



DOMAIN TECHNOLOGIES INC.

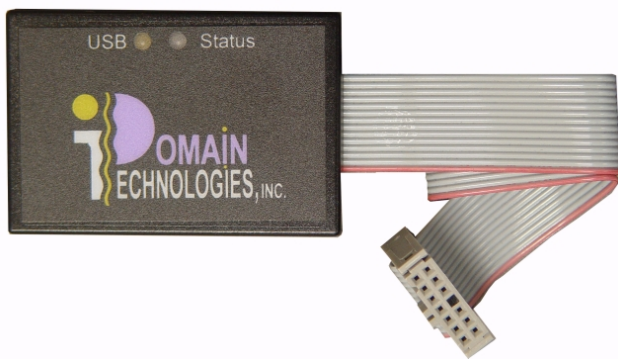
Users Guide Version 1.1

USB-EMU

Emulator

Table of Contents

- 1 INTRODUCTION 3
 - 1.1 Features..... 4
 - 1.2 Package Contents 5
 - 1.3 Related Components 5
- 2 INSTALLATION 5
- 3 OPERATION OF THE USB-EMU 6
 - 3.1 OnCE Pin-out..... 6
 - 3.2 JTAG Pin-Out..... 6
- 4 SCHEMATICS 7



1 Introduction

The USB-EMU emulator enables efficient and productive embedded software debugging. This versatile probe supports either a single JTAG connection or a single OnCE (On-Chip Emulation) connection promoting debug flexibility and convenience.

When used with Domain Technologies' BoxView or BoxView IDE debugger, the USB-EMU provides access to the JTAG device's boundary scan functionality (BSDL file required). Boundary scan operations enable non-intrusive monitoring of the target device pins, even while the target device is executing its own application code. The USB-EMU emulator can program external flash memory devices also.

With the use of Domain Technologies BoxServer connectivity software, the USB-EMU emulator can be used for multi-core and/or multi-device development when the JTAG devices are properly connected within the same JTAG scan chain. This development capability allows simultaneous start/stop/single-step for multiple devices; BoxServer connectivity software provides access via TCP/IP connection.

1.1 Features

The USB-EMU has the following features:

- Powered by USB port
- Freescale On-Chip Emulation OnCE support
- JTAG TAP Debug support
- JTAG Boundary Scan (IEEE1149.1) support
- Device Power Detection
- Supplies max of 300mA to Devices
- Dimensions: 1.7"x2.4"x0.4"

Measuring only 1.7 x 2.4 x 0.4 inches, the USB-EMU communicates with the host PC via the USB port. The versatile USB-EMU emulator supports debugging through two protocols: the standard JTAG and Freescale's embedded processors via OnCE (On-Chip Emulation).

On-Chip Emulation (OnCE) is a circuit included in Freescale's embedded processors that allows simple, inexpensive, and speed independent access to the processor's internal registers and peripherals. OnCE tells application programmers the actual status of registers, memory locations, peripherals, and even the last few instructions executed. However, it is limited to one device per emulator, so serial access to multiple processors is not possible.

The JTAG Boundary Scan Interface (IEEE 1149.1), is a serial interface allowing for debugging and diagnostics of embedded systems through a relatively small number of pins.

In addition to supporting both JTAG and OnCE, USB-EMU can detect whether or not the device has power, and can also supply up to 300mA of power to the device. The USB-EMU emulator is powered from the USB connection which eliminates the need for a separate power supply and also making it ideal for use with notebook computers. JTAG operations are carried out at a rate of about 400 kbits per second.

1.2 Package Contents

The USB-EMU ships with the following:

- Emulator
- USB cable
- Drivers for MS Windows
- Users Guide

1.3 Related Components

Domain Technologies features several evaluation boards to promote fast and reliable prototyping. External connectors provide the option for increased performance utilizing the USB-EMU, SB-USB, SB-USB2-DSP emulators.

For more information contact Domain Technologies or review www.domaintec.com.

2 Installation

Included with the USB-EMU emulator is a 6-ft. USB cable and installation CD. Verify both have been delivered with the emulator.

The installation CD contains a number of emulator test program and driver DLLs; these enable the USB-EMU emulator to operate with Domain Technologies' BoxView and BoxView Integrated Development Environment (IDE) as well as Altium's Crossview Debugger. The software installation must be executed before connecting USB emulator to the system. The installation procedure provides information about location of the USB drivers, so Windows can find them automatically.

Insert the installation CD into your CD ROM drive. If auto detect is enabled in your system environment setup, then the installation program will automatically launch. Otherwise, double-click the *UsbEmuInstall.exe* file located on the CD drive from within Windows Explorer. Follow the steps through the installation program to perform a complete or partial install of the USB-EMU supporting software.

3 Operation of the USB-EMU

The USB-EMU’s ribbon cable provides connectivity to both OnCE and JTAG devices.

3.1 OnCE Pin-out

The following pin-out configuration is used with an OnCE connection:

DSI	1	2	MUX1
DSO	3	4	GND
DSCK	5	6	GND
-DR	7		key
-RST	9	10	nc
VCC	11	12	nc
nc	13	14	MUX2

3.2 JTAG Pin-Out

The following pin-out configuration is used with a JTAG connection:

TDI	1	2	GND
TDO	3	4	GND
TCK	5	6	GND
nc	7		key
-RST	9	10	TMS0
VCC	11	12	TMS1
-DE	13	14	-TRST



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