

# **TECHNICAL MANUAL**

# CHEETAH V5 – DVI MODULES



<u>Publication:</u> 81-9059-0611-0, Rev. F August, 2011



**Thank You !!** for purchasing your new V5 System from PESA. We appreciate your confidence in our products. PESA produces quality, state-of-the-art equipment designed to deliver our users the highest degree of performance, dependability and versatility available anywhere. We want you to know that if you ever have a concern or problem with a PESA product, we have a team of engineers, technicians and customer service professionals available 24/7/365 to help resolve the issue.

Our commitment is to continue earning the trust and confidence of our customers throughout the industry by incorporating cutting-edge technology into the highest quality, most cost effective products on the market. And we would like to invite you to tell us how we're doing. If you have any comments or suggestions concerning your PESA equipment, please contact our Customer Service Department.

Again thank you for choosing a PESA product and we look forward to a long-term partnership with you and your facility.

SERVICE AND ORDERING ASSISTANCE PESA 103 Quality Circle, Suite 210 Huntsville AL 35806 USA www.PESA.com

<u>SERVICE DEPARTMENT</u> Tel: 256.726.9222 (24/7) Toll Free: 800.323.7372 Fax: 256.726.9268 Email: service@PESA.com MAIN OFFICE Tel: 256.726.9200 Fax: 256.726.9271

© 2011 PESA, All Rights Reserved.

Cheetah is a trademark of PESA in the United States and/or other countries.

Microsoft, Windows, and Windows NT are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

No part of this publication (including text, illustrations, tables, and charts) may be reproduced, stored in any retrieval system, or transmitted in any form or by any means, including but not limited to electronic, mechanical, photocopying, recording or otherwise, without the prior written permission of PESA.

All information, illustrations, and specifications contained in this publication are based on the latest product information available at the time of publication approval. The right is reserved to make changes at any time without notice.

Printed in the United States of America.

August, 2011

July, 2008



### TABLE OF CONTENTS

CHAPTER 1	ABOUT THIS MANUAL	1-1
1.1	DOCUMENTATION AND SAFETY OVERVIEW	
1.2	WARNINGS, CAUTIONS, AND NOTES	
1.2.1	Warning	
1.2.2	Caution	
1.2.3	Note	1-1
CHAPTER 2	INTRODUCTION	2-1
2.1	DESCRIPTION	
2.2	TRANSMIT MODULE	
2.3	Receive Module	
2.4	TYPICAL CHEETAH V5 SYSTEM APPLICATIONS	
2.5	SUPPORTED VIDEO RESOLUTION AND REFRESH RATES	
CHAPTER 3	SYSTEM SET-UP AND CONFIGURATION	3-1
3.1	INITIAL SET-UP STEPS	
3.2	INSTALL CHEETAH DVI USB DRIVER TO THE HOST PC	
3.3	CONNECT THE V5 MODULE TO THE HOST PC	
3.4	INSTALL GRAPHIC USER INTERFACE (GUI) TO THE HOST PC	
3.5	TRANSMIT MODULE CONFIGURATION	
3.6	RECEIVE MODULE CONFIGURATION	
CHAPTER 4	INSTALLATION AND OPERATION	4-1
4.1	TRANSMIT MODULE INSTALLATION AND OPERATION	
4.2	RECEIVE MODULE INSTALLATION AND OPERATION	
CHAPTER 5	MAINTENANCE	5-1
5.1	UPDATING THE FIRMWARE	
5.2	RE-BOOT FUNCTION	

### LIST OF FIGURES AND TABLES

FIGURE 2-1	CHEETAH V5–DVI - TYPICAL TRANSMIT AND RECEIVE MODULE	.2-1
FIGURE 2-2	CHEETAH V5 TRANSMIT MODULE	.2-2
	CHEETAH V5 RECEIVE MODULE	
FIGURE 2-4	TYPICAL SINGLE-POINT INSTALLATION	.2-4
FIGURE 2-5	TYPICAL MULTI-MODULE INSTALLATION INCLUDING A ROUTING SWITCHER	.2-5
FIGURE 3-1	CONNECTING V5 MODULE TO HOST PC	.3-5
FIGURE 5-1	CONNECTING V5 MODULE TO HOST PC	.5-1
TABLE 2-1	SUPPORTED VIDEO RESOLUTIONS AND REFRESH RATES	.2-6



## **Chapter 1 About This Manual**

#### 1.1 DOCUMENTATION AND SAFETY OVERVIEW

This manual provides instructions for the installation, operation, and maintenance of the Cheetah V5 - DVI Modules built by PESA.

It is the responsibility of all personnel involved in the installation, operation, and maintenance of the equipment to know all the applicable safety regulations for the areas they will be working in. Under no circumstances should any person perform any procedure or sequence in this manual if the procedural sequence will directly conflict with local Safe Practices. Local Safe Practices shall remain as the sole determining factor for performing any procedure or sequence outlined in this document.

#### 1.2 WARNINGS, CAUTIONS, AND NOTES

Throughout this document, you should notice various Warnings, Cautions, and Notes. These addendum statements supply necessary information pertaining to the text or topic they address. It is imperative that audiences read and understand the statements to avoid possible loss of life, personal injury, and/or destruction/damage to the equipment. These additional statements may also provide added information that could enhance the operating characteristics of the equipment (i.e., Notes). Examples of the graphic symbol used to identify each type of statement and the nature of the statement content are shown in the following paragraphs:

#### 1.2.1 WARNING



Warning statements identify conditions or practices that can result in loss of life or permanent personal injury if the instructions contained in the statement are not complied with.

#### **1.2.2** CAUTION



Caution statements identify conditions or practices that can result in personal injury and/or damage to equipment if the instructions contained in the statement are not complied with.

#### 1.2.3 NOTE



Notes are for information purposes only. However, they may contain invaluable information important to the correct installation, operation, and/or maintenance of the equipment.



## **Chapter 2 Introduction**

#### 2.1 **DESCRIPTION**

PESA's Cheetah V5-DVI Modules allow transmission of digital or analog video and stereo audio, such as from a computer, over a single coaxial cable (or optional fiber optic link) to a remote location or to a routing switcher. Every Cheetah V5 System is composed of Transmit Modules and Receive Modules. Modules may be used as stand-alone "bricks" or mounted in an optional 1 Rack Unit (RU) frame that holds up to 4 modules. Figure 2-1 shows a typical transmit module (bottom) and receive module.



Figure 2-1 Cheetah V5–DVI - Typical Transmit and Receive Module

Cheetah V5 modules offer a great deal of flexibility in planning and configuring an A/V extender system. Typical applications range from a very basic extender installation using a single source origination computer and one V5 extender system to large systems using any number of V5 transmit modules for each A/V origination source and any number of receive modules for each A/V destination point. Incorporating a video matrix switcher in the system allows any A/V destination point access to any available A/V source.

Transmit modules accept an input of digital (DVI) video or analog video in RGBHV (VGA), RGsB (Sync-on-Green) or RGBS (RGB+Composite Sync) formats. Format detection is automatic, or may be manually selected. Regardless of the input signal format, the output signal on the remote receive module may be selected as either DVI or any of the valid analog formats.



#### 2.2 TRANSMIT MODULE

A Cheetah V5 Transmit Module is the component of the V5 system that interfaces with the A/V origination source and generates the output data stream. The data stream may be sent to the receive module over high quality coaxial cable suitable for HDSDI Video, Belden 1694A or equivalent, fitted with a BNC connector on each end, or (optionally) over a fiber optic cable. Figure 2-2 illustrates a typical V5 transmit module.



Figure 2-2 Cheetah V5 Transmit Module

All connectors and status LEDs are accessible from the module rear panel as shown in Figure 2-2. The function of each is discussed below:

Power	Operating power from an external supply is attached to this connector. When the module is used as a stand-alone, power is derived from a power brick. If the module is mounted in a rack frame, power for all modules in the frame, plus the frame cooling fans, is derived from a single power brick connected to the frame power distribution panel. A connecting cable connects between the frame power distribution panel and the module power input connector.
Status LEDs	There are two green LEDs mounted beside the power connector. The upper LED lights when a source of external power is applied to the connector. The lower LED lights when a valid video signal is transmitted.
In/Out	This connector pair is the input and loop-thru output connection for audio from the A/V origination source. Each connector accepts a 3.5mm stereo plug.
USB	The USB connector allows the transmit module to communicate with a host PC over a standard USB bus. This connector is used when initially entering operational and set-up parameters to the module via the GUI application. It is not necessary to keep the module attached to the host PC during normal operation of the V5 system.
Out	The output (OUT) connector provides the serial data stream signal output from the transmit module to the receive module or video matrix switcher. This is a standard BNC type connector and interfaces with coaxial cable. Cable runs of up to 100 meters are permitted between a transmit and receive module.



Fiber	A VS transmit module equipped with optional fiber optic capability will have a fiber
	transceiver (LC type, SFP) module installed in the FIBER carrier slot. Either
	singlemode or multimode fiber cable can be used with the V5 module when
	connecting the module output to a receive module or fiber input of a video matrix switcher. Optical cable runs up to 10 kilometers are possible using singlemode fiber;
	runs up to 200 meters are possible when using multimode fiber cable.
Local/In	This connector pair is the input (IN) and loop-thru output (LOCAL) connection for
Local/In Monitor (DVI)	video from the A/V origination source. Each connector accepts a standard DVI-I
	video from the A/V origination source. Each connector accepts a standard DVI-I mating plug. The DVI-I connector accepts both digital and analog video sources. A
	video from the A/V origination source. Each connector accepts a standard DVI-I mating plug. The DVI-I connector accepts both digital and analog video sources. A monitor may be attached to the local output connector. Note that the DVI-I loop-thru
	video from the A/V origination source. Each connector accepts a standard DVI-I mating plug. The DVI-I connector accepts both digital and analog video sources. A

#### 2.3 **RECEIVE MODULE**

A Cheetah V5 Receive Module is the component of the V5 system that interfaces with the A/V destination point and provides the video and audio outputs. The receive module interfaces with a V5 transmit module over a standard coaxial cable fitted with a BNC connector on each end, or (optionally) over a fiber optic cable. Figure 2-3 illustrates a typical V5 receive module.



Figure 2-3 Cheetah V5 Receive Module

All connectors and status LEDs are accessible from the module rear panel as shown in Figure 2-3. The function of each is discussed below:

Power	Operating power from an external supply is attached to this connector. When the module is used as a stand-alone, power is derived from a power brick. If the module is mounted in a rack frame, power for all modules in the frame, plus the frame cooling fans, is derived from a single power brick connected to the frame power distribution panel. A connecting cable connects between the frame power distribution panel and the module power input connector.
Status LEDs	There are two green LEDs mounted beside the power connector. The upper LED

Status LEDs There are two green LEDs mounted beside the power connector. The upper LED lights when a source of external power is applied to the connector. The lower LED lights when a valid video signal is received.



Out	This connector accepts a 3.5mm stereo plug and is the output connection for audio from the A/V origination source.
USB	The USB connector allows the receive module to communicate with a host PC over a standard USB bus. This connector is used when initially entering operational and set- up parameters to the module via the GUI application. It is not necessary to keep the module attached to the host PC during normal operation of the V5 system.
In	The input (IN) connector receives the serial data stream signal from the transmit module or video matrix switcher. This is a standard BNC type connector and interfaces with coaxial cable. Cable runs of up to 100 meters are permitted between a transmit and receive module.
Fiber	A V5 receive module equipped with optional fiber optic capability will have a fiber transceiver (LC type, SFP) module installed in the FIBER carrier slot. Either singlemode or multimode fiber cable can be used with the V5 module when connecting the module output to a transmit module or fiber output of a video matrix switcher. Optical cable runs up to 10 kilometers are possible using singlemode fiber; runs up to 200 meters are possible when using multimode fiber cable.
Out Monitor (DVI)	This connector is the output (OUT) connection for video to the A/V destination point. The OUT connector accepts a standard DVI-I mating plug from the remote monitor. Note that the DVI-I connector provides both digital and analog video outputs.

#### 2.4 TYPICAL CHEETAH V5 SYSTEM APPLICATIONS

Figure 2-4 illustrates the most basic Cheetah V5 configuration using one transmit and one receive module. Note from the illustration that video and audio sources, in this illustration from a computer, are connected to the V5 transmit module. The transmit module provides loop-thru connectors for both video and audio that allows a local video and audio monitor to remain attached to the originating computer.

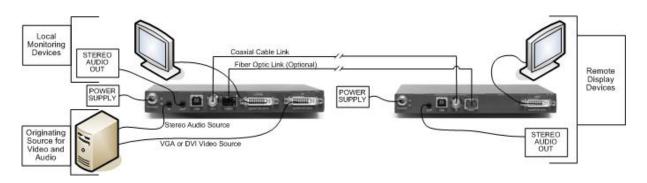


Figure 2-4 Typical Single-Point Installation



Figure 2-5 illustrates a typical expanded system using multiple transmit and receive modules. In this example the output signal from each transmit module is shown switched through a video matrix switcher. Each input module is connected to a dedicated output channel of the switcher. This arrangement allows any receiver module access to the output signal from any transmit module.

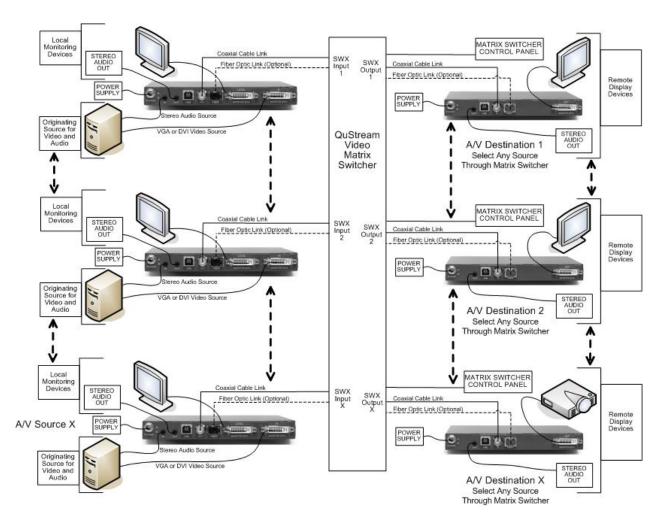


Figure 2-5 Typical Multi-Module Installation Including a Routing Switcher



DO NOT connect a transmit or receive module to the host PC until the USB drivers are installed on the computer.



#### 2.5 SUPPORTED VIDEO RESOLUTION AND REFRESH RATES

Table 2-1 lists video resolutions and refresh rates supported by the Cheetah V5-DVI Modules.

Resolution	V Refresh (Hz)	Resolution	V Refresh (Hz)
640x350	70	1024x768	85
640x350	85	1152x768	55
640x400	56	1152x864	60
640x400	70	1152x864	70
640x400	85	1152x864	75
640x480	60	1152x864	84
640x480	67	1152x900	66
640x480	72	1280x768	60
640x480	75	1280x960	60
640x480	85	1280x960	75
720x400	70	1280x960	85
720x400	85	1280x1024	60
800x600	56	1280x1024	70
800x600	60	1280x1024	75
800x600	72	1280x1024	85
800x600	75	1400x1050	60
800x600	85	1400x1050	75
832x624	75	1600x1024	60
1024x768	60	1600x1024	72
1024x768	70	1600x1200	60
1024x768	72	1680x1050	60
1024x768	75	1920x1200	60
1024x768	76		

 Table 2-1
 Supported Video Resolutions And Refresh Rates



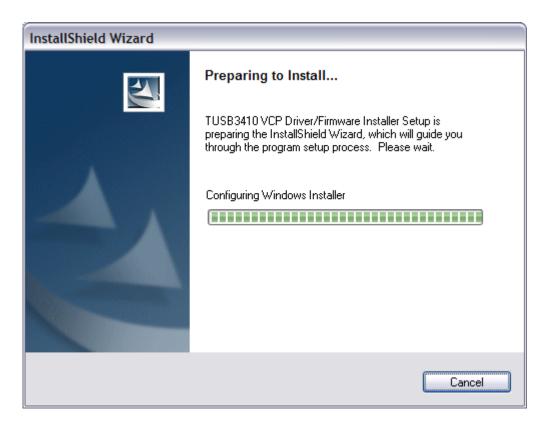
## **Chapter 3 System Set-Up and Configuration**

#### 3.1 INITIAL SET-UP STEPS

Configuring a Cheetah V5-DVI module system requires the use of a "host" PC running MicroSoft Windows<sup>™</sup> with the Cheetah DVI USB Driver and Graphic User Interface (GUI) applications loaded. Operating parameters are loaded into each module via the USB interface. Module set-up and configuration steps are discussed in the following paragraphs. It is necessary to complete configuration of all V5 modules prior to installation in a system.

#### 3.2 INSTALL CHEETAH DVI USB DRIVER TO THE HOST PC

- 1. Locate the CD shipped with your V5 module(s) and place it in the drive of the host PC.
- 2. Browse to the USB driver folder and double-click Setup.exe. The following screen is displayed on the monitor.





3. When configuration is complete, the following screen is displayed.

TUSB3410 VCP Driver/Firmware Installer - InstallShield Wizard
Choose Destination Location Select folder where setup will install files.
Setup will install TUSB3410 VCP Driver/Firmware Installer in the following folder.
To install to this folder, click Next. To install to a different folder, click Browse and select another folder.
Destination Folder
C:\TI\TI3410XP_DEVICE1\
InstallShield
< <u>B</u> ack Cancel

- 4. Modify the default Destination Folder, if you wish, by using the Browse function to select the desired directory for software installation. When the destination folder is correct, click the Next button to proceed with installation.
- 5. You will receive a message indicating that the software has not passed Windows Logo testing, as shown below. The USB Driver files have been provided by Texas Instruments and have been thoroughly validated. Click "Continue Anyway" to continue.



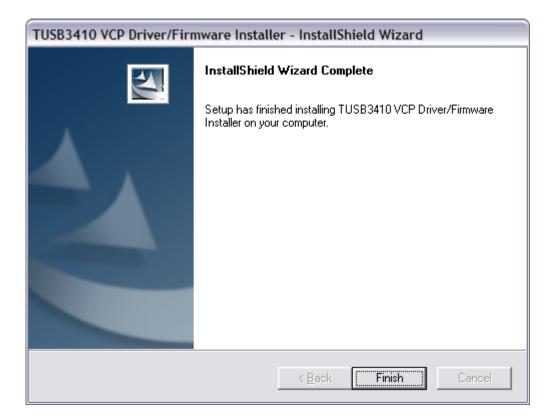
Software Installation			
1	The software you are installing has not passed Windows Logo testing to verify its compatibility with Windows XP. ( <u>Tell me why</u> this testing is important.) Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the software vendor for software that has passed Windows Logo testing.		
	Continue Anyway STOP Installation		

6. The Logo testing window will pop-up a 2<sup>nd</sup> time. Click "Continue Anyway" to continue.





7. When the driver installation is complete, you will receive the message window shown below, indicating that the Driver/Firmware is installed successfully on your PC.



8. Click the Finish button to exit the installer program.

#### 3.3 CONNECT THE V5 MODULE TO THE HOST PC

Once the USB driver application is installed, perform the following steps to allow Windows<sup>TM</sup> "Plug and Play" capability to interface the V5 hardware to the host PC.

- 1. Apply power to a Cheetah V5 module by connecting the external power supply to the module and to a source of primary power. Either a transmit or receive module may be used for this step.
- 2. Connect a USB cable first to the V5 module and then into an open USB port on the host PC, Figure 3-1.



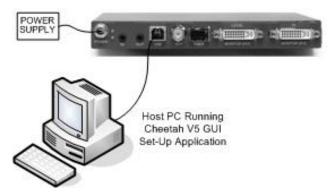
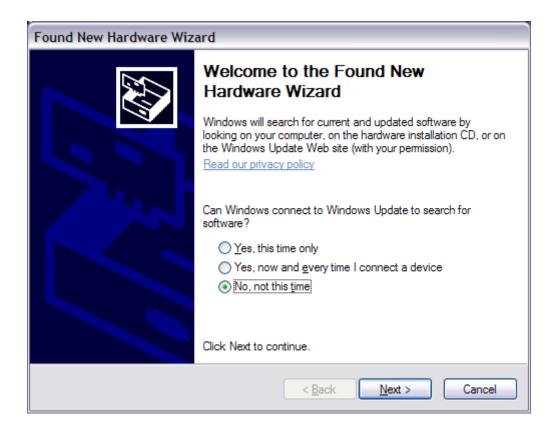


Figure 3-1 Connecting V5 Module To Host Pc

3. After a brief pop-up from the taskbar, the following "Found New Hardware" window should appear on the monitor.

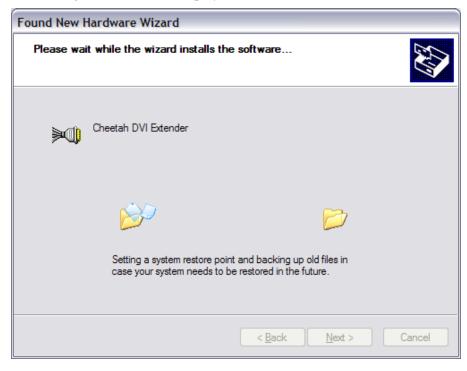


- 4. Select the "No, not this time" option button and then click Next to continue.
- 5. The following window should display on the monitor.



Found New Hardware Wizard		
Image: Non-State State		
< <u>B</u> ack <u>N</u> ext > Cancel		

- 6. Select the "Install the software automatically" option button and then click Next to continue.
- 7. The following window should display on the monitor.





8. Software installation process will begin and you should receive the following window display message on the monitor indicating the software has not passed Windows Logo testing. The USB Driver files have been provided by Texas Instruments and have been thoroughly validated. Click "Continue Anyway" to continue installation.



9. Software installation process will continue and you should receive the following window display message on the monitor.



Found New Hardware Wizard		
Found New Hardware Wiz	Ard Completing the Found New Hardware Wizard The wizard has finished installing the software for: Cheetah DVI Extender	
	Click Finish to close the wizard.	
	< Back Finish Cancel	

- 10. Click "Finish" to continue software installation.
- 11. The installation sequence will repeat itself while the 2<sup>nd</sup> component of the USB Driver is installed and you should receive the following display screen on the monitor.



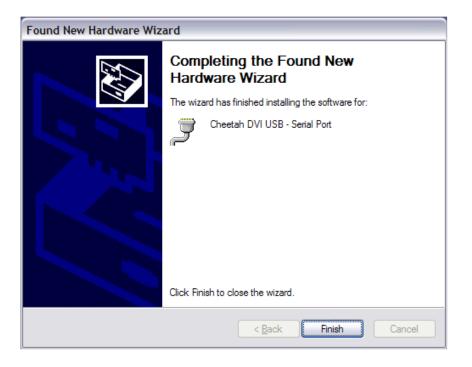
Found New Hardware Wizard			
Please wait while the wizard installs the software			
Cheetah DVI USB - Serial Port			
i i i i i i i i i i i i i i i i i i i			
	< <u>B</u> ack Next > Cancel		

12. You will receive the following message indicating that the software has not passed Windows Logo testing. The USB Driver files have been provided by Texas Instruments and have been thoroughly validated. Click "Continue Anyway" to continue.





13. Software installation process will continue and you should receive the following window display message on the monitor.



14. Click "Finish" to complete software installation. The following message should be displayed.



15. The USB Driver has been successfully installed.

#### 3.4 INSTALL GRAPHIC USER INTERFACE (GUI) TO THE HOST PC

- 1. Locate the CD shipped with your V5 module(s) and place it in the drive of the host PC.
- 2. Browse to the GUI Folder and double-click Setup.exe.
- 3. Choose a destination folder (Program Files\CheetahDVI\Drivers)
- 4. Overwrite existing files if prompted.
- 5. The GUI application will install to your computer.
- 6. Start the GUI application from the Windows Start Menu.
- 7. Browse to the Programs  $\Rightarrow$  PESA folder and click on the *Cheetah DVI Extender* icon.



#### 3.5 TRANSMIT MODULE CONFIGURATION

Every transmit module used in a Cheetah V5-DVI installation must be configured individually prior to installation or use. Follow this procedure to configure a transmit module and repeat the process for each transmit module.

#### **Transmit Module Configuration:**

- 1. Determine whether the Transmitter will be configured to accept VGA or DVI video from the A/V origination source. You must configure the transmit module for the correct video type (VGA or DVI) before you can begin using it.
- 2. Configuration of the modules will be much simpler if you use a different PC (with the USB Drivers and GUI installed), rather than trying to configure the module using the same PC as the video origination source.
- 3. Connect the Cheetah V5 Gen II transmit module to the host PC with a USB cable and plug in the power supply, Figure 3-1.
- 4. Open the GUI application, refer to Paragraph 3.4, and click Connect.

CheetahDVI Extender			
File Edit Help			
	Device Info		
	Device Type Refresh		
	Serial Num		
	Connect © Auto © Manual - Use Port: 5		
Status		6/28/2007	2:41 PM

- 5. The GUI application will automatically establish communication with the module and display the Device Type (Transmitter) and Serial Number.
- 6. Click on the Transmitter Tab.



CheetahDVI Extender	
File Edit Help  Device Info  Device Type Transmitter  Serial Num [652748H08030796  Disconnect	Refresh ○ Auto ○ Manual - Use Port: 5
VGA RGBS (SOG) RGBS None Input Resolution: 1920x 1080 60Hz CEA 861B (47) Belock to	ideo C VGA Reset to A
Connected on Port 5	9/30/2008 3:46 PM

#### **Input Select Setting**

Options available through Input Select configure the transmit module for the type of video signal it accepts from the origination source.

CheetahDVI Extender		
File Edit Help	Device Info Device Type Transmitter Refresh Serial Num [652748H08030796 Disconnect C Manual - Use Port 5	
Transmitter Receiver Mair Input Status VGA RGB6 (SOG) RGB5 RGB5 None Input Resolution: 1320x 1080 60Hz CEA 861B (47)	Settings Input Select Output Select EDID Select C Auto Video VGA C RGBHV (VSA) Video C VGA C RGBS (SOG) C RGBS	
	ock to ppt Set	



- 7. The default Input select setting is Auto. The Transmitter will attempt to automatically detect the format of the input signal as DVI, RGBHV, RGsB or RGBS.
- 8. If you would like to force the Transmitter to only accept either DVI or one of the analog format signals (you can change this at any time) or if you encounter problems detecting the input type in the Auto setting, select DVI or the desired analog format from the listing.
- 9. Select the desired Input Select setting and click Apply.

#### **EDID Setting**

Your PC uses EDID data to identify the type of monitor that is connected and the resolutions it can support.

File Edit Help	e 	
	Device Info Device Type Transmitter Refresh Serial Num [652748H08030796 Disconnect C Auto C Manual - Use Port: 5	
Transmitter Receiver Main	tenance Settings Input Select C Auto C DVI C RGBHV (VGA) C Local C	
	C RGsB (SOG) C None ↓ ▼	

10. The Cheetah V5 Gen II contains two sets of EDID information, one for VGA and one for DVI. The following choices are available to the user for the EDID setting:

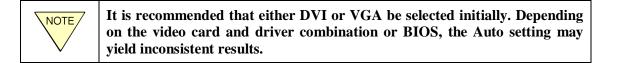
DVI - Sends DVI EDID information to the PC

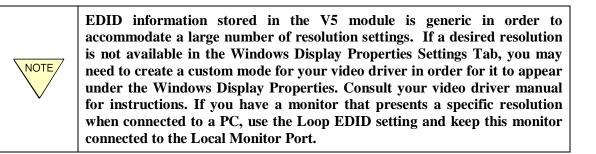
VGA - Sends VGA EDID information to the PC

- Loop Allows EDID data from the Local Monitor to be passed to the PC
- **None** Does not send any EDID information to the PC (older VGA cards may present more video resolution choices in Windows with this setting) !!! Do not use this setting with DVI !!!



11. Select the desired EDID setting and click Apply.





#### **Output Select Setting**

Options available through the Output Select box allow the user to activate the local monitor connector and also disable transmission of audio or video from the origination source, if desired.

File Edit Help         Device Info         Device Type Transmitter         Serial Num [552749H08030796         Disconnect         Auto         Manual - Use Port         Transmitter         Receiver         Maintenance         Input Status         VGA         RG8B         RG8B         None         Input Resolution:         1320x 1000 60Hz         CEA 8618 (47)         Refeesh         Reput	CheetahDVI Extender		
Device Type       Transmitter       Refresh         Serial Num       552748H08030796         Disconnect       Auto         Of Manual - Use Port       5         Transmitter       Receiver         Maintenance       Manual - Use Port         Input Status       Settings         Input Status       Input Select         VI       VGA         RGs8 (SOG)       Input Select         Input Resolution:       1320x 1080 60Hz         1320x 1080 60Hz       CEA 861B (47)         Refeesh       Relock to	File Edit Help		
Input Status       Settings         VGA       Input Select       Output Select       EDID Select         VGA       Auto       ✓ Audio       ✓ DVI         VGA       C DVI       ✓ Video       ✓ DVI         Input Resolution:       1920x 1080 60Hz       C RGBS       ✓ Local       ✓ Loop         RGBS       C RGBS       Sampling Phase       50	Devi	rial Num 652748H08030796	
Imput Select       Imput Select       EDID Select         Imput Select       Imput Select       Imput Select       Screen Position         Imput Select       Imput Select       Imput Select       Imput Select       Imput Select         Imput Select       Imput Select       Imput Select       Imput Select       Imput Select       Imput Select       Imput Select         Imput Resolution:       Imput Resolution:       Imput Select       Imput Select	Transmitter Receiver Maintenance	~	
	DVI VGA RGsB (SOG) RGBS None Input Resolution: 1920x 1080 60Hz CEA 861B (47) Refore Refore	Input Select Output Select Dutput Select EDID Select Screen Position Screen Position OVI Video VGA C Loop C RGBB (SOG) C Local C None Sampling Phase 50	



- 12. To use a Local Video Monitor, check the Local checkbox.
- 13. To disable video transmission to a Receiver Module, remove the check from the Video checkbox.
- 14. To disable audio transmission to a Receiver Module, remove the check from the Audio checkbox.
- 15. Click the Apply Button to apply your changes.

#### **Screen Position Controls**

Modifications made through the positioning controls allow you to change the screen position of the analog video image as desired. By clicking on the directional arrows, the screen image may be moved up, down, left or right.

CheetahDVI Extender	
File Edit Help	
Device Info Device Type Transmitter Refresh Serial Num [652748H08030796 Disconnect C Manual - Use Port: [5	
Transmitter Receiver Maintenance	
VGA         C Auto         V Audio         C DVI           RG85         C DVI         V Video         V VGA           RGBS         C RGBHV (VGA)         V Local         C Loop           Input Resolution:         C RGBS         C RGBS         C None           1920x 1080 60Hz         C RGBS         C RGBS         C None	Provide Adjustments
Connected on Port 5 9	3/30/2008 3:46 PM

- 16. If you wish to change the screen position of the analog video image, use the directional arrows to place the image as desired.
- 17. Clicking the Reset to Defaults Button removes any changes you have made and returns the image to the default position.



18. Once you have the image positioned as desired, click the Set Button to write the new position data to memory.

#### **Sampling Phase**

Adjustments made to the Sampling Phase Slider allow you to select the sampling phase of the analog signal to optimize the image quality.

Setting of the Sampling Phase control applies **only** to Analog Video input signals (VGA, RGsB, RGBS) applied to the Transmitter, and has no effect on DVI signals. Image quality on the Local port is not affected with this control.

G CheetahDVI Extender File Edit Help		
De	e Info vice Type Transmitter Refresh ierial Num 652748H08030796 Disconnect C Auto Manual - Use Port: 5	
Transmitter Receiver Maintenance	Settings Input Select C Auto C DVI C RGBHV (VGA) C RGBS C RGBS Apply Audio C DVI C Audio C DVI C VGA C Loop C None Analog Image Adjustments Screen Position Reset to Default Sampling Phase 50 Set	
Connected on Port 5	9/30/2008 3:46 F	

- 19. If you wish to adjust the phase of the incoming analog video signal, use the cursor to move the slider for best image quality.
- 20. Once you have the slider set for best image quality, click the Set Button to save the new setting to memory.



#### **Final Steps**

- 21. Use the "Remove Hardware" function of Windows<sup>TM</sup> to disable the USB connection between the module and the PC.
- 22. Remove the USB cable from the transmit module and remove power.
- 23. The configured transmit module may now be installed as needed.
- 24. Repeat the configuration procedure for any remaining transmit modules.

#### 3.6 **RECEIVE MODULE CONFIGURATION**

Every receive module used in a Cheetah V5 Gen II installation must be configured individually prior to installation or use. Follow this procedure to configure a receive module and repeat the process for each receive module.

#### **Receive Module Configuration:**

- 1. Connect the Cheetah V5-DVI Receive Module to the host PC with a USB cable and plug in the power supply, Figure 3-1.
- 2. Open the GUI application, refer to Paragraph 3.4, and click Connect.

CheetahDVI Extender		
File Edit Help		
Device Info		
Device Type Refresh		
Serial Num		
Connect Connect Manual - Use Port: 5		
C Manual - Use Port:  5		
$\bullet$		
Status	6/28/2007	2:41 PM



- 3. The GUI application will automatically establish communication with the module and display the Device Type (Receiver) and Serial Number.
- 4. Click on the Receiver Tab.

CheetahDVI Extender	
File       Edit       Help         Device Info       Device Type       Refresh         Serial Num       652749F07479202       Refresh         Disconnect       C       Auto         C       Manual - Use Port:       5	
Transmitter       Receiver       Maintenance         Input Status       Coax Input:       Present         Fiber Input: not detected       Fiber Input Signal Lock: LOCKED       DVI Cable Detect: not detected         DVI Cable Detect: not detected       Fiber (PPU)       Auto (BNC)         Transmitter Serf#: 0796       C Auto (BNC)       C RGBHV (VGA)         Resolution:       1320x 1080 60 Hz       C Auto (Fiber)         Refresh       Relock to       Input	
Connected on Port 5 9/30/2008 3:52 f	PM _//

#### **Input Select Setting**

Options available through Input Select determine the input signal source for the receive module as the coaxial cable BNC or the fiber optic module.



CheetahDVI Extender File Edit Help	
Device Info Device Type Receiver Refresh Serial Num [652743F07479202 Disconnect C Auto C Manual - Use Port: 5	
Input Status  Coax Input: Present Fiber Input: not detected Input Signal Lock: LOCKED DVI Cable Detect: not detected Transmitter Ser#: 0796 Resolution: 1320x 1080 60 Hz	utput Options Enable Video Scaler: © 800x600 © 1024x768 © 1280x1024 Override Cable Detect. Include Vertical Interval Serration Pulses. (RGBS, SDG only.)
Connected on Port 5 9/	/30/2008 3:52 PM

5. The following input select choices are available:

**Coax** – Forces selection of the coaxial cable as the input signal source

Fiber - Forces selection of the fiber optic cable as the input signal source

- Auto (BNC) Causes the Receiver to switch to the Coax input if signals are detected on both the Coax cable and fiber optic cable
- Auto (Fiber) Causes the Receiver to switch to the Fiber input if signals are detected on both the coax cable and fiber optic cable
- 6. Select the desired Input Select setting and click Apply.

#### **Output Select Setting**

Options available through the Output Select box allow you to deactivate specific outputs from the receive module, if desired. When a check is present next to the output option, the output signal is active. Removing the check deactivates the specified output signal.



CheetahDVI Extender File Edit Help	
Device Info Device Type Receiver Serial Num [652749F07479202 Disconnect Transmitter Receiver Maintenance	C Auto C Manual - Use Port 5
Input Status Coax Input: Present Fiber Input Signal Lock: LOCKED DVI Cable Detect: not detected Transmitter Ser#: 0736 Resolution: 1920x 1080 60 Hz CEA 861B (47) Refresh Relock to Input Serter Present Prese	• RUBHV (VGA)
 Connected on Port 5	9/30/2008 3:52 PM

7. Click in the box beside each output option to activate or de-activate the selection:

Audio – Enables or disables the audio output

- **DVI** Enables or disables the DVI output on the DVI-I connector.
- Analog Enables or disables the analog video output on the DVI-I connector in the format selected by the radio buttons below the Analog Video checkbox
- **RGBHV** (VGA) Selecting this radio button selects standard VGA output format for the analog video output signal
- **RGsB (SOG)** Selecting this radio button selects Sync-On-Green output format for the analog video output signal
- **RGBS** Selecting this radio button selects RGB+Composite Sync output format for the analog video output signal
- 8. Make any desired changes to the Output Select options and click Apply.

#### **Output Options Menu**

#### Video Scaler

Cheetah V5\_DVI Receive Modules can automatically scale the resolution of the video input to any of the three values listed beneath the Enable Video Scaler checkbox. Use of the scaler function is not necessary in most applications, but is provided in the event that the monitor or projector connected to the output of the receiver module does not contain an internal scaler; or if the internal scaler does not support a particular resolution.



The V5-DVI scaler function supports input resolutions up to 1280X1024 at 60Hz and 75Hz refresh rates. Input video can be scaled to any of three output resolutions: 800X600, 1024X768 or 1280X1024 at refresh rates of 60Hz or 75Hz. Note that refresh rates other than 60 or 75Hz, or video resolutions higher than 1280X1024 are not supported by the V5-DVI scaling function.

CheetahDVI Extender	
File Edit Help Device Info Device Type Receiver Serial Num (652743F07473202	
Disconnect C Auto C Manual - Use Port: 5	<u> </u>
Coax Input:     Present     Input Select     Output Select       Fiber Input:     not detected     Coax     ✓ Audio       Fiber Rx Pwr:     not detected     ✓ Fiber     ✓ DVI       Input Signal Lock:     LOCKED     ✓ Fiber     ✓ DVI       DVI Cable Detect:     not detected     ✓ Auto (BNC)     ✓ RGBHV (VGA)       Transmitter Ser#:     0796     ✓ Auto (Fiber)     ✓ RGBHV (VGA)       CEA 861B (47)     ✓ Auto (Fiber)     ✓ RGBS	Output Options Enable Video Scaler: © 800x600 © 1024x768 © 1280x1024 Veride Cable Detect. Include Vertical Interval Serration Pulses. (RGBS, SOG only.)
Refresh Relock to Apply	· · · · · · · · · · · · · · · · · · ·
Connected on Port 5	9/30/2008 3:52 PM

9. Click in the box beside each Video Scaler option to activate or de-activate the selection:

Enable Video	Scaler - Click in this box to activate or de-activate the scaler function. Note
	that if the scaler function is disabled (not checked) the output
	resolution will be the same as the input resolution.
800X600 -	Selects an output video resolution of 800X600 from the input video source
1024X768 -	Selects an output video resolution of 1024X768 from the input video source
1280X1024 -	Selects an output video resolution of 1280X1024 from the input video source



#### **Override Cable Detect**

Activating this function allows the receive module to produce a video output if a monitor's hot plug signal is not detected. This compensates for monitors that are not "Plug-and-Play" compatible and video cables or VGA to DVI adapters that do not contain the HotPlug signal pins. A check in the menu box indicates that the function is active.

#### **Vertical Interval Serration Pulses**

When using the RGsB or RGBS analog video format output, some monitors require the presence of Horizontal Serration Sync pulses during the Vertical Sync period in order to synchronize properly. This output option, when activated, will include these pulses in the video output signal. The default setting is to disable the sync pulse output (box not checked). Note that this function is available only when using the RGsB or RGBS analog video signal formats.

10. Make any desired changes to the Output Select options and click Apply.

#### **Final Steps**

- 11. Use the "Remove Hardware" function of Windows<sup>™</sup> to disable the USB connection between the module and the PC.
- 12. Remove the USB cable from the receive module and remove power.
- 13. The configured receive module may now be installed as needed.
- 14. Repeat the configuration procedure for any remaining receive modules.



## **Chapter 4 Installation and Operation**

#### 4.1 TRANSMIT MODULE INSTALLATION AND OPERATION



Each Transmit Module MUST be configured using the GUI application prior to installation in a system. Refer to Paragraph 3.5 of this manual for a step-by-step configuration procedure.

1. Connect video from the origination source to a configured Cheetah V5-DVI transmit module using an appropriate cable:

For connection to a PC with a DVI video card, use a DVI-D to DVI-D or DVI-I to DVI-I cable. For connection to a PC with a VGA video card, use a VGA to VGA cable and a VGA to DVI-I converter adapter.

2. If desired, connect a local monitor to the transmit module using an appropriate cable

Connect a DVI monitor using a DVI-D to DVI-D cable. Connect a VGA monitor using the monitor's VGA cable with a VGA to DVI-I converter attached. Connect a VGA monitor using a VGA to VGA cable with a VGA to DVI-I converter attached.

- 3. Connect audio from the PC to the transmit module, and to local speakers if desired, using appropriate 3.5mm stereo cables.
- 4. Connect the transmit module to either a Cheetah V5-DVI receive module or routing switcher using appropriate cabling (Belden 1694A coax or equivalent, or single-mode fiber cable with LC-connectors, if module is equipped for fiber transmission).
- 5. When the transmit module has been configured and installed, it is not necessary to keep it connected to the USB port for normal operation nor does the GUI need to be running. However, if you wish to monitor operation, you may connect the module to a host PC (running the GUI software) using a USB cable.
- 6. Start the GUI application, refer to Paragraph 3.4, and click Connect.



CheetahDVI Extender				
File Edit Help				
	- Device Info			
	Device Type	Refresh		
	Serial Num			
	Connect	<ul> <li>Auto</li> <li>Manual - Use Port: 5</li> </ul>		
	·			
Status			6/28/2007	2:41 PM

- 7. The GUI application will automatically establish communication with the module and display the Device Type (Transmitter) and Serial Number.
- 8. Click on the Transmitter Tab.

CheetahDVI Extender		_ 🗆 🛛
Transmitter Receiver Main Input Status VGA RGBS None Input Resolution: 1920k:1080 60Hz CEA 861B (47) Reference Refer	Device Info Device Type Transmitter Serial Num 652748H08030736 Disconnect © Auto © Manual - Use Port: 5 tenance tenance Settings Input Select Output Select © DVI © Auto © VGA © None RGBHV (VGA) © RGBS Disconnect © Auto © Manual - Use Port: 5 Analog Image Adjustments Screen Position Reset to Default Potent Settings Settings Settings Settings Settings Analog Image Adjustments Screen Position Reset to Settings Setings Settings Settings Settings Settings Settings Settin	
Connected on Port 5	9/30/2008 3:46 PM	1 /



9. The Input Status box displays the video input type and resolution detected.

CheetahDVI Extender	
File Edit Help	
Device Info Device Type Transmitter Refresh Serial Num 652748D07264288 Disconnect O Auto C Manual - Use Port: 5	
Transmitter Recover Maintenance	
Input Status       Input Select       Output Select       EDID Select       Screen Position         Input Resolution:       1820x 1200 60Hz       C RGBS       C Loop       C None       Imput Select       Imput Select </td <td></td>	
Connected on Port 5 7/14/2008 3:59 PM	

- 10. Press Refresh at any time to update the displayed information.
- 11. Press the Reclock to Input button to re-establish connection to the video graphics card in the event the EDID data should be corrupted or the V5 Transmitter did not properly lock to the video source.

#### 4.2 RECEIVE MODULE INSTALLATION AND OPERATION



Each Receive Module MUST be configured using the GUI application prior to installation in a system. Refer to Paragraph 3.5 of this manual for a stepby-step configuration procedure.

1. Connect video output from a configured Cheetah V5-DVI Receive Module to a monitor using an appropriate cable:

For connection to a DVI monitor, use a DVI-D to DVI-D cable.

For connection to a VGA monitor use the monitor's VGA cable with a VGA to DVI-I converter attached.



Or for connection to a VGA monitor use a VGA to VGA cable with a VGA to DVI-I converter attached.

- 2. Connect audio from the receive module to local speakers, if required, using appropriate 3.5mm stereo cables.
- 3. Connect the receive module to either a Cheetah V5-DVI transmit module or HD-SDI routing switcher using appropriate cabling (Belden 1694A coax or equivalent, or single-mode fiber cable with LC-connectors, if module is equipped for fiber transmission).
- 4. When the receive module has been configured and installed, it is not necessary to keep it connected to the USB port for normal operation nor does the GUI need to be running. However, if you wish to monitor operation, you may connect the module to a host PC (running the GUI software) using a USB cable.
- 5. Start the GUI application, refer to Paragraph 3.4, and click Connect.

CheetahDVI Extender		
File Edit Help		
Device Info	]	
Device Type Refresh		
Connect Connect Connect		
Status	6/28/2007	2:41 PM

- 6. The GUI application will automatically establish communication with the module and display the Device Type (Transmitter) and Serial Number.
- 7. Click on the Receiver Tab.



CheetahDVI Extender	Device Info				
Ň	Device Type Receiv	9F07479202	Refresh Auto Manual - Use Port: 5		
Transmitter Receiver Mainter Input Status Coax Input: Pre Fiber Input. not Fiber RA Pwr. not Input Signal Lock: LO	esent detected detected	Settings	Output Select	⊂ Output Options ⊂ Enable Video Scaler: ⊂ 800x600 ⊂ 1024x768	
		<ul> <li>Auto (BNC)</li> <li>Auto (Fiber)</li> </ul>	Analog Video: C RGBHV (VGA) C RGsB (SOG) C RGBS Apply	<ul> <li>1280x1024</li> <li>Override Cable Detect.</li> <li>Include Vertical Interval</li> <li>Serration Pulses. (RGBS SOG only.)</li> </ul>	i,

8. The Input Status box displays the video input type and resolution detected; and indicates if a monitor has been detected on the output. This box will also display the ID number of the transmit module that is sending the video signal. The ID number is typically determined by the last 4 digits of the transmitter's serial number.

CheetahDVI Extender	
File Edit Help	
Device Info Device Type Receiver Refresh Serial Num 652749F07479202 Disconnect C Auto C Manual - Use Port 5	
Transmitter       Receiver       Input Status       Dutput Status       Input Status       Inp	o Scaler: 8 24 ble Detect. ical Interval
Connected on Port 5 9/30/2008	3:52 PM

Typical Input Status Display When Using Coax Interconnect Cable



CheetahDVI Extender		
File Edit Help		
Device Info Device Type Receiver Refresh Serial Num 652749D07285341 Disconnect C Auto Manual - Use Port: 5		
Transmitter       Receiver       Input Status         Input Status       Input Select       Output Select         Fiber Input:       Present       Input Select       Output Select         Input Signal Lock:       LOCKED       DVI Cable Detect:       Detect:       Detect:       Output Select         DVI Cable Detect:       Detect:       Detect:       Detect:       Detect:       Input Select       Imput Select         Transmitter Ser#:       4288       Resolution:       1680x 1050 60 Hz       Imput       Analog Video:       Imput Select       Imput Select	Output Options Enable Video Scaler: 900x600 1024x768 1280x1024 Verride Cable Detect. Include Vertical Interva Serration Pulses. (RGB SOG only.)	a
Connected on Port 8	2/11/2008 2:44 F	M //

#### Typical Input Status Display When Using Fiber Optic Interconnect Cable

- 9. Press Refresh at any time to update the displayed information.
- 10. Press the Reclock to Input button to re-establish connection to the video graphics card in the event the EDID data should be corrupted or the V5 Receiver did not properly lock to the video source.



## **Chapter 5 Maintenance**

#### 5.1 UPDATING THE FIRMWARE

As firmware updates are released by PESA, they may easily be installed to the Cheetah V5-DVI modules in the field. The following procedure should be followed when updating system firmware.

- 1. Download the firmware update to a folder on a host PC with the USB Driver and GUI installed, Refer to Chapter 3 of this manual .
- 2. Apply power to the Cheetah V5-DVI module to be upgraded by connecting the external power supply to the module and to a source of primary power.
- 3. Connect a USB cable first to the V5 module and then into an open USB port on the host PC, Figure 5-1.

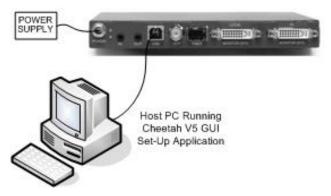


Figure 5-1 Connecting V5 Module To Host Pc

4. Open the GUI application, refer to Paragraph 3.4, and click Connect.



CheetahDVI Extender File Edit Help			
File Edit Help			
	Device Info		
	Device Type Refresh		
	Serial Num		
	Connect © Auto © Manual - Use Port: 5		
	( Manual-Use Fort j5		
Status		6/28/2007	2:41 PM

- 5. The GUI application will automatically establish communication with the module and display the Device Type and Serial Number.
- 6. Click on the Maintenance Tab.

Device Info Device Type Transmitter Refresh Serial Num (552748H08030796 Disconnect C Auto Manual - Use Port 5 Transmitter Receiver Maintenance Update Items Update FPGA Current Revision: 8, 6 Update S/W Current Revision: 11 Update EDID Current Revision: 2 Update EDID Current Revision: 5 Update USB Current Revision: 1 Refresh Refresh Manual - Use Port (5) Manual - Use Port (6) Manual - Use Port (	CheetahDVI Extender Fie Edit Help	
Update FPGA Current Revision: 8, 6 Update S/W Current Revision: 11 Update EDID Current Revision: 2 Update LUT Current Revision: 5	Device Info Device Type Transmitter Refresh Serial Num [552748H08030796 Disconnect C Auto C Manual - Use Po	art 5
Update USB Current Revision: 1	Update FPGA Current Revision: 8, 6 Update Progress – Update S/W Current Revision: 11 Update EDID Current Revision: 2 Current Operation	ı Idle
	Update USB Current Revision: 1	Re Boot



- 7. Current revision level of all internal firmware is displayed for reference.
- 8. Click the button of the firmware you wish to update.
- 9. Browse to the location of the folder containing the update file, select the file and click OK.
- 10. After the update completes, power cycle the V5 module and restart the GUI.
- 11. If you have any problems with the firmware update, contact the PESA Customer Advocacy Department for assistance.
- 12. Following a successful PBN download and re-programming cycle, the user is prompted by the following sequence to proceed with re-boot of the module.

File       Edit       Help         Device Info       Device Type       Transmitter         Device Type       Transmitter       Refresh         Serial Num       652748H08030796       Image: Comparison of the co
Device Type     Transmitter     Refresh       Serial Num     652748H08030796       Disconnect          • Auto         • Manual - Use Port:         5         •         Transmitter
Updatable items
Update FPGA Current Revision: 8, 6 Update S/W Current Revision: 11 Update EDID Current Revision: 2 Update LUT Current Revision: 5
Update USB     Image Programming Complete     Re Boot       Image Programming Completed Successfully     Would you like to Re-boot the Device Now?     Yes
Image Reprogramming Successful 9/30/2008 4:06 PM

13. Click YES to begin the re-boot process.



CheetahDVI Extender		
File Edit Help		
Device Info Device Type Transmitter Refresh Serial Num (552748H08030796 Disconnect C Auto C Manual - Use Port: 5		
Transmitter Receiver Maintenance		
Update Items Update FPGA Current Revision: 8, 6 Update S/W Current Revision: 11 Update EDID Current Revision: 2 Current Operation: Programming Co	mpleted	
Update LUT Current Revision: 5 Update USB Current Revision: 1 Re Boot	]	
Reboot Device         X           Are You Sure You Want to Reboot This Device? This Will Cause The Application To Disconnect From The Device.         OK         Cancel		
Image Reprogramming Successful	9/30/2008 4	:06 PM

14. If you are sure you wish to proceed with reboot, click YES to continue.

CheetahDVI Extender	_ 🗆 🗙
File Edit Help	
Device Info Device Type Refresh Serial Num Connect C Auto C Manual - Use Port 5	
Transmitter Receiver Maintenance	1
Update FPGA Current Revision: Update S/W Current Revision: Update EDID Current Revision: Update LUT Current Revision: Update LUT Current Revision: Update USB Device is Rebooting Vou Have Been Disconnected From The Device. Please Wait A Few Seconds For The Device To Perform USB Re-Enumeration Before Re-Connecting. OK	
Not Connected 9/30/2008 4:07 PM	

15. Click OK to clear the re-boot prompt.



#### 5.2 **RE-BOOT FUNCTION**

The ReBoot button on the Maintenance Menu allows the user to execute a system restart on the selected module.

- 1. Click the ReBoot button to initiate the soft reset sequence.
- 2. A prompt box will ask if you wish to proceed with reset.
- 3. Accepting the reset function will disconnect you from the USB port and reset the module.

G CheetahDVI Extender		
File Edit Help  Device Info  Device Type Transmitter  Serial Num [652748H08030796  Disconnect  C Auto C Manual - Use Port: 5		
Transmitter       Receiver       Maintenance         Updatable Items       Update FPGA       Current Revision: 8, 6         Update S/W       Current Revision: 11         Update EDID       Current Revision: 2         Update LUT       Current Revision: 5         Update USB       Current Revision: 1		
Connected on Port 5	9/30/2008 3:46	PM //

