TMS320-XDS100v3
DSP and ARM emulator and adapter
USER'S MANUAL

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Designed by OLIMEX Ltd, 2013

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THERE IS NO WARRANTY FOR THE DESIGN MATERIALS AND THE COMPONENTS USED TO CREATE TMS320-XDS100v3. THEY ARE CONSIDERED SUITABLE ONLY FOR TMS320-XDS100v3.

Table of Contents

CHAPTER 1 OVERVIEW

1. Introduction to the chapter

Thank you for choosing the TMS320-XDS100v3 emulator from Olimex! This document provides a user's guide for the Olimex TMS320-XDS100v3. As an overview, this chapter gives the scope of this document and lists the board's features. The differences between the members of the TMS320-XDS100v3 family are mentioned. The document's organization is then detailed.

The emulator is based on design provided and distributed by Texas Instruments.

1.1 Features

- TMS320-XDS100V3 hardware is designed to work with CCS 5.x software
- IEEE 1149.7 capable emulator with a USB interface.
- Can function as an 1149.7 adapter for use with existing scan controllers.
- Support for ARM Ltd's Single Wire Output (SWO).
- Software compatible with XDS100v2 (except link delay and IEEE 1149.7 modes).
- Physical jumper to select emulator or adapter mode.
- Operates in 1149.7 Class 4, up to 25MHz.
- LED to indicate IEEE 1149.7 Class 4 operation.
- LED to indicate operation in adapter mode.
- Supported devices: TMS320C28xx, TMS320C54xx, TMS320C55xx, TMS320C674x, TMS320C64x+, TMS320C66x, ARM9, ARM Cortex A9, ARM Cortex A8, ARM Cortex M3, ARM Cortex R4
- Suitable for ARM 14 pin and ARM 20 pin layouts
- Works with targets in the 1.65 – 5.0V range
- Uses standard 0.1" 2x7 pin and 2x10 pin JTAG connector
- No need for external power supply, all required power is taken from USB and the target
- Dimensions 95x46 mm (3.75x1.8") + 2x15 cm (8") cables

For full list of features visit the TI's wiki address:
http://processors.wiki.ti.com/index.php/XDS100#XDS100v3_Features

1.2 Target market and purpose of the board

The main purpose of the board is programming Texas Instrument's DSP (digital signal processing) chips AND ability to program high-speed ARM chips. The board can also act as adapter to existing scan controllers.

The design of the board follows the suggestions and the schematics provided by Texas Instruments.

1.3 Organization

Each section in this document covers a separate topic, organized as follow:
- Chapter 1 is an overview of the board usage and features
- Chapter 2 provides a guide for quickly setting up the board
- Chapter 3 contains the general board diagram and layout
- Chapter 4 mentions the main software tools used with TMS320-XDS100v3
- Chapter 5 is an explanation of the interfaces, the leds, the jumpers position
- Chapter 6 contains the revision history, useful links and support information

CHAPTER 2 SETTING UP THE TMS320-XDS100v3

2. Introduction to the chapter

This section helps you set up the TMS320-XDS100v3 emulator/adapter for the first time.

Please consider first the electrostatic warning to avoid damaging the board, then discover the hardware and software required to operate the board.

The procedure to power up the board is given, and a description of the default board behavior is detailed.

2.1 Electrostatic warning

TMS320-XDS100v3 is shipped in a protective anti-static package. The board must not be exposed to high electrostatic potentials. A grounding strap or similar protective device should be worn when handling the board. Avoid touching the component pins or any other metallic element.

2.3 Requirements

In order to set up the TMS320-XDS100v3 optimally, the following items are required:

- USB-A to mini-USB cable
- Set of software tools (preferably Code Composer Studio 5 – check the table - http://processors.wiki.ti.com/index.php/XDS100#XDS100_Installation_Instructions)
- a TARGET from the supported list (can be found here: http://processors.wiki.ti.com/index.php/XDS100#XDS100v3_Features)

Note that there are two ribbon cables included in the package – for the JTAG_14 and the JTAG_20 connectors.

2.4 Powering the board and installation procedure

The board is powered via the USB.

A. Install Code Composer Studio 5.1.x before connecting XDS100 USB hardware.

B. Install the EmuPack with XDS100v3 support.

C. Connect the XDS100 hardware

    1. Make sure the Code Composer Studio 5.1.x and EmuPack with XDS100v3 support is installed FIRST before plugging in the XDS100 HW to the PC.

    2. Connect USB cable from the PC to the XDS100 hardware. Connect the JTAG to the target board (be careful to plug it in correctly: pin 1 should go to pin 1. Red strip usually indicates the side of pin 1)

    3. You will notice small popups to inform user that USB hardware is recognized and installed correctly. No input are required.

D. Setup Code Composer Studio v5.x.x

    4. Start Code Composer Studio and create a new target configuration.

    5. Select XDS100v3 as connection type

    6. Select device (target).

E. The configuration of the emulator in CCS 5 is shown below:

Connection Properties
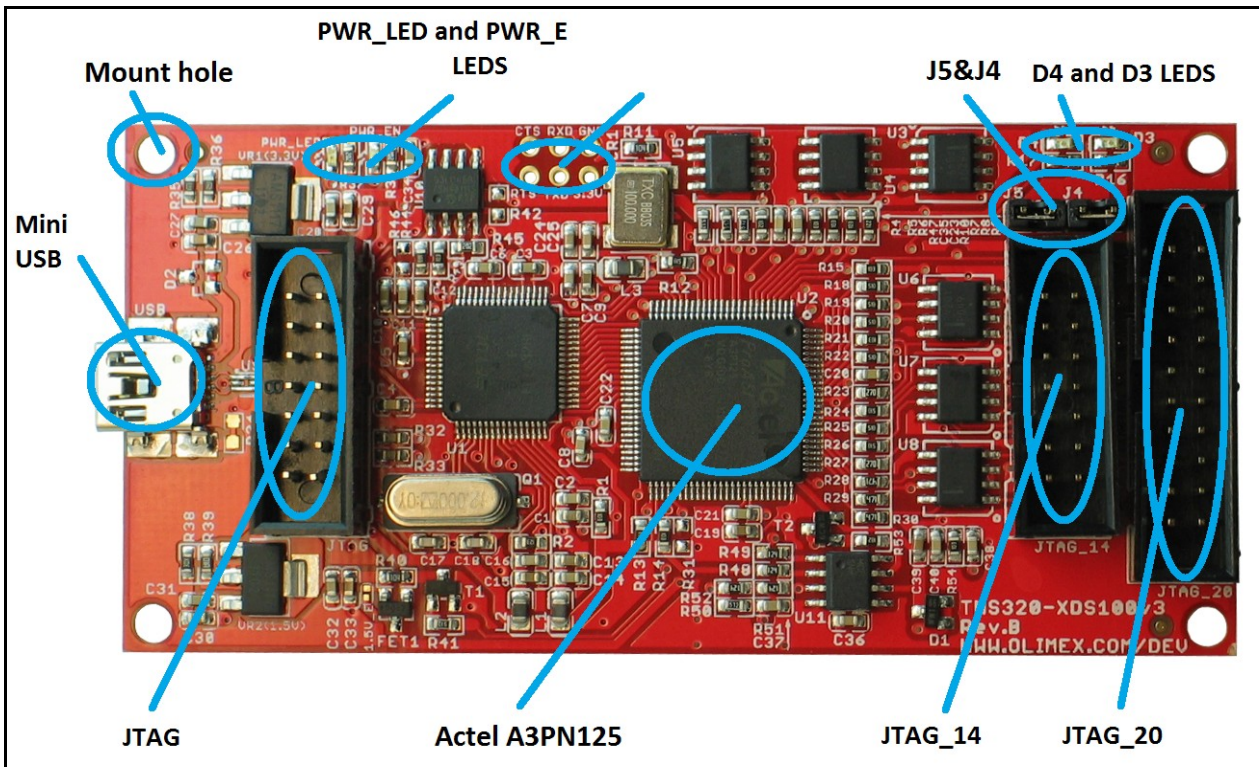Set the properties of the selected connection.

Board Data File	auto generate
Emulator Selection	Only one XDS100v3 installed
The JTAG nTRST Boot-Mode	Disabled - Both EMU pins remain hi-z
The Power-On-Reset Boot-Mode	Disabled - Both EMU pins remain hi-z
The JTAG Signal Isolation	Don't isolate JTAG signals at final disconnect
The Converter Usage	Generate 1149.7 4-pin standard mode
The Emulator 1149.1 Frequency	Adaptive with user specified limit
-- Enter a value from 488Hz to 30.0MHz	30.0MHz
The Target Pin Width	The target hardware has 4 JTAG pins

CHAPTER 3 TMS320-XDS100v3 DESCRIPTION

3. Introduction to the chapter

Here you get acquainted with the main parts of the board. Note the names used on the board differ from the names used to describe them. For the actual names check the TMS320-XDS100v3 board itself.

3.1 Layout (top view)

CHAPTER 4 INTERFACES AND HARDWARE

4. Introduction to the chapter

In this chapter the connectors function will be pointed, the LEDs will be explained, as well as the jumpers.

4.1 Connectors

There are five connectors on this board. 3 of them are explained below. The USB connector is type mini and the small testpads for CT-RXD-GND-RTS-RXD-3/30V is named at the silk.

Note that the JTAG layout follows the TI specification. Please refer to the table that can be found at the following web address: http://processors.wiki.ti.com/index.php/JTAG_Connectors

4.1.1 JTAG

The JTAG connector (note the one WITHOUT _14 appended) is used when the device is used as adapter for older devices.

4.1.2 JTAG_14

Used for 14 pin JTAG connectoon.

4.1.3 JTAG_20

Used for 20 pin JTAG connection

4.2 LEDs

There are four leds on TMS320-XDS100v3. Two for indicating power input and power output and two for the state of the jumpers.

4.2.1 Power LEDs

The PWR_LED shows whether the board is powered. The PWR_EN shows whether the board can power the target.

4.2.2 D3 and D4

The D3 and D4 leds show the state of, respectively, J4 and J5 jumpers.

4.3 Jumpers

There are two PTH jumpers on TNS320-XDS100v3. They are responsible for the emulation – adapter configuration. When J4 and J5 are open – the chosen mode is emulator mode. When J4 an J5 are closed the chosen mode is adapter.

CHAPTER 5 REVISION HISTORY AND SUPPORT

5. Introduction to the chapter

In this chapter you will find the current and the previous version of the document you are reading. Also the web-page for your device is listed. Be sure to check it after a purchase for the latest available updates and examples.

5.1 Document revision

Revision	Changes	Modified Page#
A, 10.09.12	Initial Creation	All
B, 25.09.12	Fixed several problems with links. Fixed the line numbers and the formatting of the index. Some other minor changes	3, 6, 7, 9, 12
C, 03.01.12	Added emulator options screenshot, fixed several spelling errors	7

5.2 Useful web links and purchase codes

The web page you can visit for more info on your device is
https://www.olimex.com/Products/DSP/Emulators/TMS320-XDS100-V3/.

ORDER CODES:

TMS320-XDS100v3 – completely assembled and tested JTAG emulator

How to order?

You can order to us directly via our internet shop or from any of our distributors.
Check https://www.olimex.com/ for more info.

5.3 Product support

For product support, hardware information and error reports mail to: support@olimex.com. Note that we are primarily a hardware company and our software support is limited.

Please consider reading the paragraph below about the warranty of Olimex products.

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Warranty and returns:

Our boards have lifetime warranty against manufacturing defects and
components.

During development work it is not unlikely that you can burn your programmer
or development board. This is normal, we also do development work and we have
damaged A LOT of programmers and boards during our daily job so we know how it
works. If our board/programmer has worked fine then stopped, please check if
you didn't apply over voltage by mistake, or shorted something in your target
board where the programmer was connected etc. Sometimes boards might get
damaged by ESD shock voltage or if you spill coffee on them during your work
when they are powered.

Please note that warrany do not cover problems caused by unproper use, shorts,
over-voltages, ESD shock etc.

If the board has warranty label it should be not broken. Broken labels void
the warranty, same applies for boards modified by the customer, for instance
soldering additional components or removing components - such boards will be
not be a subject of our warranty.

If you are positive that the problem is due to manufacturing defect or
component you can return the board back to us for inspection.

When we receive the board we will check and if the problem is caused due to
our fault and we will repair/replace the faulty hardware free of charge,
otherwise we can quote price of the repair.

Note that all shippings back and forth have to be covered by the customer.
Before you ship anything back you need to ask for RMA. When you ship back
please attach to it your shipping address, phone, e-mail, RMA# and brief
description of the problem. All boards should be sent back in antistatic
package and well packed to prevent damages during the transport.
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