ML505/506/507 Overview and Setup
Overview of the Hardware Designs and Software Applications
How to set up the equipment, software, CompactFlash, network, and terminal programs

May 2010
ML505 Overview

- ML505 Overview
- Equipment Overview
- Equipment Setup
- Software Setup
- CompactFlash Setup
- Network Setup
- Appendix

Note: This Presentation applies to the ML505, ML506, and ML507
ML505 Overview

- The ML505 embedded development platform provides several reference designs and a versatile hardware platform for rapid prototyping and system verification

- **Hardware Designs**
  - ml505_bsb_design
  - ml505_bsb_std_ip
  - ml505_std_ip_pcores

- **Software Applications**
  - Standalone non-OS applications

*Note: Presentation applies to the ML505, ML506, and ML507*
ML505 BSB Hardware

- The ML505 MicroBlaze design hardware includes:
  - DDR2 Interface (256 MB)
  - BRAM
  - External Memory Controller (EMC)
    - ZBT SRAM
  - Networking
  - UART
  - Interrupt Controller
  - System ACE CF Interface
  - GPIO (IIC, LEDs and LCD)
  - PLB Arbiter

Note: Presentation applies to the ML505, ML506, and ML507
The ML507 PPC440 design hardware includes:

- PPC440MC DDR2 Interface
- External Memory Controller (EMC)
  - ZBT SRAM
- BRAM
- Networking
- UART
- Interrupt Controller
- System ACE CF Interface
- GPIO (IIC, LEDs and LCD)
- PLB Arbiter
Also Available From Xilinx

- These items are not included with the ML505, but are available for purchase from Xilinx:
  - Xilinx IDS (ISE Design Suite)
    - Includes ISE and XPS
  - Platform Cable USB

- These items are required to run the ML505 presentations

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ISE Software Requirements

- Xilinx ISE 12.1 software
EDK Software Requirement

- Xilinx EDK 12.1 software

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ChipScope Pro Software Requirement

- Xilinx ChipScope Pro 12.1 software

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ML505 Board

- Features the Xilinx Virtex™-5 XC5VLX50T FPGA

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ML505 Board

- USB Peripheral - J17
- Serial Port COM2
- Line Out - P12
- Amplified Line Out - P13
- Line In - P11
- Microphone In - P10
- Power Connector, P20
- Power-On Switch SW1
- Diff CLK Out J12, J13
- Piezo Transducer SW1
- Virtex-5 XC5VLX50T FPGA
- Rotary Switch SW3
- USB Host, J18
- SFP Module, P19
- SPDIF Out, P14
- Parallel Cable IV (PC4) JTAG, J1
- VGA Port P8
- MGT Connection J42-J45
- Ethernet P6
- Diff CLK In J10, J11
- Digital Video Connector, P7
- SATA Connectors J40, J41
- Prog Pushbutton, SW5 SYSACE Reset, SW4 CPU Reset, SW7
- Status & Error LEDs
- PCIe Interface
- GPIO LEDs
- GPIO PBs
- GPIO DIP SW8
Equipment Overview

- **SiliconDrive™ 128 MB CompactFlash™**
  - Comes preloaded with hardware and software demonstration systems for ML505

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Equipment Overview

- **DVI monitor**
  
or

- **DVI to VGA adapter**
  - To connect from the ML505 DVI port to a standard VGA monitor
  - [http://www.belkin.com](http://www.belkin.com)

- **Pancake Fan (optional)**
  - Recommended for cooling the Virtex-5 device on the ML505 board

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Equipment Setup

- Set Front DIP Switches to 00010101 (1 = ON)

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Equipment Setup

- Set Rear DIP switches to 11001010 (1 = ON)

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Equipment Setup

- **Set the Ethernet PHY jumper settings**
  - For GMII/MII (factory default), set J22, J23 to positions 1-2 (as shown)
  - For SGMII, set both J22 and J23 to positions 2-3
  - Refer to the ML505/506/507 User Guide – UG347 for details

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Equipment Setup

- **Optional: Second serial port connection**
  - Connecting the serial cable to the ML505 COM2 port requires an additional serial cable and standoff:

- **Standoff**
  - Samtec part Number: SSQ-105-02-G-D, available from Digikey:
  - [http://www.digikey.com](http://www.digikey.com)

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Equipment Setup

- Serial cable
  - DB9M TO IDC10 SERIAL (AT-EVEREX-INTEL Version) PORT
  - [http://www.pccables.com](http://www.pccables.com)

- Remove the bracket and reinstall the screws to keep the connector together (1)

Note: Presentation applies to the ML505, ML506, and ML507
• Push the header onto the COM2 pins as seen here

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Equipment Setup

- Attach the DB9M to IDC10 serial cable to the header
  - The red stripe should be closest to the edge of the board

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Equipment Setup

- User supplied – null modem serial cable

*Note:* Presentation applies to the ML505, ML506, and ML507
Equipment Setup

- Connect power, serial cable, PS2 Keyboard and a USB Keyboard to the ML505

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Equipment Setup

- **Connect Ethernet and DVI to ML505**
  - Use DVI adapter if using VGA monitor

*Note: Presentation applies to the ML505, ML506, and ML507*
Software Setup

- Install a terminal program, such as Tera Term Pro
  - Required to input the commands, and view the results
- See the appendix for details on terminal programs and setup

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CompactFlash Setup

- Insert the CompactFlash provided with the ML505 fully into the CompactFlash slot on the ML505 board.
Network Setup

- From the Windows Control Panel, open Network Connections
- Right-click on the Gigabit Ethernet Adapter and select Properties

Note: Presentation applies to the ML505, ML506, and ML507
Network Setup

- Click Configure
  - Set the Media Type to Auto for 1 Gbps then click OK

**Note:** ML505/506 QuickStart uses 100Mb Full
Network Setup

- Reopen the properties after the last step
- Set your host (PC) to this IP Address:

**Note:** Some presentations use other IP addresses; change as directed
Browser Setup

- Depending on your local network, the browser used for the LwIP demo may need the proxy disabled (Internet Explorer shown)

Note: Presentation applies to the ML505, ML506, and ML507
Terminal Programs

- Terminal programs are used to communicate with the processor
- Terminal programs in this setup use a serial interface
- Free programs are available
  - Tera Term Pro (recommended)
    - [http://hp.vector.co.jp/authors/VA002416/teraterm.html](http://hp.vector.co.jp/authors/VA002416/teraterm.html)

Note: Presentation applies to the ML505, ML506, and ML507
Tera Term Pro

- After installation, open Tera Term Pro and select the serial port desired

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Tera Term Pro

- Select Setup → Serial Port...

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Tera Term Pro

- Set the serial port parameters
  - 9600 baud
  - 8 Data Bits
  - No Parity
  - One Stop Bit
  - No Flow Control

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Tera Term Pro

- Select Setup → Window…
  - Increase the Scroll Buffer to 10,000 lines

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Tera Term Pro

- **Select Setup → Save Setup…**
  - Save init file as COM1_9600.INI

Note: Presentation applies to the ML505, ML506, and ML507
Repeat these steps for your second COM port
  - Save init file as COM2_9600.INI

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Tera Term Pro

- **To automatically restore the command line options**
  - Use "/F=<file name>.ini"

- **To automatically open a log file**
  - Use "/L=<log file>.log"

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Tera Term Pro

- You can add shortcuts to your desktop for Tera Term Pro
  - Allows the command line options to be added here
- Right-click on your desktop and select New → Shortcut
- Browse for the terminal program folder

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Tera Term Pro

- For Tera Term Pro, link to the `ttermpro.exe` program file:
  - `C:\Program Files\TTERMPRO\ttermpro.exe`

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Tera Term Pro

- Add the command line options
  
  `/F=COM1_9600.INI /L=COM1.LOG`

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Tera Term Pro

- **Finish creating the shortcut**
  - Name the shortcut
  - Click Finish

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Documentation
Documentation

- **ML505/506/507 Documentation**
  - ML505 Overview
    [http://www.xilinx.com/ml505](http://www.xilinx.com/ml505)
  - ML506 Overview
    [http://www.xilinx.com/ml506](http://www.xilinx.com/ml506)
  - ML507 Overview
  - ML505/506/507 Getting Started Tutorial – UG348