

XDS510PP ***MPSD Emulator Pod***

Installation Guide

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MPSD Emulator Pod
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Contents

1	Installing the Emulator	1-1
	<i>Lists the hardware and software you'll need to install the XDS510 emulator pod.</i>	
1.1	What You'll Need	1-2
	Hardware checklist	1-2
	Software checklist	1-2
1.2	Step 1: Connecting the Emulator to your PC	1-3
	Preparing the emulator for installation	1-3
1.3	Step 2: Connecting the Emulator to Your Target System	1-4
	Setting up the "XDS510PP.INI" file	1-5
	Resetting the emulator	1-6
1.4	Utility Programs	1-6
2	Specifications for Your Target System's Connection to the Emulator	2-1
	<i>Contains information about constructing a 14-pin connector on your target system and information about connecting the emulator to the target system.</i>	
2.1	Designing Your Target System's Emulator Connector (14-pin Header)	2-2
2.2	Bus Protocol	2-3
2.3	Emulator Pod Logic	2-4
2.4	Emulator Pod Signal Timing	2-6
2.5	Buffering Signals Between the Emulator and the Target System	2-7
2.6	Emulation Timing Calculations	2-10
2.7	Mechanical Dimensions for the 12-Pin Emulator Connector	2-13

Chapter 1

Installing the XDS510PP MPSD Emulator Pod

This chapter helps you install the XDS510PP MPSD emulator pod on a PC running Windows or Windows 95. When you complete the installation, refer to the appropriate *C Source Debugger User's Guide* for software installation.

Topic	Page
1.1 What You'll Need	1-2
Hardware checklist	1-2
Software checklist	1-2
1.2 Step 1: Connecting the Emulator to your PC	1-3
Preparing the Emulator pod for installation	1-3
1.3 Step 2: Connecting the Emulator to Your Target System	1-4
Setting up the "XDS510PP.INI" file	1-5
Resetting the emulator	1-6
1.4 Utility Programs	1-6

1.1 What You'll Need

The following checklists detail items that are shipped with the XDS510PP MPD emulator and additional items you'll need to use these tools.

Hardware checklist

- ___ **host** An IBM PC/AT or compatible ISA/EISA-based PC with a hard-disk system and a 1.44M floppy-disk drive
- ___ **memory** Minimum of 640K; in addition, if you are running under Microsoft Windows, you'll need at least 256K of extended memory
- ___ **display** Monochrome or color (color recommended)
- ___ **parallel port** One centronics printer port, bidirectional for 4 bit, 8 bit, or EPP compatible,
- ___ **emulator module power requirements** 5 Volts DC (125 milliamps)
- ___ **target system** A board with an appropriate target device
- ___ **connector to target system** 12-pin connector (two rows of six pins) --- see Chapter 2 for more information about this connector
- ___ **optional hardware** A Microsoft-compatible mouse

An EGA or VGA compatible graphics display card and a large monitor. The debugger has several options that allow you to change the overall size of the debugger display. If you have an EGA or VGA compatible graphics card, you can take advantage of some of these larger screen sizes. These larger screen sizes are most effective when used with a large (17" or 19") monitor. (To use a larger screen size, you must invoke the debugger with an appropriate option. For more information about options, refer to the invocation section in Chapter 1, *Overview of a Code Development and Debugging System, in the TMS320C5x C Source Debugger User's Guide.*)
- ___ **miscellaneous materials** Blank, formatted disks
25 Conductor Printer Cable

Software checklist

- ___ **operating system** Microsoft Windows 3.1 or Windows 95
- ___ **required file** *emurst.exe* resets the XDS510PP emulator pod

1.2 Step 1: Installing the XDS510PP MPD Emulator Pod

This section contains the hardware installation information for the emulator pod.

Preparing the emulator board for installation

The printer port connection on the back of the PC is a 25 Pin Female D connector. Connect one end of the supplied cable to the printer port that you intend to use (LPT1 or LPT2). Connect the other end of the cable to the 25 pin connector on the XDS510PP emulator pod. The XDS510PP is also known as a scan path adapter.

The XDS510PP can be powered from two different sources. The easiest is to use power from the target system. This is done automatically when the target cable is connected. The pod uses the PD pin on the cable. The trace going to this pin on the target board must be able to carry the current requirements of the pod. The second source of power is the included 5 volt power supply

Warning: The power input to the pod must be regulated. Voltages higher than 5 volts will destroy the emulator

Note: The external power supply must be used for 3 volt target systems.

Target Cable Connectors:

Be very careful with the target cable connectors. connect them gently; don't force them into position, or you may damage the connectors.

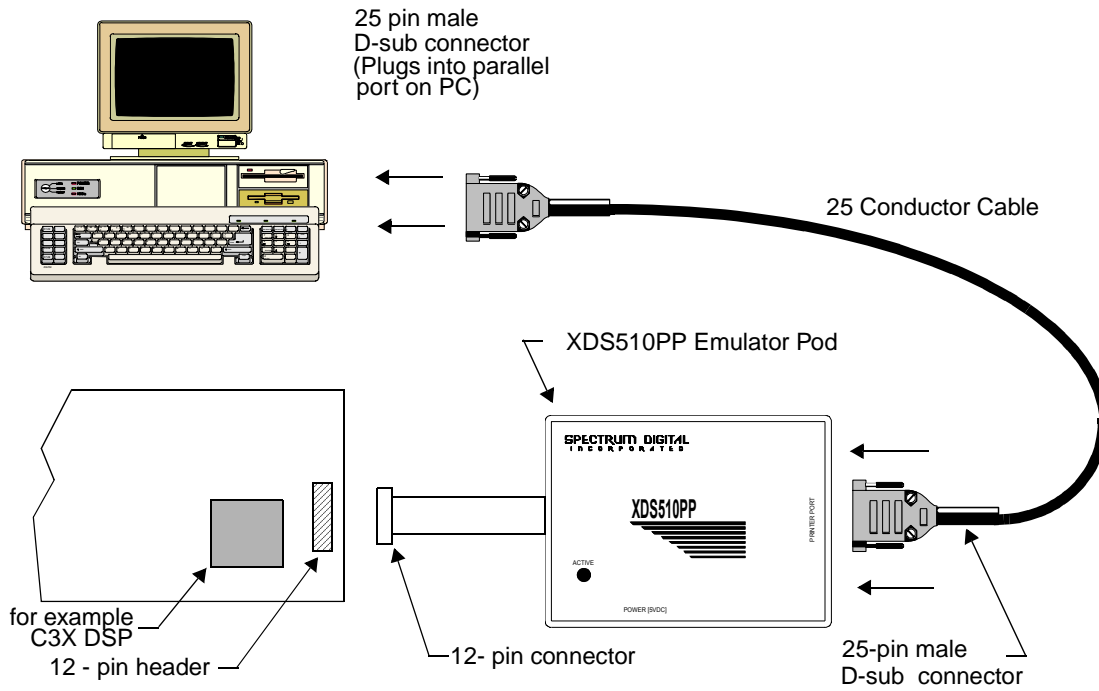
Do **not** connect or disconnect the 25-pin D connector while the PC is powered up.

Do **not** connect or disconnect the 12-pin cable while the target system is powered up.

1.3 Step 2: Connecting the XDS510PP to Your Target System

Figure 1-1 shows how you connect the XDS510PP emulator pod and 25 conductor cable to your target system. In most cases, the target system will be a target board of your own design.

Figure 1-1. Connecting the XDS510PP Emulator Pod to Your Target System



Setting up the XDS510PP.INI file

The *xds510pp.ini* file is used to set driver parameters. The “.INI” should be located in the same directory as the HLL Debugger. The D_DIR environment variable is used to select the Debugger directory. If the *xds510pp.ini* file doesn't exist or can't be found certain parameters are used as default. Shown below are the parameters and their defaults.

speed = 25
mode = spp4
port -p command line parameter, or 240 if no command line

When the *xds510pp.ini* file is invoked there are four parameters which can be used. These parameters are: speed, port, mode, and timing.

The 'speed' parameter selects the amount of delay between port accesses. The higher the value the more delay added. A good value to start with is 25.

example: speed = 25

The 'port' parameter selects the PC's printer port. The default value is 378. Other values are 278 and 3BC.

example: port = 278

The mode parameter selects the type of hardware supported by the host PC. The three modes are shown in the table below:

Table 1: Parallel Port Modes

Modes	Description
spp4	standard parallel port
spp8	bi-directional port
epp	enhanced parallel port

The “spp4” mode should work on all machines, but is the slowest. The “spp8” mode requires a bidirectional parallel port. The “epp” mode is the fastest but requires an EPP compatible parallel port on the host PC. If you are using EPP mode you must make sure the PC is configured for EPP operation. Check the documentation that came with the PC or add-in card on how to configure the parallel port. The default mode is “spp4”.

example: mode = epp

The timing parameter is used to select alternate timing for the TDI and TMS signals. The default operation is to change the state of these signals on the falling edge of the TCK_RET signal. When alternate timing is selected TDI and TMS are changed to the rising edge of the clock. The default mode is to use the default timing.

example: timing = alternate

As shipped from the factory the *xds510pp.ini* file has the parameters set as:

**speed = 25
mode = epp
port = 378**

Resetting the emulator

To reset the emulator, execute the *emurst.exe* file from the file manager or explorer. The emulator should respond with no errors.

1.4 Utility Programs

There are several utility programs that can be found in the installation directory. One such program is "PORTCHK". This program searches for parallel ports and tries to detect if they are bi-directional. To run this program type "PORTCHK" at the command line prompt. This program does not require any arguments.

There may be other utility programs on the diskette that is shipped with the XDS510PP. These programs may aid you in installing the XDS510PP on a particular PC hardware configuration. Refer to the 'readme' files or the 'port utilities' manual for their use.

Chapter 2

Specifications for Your Target System's Connection to the Emulator

This chapter contains information about connecting your target system to the emulator. Your target system must use a special 12-pin connector for proper communication with the emulator.

Topic	Page
2.1 Designing Your Target System's Emulator Connector (12-pin Header)	2-2
2.2 Emulator Cable Pod Logic	2-3
2.3 Emulator Cable Pod Signal Timing	2-4
2.4 Buffering Signals Between the Emulator and the Target System	2-5
2.5 Mechanical Dimensions for the 12-Pin Header	2-7

2.1 Designing Your Target System’s MPSD Emulator Connector (12-pin Header)

The ‘C3x devices support complete emulation through a dedicated serial scan path port. This port uses a modular port scan technology (MPSD). For the application target system to communicate with the EMU320C3x your target system must have a 12-pin header(2x6). The pin signal assignments are shown in figure 2-1. Pin 8 is removed for keying purposes.

Figure 2-1. 12-Pin Header Signals and Header Dimensions

EMU1	1	2	GND	Header Dimensions Pin-to-Pin spacing, 0.100 in. (X,Y) Pin width, 0.025-in. square post Pin length, 0.235-in. nominal
EMU0	3	4	GND	
EMU2	5	6	GND	
PD(Vcc)	7	8	no pin (key)	
EMU3	9	10	GND	
H3	11	12	GND	

Note: Signals EMU0, EMU1, EMU2 should always be pulled up with a separate 20k ohm resistors to Vcc.
Position pin 8 will be plugged to prevent improper connection. Pin 8 is present in the cable and is grounded.

Table 1: 12-Pin Header Signal Description

EMU320C3X Signal	Description	‘C30 Pin Number	‘C31 Pin Number	‘C32 Pin Numbers
EMU0	Emulation Pin 0	F14	124	14
EMU1	Emulation Pin 1	E15	125	17
EMU2	Emulation Pin 2	F13	126	18
EMU3	Emulation Pin 3	E14	123	13
H3	‘C3x H3	A1	82	108
PD	Presence detect. Indicates that the emulation cable is connected and that the target is powered up. PD should be tied to +5 volts in the target system.			

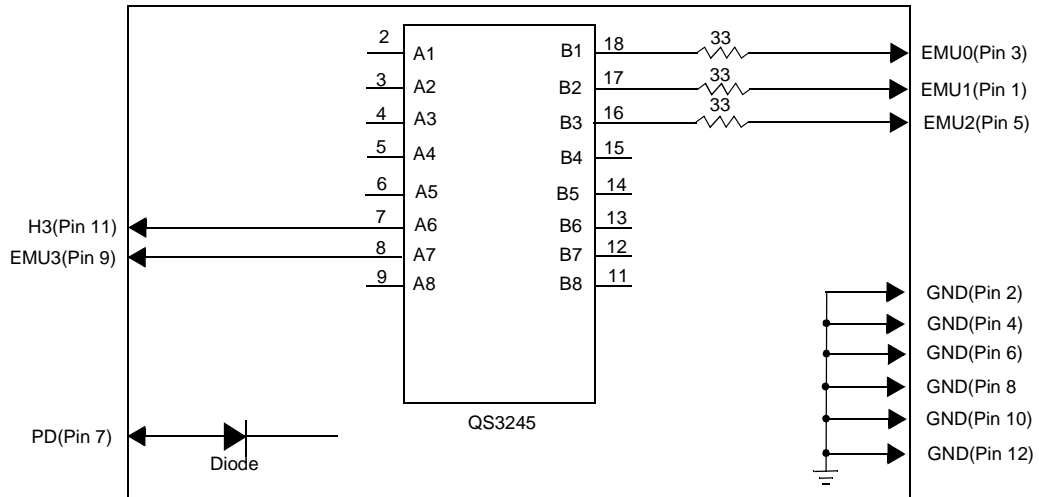
Although you can use other headers, recommended parts include:

straight header, unshrouded	DuPont Connector Systems
	part # 65610-112
	part # 65611-112
	part # 37996-112
	part # 67997-112

2.2 Emulator Cable Pod Logic

Figure 2-2 shows a portion of the logic in the EMU320C3x emulator pod. Please note the 33 ohm resistors have been added to the EMU0, EMU1, and EMU2 lines. These resistors minimize cable reflections.

Figure 2-2. Emulator Pod Interface



2.3 Emulator Cable Pod Signal Timing

Figure 2-3 shows the signal timings for the emulator. Table 2-2 defines the timing parameters for the emulator. The timing parameters are calculated from standard data sheet parts used in the emulator and cable pod. These parameters are for reference only. Spectrum Digital does not test or guarantee these timings.

Figure 2-3. Emulator POD Timing

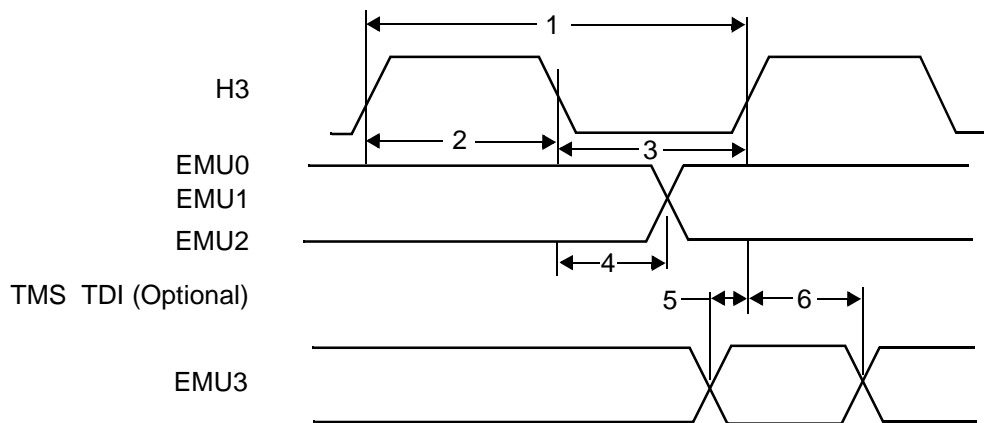


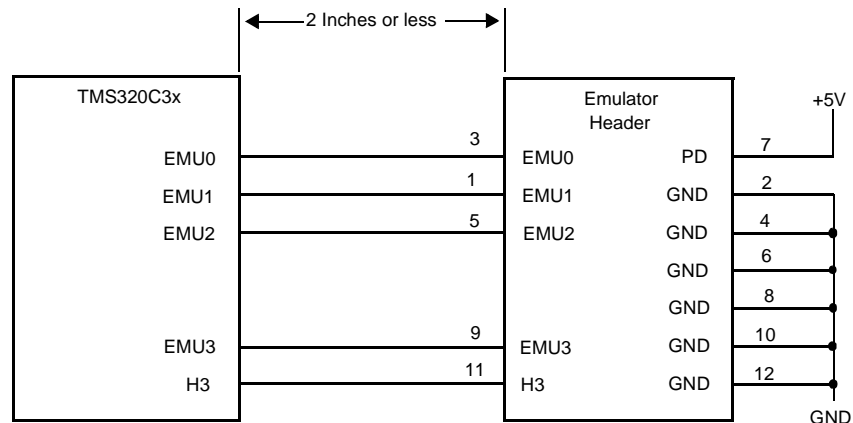
Table 2: Emulator Pod Timing Parameters

No.	Reference	Description	Min	Max	Units
1	t_{H3min}	H3 period	30	200	ns
	t_{H3max}				
2	$t_{H3highmin}$	H3 high pulse duration	8		ns
3	$t_{H3lowmin}$	H3 low pulse duration	8		ns
4	$td_{(EMU0,1,2)}$	EMU0, 1, 2 valid from H3 low	1	5	ns
5	$tsu_{(EMU3)}$	EMU3 setup time to H3 high	3		ns
6	$thd_{(EMU3)}$	EMU3 hold time from H3 high	0		ns

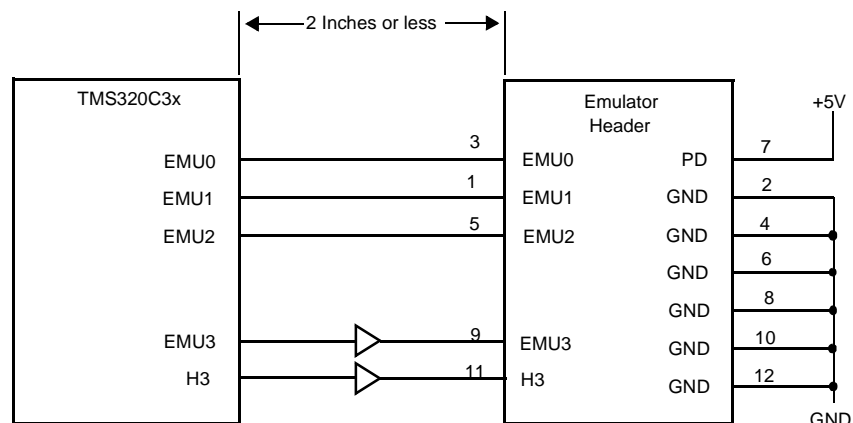
2.4 Buffering Signals Between the Emulator and the Target System

It is extremely important to provide high-quality signals between the emulator and the 'C3x on the target system. In many cases, the signal must be buffered to produce a high-quality signal. The need for signal buffering and placement of the emulation header can be divided into three categories:

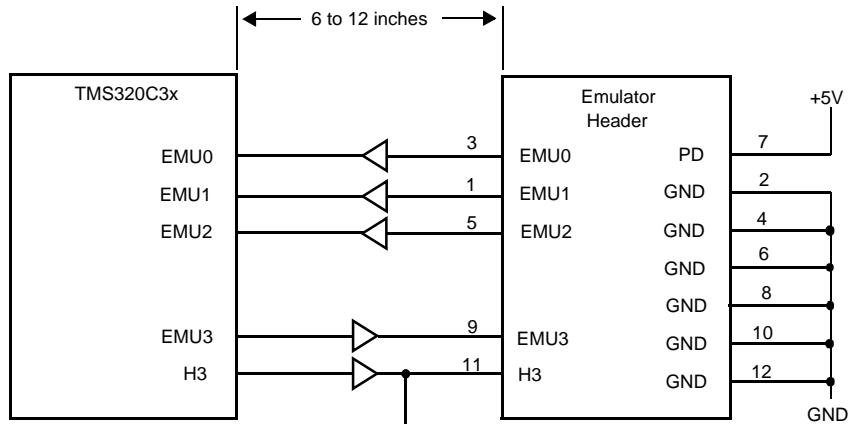
- **No signal buffering.** In this situation, the distance between the header and the 'C3x should be no more than 2 inches.



- **Buffered emulation signals.** In this situation, the distance between the emulation header and the 'C3x is greater than 2 inches but less than 6 inches. The transmission signals ---H3 and EMU3--- are buffered through the same package.

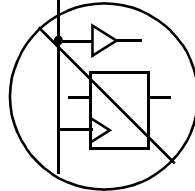


All Signals buffered. The distance between the emulation header and the 'C3X is greater than 6 inches but less than 12 inches. All 'C3X emulation signals --EMU0, EMU1, EMU2, EMU3, and H3 -- are buffered through the same package.



H3 Buffer Restrictions

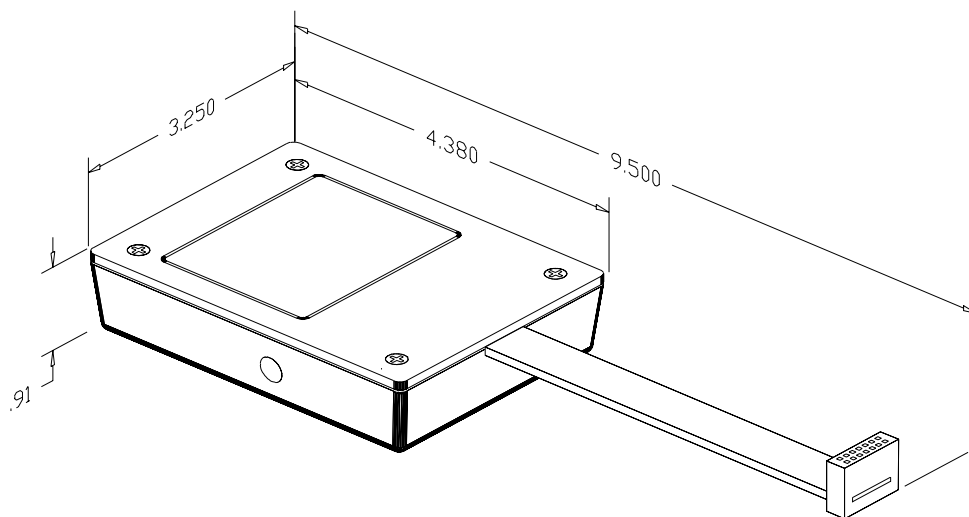
Don't connect any devices between the buffered H3 output and the header!



2.5 Mechanical Dimensions for the 12-Pin Emulator Connector

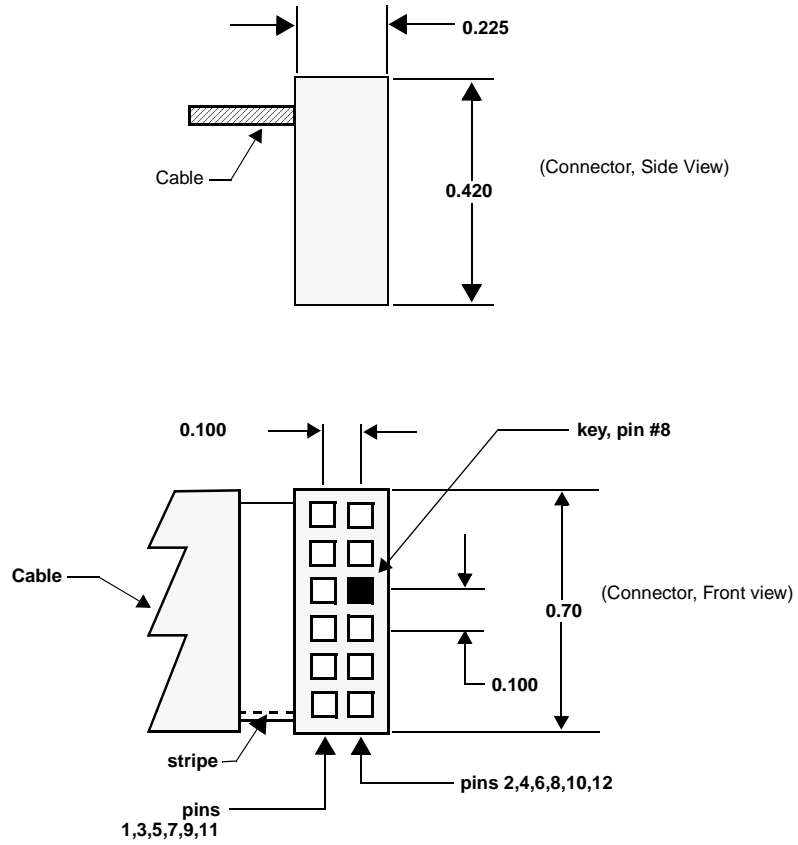
The EMU320C3x emulator consists of a 6-foot 25 conductor cable, the XDS510PP Scan Path Adapter, and a short section of cable that connects to the target system. The overall cable length is approximately 6 feet, 10 inches. Figure 2-4 and Figure 2-5 (page 2-8) show the mechanical dimensions for the XDS510PP Scan Path Adapter and short cable. Note that the pin-to-pin spacing on the connector is 0.100 inches in both the X and Y planes. The XDS510PP enclosure is nonconductive plastic with four recessed metal screws.

Figure 2-4. Pod/Connector Dimensions



Note: All dimensions are in inches and are nominal dimensions, unless otherwise specified.

Figure 2-5. 12-Pin Connector Dimensions



Note: All dimensions are in inches and are nominal dimensions, unless otherwise specified.

A

assembler 1-3
autoexec.bat file 1-6 to 1-9
 invoking 1-7
 sample 1-7
addresses
 port 1-3, 1-7

B

-b debugger option
 with D_OPTIONS environment variable
 1-9
batch files
 autoexec.bat 1-6 to 1-9
 emuinit.cmd 1-3
 emurst 1-3, 1-8
 init.clr 1-3
 initdb.bat 1-7 to 1-9
initialization
 emuinit.cmd 1-3
invoking
 autoexec.bat 1-7
 initdb.bat 1-7
 mono.clr 1-3
bus protocol 2-3

C

c5xhll directory 1-6 to 1-8
cable pod 2-4 to 2-6
compiler 1-3
configuration
 multiprocessor 2-9
connector
 target system emulator 1-4, 2-1 to 2-14
customizing the display
 init.clr file 1-3
 mono.clr file 1-3

D

D_DIR environment variable 1-7, 1-8
D_OPTIONS environment variable 1-7, 1-9
D_SRC environment variable 1-7
debugger 1-1 to 1-11
 environment setup 1-6 to 1-9
 installation 1-6
 error messages 1-11
 verifying 1-10
 using with Microsoft Windows 1-6, 1-11
default
 screen configuration file 1-3
 color displays 1-3
 monochrome displays 1-3
directories
 c5xhll directory 1-6 to 1-8
 for auxiliary files 1-8
 for debugger software 1-6, 1-8
 identifying additional source directories
1-8
display requirements 1-2
DOS
 setting up debugger environment 1-6 to
1-9

E

emu5x command
 options
 D_OPTIONS environment variable 1-9
 verifying the installation 1-10
emuinit.cmd file 1-3
emulation timing calculations 2-10 to 2-12

emulator

- additional tools 1-3
- connection to target system 1-4 to 2-14
 - mechanical dimensions 2-13 to 2-14

- debugger environment 1-6 to 1-9
- debugger installation 1-1 to 1-11
 - error messages* 1-11
 - verifying* 1-10

host system 1-2

- installation 1-4
 - debugger software* 1-6
 - error messages* 1-11
 - preparation* 1-4
 - verifying* 1-10

operating system 1-3

requirements

- display* 1-2
- graphics card* 1-2
- hardware* 1-2
- memory* 1-2
- mouse* 1-2
- power* 1-2
- software* 1-3

resetting 1-9

signal buffering 2-7 to 2-9

25 conductor cable 1-4

- header design* 2-2 to 2-3

target system 1-2

emurst file 1-3, 1-9

environment variables

D_DIR 1-7 to 1-9

D_OPTIONS 1-9

D_SRC 1-7 to 1-9

for debugger options 1-9

identifying auxiliary directories 1-8

identifying source directories 1-8

error messages

installation 1-11

G

graphics card requirements 1-2

H

hardware checklist 1-2

host system 1-2

I

-i debugger option

- with D_OPTIONS environment variable 1-9

init.clr file 1-3

initdb.bat file 1-7 to 1-9

invoking 1-7

sample 1-7

initialization batch files

emuinit.cmd 1-3

installation

debugger software 1-6

error messages 1-11

verifying 1-10

invoking

autoexec.bat 1-7

initdb.bat file 1-7

L

linker 1-3

M

memory

default map 1-3

mapping 1-3

emuinit.cmd file 1-2

requirements 1-2

messages

installation errors 1-11

Microsoft Windows

using with the debugger 1-6, 1-11

mono.clr file 1-3

mouse

requirements 1-2

O

operating system 1-3
optional files 1-3

P

-p debugger option
 with D_OPTIONS environment variable
 1-9
PATH statement 1-8
port addresses 1-3, 1-11
power requirements
 board 1-2
-profile debugger option
 with D_OPTIONS environment variable
 1-9
protocol
 bus 2-3

R

required files 1-3
required tools 1-3
resetting 1-9

S

-s debugger option
 with D_OPTIONS environment variable
 1-9
 signal buffering for emulator connections
 2-7 to 2-9
software checklist 1-3

T

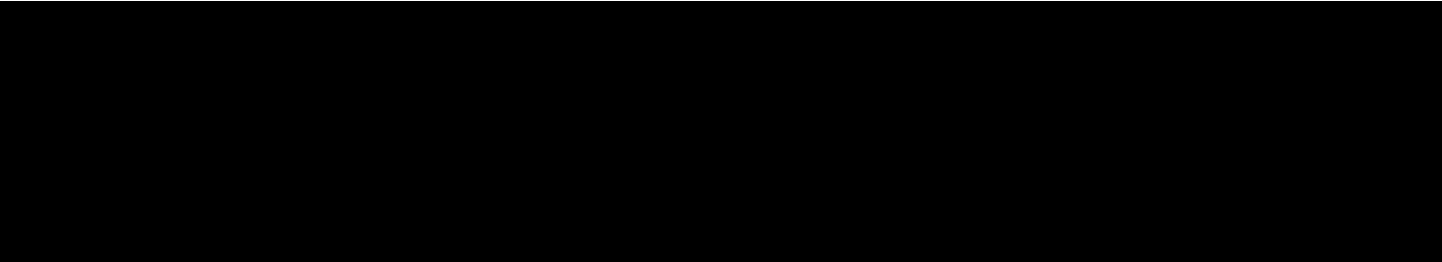
-t debugger option
 with D_OPTIONS environment variable
 1-9
target system 1-2
 connection to emulator 1-4, 2-1 to 2-14
test clock 2-8
timing calculations 2-10 to 2-12

V

-v debugger option
 with D_OPTIONS environment variable
 1-11
verifying
 installation 1-10

X

-x debugger option 1-9



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