



XRT86SH328ES

Evaluation System User Manual

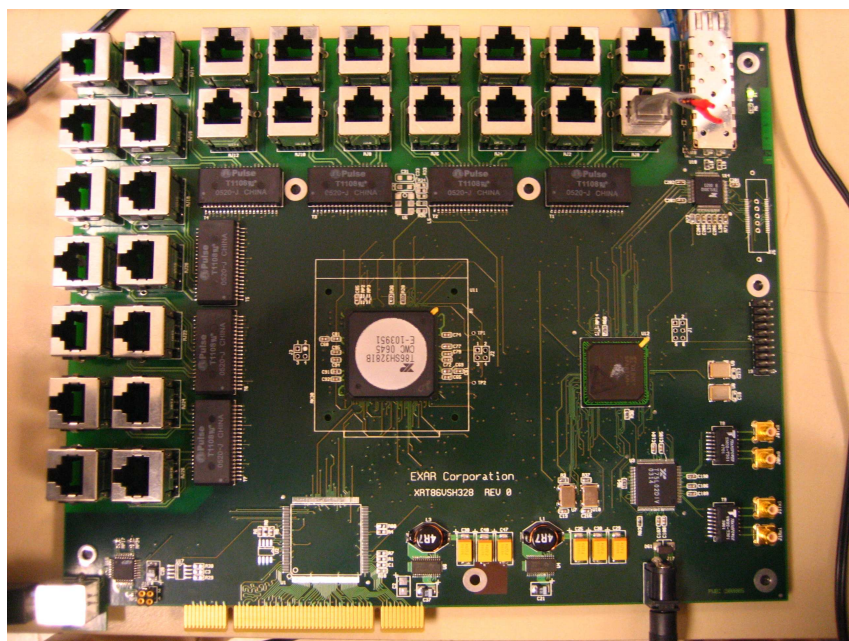




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SECTION 1 Introduction

This XRT86SH328ES is a complete evaluation kit for characterizing the 28 Channel VT Mapper IC. The evaluation kit includes the following:

1. Evaluation Board
2. USB Cable
3. AC Adaptor Power Cord
4. CD Rom
5. Documentation

SECTION 2 Circuit Overview

This evaluation board is controlled by a graphical user interface (GUI) through a USB port from a typical PC. (Quick Note: The software supports Windows XP and NT down to most versions of Windows 98) Figure 1 shows that there are two separate data paths supported by the evaluation board. It is important to note that only one data path can be selected at any time due to the board architecture (not the DUT). The two data paths are the Telecom Bus (Connected to the XRT91L30 OC-3 Transceiver) or the Serial Interface (Connected to the XRT75VL00 STS-1 LIU). If the part is configured in STS-1/STM-0, the Serial Interface can be used. If the part is configured in STS-3/STM-1, then only the Telecom Bus can be used. There are two separate FPGA configuration files (“TelecomBus.hex” and “SerialInterface.hex”) that come with this kit.

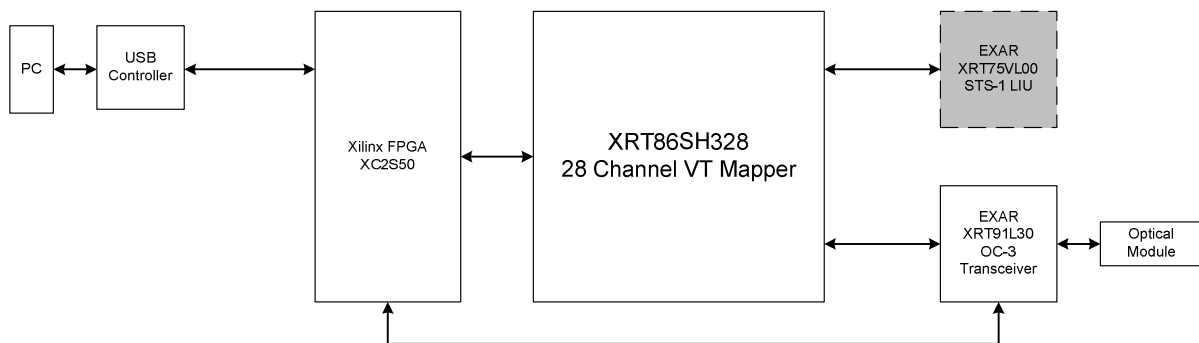


Figure 1. Simplified Block Diagram of the XRT86SH328ES

SECTION 3 Schematic Design

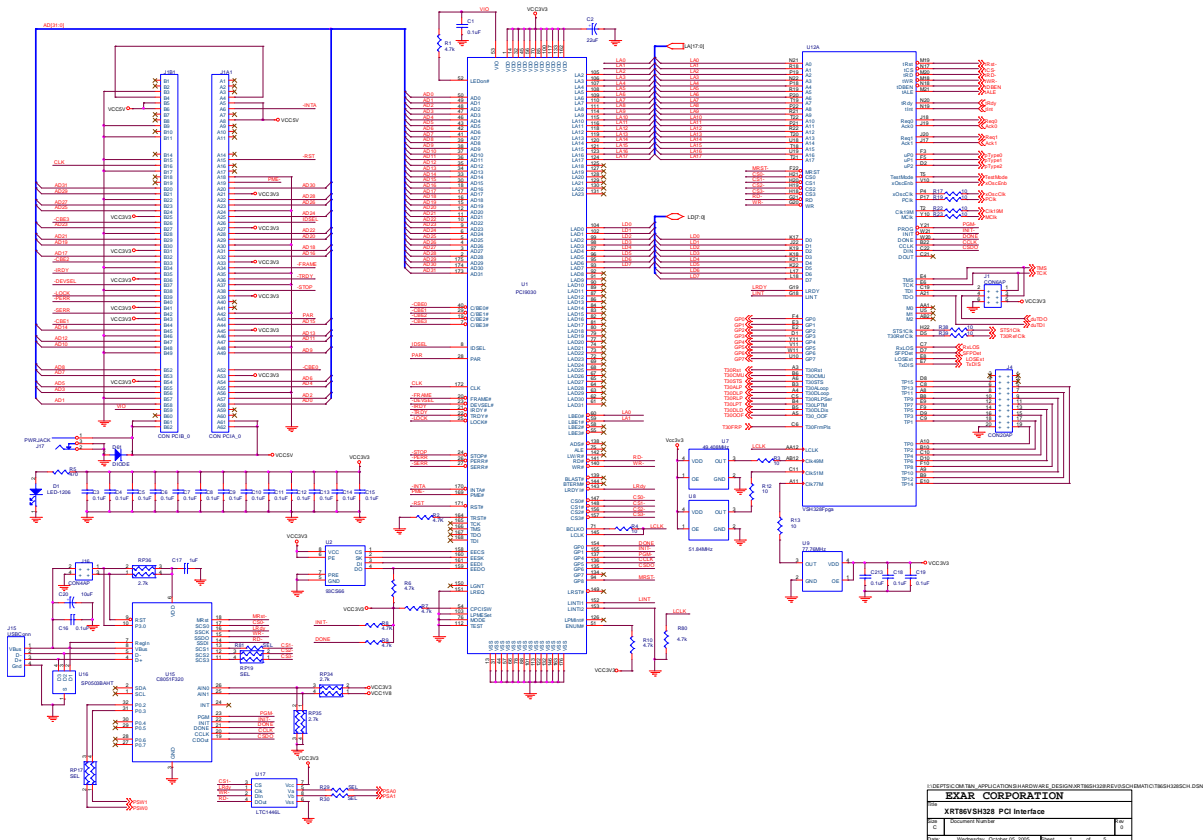
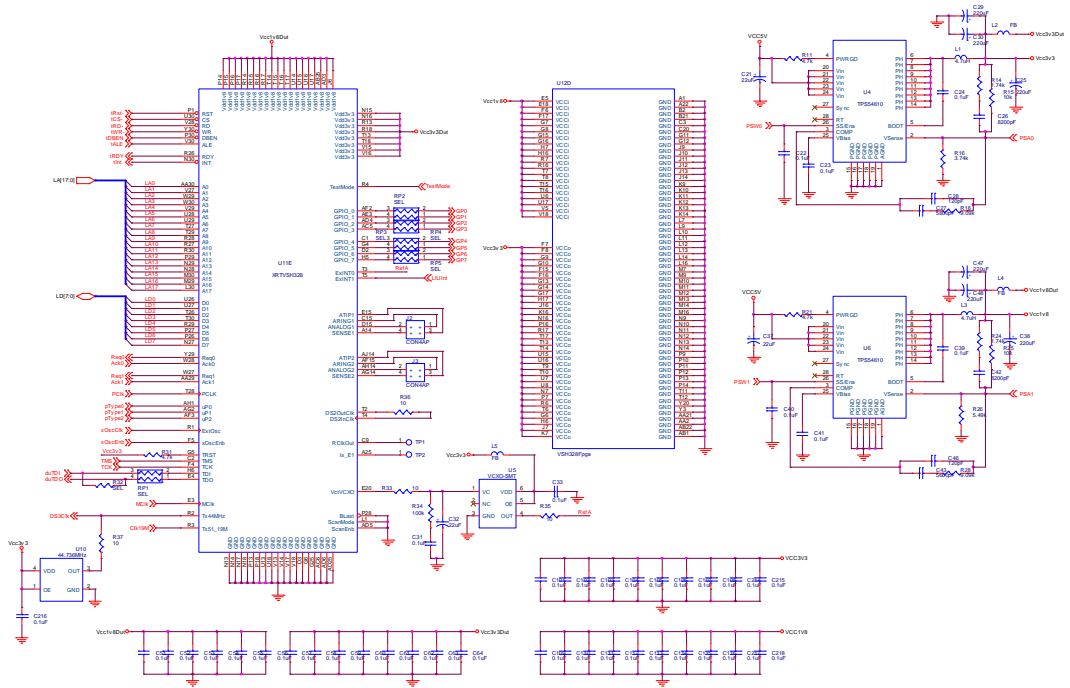


Figure 2. XRT86SH328 Schematic Page 1



I:\DEPT\CDATA\APPLICATIONS\HARDWARE DESIGN\XRT86SH328\REV01\SCHEM\XRT86SH328CH1.DSN	
REV	XRT86VSH328 Microprocessor Interface
CD	Document Number
	Wednesday, October 06, 2004 11:47 AM

Figure 3. XRT86SH328 Schematic Page 2

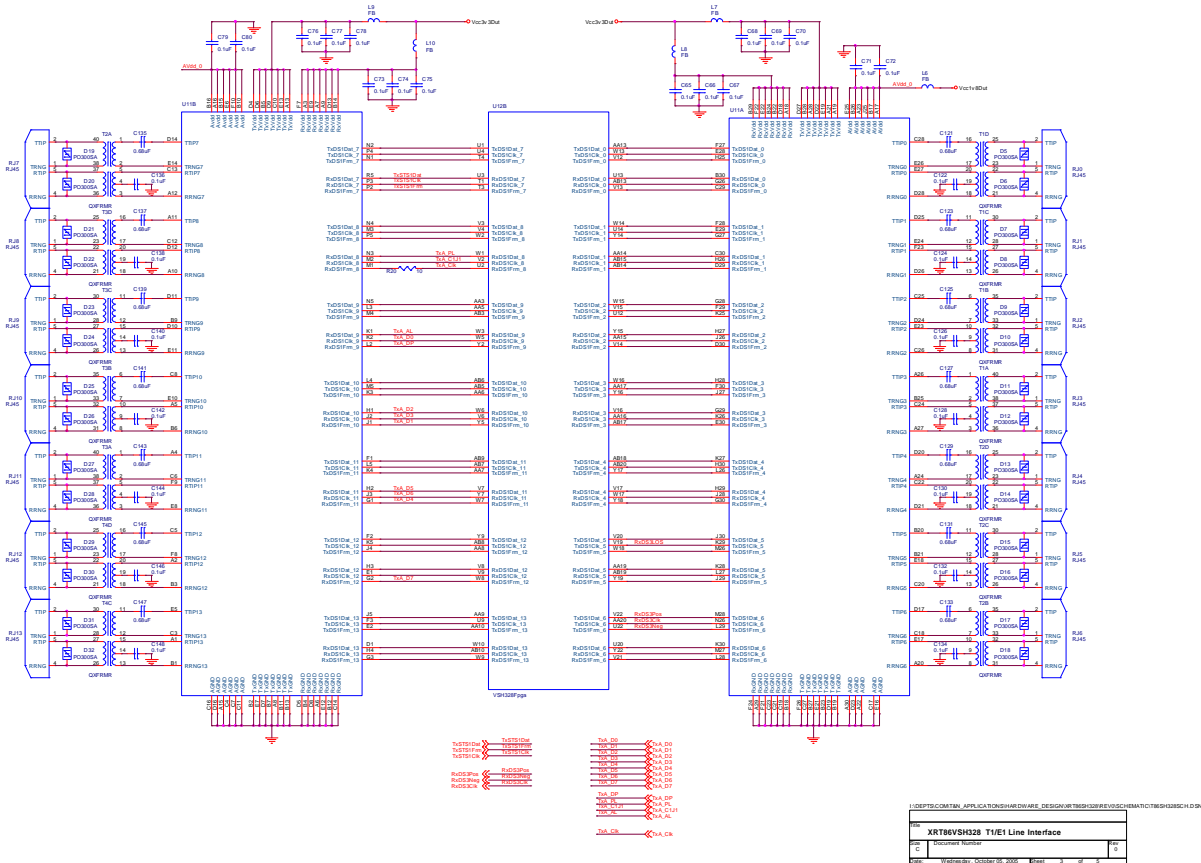


Figure 4. XRT86SH328 Schematic Page 3

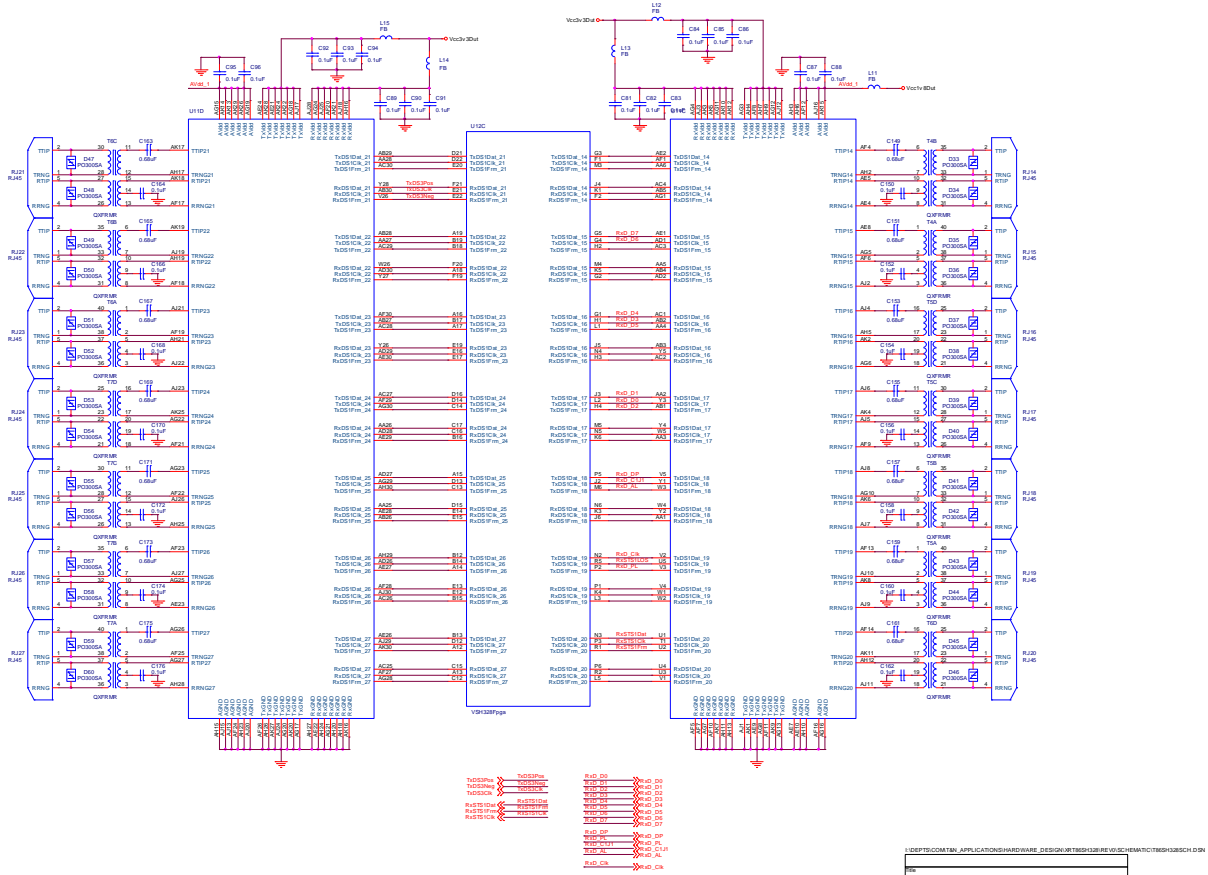
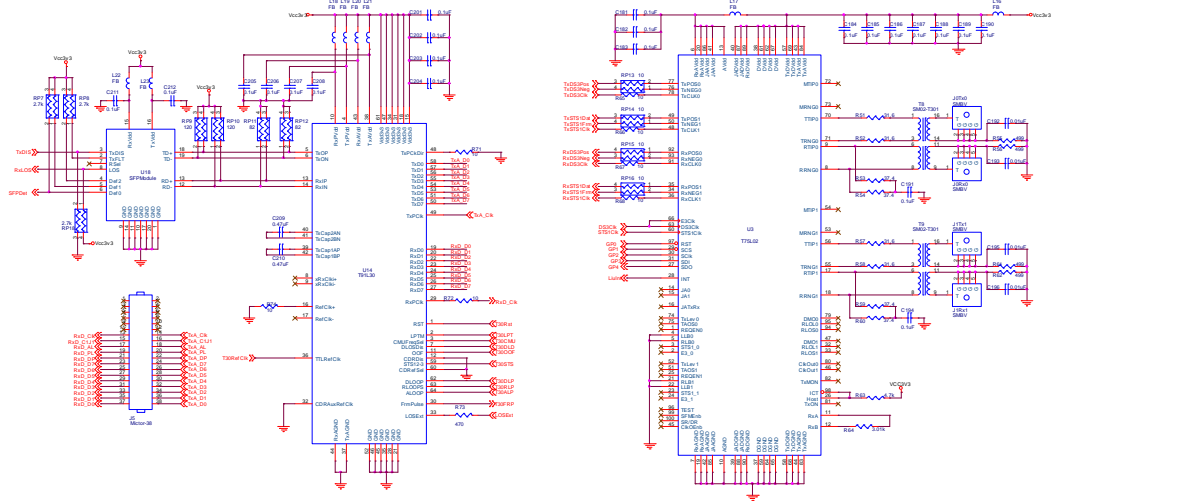


Figure 5. XRT86SH328 Schematic Page 4



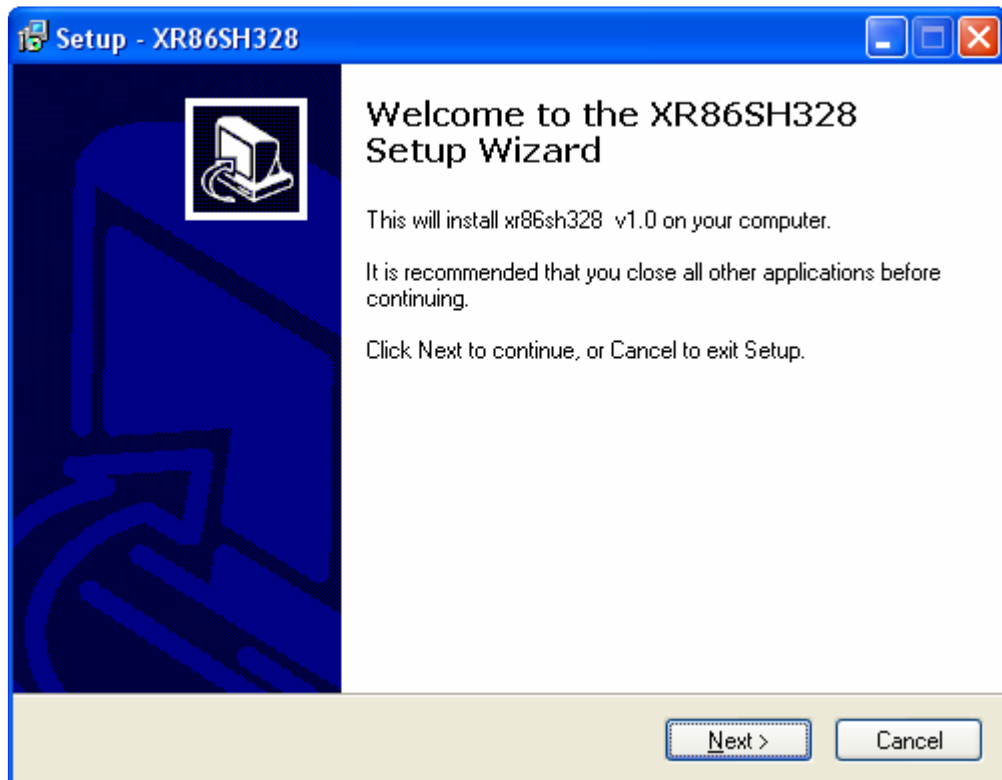
DEPTSCOM\EN_APPLICATIONS\USER\DESIGN\XRT86SH328ES\SCHEMATIC\T86SH328ES.DSN
XRT86SH328 DS90LV03 Interface
1

Figure 6. XRT86SH328 Schematic Page 5

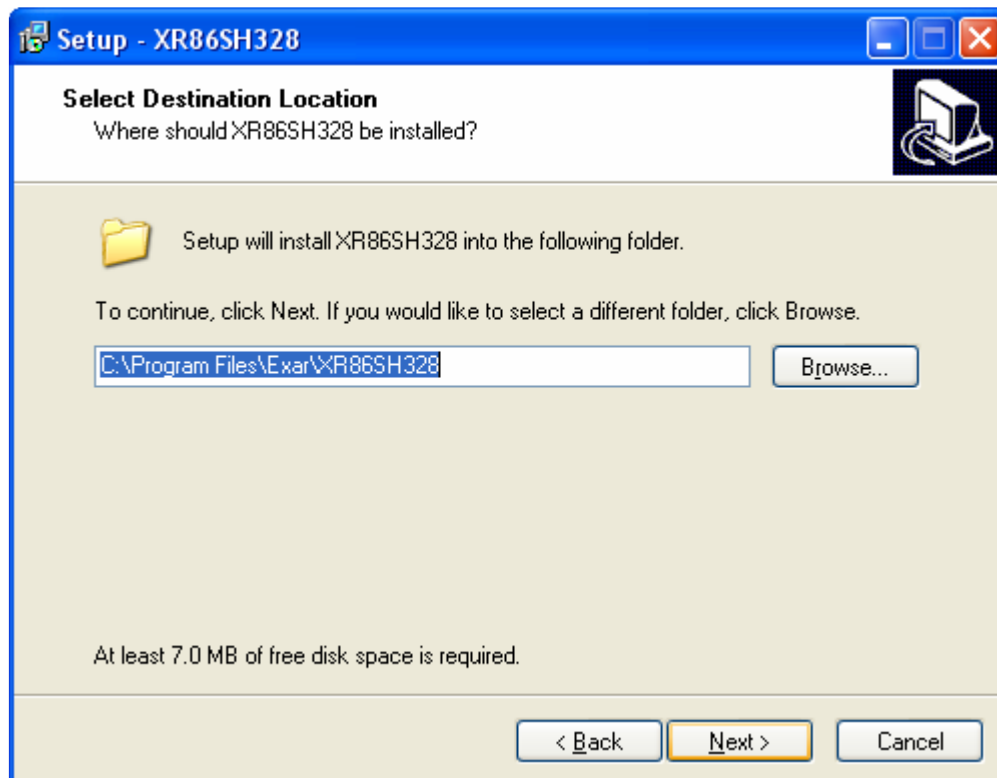
SECTION 4 USB Installation

Included in the Evaluation System Kit, there is an Installation file on the CD Rom called "XRT86SH328EvaluationUSB.exe". This file should automatically load the Exar Usb drivers and the board will be up and running. However, if the following steps are performed and the board is NOT recognized by the PC, the last step in this process describes how to manually load the drivers.

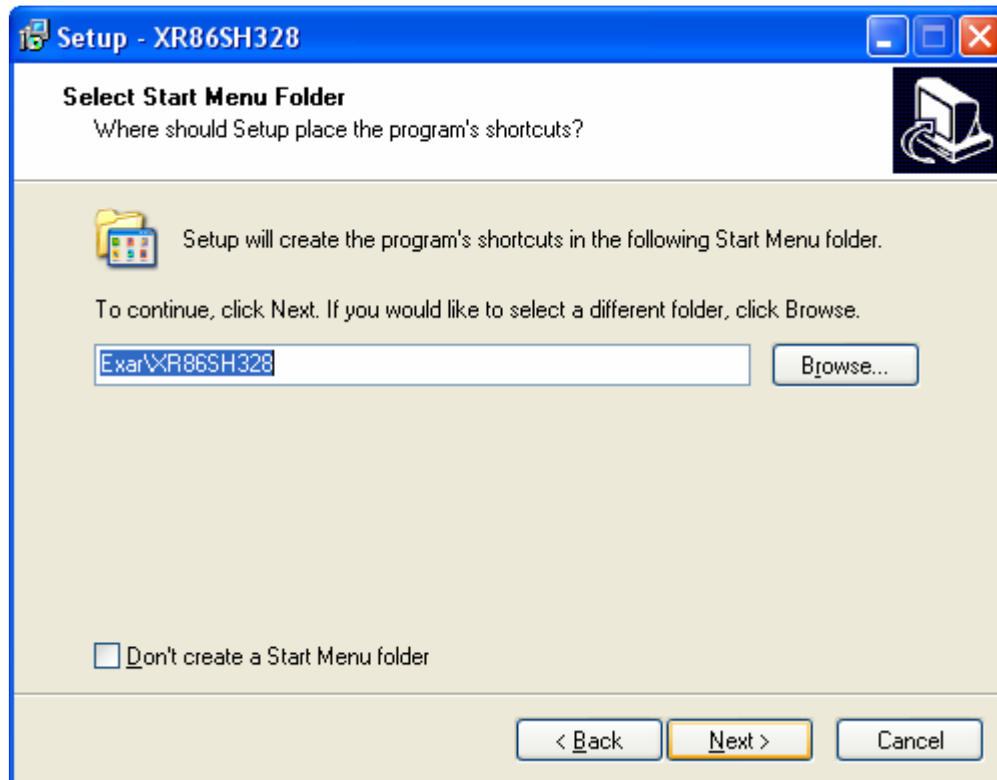
Step 1 Double Click the "XRT86SH328EvaluationUSB.exe" file to bring up the following screen. Click on the **Next>** button.



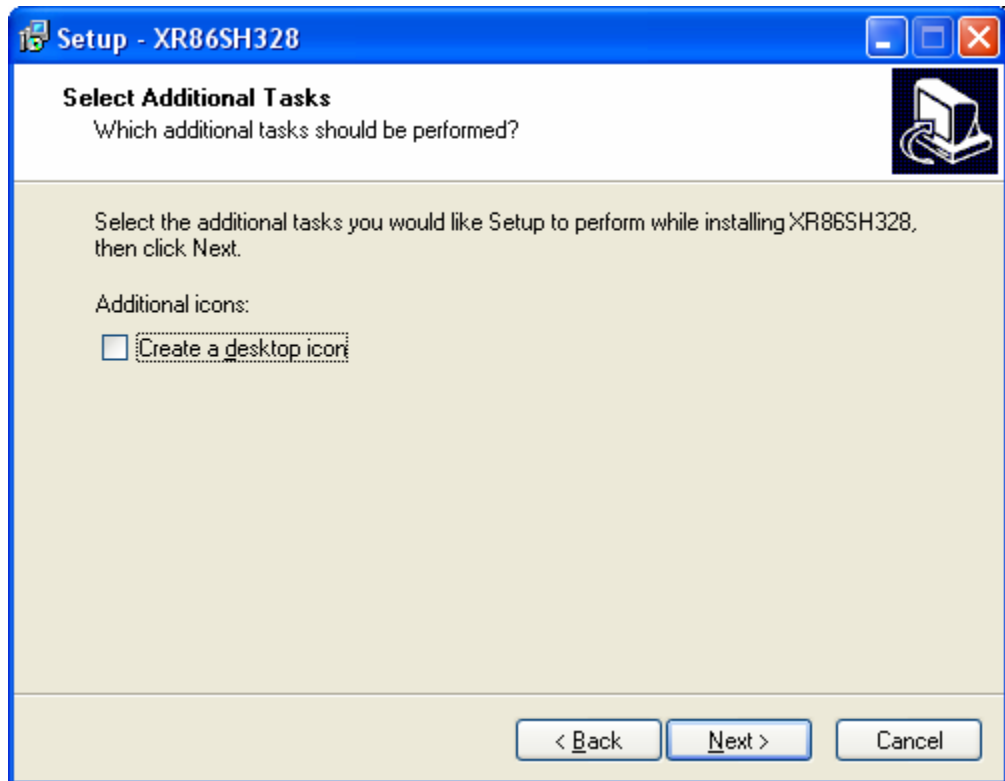
Step 2 Exar recommends using the default directory, but the files can be installed to any directory that you choose. *Note: Make sure that all files from the CD are properly copied to the unique directory if it is changed.* Click on the **Next>** button to proceed.



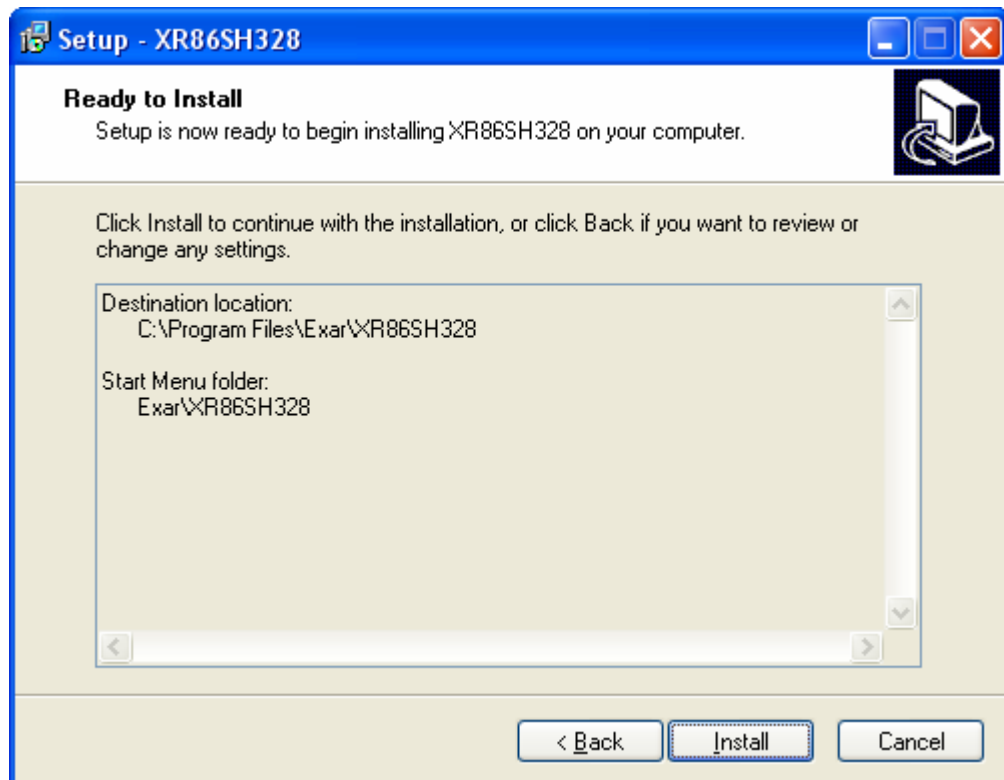
Step 3 Click the Next> button to continue.



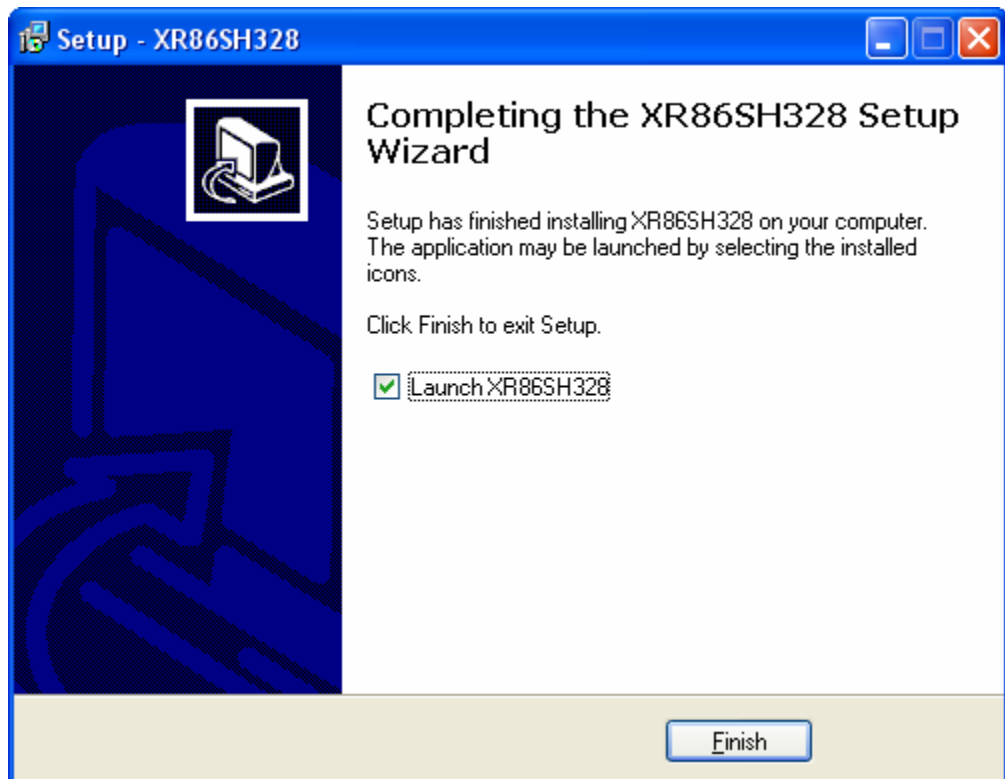
Step 4 Click on the “Create a desktop icon if desired.”



Step 5 Click on the Install button.



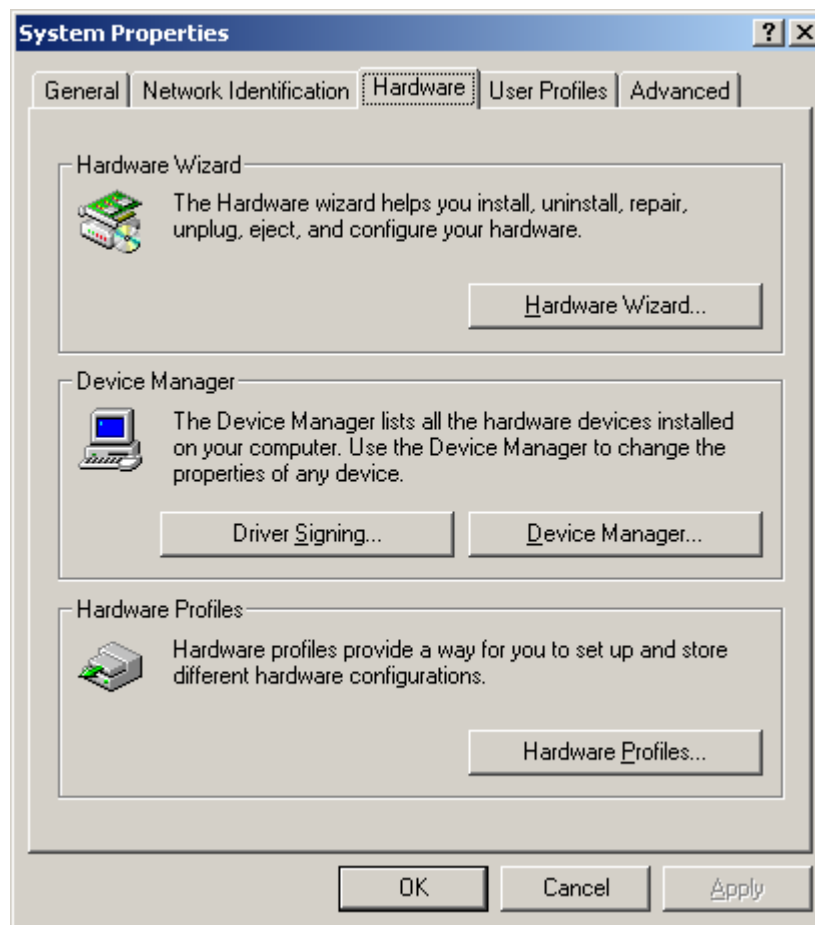
Step 6 Click on the Finish button to complete installation. The Exar USB drivers should be properly installed and ready to go. If so, continue to the next section that describes the Graphical User Interface. If not, see the last step below to manually load the Exar USB Drivers.



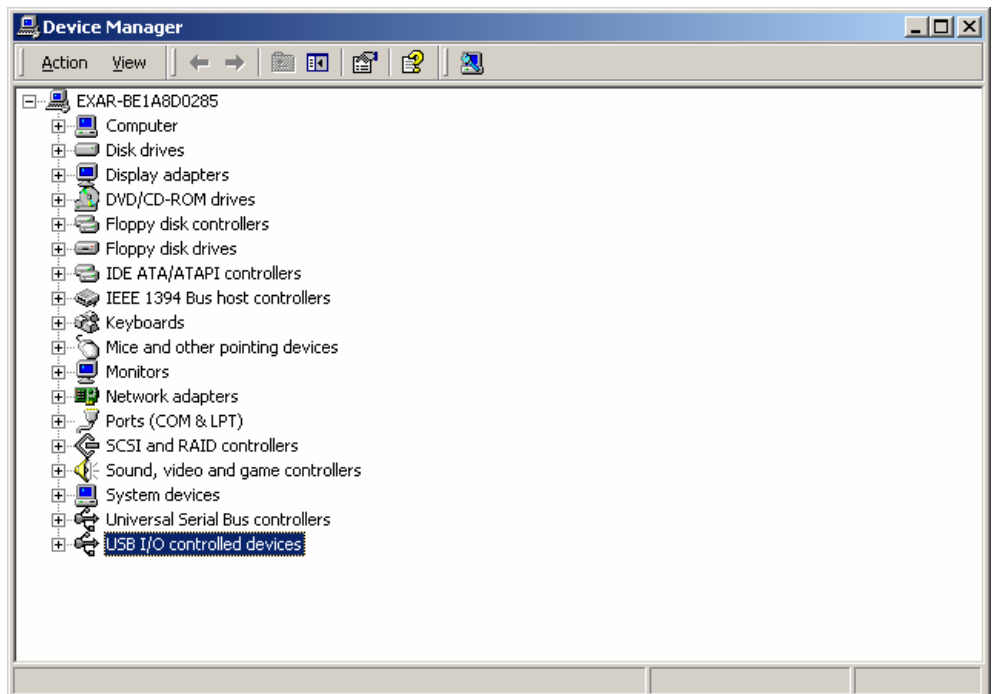
Manually Loading Exar Drivers (If Installation is NOT Successful)

If the Evaluation Board is NOT recognized and/or the installation process was NOT successful, most likely there is a driver contention or the driver was not installed in the proper directory from the software. This section describes how to manually load the drivers.

Note: Each Windows operating system may access the System Hardware differently. Therefore, it is not practical to describe this procedure for each OS. However, the key component is usually the Control Panel of the PC. From the Control Panel, you can access the System Properties dialog box. From there, choose the Hardware menu item and go to the Device Manager...



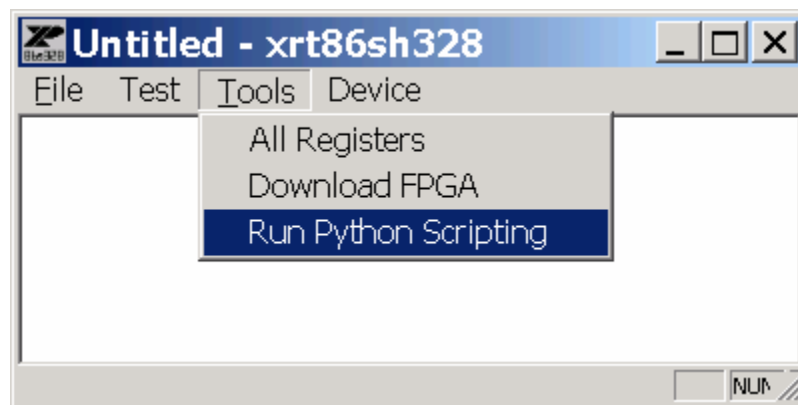
The device Manager will bring up the following dialog box. Choose the USB I/O Controlled Devices, select Exar Device, right click, select properties, select Update Driver, and then follow the directions to choose the driver from the CD or the /Driver directory in the Exar working directory (“C:\Program Files\Exar\XRT86SH328 Evaluation Software\Drivers” by default).



SECTION 5 Python Script Interface

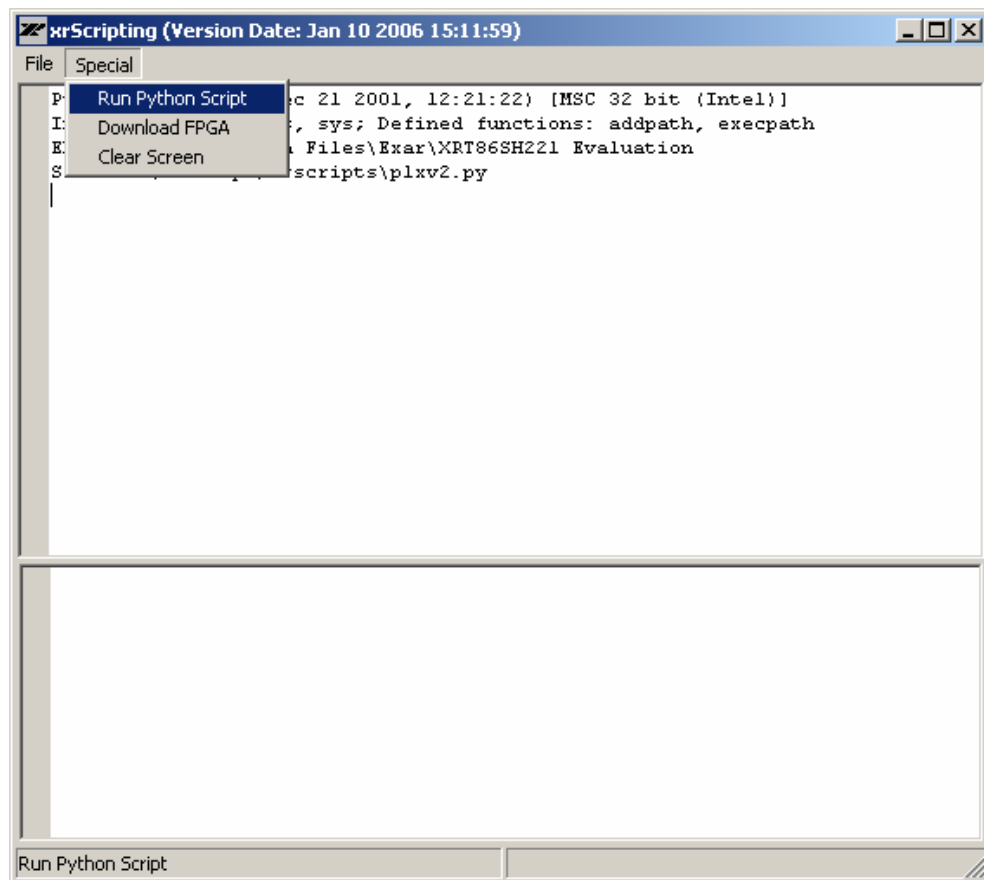
Running a Python Script From the GUI

From the main GUI, select the Special Operations menu shown below and click on the “Run Python Script” to continue.

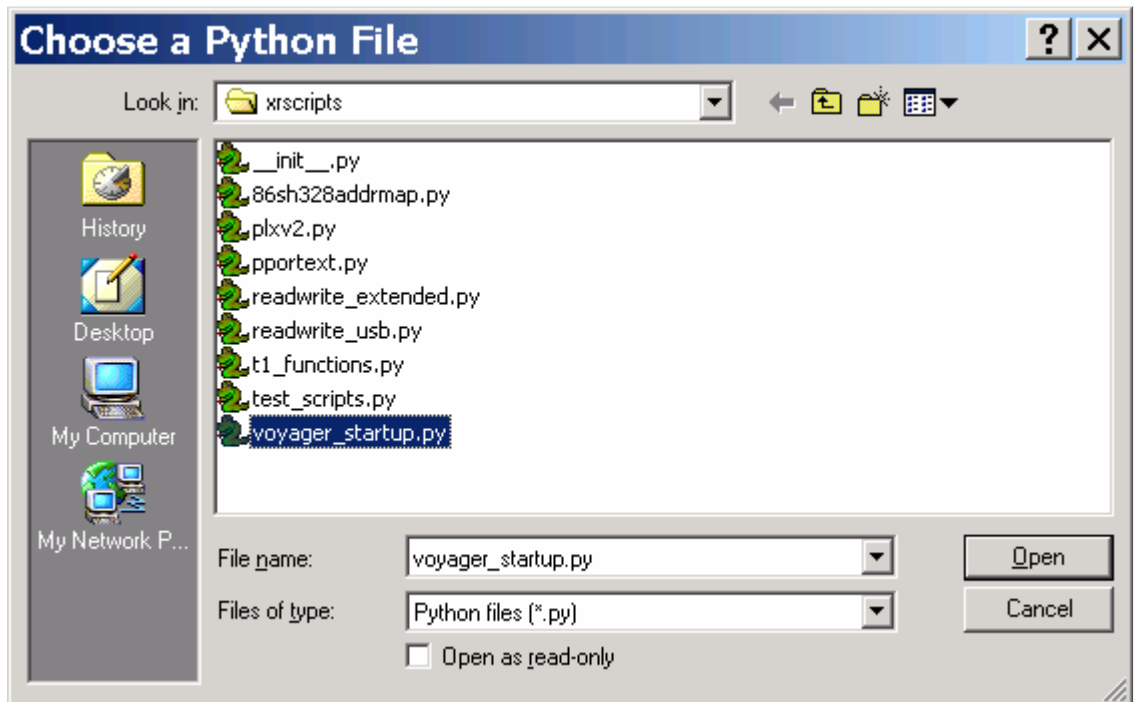


Once you select the “Run Python Script” option from the Special Operations menu from the GUI, the “xrScripting Interface” will pop-up as shown below. At this point, the xrScripting Interface is independent of the GUI and any script files that are run will automatically overwrite the GUI settings if there is an overlap with the registers. Therefore, caution must be used to keep track of the register configurations if one wants to toggle back and forth from the GUI to the xrScripting Interface. The next step is to use the “Special” menu on the tool bar to run the actual test script file.

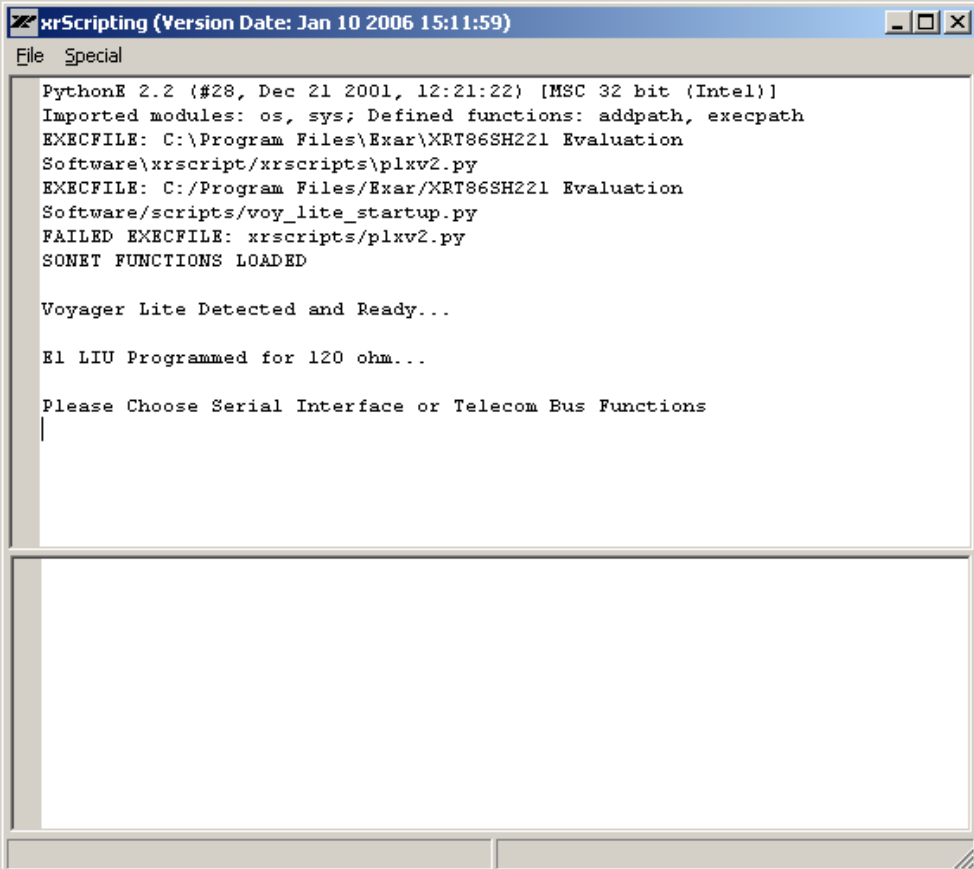
Note: If you would like to view a particular test script in a plain text editor mode, use the “File” menu on the tool bar and select “Open”.



Once you select the “Run Python Script” option from the “xrScripting Interface”, the following dialog box will appear. The first python script that should be run is the “voyager_startup.py” which will automatically run all the other script files for you. This way, you do NOT have to run each one individually. Once this file runs, you can open up any one of these files for reference. Select the “voyager_startup.py” script file and click Open.



After running the “voyager_startup.py” script and a brief pause, the following dialog box will appear. This is the main Python Window that consists of two main windows. The window on top is the Display Monitor, which as can be seen starts with the message “Voyager is Detected and Ready...”. The bottom Window is the Command Console where you can perform manual Read/Write to registers and perform function calls. See the examples on the following pages.



```
PythonE 2.2 (#28, Dec 21 2001, 12:21:22) [MSC 32 bit (Intel)]
Imported modules: os, sys; Defined functions: addpath, execpath
EXECFILE: C:\Program Files\Exar\XRT86SH221 Evaluation
Software\xrscript\xrscripts\plxv2.py
EXECFILE: C:/Program Files/Exar/XRT86SH221 Evaluation
Software/scripts/voy_lite_startup.py
FAILED EXECFILE: xrscripts/plxv2.py
SONET FUNCTIONS LOADED

Voyager Lite Detected and Ready...

E1 LIU Programmed for 120 ohm...

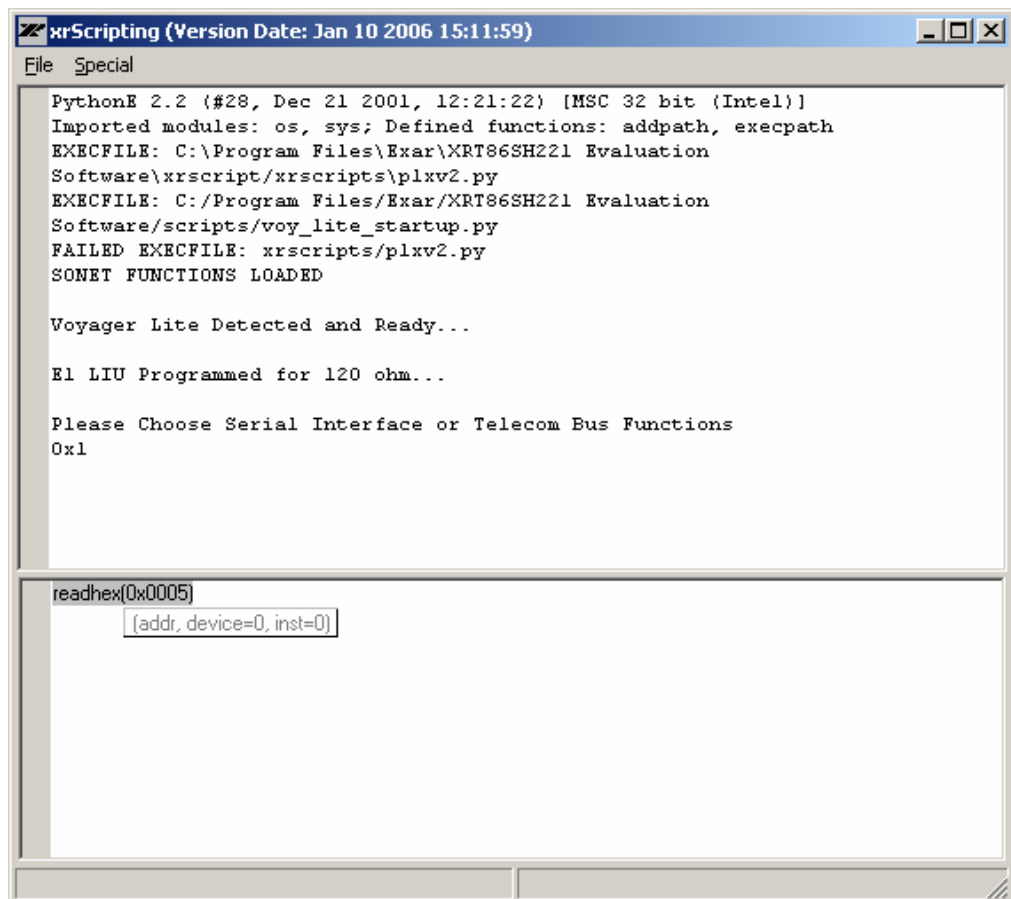
Please Choose Serial Interface or Telecom Bus Functions
|
```

Example 1: Read the Revision ID Register

Looking at the dialog box below, you can see that the Command Console (lower window) was used to type the following command: `readhex(0x0005)`, which is the Revision ID register. You can also see that the value of `0x1` was returned in the Display Monitor (upper window), which corresponds to Revision A silicon.

Note 1: Critical: You must press Ctrl + Enter to execute a command from the Command Console!

Note 2: in the lower window, the command is highlighted in Grey. The Grey highlight notifies the user that the command has been executed. If the Grey highlight does not appear, the command (or function) is still being processed. Please wait for the Grey highlight before continuing.



The screenshot shows a window titled "xrScripting (Version Date: Jan 10 2006 15:11:59)". The window is divided into two main sections. The upper section is a text area containing the following output:

```
PythonE 2.2 (#28, Dec 21 2001, 12:21:22) [MSC 32 bit (Intel)]
Imported modules: os, sys; Defined functions: addpath, execpath
EXECFILE: C:\Program Files\Exar\XRT86SH221 Evaluation
Software\xrscript\xrscripts\plxv2.py
EXECFILE: C:/Program Files/Exar/XRT86SH221 Evaluation
Software/scripts/voy_lite_startup.py
FAILED EXECFILE: xrscripts/plxv2.py
SONET FUNCTIONS LOADED

Voyager Lite Detected and Ready...

E1 LIU Programmed for 120 ohm...

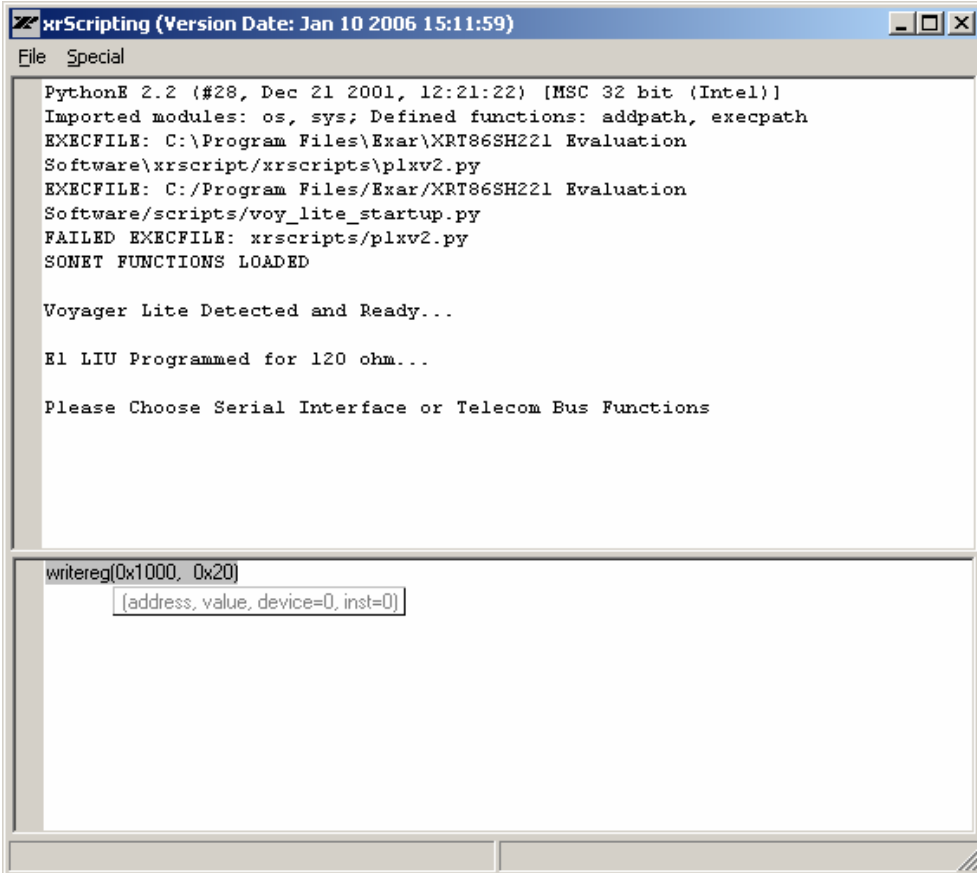
Please Choose Serial Interface or Telecom Bus Functions
0x1
```

The lower section is a command console. It shows the command `readhex(0x0005)` entered, with a grey highlight under the command text. Below the command, there is a small input field containing `{addr, device=0, inst=0}`.

Example 2: Write to Specific Register

Looking at the dialog box below, you can see that the Command Console (lower window) was used to type the following command: `writereg(0x1000, 0x20)`, which will turn the E1 LIU Receiver On. Nothing will show up in the Display Monitor for Write functions. However, you can perform a Read function to verify that the value was written if desired.

Note: Critical: You must press Ctrl + Enter to execute a command from the Command Console!



```
xrScripting (Version Date: Jan 10 2006 15:11:59)
File Special
PythonE 2.2 (#28, Dec 21 2001, 12:21:22) [MSC 32 bit (Intel)]
Imported modules: os, sys; Defined functions: addpath, execpath
EXECFILE: C:\Program Files\Exar\XRT86SH221 Evaluation
Software\xrscript\xrscripts\plxv2.py
EXECFILE: C:/Program Files/Exar/XRT86SH221 Evaluation
Software/scripts/voy_lite_startup.py
FAILED EXECFILE: xrscripts/plxv2.py
SONET FUNCTIONS LOADED

Voyager Lite Detected and Ready...

E1 LIU Programmed for 120 ohm...

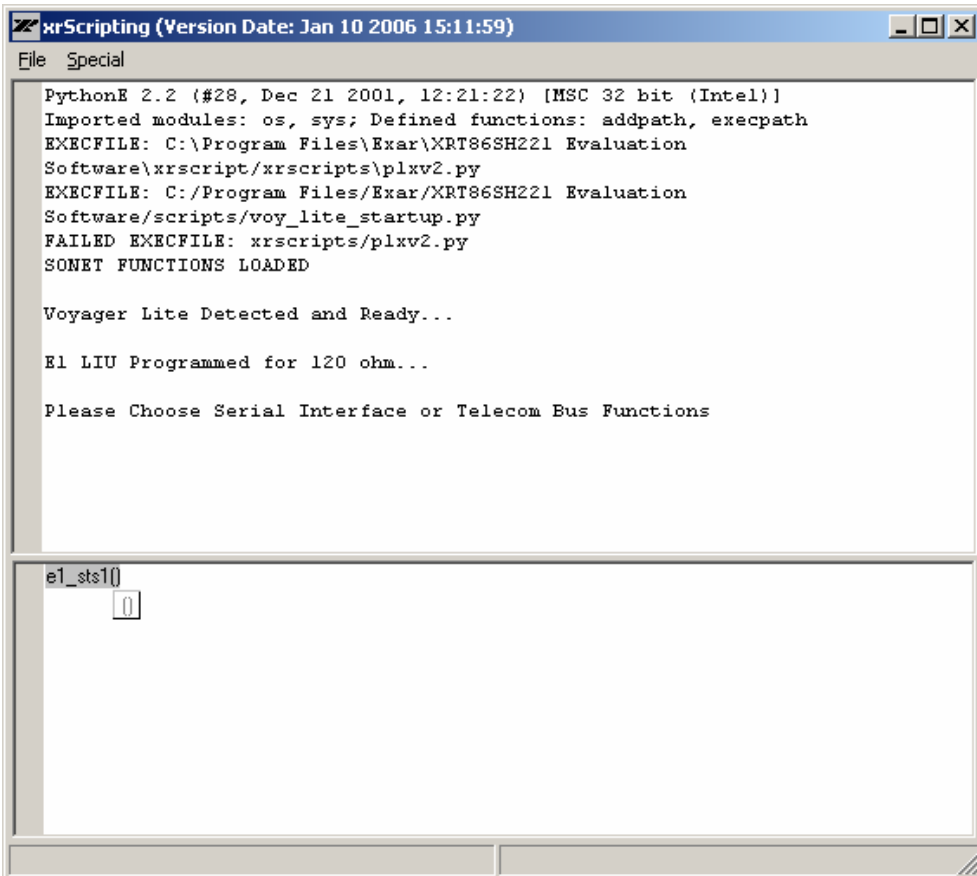
Please Choose Serial Interface or Telecom Bus Functions

writereg(0x1000, 0x20)
(address, value, device=0, inst=0)
```

Example 3: Run a Function Call for STM-0 Serial Interface

The following function “e1_sts1()” (which is located in the “test_scripts.py” script file) will set a general provision for running 21 channels of E1 traffic, VT Mapped up to STM-0 and output to the Serial Interface. On the Evaluation Board, a jumper cable can be used to externally route the output of the XRT75VL00 to the inputs. Once this is done, there should be no bit errors on the Test Equipment. From this point, the manual Read/Write access or a customized script can be used to fit a particular application.

Note: Critical: You must press Ctrl + Enter to execute a command from the Command Console!



```
xrScripting (Version Date: Jan 10 2006 15:11:59)
File Special
PythonE 2.2 (#28, Dec 21 2001, 12:21:22) [MSC 32 bit (Intel)]
Imported modules: os, sys; Defined functions: addpath, execpath
EXECFILE: C:\Program Files\Exar\XRT86SH221 Evaluation
Software\xrscript\xrscripts\plxv2.py
EXECFILE: C:/Program Files/Exar/XRT86SH221 Evaluation
Software/scripts/voy_lite_startup.py
FAILED EXECFILE: xrscripts/plxv2.py
SONET FUNCTIONS LOADED

Voyager Lite Detected and Ready...

E1 LIU Programmed for 120 ohm...

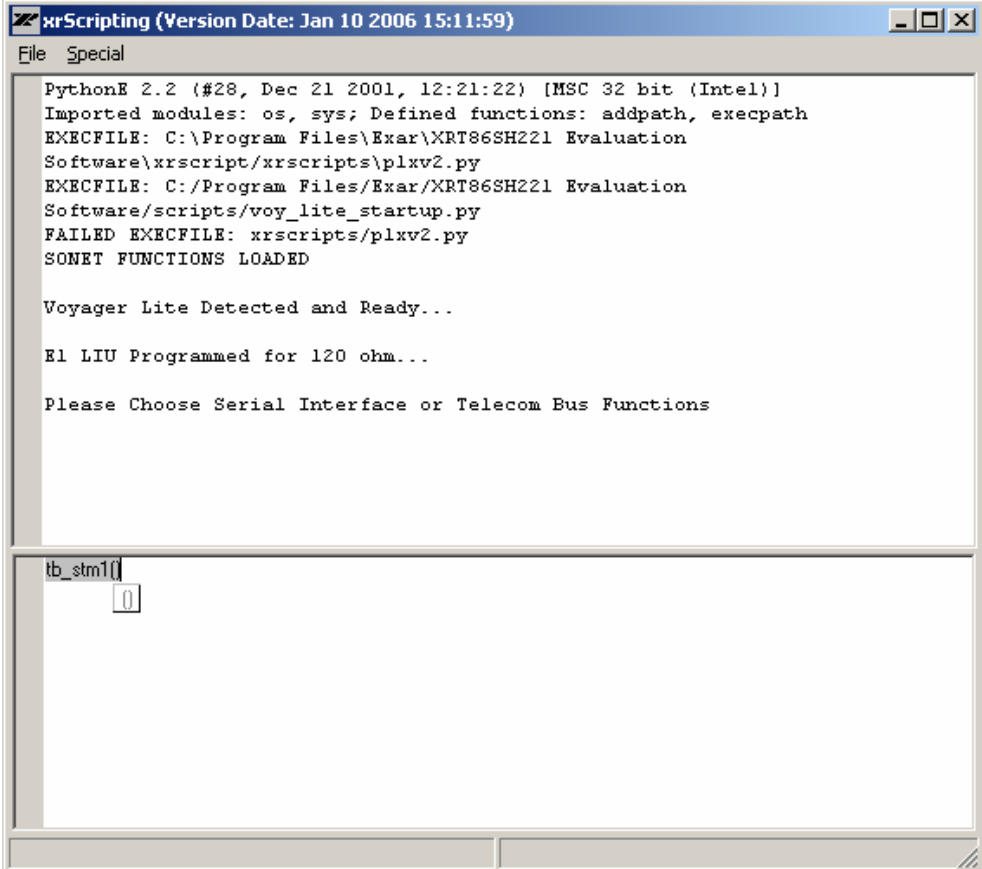
Please Choose Serial Interface or Telecom Bus Functions

e1_sts1()
0
```

Example 4: Run a Function Call for STM-0 Telecom Bus Interface

The following function “tb_stm1()” (which is located in the “test_scripts.py” script file) will set a general provision for running 21 channels of E1 traffic, VT Mapped up to STM-1 and output to the Telecom Bus. From this point, the manual Read/Write access or a customized script can be used to fit a particular application.

Note: Critical: You must press Ctrl + Enter to execute a command from the Command Console!



```
xrScripting (Version Date: Jan 10 2006 15:11:59)
File Special
PythonE 2.2 (#28, Dec 21 2001, 12:21:22) [MSC 32 bit (Intel)]
Imported modules: os, sys; Defined functions: addpath, execpath
EXECFILE: C:\Program Files\Exar\XRT86SH221 Evaluation
Software\xrscript\xrscripts\plxv2.py
EXECFILE: C:/Program Files/Exar/XRT86SH221 Evaluation
Software/scripts/voy_lite_startup.py
FAILED EXECFILE: xrscripts/plxv2.py
SONET FUNCTIONS LOADED

Voyager Lite Detected and Ready...

E1 LIU Programmed for 120 ohm...

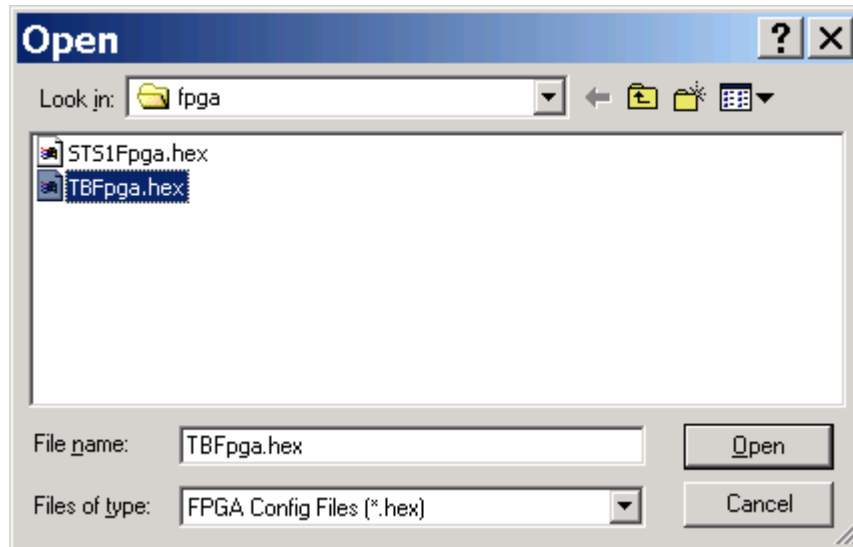
Please Choose Serial Interface or Telecom Bus Functions

tb_stm1()
```

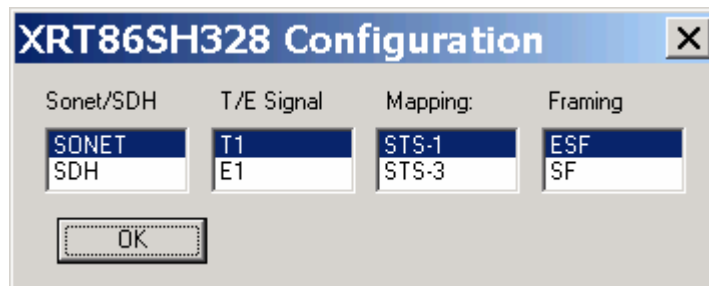

SECTION 6 Graphical User Interface

To start the GUI, double click on the xrt86sh328.exe icon, or select it through the start menu.

The following dialog box will appear:

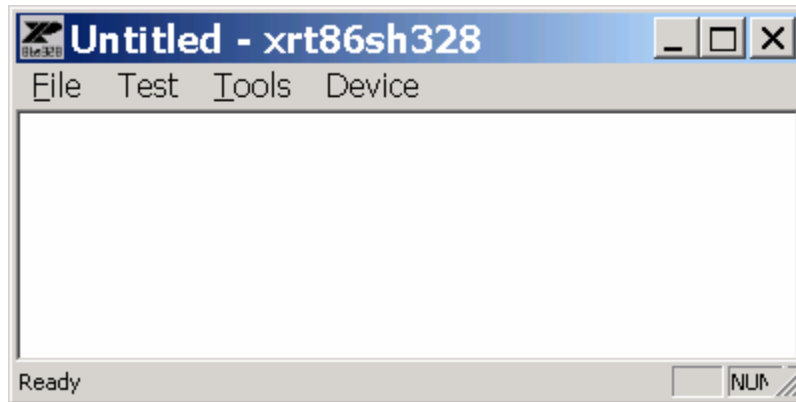


When the FPGA is finished downloading, the following choices need to be made depending on the application.

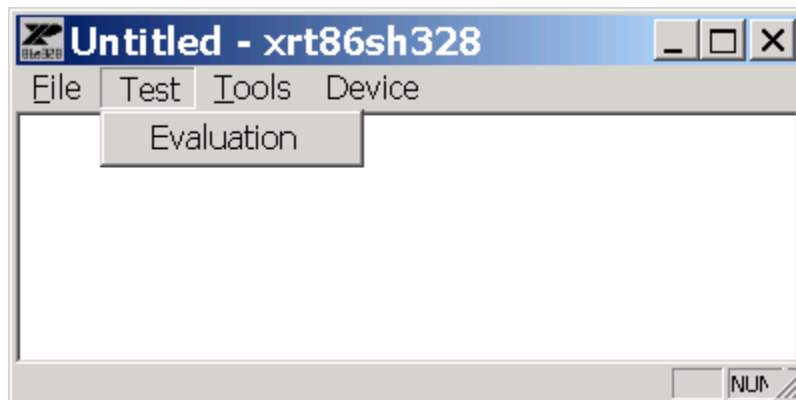


After the selections have been made, please wait a moment for the device to be configured.

The following dialog will appear and you will be ready to evaluate the XRT86SH328 device.



Select Test->Evaluation to begin evaluation.



This dialog box allows the user to configure, generate and detect alarms.

