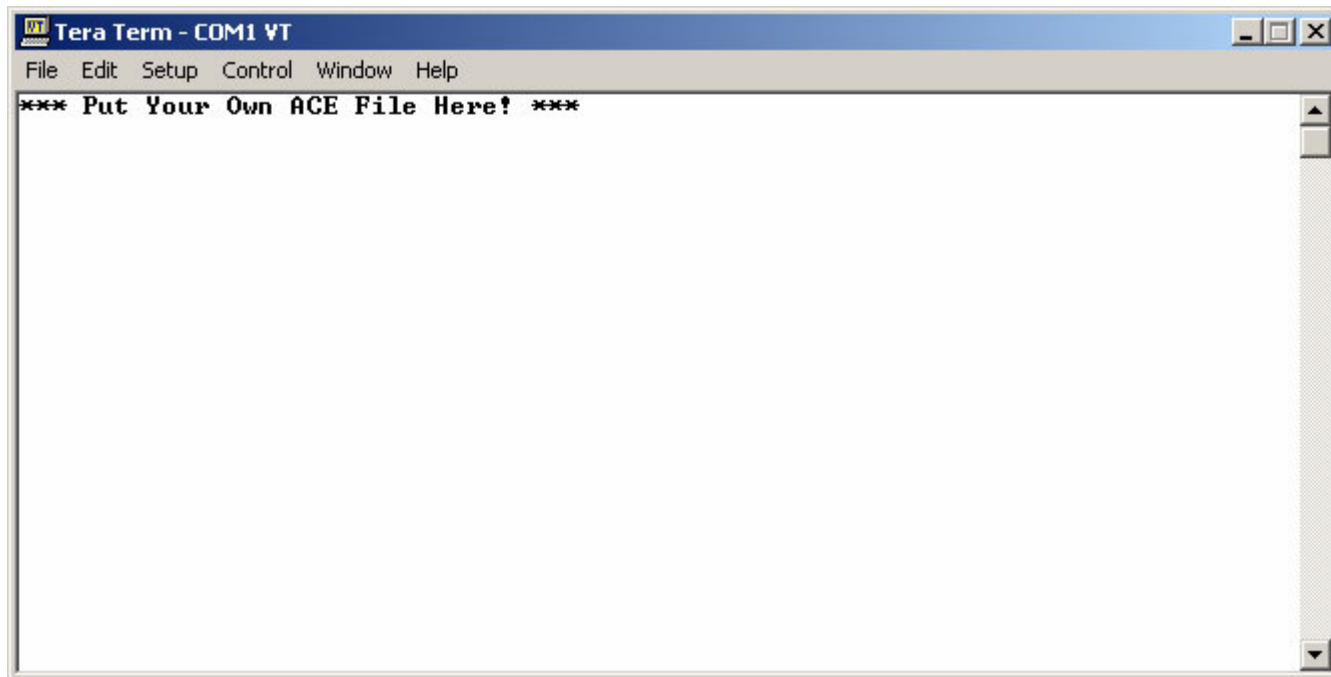
Running TmrCtrSelfTestExample() for xps_timer_1...
TmrCtrSelfTestExample PASSED

Running Interrupt Test for xps_timer_1...
Timer Interrupt Test PASSED

Running UartLiteSelfTestExample() for debug_module...
UartLiteSelfTestExample PASSED
-- Exiting main() --
```

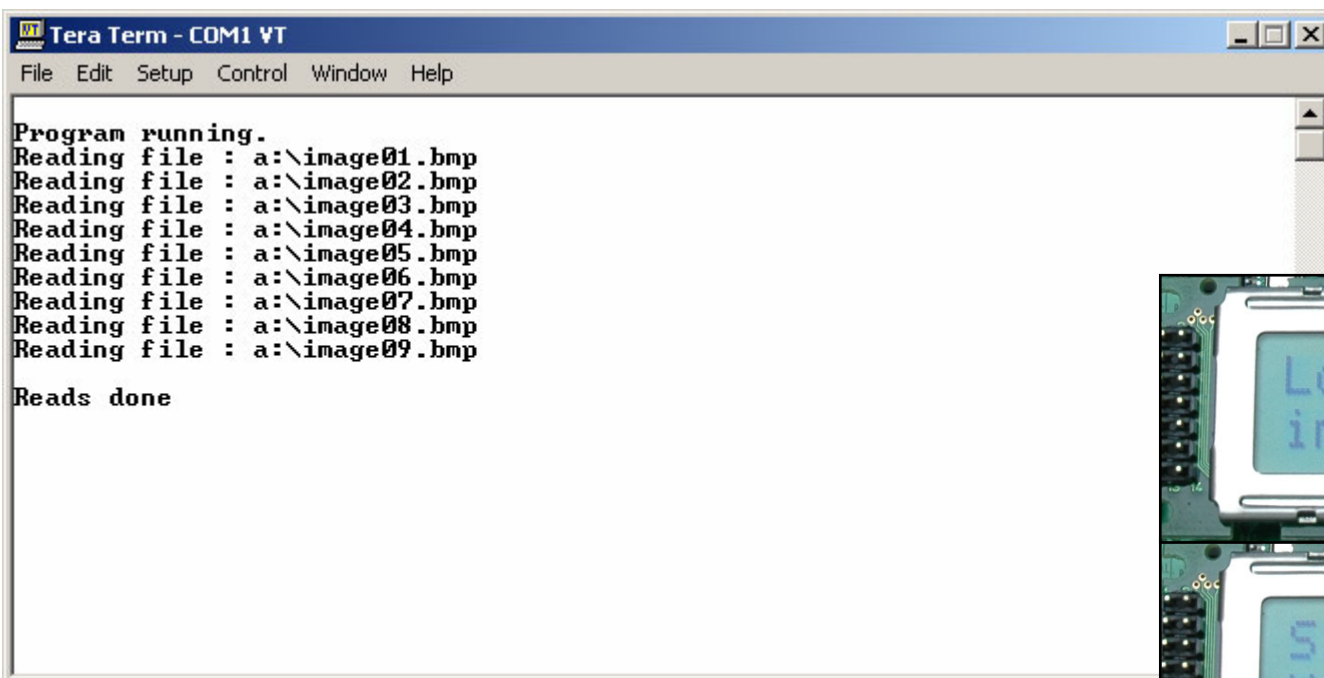

CF6 – My ACE

- Type 6, to launch the placeholder design, my_ace
 - Same message appears on the Monitor



CF7 – Slideshow

- Type 7, to launch the slideshow application
- The slideshow loads the presentation into memory then presents it



```
Tera Term - COM1 VT
File Edit Setup Control Window Help

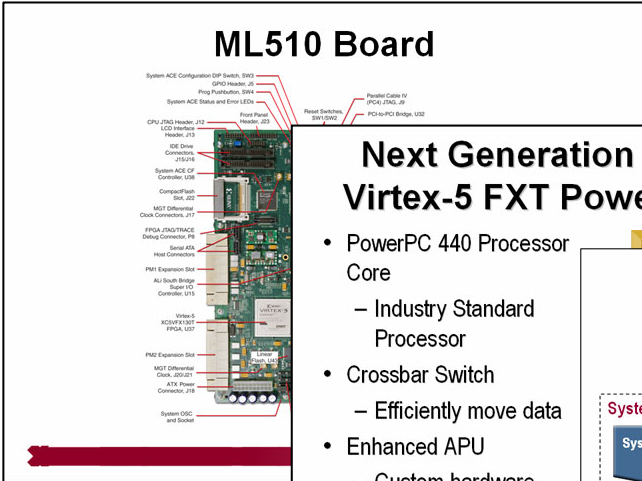
Program running.
Reading file : a:\image01.bmp
Reading file : a:\image02.bmp
Reading file : a:\image03.bmp
Reading file : a:\image04.bmp
Reading file : a:\image05.bmp
Reading file : a:\image06.bmp
Reading file : a:\image07.bmp
Reading file : a:\image08.bmp
Reading file : a:\image09.bmp

Reads done
```



Slideshow

- The slideshow app will present a series of slides on the Monitor:



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Documentation

- Virtex-5
 - Silicon Devices
http://www.xilinx.com/products/silicon_solutions
 - Virtex-5 Multi-Platform FPGA
http://www.xilinx.com/products/silicon_solutions/fpgas/virtex/virtex5
 - Virtex-5 Family Overview: LX, LXT, SXT, and FXT Platforms
http://www.xilinx.com/support/documentation/data_sheets/ds100.pdf
 - Virtex-5 FPGA DC and Switching Characteristics Data Sheet
http://www.xilinx.com/support/documentation/data_sheets/ds202.pdf

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- Virtex-5
 - Virtex-5 FPGA User Guide
http://www.xilinx.com/support/documentation/user_guides/ug190.pdf
 - Virtex-5 FPGA Configuration User Guide
http://www.xilinx.com/support/documentation/user_guides/ug191.pdf
 - Virtex-5 System Monitor User Guide
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 - Virtex-5 Packaging and Pinout Specification
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 - RocketIO GTP Transceivers
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 - RocketIO GTX Transceivers
http://www.xilinx.com/products/silicon_solutions/fpgas/virtex/virtex5/capabilities/RocketIO_GTX.htm
 - RocketIO GTP Transceiver User Guide – UG196
http://www.xilinx.com/support/documentation/user_guides/ug196.pdf
 - RocketIO GTX Transceiver User Guide – UG198
http://www.xilinx.com/support/documentation/user_guides/ug198.pdf

Documentation

- Design Resources

- ISE Development Tools and IP

<http://www.xilinx.com/ise>

- Integrated Software Environment (ISE) Foundation Resources

http://www.xilinx.com/ise/logic_design_prod/foundation.htm

- ISE Manuals

http://www.xilinx.com/support/software_manuels.htm

- ISE Development System Reference Guide

<http://toolbox.xilinx.com/docsan/xilinx10/books/docs/dev/dev.pdf>

- ISE Development System Libraries Guide

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- Additional Design Resources
 - Customer Support
<http://www.xilinx.com/support>
 - Xilinx Design Services:
<http://www.xilinx.com/xds>
 - Titanium Dedicated Engineering:
<http://www.xilinx.com/titanium>
 - Education Services:
<http://www.xilinx.com/education>
 - Xilinx On Board (Board and kit locator):
<http://www.xilinx.com/xob>

Documentation

- Platform Studio
 - Embedded Development Kit (EDK) Resources
<http://www.xilinx.com/edk>
 - Embedded System Tools Reference Manual
http://www.xilinx.com/support/documentation/sw_manuals/edk10_est_rm.pdf
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http://www.xilinx.com/support/documentation/sw_manuals/edk_ctt.pdf

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- PowerPC 440
 - PowerPC 440 Processor
<http://www.xilinx.com/powerpc>
 - Embedded Processor Block in Virtex-5 FPGAs Reference Guide – UG200
http://www.xilinx.com/support/documentation/user_guides/ug200.pdf
 - PPC440 Virtex-5 Wrapper – DS621
http://www.xilinx.com/support/documentation/ip_documentation/ppc440_virtex5.pdf
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- Memory Solutions

- Demos on Demand – Memory Interface Solutions with Xilinx FPGAs

http://www.demosondemand.com/clients/xilinx/001/page_new2/index.asp#35

- Xilinx Memory Corner

http://www.xilinx.com/products/design_resources/mem_corner

- Additional Memory Resources

<http://www.xilinx.com/support/software/memory/protected/index.htm>

- Xilinx Memory Interface Generator (MIG) 2.2 User Guide

http://www.xilinx.com/support/documentation/ip_documentation/ug086.pdf

- Memory Interfaces Made Easy with Xilinx FPGAs and the Memory Interface Generator

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 - ChipScope Pro 10.1i Serial IO Toolkit User Manual
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 - Virtex-5 Embedded Tri-Mode Ethernet MAC Wrapper Getting Started Guide
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 - Virtex-5 Tri-Mode Ethernet Media Access Controller User Guide
http://www.xilinx.com/support/documentation/user_guides/ug194.pdf
 - LightWeight IP (lwIP) Application Examples – XAPP1026
http://www.xilinx.com/support/documentation/application_notes/xapp1026.pdf

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- PLB v4.6 IP
 - Processor Local Bus (PLB) v4.6 Data Sheet – DS531
http://www.xilinx.com/support/documentation/ip_documentation/plb_v46.pdf
 - Multi-Port Memory Controller (MPMC) – DS643
http://www.xilinx.com/support/documentation/ip_documentation/mpmc.pdf
 - XPS Multi-Channel External Memory Controller (XPS MCH EMC) – DS575
http://www.xilinx.com/support/documentation/ip_documentation/xps_mch_emc.pdf
 - XPS LocalLink TEMAC – DS537
http://www.xilinx.com/support/documentation/ip_documentation/xps_ll_temac.pdf
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 - XPS Timer/Counter – DS573
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http://www.xilinx.com/support/documentation/ip_documentation/xps_intc.pdf
 - Using and Creating Interrupt-Based Systems Application Note
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- PLB v4.6 IP
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http://www.xilinx.com/support/documentation/ip_documentation/xps_epc.pdf
 - XPS 16550 UART – DS577
http://www.xilinx.com/support/documentation/ip_documentation/xps_uart16550.pdf
 - PLBV46 to DCR Bridge Data Sheet – DS578
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 - Local Memory Bus Data Sheet – DS445
http://www.xilinx.com/support/documentation/ip_documentation/lmb_v10.pdf
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- JTAGPPC Controller Data Sheet – DS298

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- Processor System Reset Module Data Sheet – DS402

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- Clock Generator v2.0 Data Sheet – DS614

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- Util Bus Split Operation Data Sheet – DS484

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http://www.xilinx.com/support/documentation/boards_and_kits/ml510_bom.xls

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