VIP 4500

Operator's Manual

ED-16594   *Rev 11 – 8 June 2011*

DAKTRONICS

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Section 1: Introduction

1.1 How to Use This Manual

This manual explains the setup and configuration of the VIP 4500 series using the Venus® 7000 software, V-Tour®, and Tera Term®. Specifically covered are instructions on first-time setup and use as well as initial power-up procedures. For a complete command reference that describes all configuration options refer to **Section 10: Command Reference**.

Important Safeguards

- Read and understand these instructions before installing.

- Do not drop the VIP 4500 processor or allow it to get wet.

- An ambient temperature range of -20°C (-4°F) to 40°C (104°F) is recommended.

- Disconnect power to the VIP 4500 processor when not in use.

This manual is divided into ten sections:

1. **Introduction** covers the basic information needed to use this manual. Take time to read the entire introduction as it defines terms and explains concepts used throughout the manual.

2. **System Logic Flow and Input Options** provides general information on how VIP 4500s typically integrate into a control room setting and which options are available for inputs.

3. **VIP 4500 Configuration Using Venus 7000® Software** provides general information on how to control the VIP 4500 using the Venus 7000 Shell program.

4. **VIP 4500 Configuration Using Tera Term®** provides general information on how to configure the VIP 4500 using Tera Term®.

5. **VIP 4500 Configuration Using V-Tour®** provides general information on how to configure the VIP 4500 using V-Tour®.

6. **Advanced Operation** provides a user with the tools to optimize or troubleshoot the VIP 4500.

7. **VIP 4510 Converter** provides general information on how to configure the VIP 4510 converter using the Venus V7 VLink Debugger or Tera Term®.

8. **Front Panel Instructions** provides general information on how to change the VIP 4500 settings through the Front Panel Interface and also includes a list of the settings that can be changed.

9. **Web Page Navigation** provides general information on how to access and use the web pages.

10. **Command Reference** gives a detailed explanation of each command and its function.

Daktronics identifies manuals by an ED or DD number located on the cover page of each manual. Other manuals referred to in this manual are identified by their ED or DD numbers. For example, this manual would be referred to as **ED-16594**.

1.2 Common Acronyms

Acronym	Meaning
HD-SDI	High Definition Serial Digital Interface
SDI	Serial Digital Interface
VGA	Video Graphics Array
SVGA	Super Video Graphics Array
XGA	Extended Graphics Array
SXGA	Super Extended Graphics Array
RGB	Red Green Blue (color model based on additive color primaries)
DVI	Digital Visual Interface
NTSC	National Television System Committee (television format)
PAL	Phase Alternation Line (television format)
SECAM	Séquentiel Couleur Avec Mémoire (French télévision format)
DDR	Digital Disk Recorder
VTR	Video Tape Recorder
WFM	Wave Form Monitor
IRE	Institute of Radio Engineers

1.3 Conventions Used in this Manual

Bold	Any item that requires direct action, such as clicking, pressing, selecting, or formatting, appears in boldface. Any item within the manual to reference, such as a figure or another section, also appears in boldface.
Italics	Indicates an item visible on the screen or within a menu. No direct action will be taken on this item. Captions also appear in italics.
[X]	Represents a keyboard key that needs to be pressed.
"Quotes"	Items that need to be typed.
Click	Press and release the left mouse button.
Double-click	Press and release the left mouse button twice.
Right-click	Press and release the right mouse button.
>	Followed by (ex. **File > Open**).

1.4 Product Overview

The VIP 4500 serves as an interface between a video source and video display. The VIP 4500 has 10-bit digital processing that allows for 4.4 trillion colors, depending on the display type. It accepts standard NTSC, PAL, and SECAM video formats, as well as high-definition digital formats. It accepts the following inputs: analog composite, analog component, HD component (up to 720p), HD-SDI (up to 1080i), S-Video, SD-SDI, VGA, SVGA, XGA, WXGA and SXGA, in RGB or DVI. Refer to **Figure 2** in **Section 2.2** for an illustration of the processor

The VIP's Active Input^{SM} architecture provides aspect ratio versatility, allowing a wide range of video sources to be display on video boards with traditional or non-traditional aspect ratios. Active Input^{SM} architecture also makes it possible to accept multiple live inputs and incorporate zoning, alpha blending, keying, and seamless switching effects into a video presentation.

The VIP 4500 optimizes video signals for correct appearance on LED video displays. The processor uses True Pixel^{SM} processing to reduce errors and noise inherent in video signals. Features of True Pixel^{SM} processing include color space conversion, adjustable gamma correction, motion processing, and 3-D noise reduction.

Section 2:   System Logic Flow and Input Options

2.1   VIP 4500 System Logic Flow

The VIP 4500 accepts both digital and analog video sources as well as content from the DMP. DMP content is sent using Daktronics' proprietary VMax4™ signal. DMP content consists of real-time data, animations, AVIs, schedules, and sequences.

After the VIP 4500 processes the incoming video signals, it sends a VMax4™ signal to an A/B switch. Primary system is routed to port A while the backup system is routed to port B. If the primary system goes down the user simply uses the A/B switch to start sending data from the backup system.
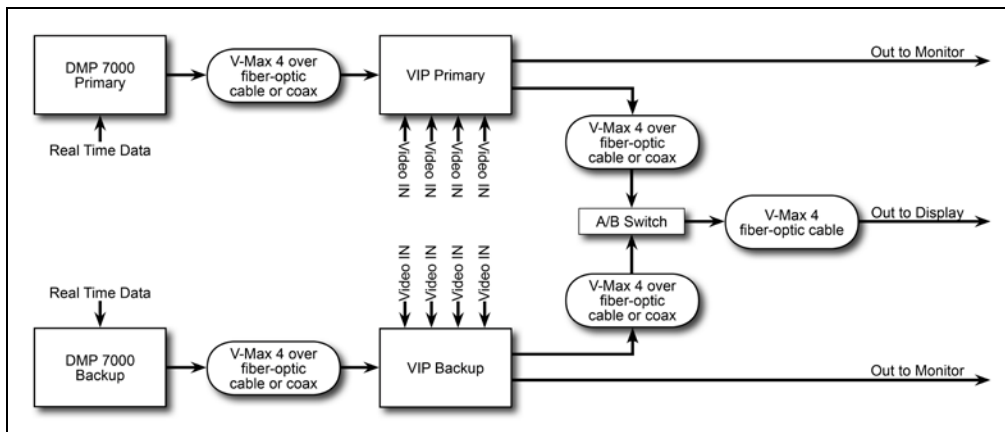
Figure 1: *VIP 4500 System Logic Flow*

Figure 1 illustrates one of numerous ways to configure a control system. Please contact a Daktronics project manager for specific information on a system.

2.2   VIP 4500 Processor Input and Output Options

Each processor is capable of simultaneously displaying four total video sources in addition to one VMax4™ signal. The sources can be composed of a variety of video standards.
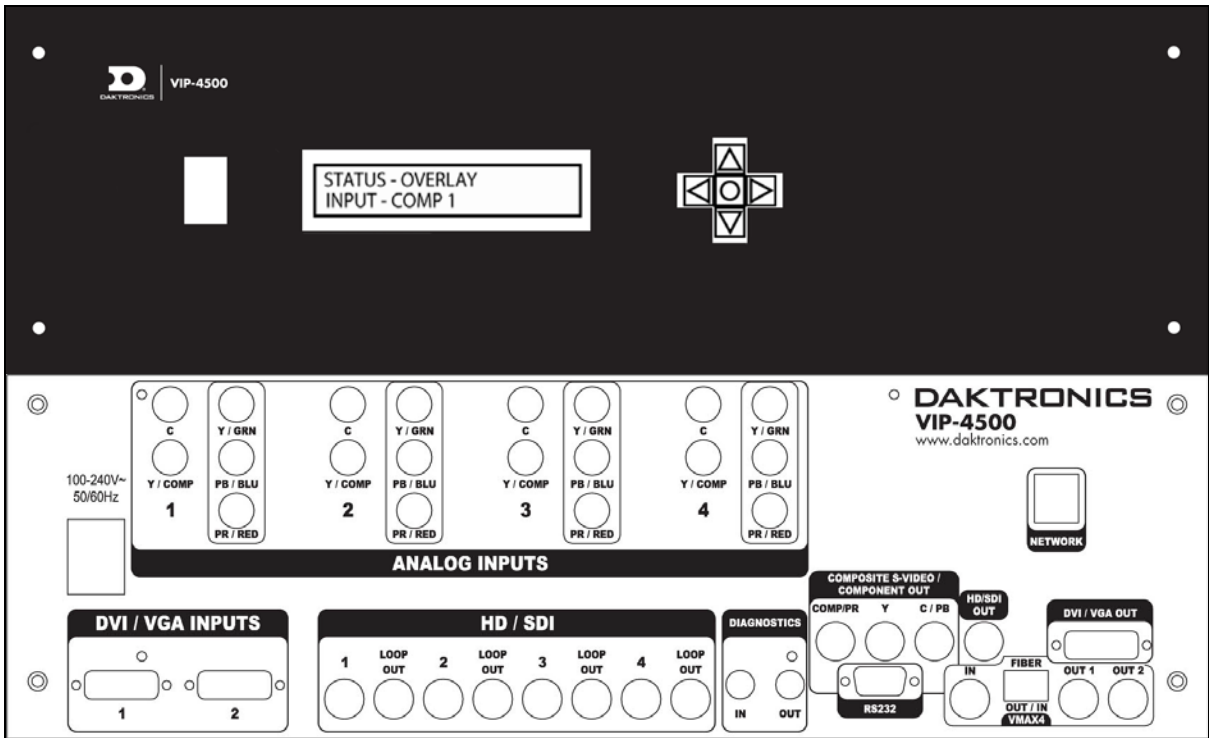
Figure 2: *VIP-4500 Video Processor (Front and Rear)*
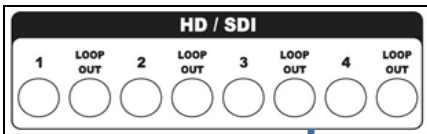
Figure 3: *Four SD-SDI/HD-SDI Ports*
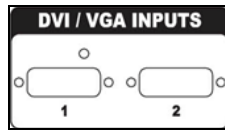
Figure 4: *DVI/VGA Ports*
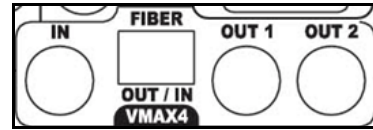
Figure 5: *VMax4 Input/Output*

Up to four SD-SDI or HD-SDI sources can be displayed at one time. These sources may come from a variety of digital output devices, including cameras, decks, switchers, and DDRs. A BNC connection located on the rear of the VIP accepts the feeds. Refer to **Figure 3**. The loop out connectors, located to the right of the HD-SDI/SDI inputs, can send the same source to a backup VIP 4500 video processor.

A maximum of four analog video sources can be connected at one time. The VIP 4500 processor accepts component, S-Video, and/or composite sources. Refer to **Figure 2** and the following table for more information.

Source Type	Required Connections
Composite signals	1 BNC cable
S-Video	2 BNC cables
Component Signals	3 BNC cables

Two DVI (Digital Visual Interface) or VGA (Video Graphics Array) sources may be connected at one time. These sources come from a variety of devices, such as desktop computers, laptops, or content servers. **Figure 4** depicts both the DVI and VGA inputs.

The processor accepts VMax4™ signals transmitted over coax or fiber-optic cable. Only one input can be active at a time. VMax4™ may come from a DMP 7000, another VIP 4500 processor, or VIP 4510. Refer to **Figure 5**.

A total of three processors may be linked together, allowing up to 12 different video sources to display. In this setup, the VMax4™ out from one VIP is routed to the VMax4™ on the second processor. This is repeated until all three processors are linked to obtain the maximum number of inputs.

2.3 EDID Supported Resolutions Table

VGA Resolution (Height x Width)	VGA Frame Rate	DVI Resolution (Height x Width)	DVI Frame Rate
480 x 640	60	480 x 640	60
480 x 640	75	480 x 640	72
600 x 800	56	480 x 640	75
600 x 800	60	600 x 800	56
600 x 800	72	600 x 800	60
600 x 800	75	600 x 800	72
768 x 1024	60	600 x 800	75
768 x 1024	70	768 x 1024	60
768 x 1024	75	768 x 1024	70
1024 x 1280	60	768 x 1024	75
864 x 1152	75	1024 x 1280	60
720 x 1280	60	864 x 1152	75
960 x 1280	60	720 x 1280	60
		960 x 1280	60
		900 x 1440	60

Section 3: VIP 4500 Configuration Using Venus® 7000 Software

The V7 VLink Controller in the Venus® 7000 software program allows the operator to control multiple VIP 4500s. Each processor can output up to four video sources simultaneously. This section focuses on setting up, adjusting, and operating multiple processors and their inputs using the Venus® 7000 software. Refer to the **DMP-7000 Installation and Setup Manual** (**DD1834905**) for more information.

1. In the *Venus 7000 Shell*, open the *V7 VLink Controller* application by clicking the **V-Link 4500** icon or by pressing **[V]**. The *V7 VLink Controller* dialog box opens; refer to **Figure 6.**
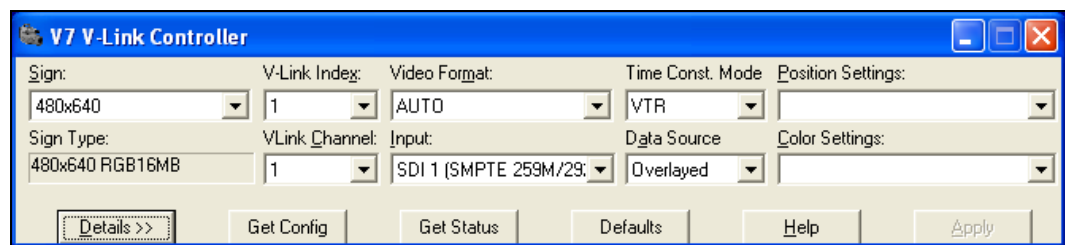
Figure 6: V7 V-Link Controller Dialog Box

2. If the sign to configure does not display in the *Sign* drop-down box, click the **drop-down arrow** next to *Sign* and select the sign to control. Users may also highlight the **Sign drop-down box** and use the **[up]** and **[down arrows]** to select the sign. After selecting a sign, the *Sign Type* automatically populates.

3. To select which VIP 4500 to control, click the **drop-down arrow** next to *VLink Index* and select the processor or press **[Alt] + [X]** and use the **[up]** and **[down arrows]** to select it. Up to three processors may connect to the Venus 7000 controller per sign.

4. To select which channel to control, click the **drop-down arrow** next to *VLink Channel* and select the channel or press **[Alt] + [C]** and use the **[up]** and **[down arrows]** to select it. Up to four channels can display per VIP 4500.

5. Set the video format for each channel. Click the **drop-down arrow** next to *Video Format* and select the preferred format. Users may also press **[Alt] + [M]** to move the cursor to the *Video Format* box and use the **[up]** and **[down arrows]** to select the video format.

    Note: *Auto* works well as a format for most applications.

6. Click the **drop-down arrow** next to *Input* and select your desired input. Users may also press **[Alt] + [I]** to move the cursor to the *Input* text box and then use the **[up]** and **[down arrows]** to select the desired input. After completing the setup procedure and configuring the settings for this input, adjust the settings for each of the other inputs as well.

7. To make the Time Constant Mode adjustment, click the **drop-down arrow** next to *Time Const. Mode* box and then select the preferred mode.

   Note: VTR works well for most applications.

8. Leave the *Data Source* setting on **Video** to play video content on the display.

9. Leave the *Position Settings* and *Color Settings* alone; adjustments are made in **Steps 10-14**. Default setting is overlay.

Figure 7: Input Selector

10. Click **Details** or press **[Alt] + [D]**. The *V7 VLink Controller* dialog box expands; refer to **Figure 9**.
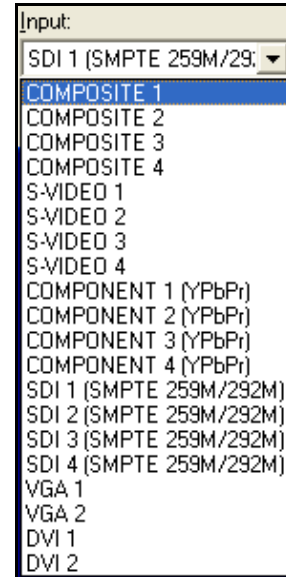
The *Viewable Area* box determines what portion of the video feed displays. The default setting is the largest area of acceptable video feed available for display. This feed is centered and may be adjusted as desired. Change the **Top** and **Left** quantities to move the display area to the desired video image area.

If adjusting the *Viewable Area* and/or *Source Window* settings, save those settings. Click **Save Position Settings** or press **[Alt] + [V].** A *Save Position Settings* dialog box opens. Type the name of the position settings (for example, "Position 1"). Click **OK** or press **[Enter]**. This saves the settings under the name entered. Recall settings using *Position Settings*.
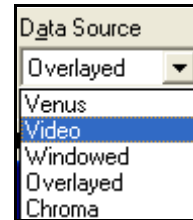
Figure 8: Data Source Selector
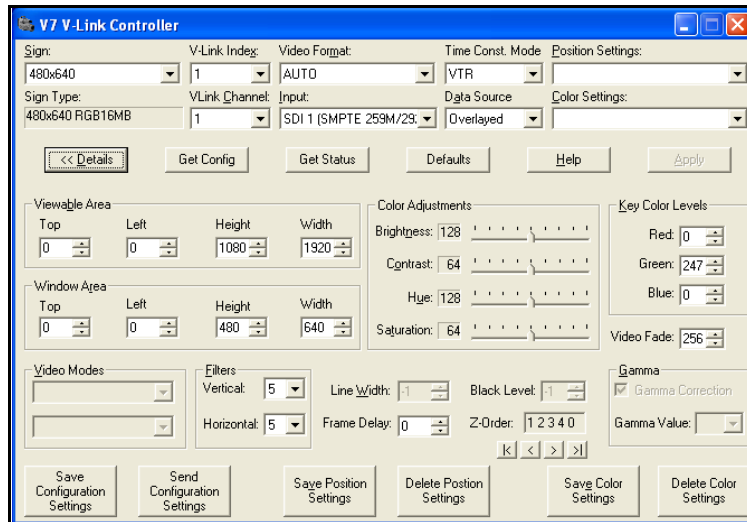
Figure 9: V7 V-Link Controller Dialog Box with Details

11. Use the *Color Adjustment* box to adjust the *Brightness*, *Contrast*, *Hue*, and *Saturation* of each input until they look their best.

- To adjust brightness, click and drag the **Brightness** slider or press **[Alt] + [N]** to move the cursor to the *Brightness* setting. Use the **[left]** and **[right arrows]** to adjust.

- To adjust contrast, click and drag the **Contrast** slider or press **[Alt] + [O]** to move the cursor to the *Contrast* setting. Use the **[left]** and **[right arrows]** to adjust.

- To adjust hue, click and drag the **Hue** slider or press **[Alt] + [U]** to move the cursor to the *Hue* setting. Use the **[left]** and **[right arrows]** to adjust.

- To adjust saturation, click and drag the **Saturation** slider or press **[Alt] + [T]** to move the cursor to the *Saturation* setting. Use the **[left]** and **[right arrows]** to adjust.

12. After entering the color settings for this input, click **Save Color Settings** or press **[Alt] + [E]**. A *Save Color Settings* dialog box opens. Type the name of the color settings (for example, "Color 1") and click **OK** or press **[Enter]**. This saves the settings under the name entered. Recall settings using *Color Settings*.

13. If using overlay, set a key color using *Key Color Levels*. Press **[Alt] + [K]** to move the cursor to the *Key Color Levels* box and use **[Tab]** or **[Shift] + [Tab]** to move between the color level boxes. Use the **[up]** and **[down arrow]** keys to set the key color level.

Note: Daktronics does not recommend changing the key color after setting it. The VIP-4500 supports 256 intensity levels for each color (0-255). The default setting is Green 247 (Red 0, Green 247, Blue 0). Create sequences with key color in mind and use only that color for sequences overlaid on video.

14. For more than one video input, return to the *Input* menu and select the next input. Adjust position or color settings for each input. Be sure to save settings when making adjustments.

15. To manually switch between VIP 4500s, inputs, and data sources in the *Venus 7000 Shell*, press **[V]** for the processor. The *V7 VLink Controller* dialog box, shown in **Figure 6**, opens.

16. After the *VLink* dialog box opens, video immediately displays on the default sign. Before the event, change the data source to the DMP 7000 controller. To do so, select **Venus** in the *Data Source* box by clicking the **drop-down arrow** next to *Data Source* and choosing **Venus** or by pressing **[Alt] + [A]** to move the cursor to the *Data Source* box and then using the **[up]** and **[down arrows]** to select **Venus**.

17. If the sign the VIP 4500 will control does not display in the **Sign** box, click in the **Sign** box and then select the sign to control. Use the **[up]** and **[down arrow]** keys to select the sign to control.

18. Set the VIP 4500 to control by clicking the **drop-down arrow** next to *VLink Index*. Then select the desired processor or press **[Alt] + [X]** to move the cursor to the *VLink Index* text box and use the **[up]** and **[down arrows]** to select the desired VIP 4500.

19. Set the output channel by clicking the **drop-down arrow** next to *VLink Channel* or by pressing **[Alt] + [C]** and using the **[up]** and **[down arrows]** to select the desired channel. Each processor outputs four channels.

20. When ready to play video on the display, click inside the **Data Source** text box and choose **Video** or press **[Alt] + [A]** to move the cursor to the *Data Source* text box and use the **[up]** and **[down arrows]** to select **Video**.

    Note: If the monitor window is open, no video plays on the display because the video does not send to the computer. The Venus software data continues on the monitor**.**

21. To select a different input from a different VIP 4500 processor, click inside the **VLink Index** text box and select a different processor from the drop-down menu. Then select the desired input from the *Input* drop-down menu. Users may also press **[Alt] + [I]** to move the cursor to the *Input* text box and use the **[up]** and **[down arrows]** to select the new input.

22. To return to the box showing Venus sequences, click the **drop-down arrow** next to *Data Source* and click **Venus** or press **[Alt] + [A]** to move the cursor to the *Data Source* text box and use the **[up]** and **[down arrows]** to select **Venus**.

23. To go to *Overlay Mode*, click the **drop-down arrow** next to *Data Source* and then click **Overlayed** or press **[Alt] + [A]** to move the cursor to the *Data Source* text box and use the **[up]** and **[down arrows]** to select **Overlayed**.

    Note: Overlay Mode allows for the display of any desired DMP sequences. Once a sequence with the key color displays, video plays inside the key color area

24. When finished with the *V7 VLink Controller* dialog box, select **Close** to close the dialog box.

    Note: Spend time practicing the various functions, such as switching between video sources and inputs.

Section 4: VIP 4500 Configuration Using Tera Term®

Initial configuration and property edits of the VIP 4500 are typically accomplished using Venus 7000 software; generally, this approach is the easiest and most practical. Tera Term® provides another method for entering the same parameters and offers the GC (Get Configuration) command, which produces a readout of current settings and is mostly used for troubleshooting.

4.1 Using Tera Term®

1. Using a serial cable, link the DB-9 connector port on the VIP 4500 to an open **COM** port on the DMP 7000 control computer. The DB-9 port on the VIP 4500 console is immediately to the left of the VMax4™ Input port.

   Note: Make sure the processor is turned on and Venus® 7000 sign service is stopped.

2. Open Tera Term® and go to **Setup > Serial Port**.

3. In the *Port* field, enter the **COM port** on the DMP 7000 connected to the VIP 4400.

4. In the *Serial Port setup* window, configure the port settings as shown in **Figure 10.**

   - **Bits per second**: 115,200

   - **Data bits**: 8

   - **Parity**: None

   - **Stop bits**: 1
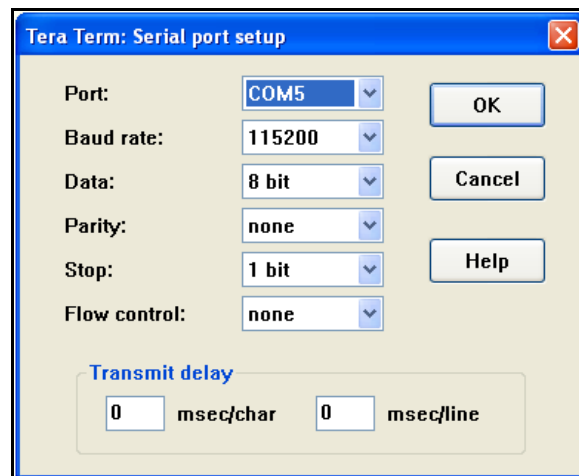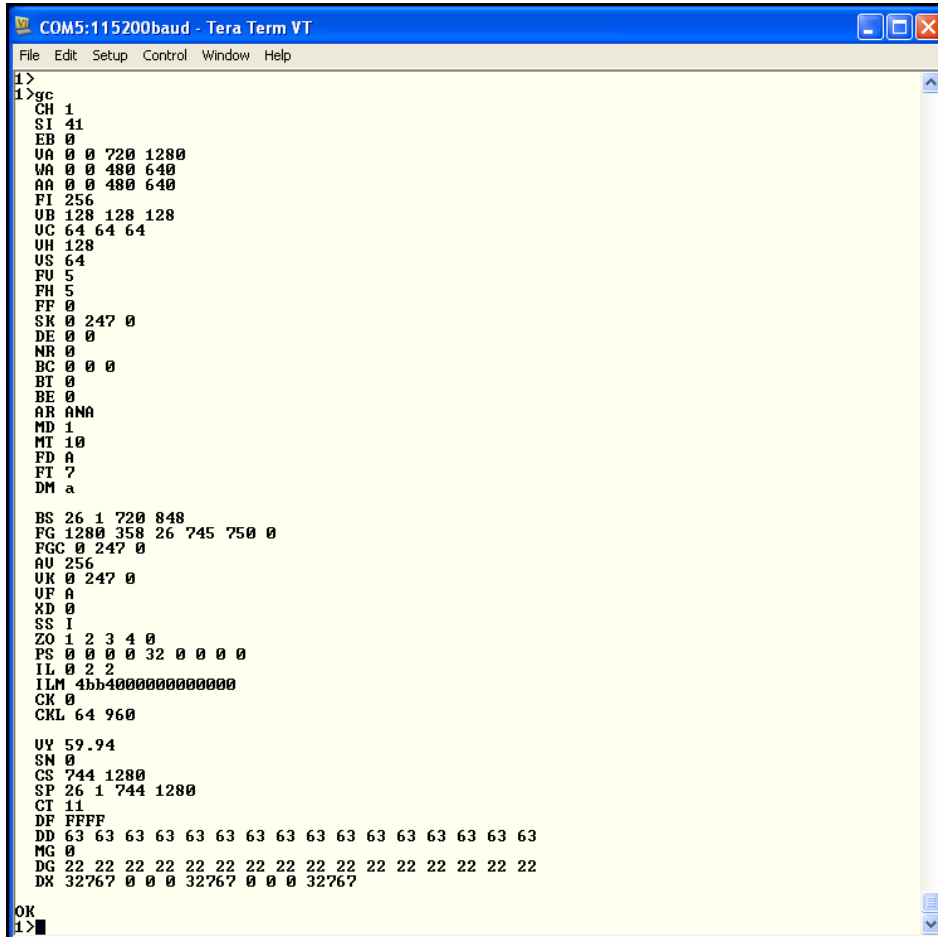
   - **Flow Control**: None

Figure 10: COM Properties Box

4.2 Initial Setup

Running the video processor for the first time requires entering configuration parameters. The preferred method uses the Venus® 7000 software to enter the parameters. However, a user can enter these commands from Tera Term® window. **Section 7: VIP 4510 Converter** explains all available commands and their key combinations.

The following example lists the commands for configuring a 480 x 640 display with one video input. **Section 7: VIP 4510 Converter** details the proper usage syntax.


```
COM5:115200baud - Tera Term VT
File  Edit  Setup  Control  Window  Help
1>
1>gc
  CH 1
  SI 41
  EB 0
  UA 0 0 720 1280
  WA 0 0 480 640
  AA 0 0 480 640
  FI 256
  UB 128 128 128
  UC 64 64 64
  UH 128
  US 64
  FU 5
  FH 5
  FF 0
  SK 0 247 0
  DE 0 0
  NR 0
  BC 0 0 0
  BT 0
  BE 0
  AR ANA
  MD 1
  MT 10
  FD A
  FT 7
  DM a

  BS 26 1 720 848
  FG 1280 358 26 745 750 0
  FGC 0 247 0
  AU 256
  UK 0 247 0
  UF A
  XD 0
  SS I
  ZO 1 2 3 4 0
  PS 0 0 0 0 32 0 0 0
  IL 0 2 2
  ILM 4bb4000000000000
  CK 0
  CKL 64 960

  UY 59.94
  SN 0
  CS 744 1280
  SP 26 1 744 1280
  CT 11
  DF FFFF
  DD 63 63 63 63 63 63 63 63 63 63 63 63 63 63 63 63
  MG 0
  DG 22 22 22 22 22 22 22 22 22 22 22 22 22 22 22 22
  DX 32767 0 0 0 32767 0 0 0 32767

OK
1>
```

Figure 11: Tera Term® Sample Configuration

1. **SI 1**—video input selection.

   - 1 indicates a composite video source.

   - Values 1-4 set composite as the input source.

   - 11-14 set S-Video.

   - 21-24 set component.

   - 31 and 32 set VGA.

   - 41-44 set SD-SDI.

   - 51 and 52 set DVI.

2. **VA 0 0 480 640**—adjusts the incoming signal's dimensions by a starting point and lengths.

   - The first 0 indicates the vertical start location.

   - The second 0 indicates the horizontal start location.

   - 480 sets the pixel height the VIP 4500 video processor controls.

   - 640 sets the pixel width the VIP 4500 processor controls.

3. **WA 0 0 480 640**—adjusts the channel's output dimensions by a starting point and lengths.

   - The first 0 indicates the vertical start point of the window.

   - The second 0 indicates the horizontal start point of the window.

   - 480 sets the value for the window height.

   - 640 sets the window length.

4. **VB 128**—video brightness.

   - 128 sets the video brightness level.

   - The default value is 128.

   - The range is 0-255. Zero is full black and 255 is full white.

---

5. **VC 64**—video contrast.

    - 64 sets the video contrast level.

    - The default is 64.

    - The range is 0-127.

6. **VH 128**—video hue.

    - 128 sets the video hue.

    - The default value is 128.

    - The range is 0-255.

7. **VS 64**—video saturation.

    - 64 sets the value for video saturation.

    - The default value is 64.

    - The range is 0-127. Zero is full black and 127 is completely saturated.

8. **CS 480 640**—display size.

    - 480 sets the height in pixels.

    - 640 sets the width in pixels.

9. **SP 26 1 480 640**—absolute sign position.

10. **DF 1**—display face enable.

    - A value of 1 enables face A.

11. **DD 127**—display dimming.

    - 127 sets the value for display dimming.

    - The default value is 127.

    - The range is 0-127.

    - A value of 0 is completely dim and the display appears black.

    - A value of 127 is at full brightness and the display appears white.

12. **DG 32**—display gamma.

   - 32 sets the data distributor gamma value.

   - The range is 10-41, which is 1.0 to 4.1.

13. **DP 0 0 240 640**—relative data distributor position.

14. **CR 48 48 48 48 48**—configure rows.

15. **CC 256 256 128**—configure columns.

16. **DN 1**—data distributor number select.

   - 0 sets to which data distributor the VMax4 signal routes.

   - 1 sets the other data distributor in the display that receives VMax4 signal.

   - The range is 0-15.

17. **DP 240 0 240 640**—relative data distributor position.

18. **CR 48 48 48 48 48**—configure rows.

19. **CC 256 256 128**—configure column.

20. **SS I**—source selection.

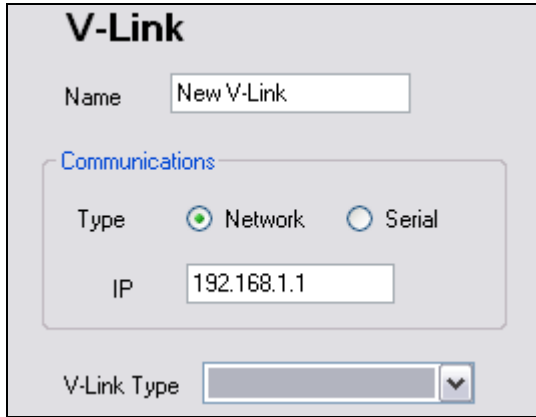   - I sets the data type to Video.

   - V sets the DMP 7000 controller as the data source.

   - O selects Overlay, which displays DMP 7000 data over video signal.

   - C sets the Chroma mode.

21. Check that all other parameters are set as shown in **Figure 11**.

Note: To avoid losing these settings, do not power the processor off and on. To save the settings, enter the command "CF S".
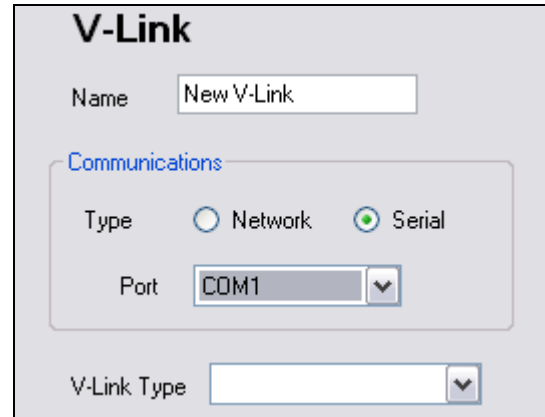
Section 5: VIP 4500 Configuration Using V-Tour®

5.1 The V-Link Window

Figure 12: *New Configuration-Network*

Figure 13: *New Configuration-Serial*

Follow these steps to configure the VIP:

1. Enter the desired **name** for the processor. Use descriptive names (e.g., VIP, Left VIP, Right VIP).

2. Choose **Network** or **Serial** in the *Communications* box.

   a. If *Network* is chosen, enter the corresponding IP address.

      Note: Use the buttons on the front panel of the VIP 4500 console to scroll through the options until the IP address is found.

   b. If *Serial* is chosen, select the Port.

      Note: The port must be different than the port selected in the display window.

3. Choose the *V-Link Type*. Refer to the series number on the console face.

4. Click **Next**. The *Summary* window opens.

5.2 The Summary Window

The Summary window overviews information entered on the *Display* and *V-Link* windows.

Note: If the options listed on the *Summary* window are incorrect, click **Previous** to adjust.
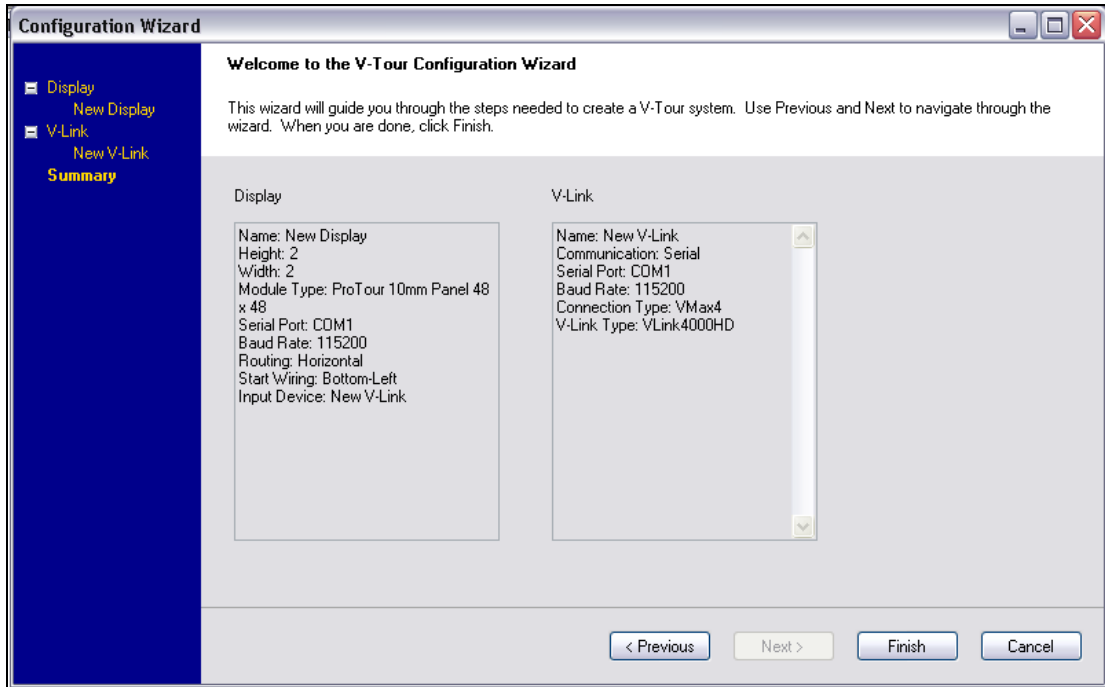

Figure 14: *Configuration Wizard*

If the summary is correct:

1. Click **Finish**. The *Send Configuration* dialog box opens.

2. From the *File* menu, select **Import System Configuration**.

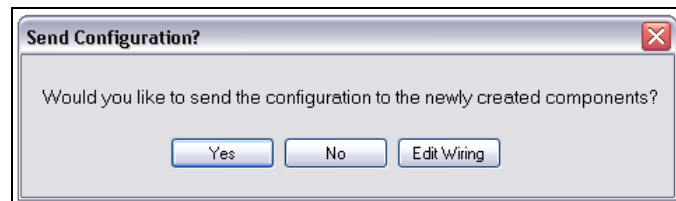3. Select the appropriate **.vcd* file from the *Open* window.

Figure 15: *Send Configuration Confirmation*

4. Click the **Open** button.

Saving a Complete Display:

1. From the *File* menu, select **Export System Configuration**.

2. In the *Save* window, name the display configuration and verify that the default file extension is *.vcd, and click the **Save** button.

3. Adjust the **VMax Pipe Size**, if necessary.

    Note: By default, the *V-Max Pipe Size* is set to 720 x 848 and 60 frames per second. The *V-Max Pipe Size* must be larger than the display's dimensions, so it is only necessary to adjust the Pipe Size when it is smaller than the display.
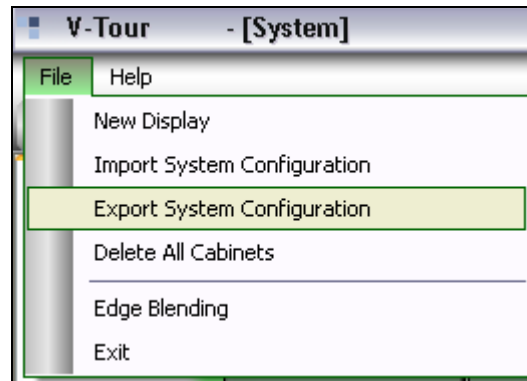
Figure 16: Export System Configuration

4. Select the **Channel** from the *Channel* drop-down menu.

5. Select the **Input** from the *Input Selection* drop-down menu. Verify that all Edge Blending settings are correct.

6. Click **Send EdgeBlending Commands**.

7. Repeat **Steps 2-6** with the remaining VIPs and columns in the display.

    Note: To reset all of the fields in the Edge Blending to default settings, click **Reset to Defaults**. To close Edge Blending, click **Close EdgeBlending**.

V-Link Tool Tab

The advanced features in this section alter VIP settings for various display configurations such as small, long and thin, or multiple displays.

Positional Pixeling℠

Positional Pixeling uses proprietary algorithms to control individual LEDs within each pixel, enhancing sharpness on smaller displays. This option smoothes edges, diagonal lines, and curves, which provides a crisper image. Use this feature at all times with displays less than 240 pixels in height and 320 pixels in width.

To enable Positional Pixeling:

1. Navigate to the **Tool** tab within the *V-Link* page tab.

2. Check the **Positional Pixeling** box.

3. Set the **V-Max Pipe Size** so it is at least two times the height and two times the width of the display, measured in pixels.

Adjusting V-Max Pipe Size

V-Max Pipe Size resizes the VMax^{TM} signal without changing the number of pixels the signal can control. This feature is useful when configuring long, thin displays or multiple displays.

To adjust the V-Max Pipe Size:

1. Navigate to the Tool tab within the *V-Link* page tab.

2. Select the appropriate FPS (Frames per Second). Most applications require 60 FPS, as NTSC signal requires this setting.

3. Choose the appropriate dimensions from the drop-down menu. The first option is labeled *Default*. The option below the default is the longest horizontally and the narrowest vertically. Continuing down the menu, dimensions become narrower horizontally and taller vertically.

Guidelines for Assigning Pixel Pitch

Displays with One Pixel Pitch

If a display uses panels with a single pixel pitch, the pixel size should equal the pixel pitch. For example, a display using only 8 mm ProTour® panels should have the pixel size of 8 mm.

Displays with Panels of Different Pixel Pitches

The pixel size must be large enough for the display to fit into the VMax^{TM} frame. Standard VMax^{TM} frame size is 720 x 848 pixels. Pixel size cannot be larger than the smallest pixel pitch in the display.

Be aware of the video input size. To maintain 1:1 mapping, the pixel size must stay within the size of the video input; otherwise the video input will need to be stretched. To obtain the best quality picture, figure the greatest common divisor of all pixel pitches used in the display and enter that number for the pixel size.

Note: The greatest common divisor (GCD) is the largest number that divides into a set of numbers without leaving a remainder. For example, given the set of 8 and 20, 4 is the GCD.

Displays with Angled Panels

Note: Angling HD panels is not recommended.

The pixel size must be large enough for the display to fit into the VMax^{TM} frame. Standard VMax^{TM} frame size is 720 x 848 pixels. Pixel size cannot be larger than the smallest pixel pitch in the display.

Be aware of the video input size. To maintain 1:1 mapping, the pixel size must stay within the size of the video input; otherwise the video input will need to be stretched.

Angling panels require some distortion of the image; however, the goal is to minimize the distortion. There is no simple method for figuring the pixel size. Start by entering one-half or one-third of the pixel pitch in **Set Pixel Size** and check the distortion of the video image.

Other values may be used, but they may distort the image. Smaller pixel sizes create a clearer image, but remember to stay within the VMax™ frame.

Another method of checking the distortion of an image is to view the translation table. To do this, open the *.png file in Microsoft® Paint. For assistance in viewing the Translation Table, see the next section, **Advanced Saving**.

Advanced Saving

Save Configuration and *Save Optimized Translation Table* offer specialized saving features for complicated configurations, such as angled panels or multiple controllers.

Save Translation Table

Save Translation Table saves .hex files of translation tables that send to the display and creates .png files that provide visual representations of the translation tables. The .png files map pixel coordinates in relationship to the VMax™ frame. *Save Translation Table* creates one translation table and one .png for each controller in the configuration.

To save a translation table:

1. In the *Wiring* tab, select **File > Save > Save Translation Table**. The *Browse for Folder* window opens.

2. Navigate to or create the desired folder to store the files and select it.

3. Click OK.

Save Optimized Translation Table

Save Optimized Translation Table creates text files listing the controller offsets and the DP commands needed for VIP setup, in addition to saving the translation tables and the PNGs. Unlike the PNG and JPG files, only one offsets.txt file is generated per configuration, rather than one for each controller. Use this saving method with configurations that have multiple controllers.

1. In the *Wiring* tab, select **File > Save > Save Optimized Translation Table**. The *Browse for Folder* window opens.

2. Navigate to or create the desired folder to store the files and select it.

3. Click **OK**. A confirm save dialog box opens.

4. Click **Yes** to confirm the save. Clicking **No** cancels the save and goes back to the previous screen.

Configuration of Angled Panels

Some customers may want some or all panels to be tilted without tilting the content. This section guides users through the V-Tour® setup for angled configurations.

The first step in creating rotated V-Tour® configurations is to set the pixel size.

Note: Daktronics cautions against changing pixel size manually due to the possibility of picture degradation as V-Tour automatically adjusts pixel size.

1. Navigate to the **Wiring** tab within the *System* page tab.

2. Open the **Current** tab on the right side of the *Wiring* screen.

3. Select the panel(s) to rotate. Information about the panel(s) appears in the *Currently Selected* tab.

4. Type the desired angle of rotation in the **Angle** field, located under *Measurement* in the *Current* tab.

5. Go to the menu bar and click **Tools > Set Pixel** Size. Enter "1" in the *Set Pixel Size* text box and click **OK**.

6. Click **Send** to send the configuration to the display.

Adjusting Precision

Adjusting alignment precision ensures proper pixel size after rotation, eliminating overlapping pixels.

1. Open the Wiring tab in the *System* page tab.

2. Click Set Precision under *Tools* in the menu bar. The *Set Alignment Precision* dialog box opens.

3. Adjust *Set Precision* and *Set Grid* to the desired levels and click **OK**. The objects snap into the created grid.

   - *Precision* sets the unit used for each grid line.

   - *Grid* sets the number of grid lines

Section 6: Advanced Operation

The procedures in this section allow a user to optimize or troubleshoot the VIP 4500. Given the advanced nature of the procedures listed, it is recommended that users perform them under the supervision of Daktronics service personnel.

6.1 Adjusting Screen Color Balance

For proper color display, using a color pattern generator is essential. The connection allows for SMPTE bars to display on a Daktronics LED video display.

SMPTE bars are multi-purpose test patterns used as an adjustment reference to verify the correct operation of a video display. Refer to **Figure 17**.

With the Calibar™ attached so the bars display on the Daktronics LED video display, perform the following steps:

1. Adjust the contrast so the white reference square in the lower-left corner looks bright and clean. The white should not spread or bleed into the darker squares surrounding it.

2. Adjust the display brightness so the three small gray and black rectangles near the bottom-right of the pattern are clearly visible; this area is called the PLUGE. Reduce the brightness just until the line separating the first and second rectangles disappears.

Figure 17: SMPTE Test Bar Display

3. If a vectorscope or waveform monitor is present, use the SMPTE bars to check system gain by feeding the pattern to the Daktronics LED video display and to the monitor with the scope.

The video line feeding the WFM must end in one 75-ohm termination. Color bars appear on a WFM as six vertical, shaded rectangles called chips. The white reference square of the pattern shows up on a WFM as a line at the top of the yellow and cyan chips. Using the vertical position on the WFM, center the blanking level at 0 IRE. Adjust the video device's gain to place the line of white reference square at 100 IRE. When the low-pass filter is selected on a WFM, IRE levels should be as follows:

- Gray 77
- Yellow 69
- White 100
- Blue 56

- Green 48
- Magenta 36
- Red 28
- Blue 15

Feeding a video device with SMPTE bars and then feeding the signal into a vectorscope and terminated monitor allows for checking the chroma phase. Select the 75 percent bars gain button on the vectorscope, and turn the phase knob to line up with the reference flag to 0 degrees. The points of the displayed pattern land inside the squares for each color vector.

Figure 18: Entering "XRD" Command

6.2 Resetting VIP to Factory Defaults

Certain issues require the VIP to be reset to its factory defaults. Confirm the following before resetting the VIP.

1. No video output is visible on the display.

2. Bypass the VIP to verify the VMax™ signal works correctly.

3. Ensure functionality of inputs via VIP web monitoring.

   Note: If web monitoring is unavailable, do not reset the VIP.

4. Verify the system configuration and display are working correctly by switching to the backup system (if available).

Figure 19: Completed Reboot

Locate the backup configuration settings before reset, as the factory reset process will remove any configuration on the VIP. In the absence of a functional configuration backup, the configuration must be re-entered manually. Typical locations include Venus 7000 scripts or command frames, as well as .VLC files.

   Note: Save the configuration as a new file.

1. Open the VLink Debugger. The VLink Debugger can be found under the *Start* menu in **Programs > Venus 7000 > Venus 7000 Tools > V7 VLink Debug**. For more information on the V7 VLink Debugger, refer to **DMP-7000 Installation and Setup Manual** (**DD1834905**).

2. In the VLink Debugger *Command* box, type "XRD," which deletes all configuration settings and restarts the VIP. Refer to **Figure 18**.

3. Wait one minute to allow the VIP to reboot, then type "XR" and click **Send Command**. Allow a minute for the VIP to reboot, then click **[Enter]** while the cursor is in the VLink Debugger Command box. When *1>* appears in the readout window, the VIP has completed the reboot. Refer to **Figure 19**.
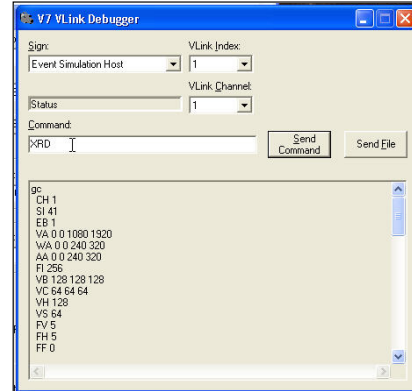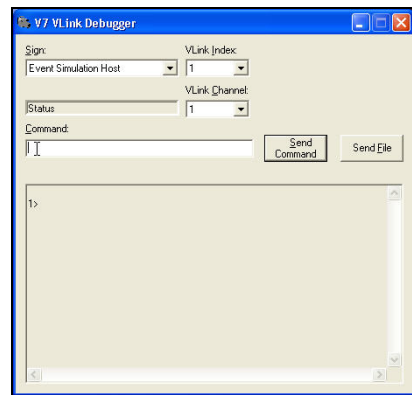
4. Reload the configuration settings at this time.

5. If settings are in a Venus 7000 script file or command frame, run that file now; if not proceed to **Step 7**.

6. If there are .VLC files for each VIP channel, follow these steps:

   a. On the Venus 7000 shell, click the **VLink** button in the bottom right corner. Refer to **Figure 20**.

   b. Select the sign connected to the VIP located in the *Sign* window. Refer to **Figure 21**.

   c. Confirm the channel is set to VLink Channel 1 and click the **Details** button on the lower left. Refer to **Figure 22**.

   d. Click the **Send Configuration Settings** button on the bottom left. Refer to **Figure 23**.

   e. Browse to the location of the .VLC files and load the configuration for Channel 1 by selecting a file and clicking **Open**. Refer to **Figure 24**.

   f. *VLink Configuration* window will appear. Click **OK**. Refer to **Figure 25**.

   g. Repeat the previous step for Channels 2 through 4.

Note: If no functional configuration backup is available, the configuration will need to be re-entered manually.
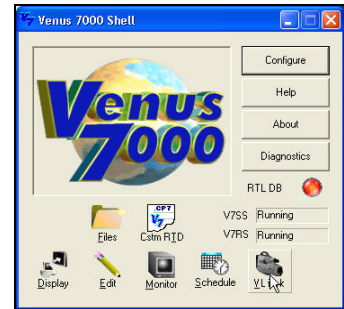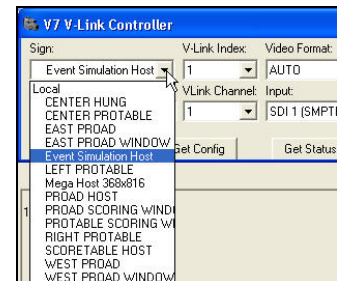

Figure 20: *Venus 7000 Shell*
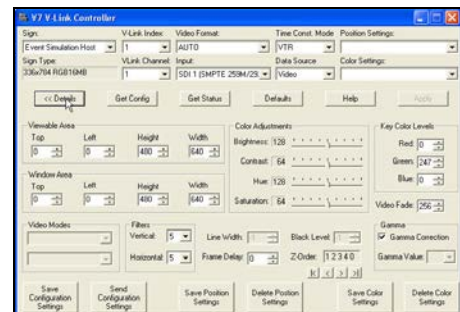

Figure 21: *Selecting Sign*

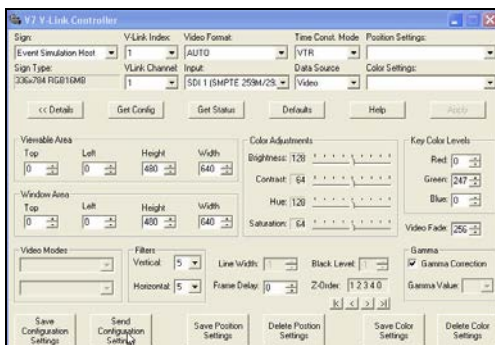**Figure 22:** *Details*

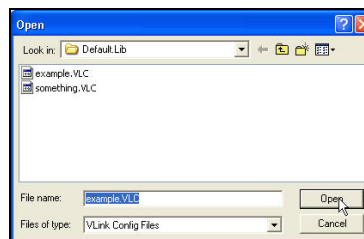**Figure 23:** *Sending Configuration Settings*
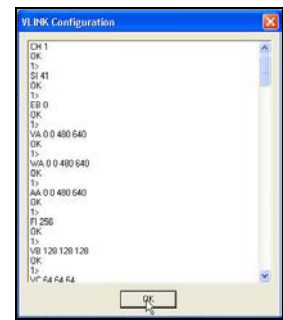

Figure 24: *Loading Configuration*

Figure 25: *VLink Configuration Window*

7. After running the initialize script or command frame, or loading all the necessary .VLC files, save the configuration on the VIP by entering "CF S" in the *V7 VLink Debugger Command* box. Create backup configuration if not done previously. Refer to **Figure 26**.

    Note: The CF S command only needs to be entered once to save all four channel configurations.

8. Test the configuration of the site under their normal operation scenario. Contact an on-site operator for help running this test.
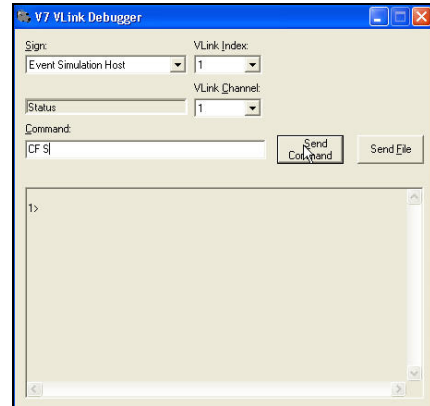
Figure 26: Send Command

6.3   Creating a .VLC file

A .VLC file functions as a backup configuration file external to the VIP 4500. Create .VLC files after completing initial setup or changing the configuration.

1. Open the Venus 7000 shell.

2. On the Venus 7000 shell, click the **VLink** button in the bottom right corner. Refer to **Figure 20**.

3. In the *Sign* window in the upper left, select the sign connected to the VIP. Refer to **Figure 21**.

4. Confirm the channel is set to VLink Channel 1 and click the **Details** button on the lower left. Refer to **Figure 22**.

5. Click the **Save Configuration Settings** button in the bottom left corner. Refer to **Figure 27**.

6. Browse to the location where you intend to save the .VLC file. Choose a descriptive name for the .VLC file that would make it easy to determine which .VLC files go to which VIP and which channels. It is also recommended to include the date. For example, a .VLC file for Channel 1 on a VIP that controls the left display half might be named **Left_CH1(5-19-11).VLC**. Refer to **Figure 28**. Click **Save** when finished.

7. Repeat this process for each channel of the VIP.
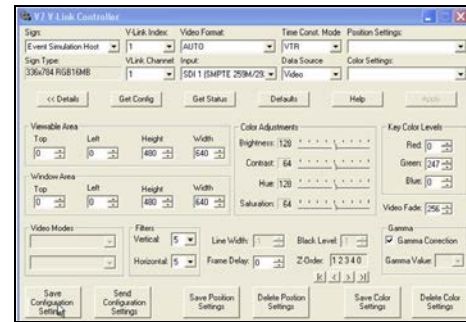
Figure 27: Save Configuration Settings
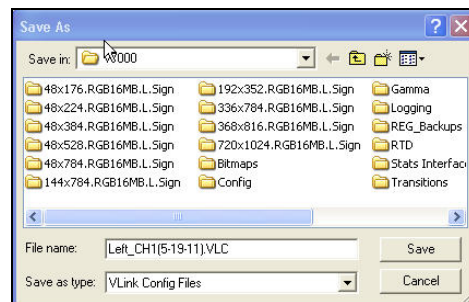
Figure 28: Saving .VLC File

6.4 Instructions on how to make a backup script file

Follow the instructions below to create a backup script for the VIP 4500. For additional information, refer to the **DMP-7000 Installation and Setup Manual** (**DD1834905**).

1. Follow the instructions in **Section 6.3** to create your .VLC files before proceeding.

2. On the *V7Dsply* scripting page, right click on an unused cell and select **Edit Cell**. Refer to **Figure 29**.

3. A pop-up window will appear where you will either enter in the name of the script file you are looking for, or name a new one. This example uses the name *backup*. Click **OK** to continue. Refer to **Figure 30**.

4. Right click on cell described in **Step 2** and select **Edit Script File**. Refer to **Figure 31**.

5. The *Edit Script* pop-up window will appear. Click the **Add Line** button to create a scripting line. Refer to **Figure 32**.

6. Select the scripting command **VLSendConfig File** then click the **Next** button. Refer to **Figure 33**.

7. Click **Select Sign** to select the sign connected to your VIP. When complete, click the **Next** button. Refer to **Figure 34**.
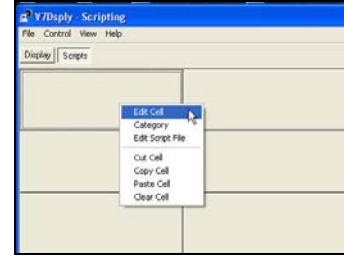
Figure 29: Edit Cell
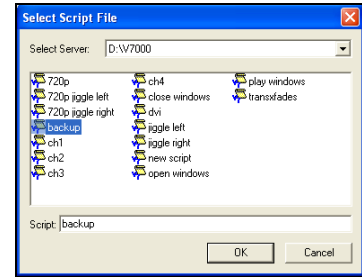
Figure 30: Pop-up Window

Figure 31: Edit Script File
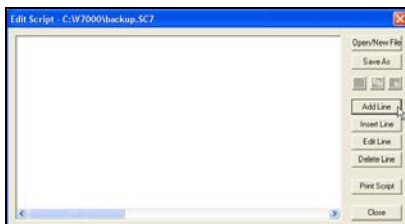
Figure 32: Add Line
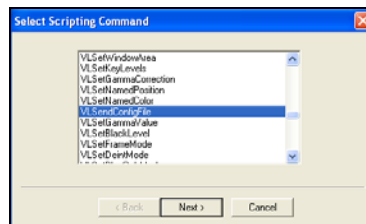
Figure 33: Selecting Command

Figure 34: Select Sign

8. Click **Select Path** to navigate to the location of the .VLC file you created for Channel 1. Then click the **Next** button. Refer to **Figure 35**.

9. Select the appropriate VIP index number and channel for the VIP you are using. In this case, it is Index 1 and Channel 1. Then click the **Next** button. Refer to **Figure 36**.

10. The *Verify Scripting Command* window will appear. Visually confirm that the script is correct, then click the **Finish** button to create the scripting command and take you back to the *Edit Script* window. Refer to **Figure 37**.

11. Repeat **Steps 4-10** to add more channel configurations.

12. Navigate to the location the .VLC file(s) created in **Step 10** and open it as a .txt file in Notepad.

13. Erase all the current settings, and replace them with "cf s". Refer to **Figure 38**.

14. In Notepad, click **File>Save As** and enter ithe **name "CF S.VLC"** into the *File* name. Be sure to include the quotations, as this ensures that the file saves as a .VLC. Refer to **Figure 39**.

15. Repeat **Steps 4-10**, this time adding the CF S.VLC file to the script. When run, this scripting line will save the configuration on to the VIP. Refer to **Figure 40**.
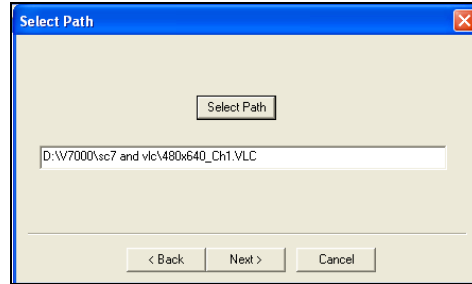
Figure 35: *Navigating to .VLC File*
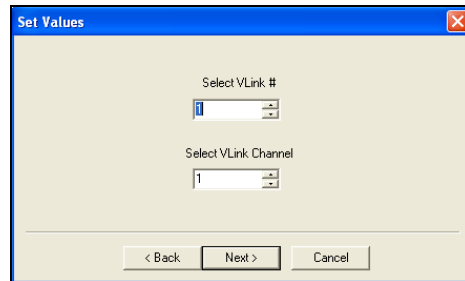
Figure 36: *Setting Values*
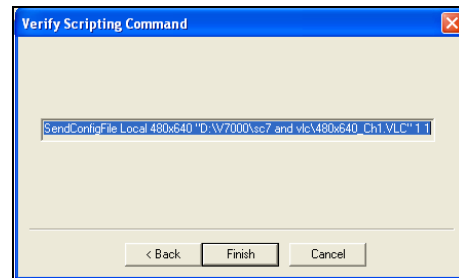
Figure 37: *Verifying Scripting Command*
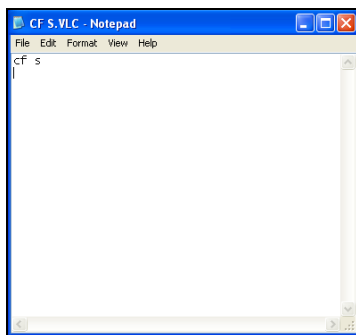
Figure 38: *Erasing and Replacing Current Settings*
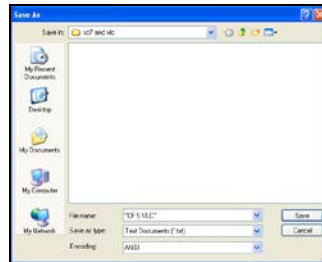
Figure 39: *Saving as .VLC*
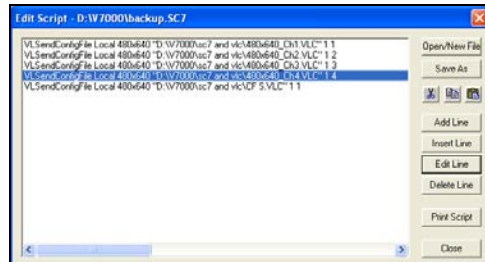
Figure 40: *Saving Configuration to VIP by Running Script*

Section 7:   VIP 4510 Converter

The processor has a built-in component that can send the processor output to a confidence monitor. This component, known as the VIP 4150 converter, supports the following standards: composite, S-Video, component, VGA and DVI standards.
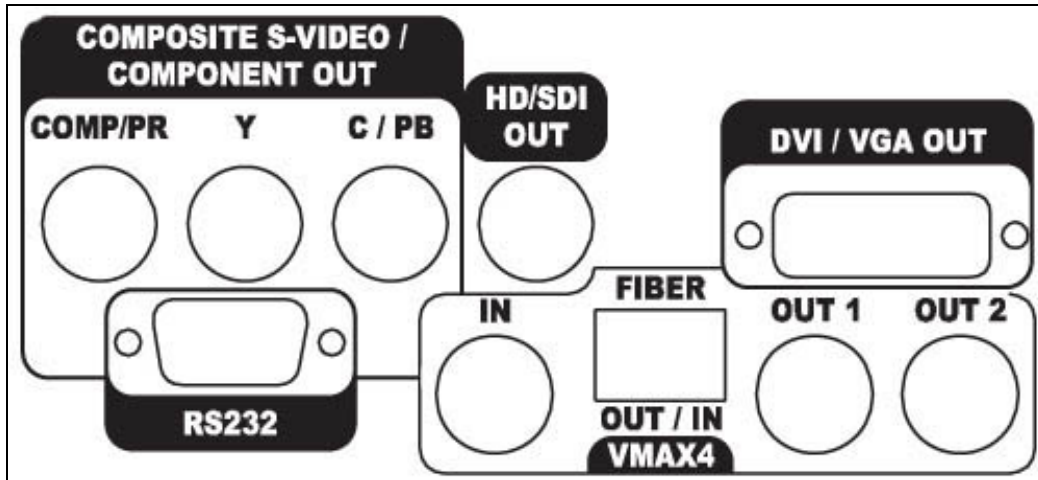
Figure 41: *VIP 4510 Converter*

7.1   Basic Setup

To set up the VIP 4510 converter, three basic commands need to change. Those commands are viewable area (VXVA), window area (VXWA), and video format (VXVF). To check these numbers, type "VXGC" into the *V7 VLink Debugger* or into Tera Term®.

The viewable area should be set to the sign size of the LED display. The window area should be set to the resolution of the monitor. The video format needs to be set to the correct format for the VIP 4510 converter to output on the monitor. See the chart below in **Section 9.8** for the different formats.

Note: In a system with two VIP 4500s, each VIP 4510 needs to be configured so that the viewable area is the same as the window area (WA) of the associated VIP. To do this, use the controller interface software to check the window area fields.

Section 8:   Front Panel Instructions

Many of the video processor settings can be changed through the **Front Panel Interface.**
To scroll through the settings, use the left and right arrows. To change a setting, use the up and down arrows. When you have the setting at the desired value, use the middle button to apply the settings.
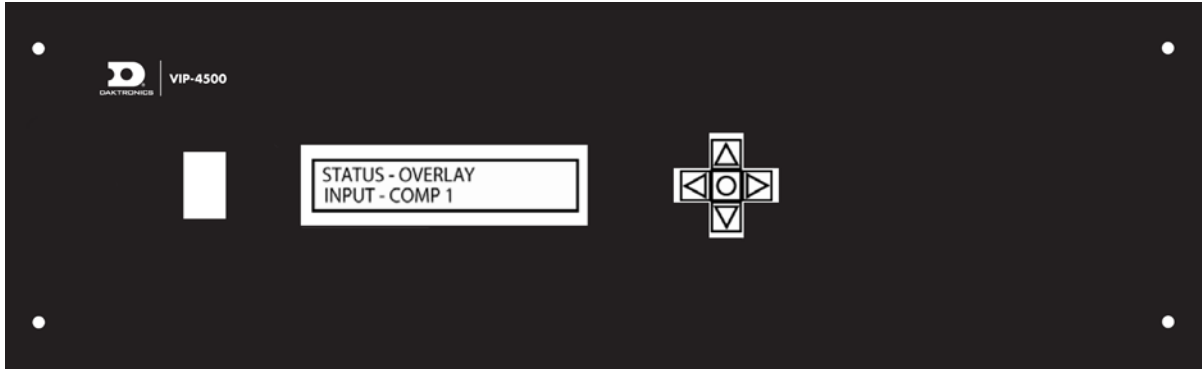
Figure 42: *Front Panel*

> **Note:** The settings are not saved until you save the configuration. Rebooting the processor will cause the settings to revert. The configuration using the front panel under the Configuration (CF) setting to the last saved configuration.
>
> Here is a list of the settings that can be changed through the front panel:
>
> - Channel
>
> - Set Input
>
> - Edge Blending
>
> - Viewable Area Top
>
> - Viewable Area Left
>
> - Viewable Area Height
>
> - Viewable Area Width
>
> - Window Area Top
>
> - Window Area Left
>
> - Window Area Height
>
> - Window Area Width
>
> - Transparency

- Brightness

- Contrast

- Hue

- Saturation

- Vertical Filter (1-8)

- Horizontal Filter (1-8)

- Overlay Color (Red Value)

- Overlay Color (Green Value)

- Overlay Color (Blue Value)

- VMax4 Active Width

- VMax4 Total Width

- VMax4 Active Height

- VMax4 Total Height

- VMax4 Clock Divider

- VIP4500 ID (SV row)

- VIP4500 ID (SV col)

- VIP4500 ID (SV total row)

- VIP4500 ID (SV total col)

- VMax4 Transparency (AV)

- VMax4 Color Red (VK)

- VMax4 Color Green (VK)

- VMax4 Color Blue (VK)

- Chroma Range (KR)

- Set Source (Video, Venus, Overlay, Chroma)

- Z-Order

- Dimming

- Gamma

- Configuration Save/Delete (CF s/d)

- Set IP (IP xxx.xxx.xxx.xxx)

- Set Netmask (NM xxx.xxx.xxx.xxx)

- Show Versions (GV)

Section 9:   Web Page Navigation

The web pages hosted on the VIP-4500 contain formats that allow the user to change the configuration of the VIP-4500. Input sources and channel outputs may also be monitored through the web page. The processor's webpage requires a network connection and a static IP address to function properly. The IP address and the Net Mask of the network need to be configured only once on the processor.

Figure 43: *Web Page*

To access the webpage, type the IP address into Internet Explorer. This will bring you to the main page. You may then go to the different sections.

Channel Configuration
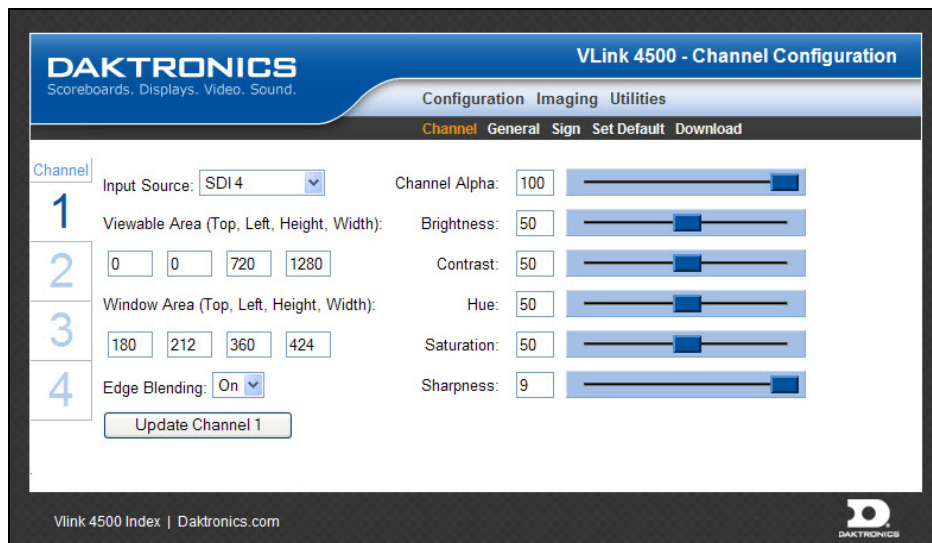
Figure 44: *Channel Configuration Page*

- Input Source

- Viewable Area

- Window Area

- Alpha control

- Brightness control

- Contrast control

- Hue control

- Saturation control

- Sharpness Filter

General Configuration
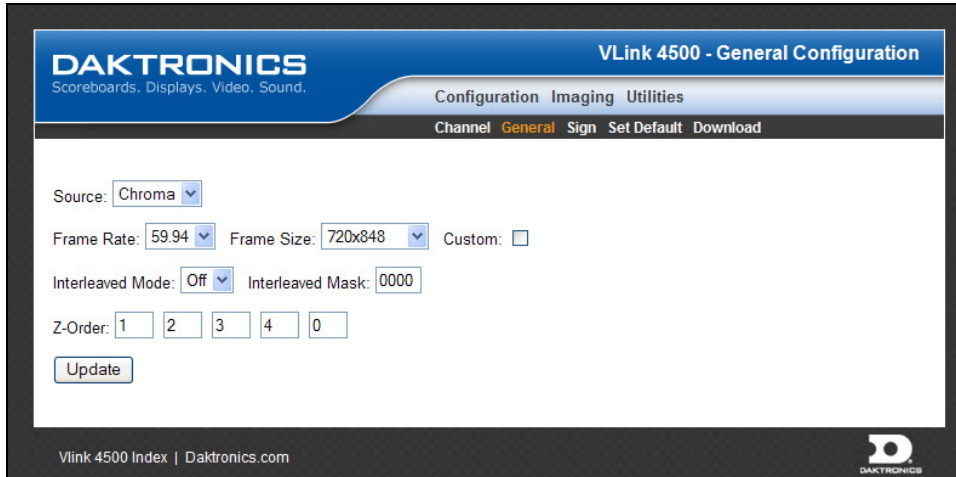
Figure 45: *General Configuration*

- VMax4 Frame Rate

- Vmax4 Frame Size

- Interleave Mode

- Interleave Mask

- Z-Order

Sign Configuration
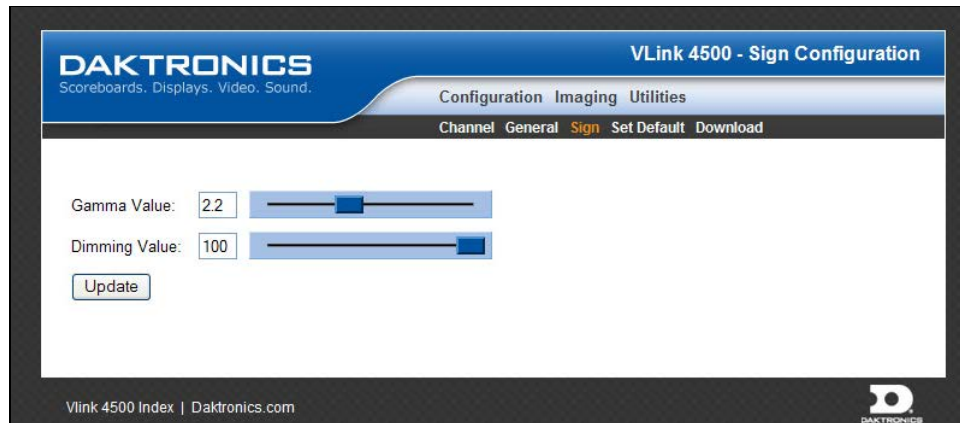
Figure 46: Sign Configuration

- Gamma control

- Dimming control

Set Default Configuration
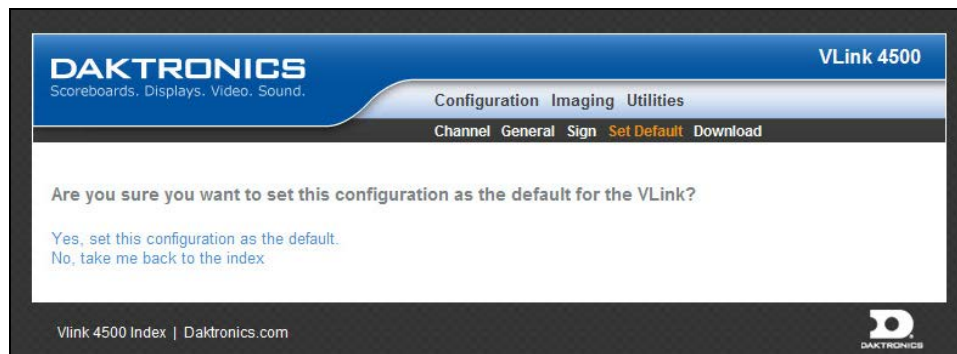
Figure 47: Set Default Configuration

- Saves the current configuration on the processor as the default

Download
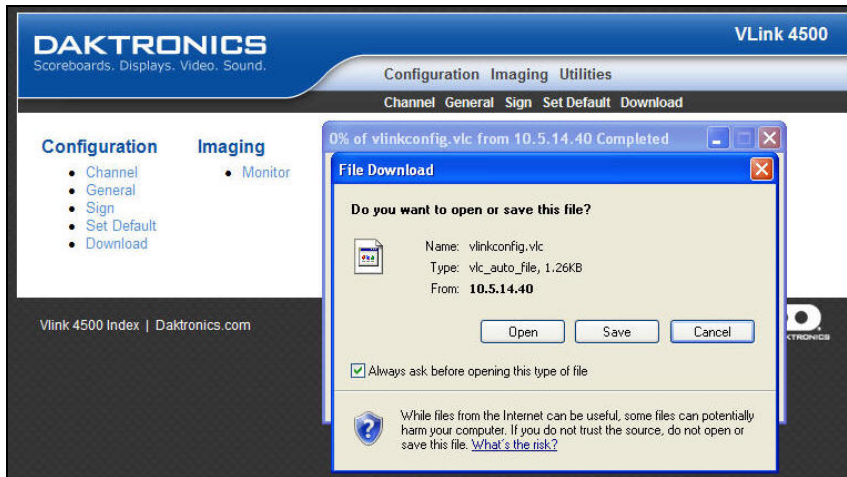
Figure 48: Download Utility

- Downloads a 7000 VLC file containing configuration settings for all four VIP channels

Imaging
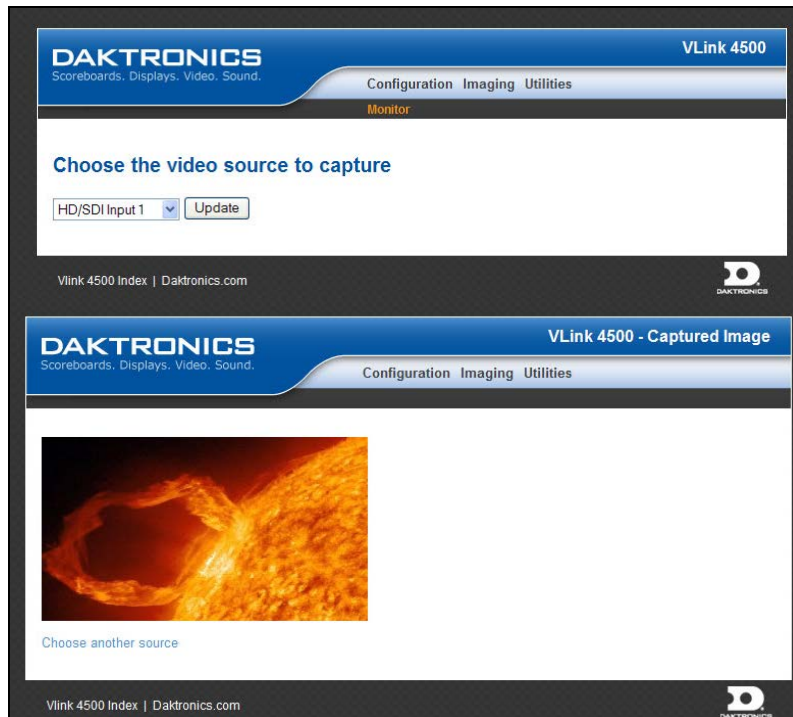
Figure 49: Video Source to Capture

- Display an image of the selected video source, channel, or incoming/outgoing VMax4 signal

Get Config Utility
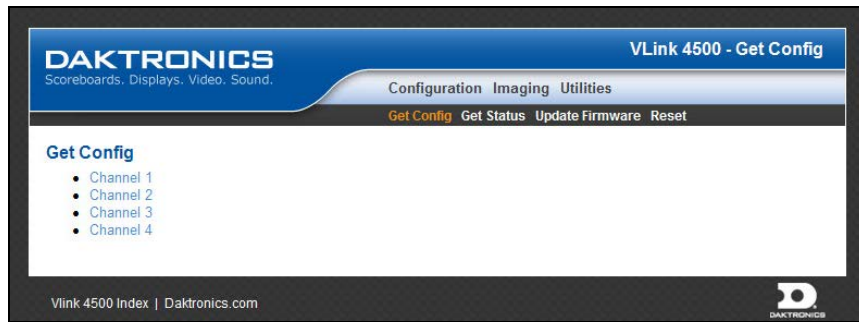
Figure 50: *Get Config Utility*

- Reports the current configuration of the selected processor channel

Get Status Utility
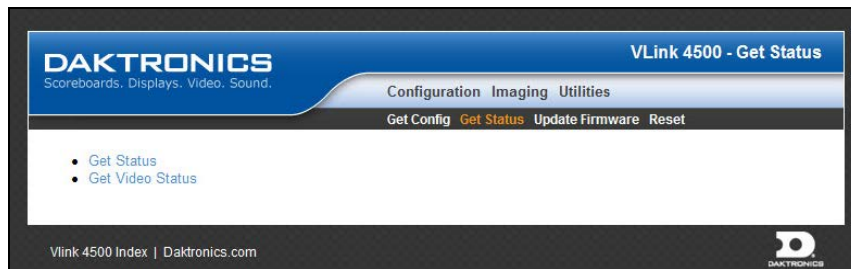
Figure 51: *Get Status Utility*

- Reports the current status and resolution of the incoming video signals and processor channels.

Update Firmware Utility
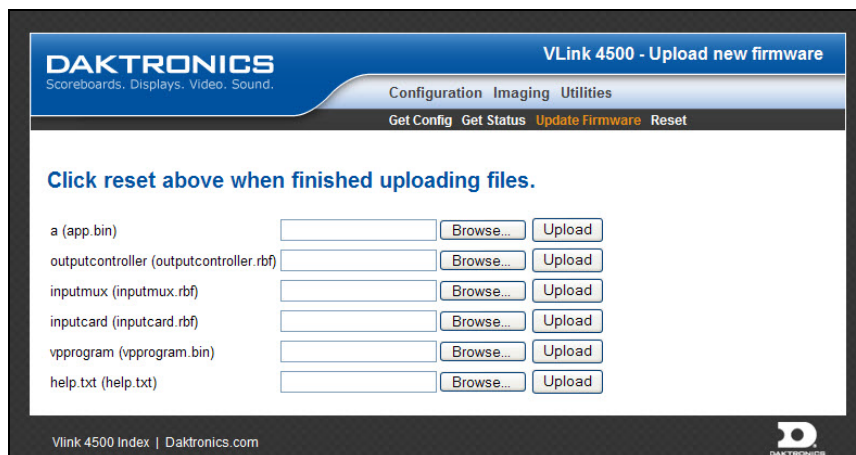
Figure 52: *Update Firmware Utility*

- Allows the user to update firmware on the processor

Reset Utility
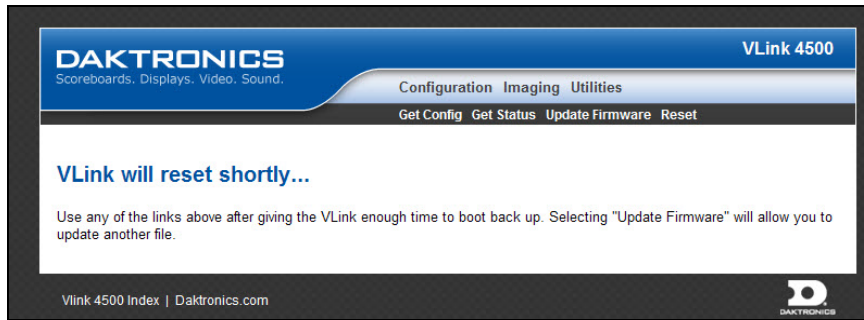
Figure 53: Reset Utility

- Resets the VIP from the Web, performs an "XR."

Section 10: Command Reference

10.1 Channel-Specific Commands

Command	Description	Definition	Example/Default
CH x	Channel Select (1-4)	Shows the channel number	CH 1
SI x	Video Input Selection • 1-4 = composite • 11-14 = S-Video • 21-24 = Component • 31, 32 = VGA • 41-44 = SD-SDI • 51, 52 = DVI	Assigns an input number to video	SI 41
EB x	Edge Blending (0-1)	Blends left side of video to remove border on left side. Used for combining two channels or two VIP 4500s to be seamless. This is a read only command	EB 1
VA t l h w	Viewable Area • t=top start • l=left start • h= height • w=width	Extracts the location and dimensions of the selected source.	VA 0 0 480 640
WA t l h w	Window Area • t=top start • l=left start • h= height • w=width	Adjusts current channel's output location on the display	WA 0 0 480 640
AA t l h w	Active Area • t=top start • l=left start • h= height • w=width	Adjusts the active dimensions of each window by defining a starting point and lengths	AA 0 0 480 640
FI x	Video Transparency (0-256)	Adjusts Video Fade	FI 256
VB x	Video Brightness (0-255)	Adjusts Sign Brightness	VB 128 128 128
VC x	Video Contrast (0-127)	Adjusts Contrast Ratio	VC 64 64 64
VH x	Video Hue (0-255)	Adjusts Hue levels	VH 128

Command	Description	Definition	Example/Default
VS x	Video Saturation (0-127)	Adjusts the Saturation Level	VS 64
FV x	Vertical Filter (0-9)	Adjusts the Vertical sharpness Filter	FV 5
FH x	Horizontal Filter (0-9)	Adjusts the Horizontal sharpness Filter	FH 5
FF x	Freeze Frame • 0 = off • 1 = on	Freezes the frame	FF 0
SK r g b	Key color (0-255)	Sets the Key Color	SK 0 247 0
DE x y	Detail Enhancement (0-63) • x = detail level • y = detail noise threshold	Sets the noise and filtering levels	DE 0 0
NR x	Noise Reduction (0-63)	Sets amount of Noise Reduction applied to image	NR 0
BC r g b	Border Color (0-255)	Sets the Border Color	BC 0 0 0
BT n	Border Thickness (0-128) • reads out as a percentage	Sets the thickness of the border as a percentage of image height	BT 0%
BE x	Border Enable (0-1)	Activate the Border	BE 0
AR x	Aspect ratio • ANA = anamorphic • PAN = panoramic • LTR = letter box • EXT = extract • THR= through	Sets the Aspect Ratio	AR ANA
MD x	Motion Detection (0-1)	Activates Motion Detection operation during deinterlacing	MD 1
MT x	Motion Threshold (0-15)	Sets the Motion Threshold detection parameter	MT 10
FD x	Freeze frame Detection • D – Disabled • T – T Compensation • V – VT Compensation	Sets the quality of the deinterlacer	FD v

Command	Description	Definition	Example/Default
FT x	Freeze Frame Threshold (0-7)	Sets the Freeze Frame Threshold	FT 7
DM x	Deinterlace Mode • A – fully Adaptive • F – field Merging • T – temporal Only	Determines deinterlacer operating mode	DM a

10.2 Additional Configuration

Command	Description	Definition	Example/Default
BS t l h w	Background Size • t=top vertical start point • l=left horizontal start point • h= window height • w=window width	Sets the Background Size	BS 26 1 720 848
FG haw hbw vas vae ve fr	VMax4 Frame Generation • haw=horizontal active width • hbw=horizontal blank width • vas=vertical active start • vae=vertical active end • ve=vertical end • fr=frame rate	Sets Frame Generation parameters	FG 1280 358 26 745 750 0
SD r c	Set Display Dimensions • r=rows • c=columns	Sets the overall physical sign dimensions	SD 720 848
SV vi hi vt ht	Set VIP Index • vi=verticall index • hi=horizontal index • vt=vertical total • ht=horizontal total	Sets the position of the VIP on the display	SV 1 1 1 1
FGC r g b	Frame Generation Color (0-255)	Sets the Frame Generation Color	FGC 0 247 0
AV x	VMax4 Transparency (0-256)	Controls transparency of incoming VMax4 content	AV 256
VK r g b	VMax4 Key Color (0-255)	Sets the VMax4 Key Color	VK 0 247 0

Command	Description	Definition	Example/Default
KR x	Chroma Range (0-255)	Adjusts how far the key color can be from the center value (set by SK and VK) to key the channel. Only applicable in Chroma mode	KR 10
VF x	Video Format • A = Auto-Detect, • NJ = NTSC-J • N = NSTC-M • P6 = PAL-60 • N4 = NTSC 4.43 • P = PAL B/G,D/K,H,I • PN = PAL-N • PMw = PAL-M(without pedestal) • PM = PAL-M • PNc = PAL-Nc • PNcw = PAL-Nc(with pedestal) • S = SECAM • Sw = SECAM(with pedestal)	Sets the processor to a specific video input format	VF A
XD x	Frame Delay (0-63)	Delays video by the selected amount of frames. The maximum delay is determined by the number of active pixels in the VMax4 frame	XD 0
SS x	Source Selection • V = Venus® controllers • I = video • O = overlay • C=Chroma	Selects the processor output source.	SS I
ZO x1 x2 x3 x4 x5	Channel Z-order (0-4) • 0=VMax • 1-4=Channel	Sets z-order	ZO 1 2 3 4 0

Command	Description	Definition	Example/Default
PS tl tc tr cl cc cr bl bc br	Post Sharpening (-71 to 55) • tl=top left • tc=top center • tr=top right • cl=center left • cc=center center • cr=center right • bl=bottom left • bc=bottom center • br=bottom right	Sharpening that is applied to all video channels after processing.	PS 0 0 0 0 32 0 0 0 0
IL x r c	Interleave Mode • x = 1 (enable) or 0 (disable) • r = row pattern (0-4) • c = column pattern (0-4)	Activates Interleave Mode and sets interleave pattern	IL 0 2 2
ILM xxxx…	Interleave Matrix	Sets the Interleave Matrix	ILM 0770000000000000
CK x	Channel Key (0-3) • 0=Luma keying disabled • 1-3=Channel Select, enables Luma keying on channel	Selects which channel is keyed on Luma	CK 0
CKL x x	Channel Key Limits (0-1023)	Sets Luma Key limits	CKL 64 960

10.3 Display Configuration

Command	Description	Definition	Example/Default
VY	VMax4 Frame Rate (Read Only)	Displays VMax4 Frame Rate (Hz)	VY 59.94
SN n	Sign Number (0-14)	Assigns the Sign Number	SN 0
CS x y	Display Size • x = rows • y = columns	Determines the Sign Size	CS 480 640
SP t l h w	Sign Position (absolute) • t= top start point • l = left start point • h = window height • w = window width	Sets the absolute Sign Position	SP 26 1 480 640

Command	Description	Definition	Example/Default
CT 11	Sign Color technology	Sets the Sign Color technology	CT 11
DF x	Face enable Mask (0-16) • parameter is hex mask	Enables the number of active faces	DF F
DD x	Display Dimming (0-127)	Controls dimming from white to black	DD 127 127 127 127
MG x	Gamma Method (0-6)	Sets the Gamma Method	MG 0
DG x	Gamma Value (10-14)	Sets the Gamma level	DG 28 28 28 28
DX Rr Rg Rb Gr Gg Gb Br Bg Bb	Color Correction values (-32768 to 32767) • Rr=Red red • Rg=Red green • Rb=Red blue • Gr=Green red • Gg=Green green • Gb=Green blue • Br=Blue red • Bg=Blue green • Bb=Blue blue	Configures the data display color correction	DX 32767 0 0 0 32767 0 0 0 32767

10.4 Data Distributor Configuration

Command	Description	Definitions	Example/Default
GCSx	Get Sign Configuration (0-14)	Displays configuration of specified sign number	GCS0
DP t l h w	Data Distributor Position (relative) • t = top start point • l = left start point • h = window height • w = window width	Sets Data Display Position	DP0 0 0 240 640
CR r1 r2 c3 c4	Configure Rows	Configures selected rows	CR0 48 48 48 48 48
CC c1 c2 c3 c4	Configure Columns	Configures selected columns	CC0 256 256 128

10.5 Effect/Transitions

Command	Description	Definition	Example/Default
TE0 ch a t	Fade Video • ch = channel (0-4) • a = alpha (0-256) • t = time (milliseconds)	Sets and adjust channel source or VMax4 fade	TE0 1 2556 5000
TE3 ch t l t	Move WA • ch = channel (1-4) • t = top start point • l = left start point • t = time (milliseconds)	Sets and adjusts channel window area location	TE3 1 250 250 1000
TE4 ch i e t	Wipe AA • ch = channel (1-4) • i = out/in (0-1) • e = effect pattern (0-10) • t = time (milliseconds)	Uses wipe transition to turn channel on/off	TE4 1 1 10 5000
TE5 ch t l h w t	Move/resize WA • ch = channel (1-4) • i = out/in (0-1) • e = effect pattern (0-10) • t = time (milliseconds)	Resizes and moves channel window area	TE5 1 0 0 720 848 10000

10.6 Miscellaneous Commands

Command	Description	Definition	Example/Default
CF x	Configuration • S = save • D = delete	Saves or deletes a configuration	CF S
GC	Get Configuration	Displays the current channel's configuration	GC
GI	Get ID	Displays the processor ID	GI
GS	Get Status	Display video input, channel, and VMax4 status	GS
GSV	Get Status Video	Displays detailed video input, channel, and VMax4 status	GSV

Command	Description	Definition	Example/Default
GSX	Get Status (Venus parseable)	Displays video status in a format that is parseable by Venus 7000 software.	GSX
GV	Get Version	Reports all version numbers	GV
XR	eXternal Reset	Resets processor	XR
XRD	eXternal Reset+Delete Config	Deletes configuration and resets processor	XRD
H	Help Menu	Displays Help Menu	H
IP xxx.xxx.xxx.xxx	IP <address>	Sets IP address	IP 192.168.0.160
IP r	Returns current IP address	Displays the IP address	IP r
NM xxx.xxx.xxx.xxx	Net Mask	Sets net mask	NM 255.255.0.0
NM r	Returns current Net Mask	Shows net mask	NM r

10.7 VIP 4510 Commands

Command	Description	Definition	Example/Default
VXVA t l h w	Viewable Area • t= top start point • l = left start point • h = window height • w = window width	Adjusts the VIP 4510 viewable area	VXVA 0 0 480 640
VXVB x	Video Brightness (0-255)	Adjusts the video brightness through the VIP 4510	VXVB 128
VXVC x	Video Contrast (0-128)	Adjusts the video contrast through the VIP 4510	VXVC 64
VXVF x	Video Format x = VIP 4510 video format command (refer to **Section 10.8**)	Adjusts the output video resolution	VXVF R0
VXVH x	Video Hue (0-255)	Adjusts the video hue through the VIP 4510	VXVH 128

Command	Description	Definition	Example/Default
VXVS x	Video Saturation (0-128)	Adjusts the video saturation through VIP 4510	VXVS 64
VXWA t l h w	Window Area • t= top start point • l = left start point • h = window height • w = window width	Adjusts the VIP 4510's window area	VXWA 0 0 480 640
VXXE x	Gamma Enable • 1 = enable • 0 = disable	Enables gamma through the VIP 4510	VXXE 1
VXXG x	Gamma Value	Sets the gamma value through the VIP 4510	VXXG 10
VXTPA vf tp rgb	Test Pattern Analog • vf = test pattern resolution (0-12) • tp = test pattern • rgb = color (24 bit hex)	Enables/Disables test patterns, sets the test pattern type and sets the test pattern color	VXTPA 1 1 dda0dd
VXTPR vf tp rgb	Test Pattern DVI/VGA • vf = test pattern resolution (0-9) • tp = test pattern • rgb = color (24 bit hex)	Enables/disables test patterns, sets the test pattern type and sets the test pattern color	VXTPR 1 6 dda0dd
VXTPS vf tp rgb	Test Pattern SD-SDI • vf = test pattern resolution (0-5) • tp = test pattern • rgb = color (24 bit hex)	Enables/disables test patterns, sets the test pattern type and sets the test pattern color	VXTPS 2 3 dda0dd
VXSM x	Sync Mode(0-1)	Enables the Sync Mode	VXSM 0
VXWE x	Waveform Monitor Enable (0-1)	Enables/disables Waveform Monitor	VXWE 0
VXMS l s	Waveform Monitor Start • l-line • s=sample	Selects which line and sample to view on the Waveform Monitor	VXMS 1 0
VXAR x	Auto Refresh (0-1)	Turns on/off the Waveform Monitor's automatic refresh option	VXAR 1

10.8 VIP 4510 Video Format Commands

Device or Mode	Format	Active Size (Row x Column)	Output Type
A0	NTSC	480 x 640	Composte/S-Video
A1	NTSC-overscan	480 x 640	Composite/iS-Video
A2	PAL	576 x 720	Composite/S-Video
A3	PAL-underscan	576 x 720	Composite/S-Video
A4	PAL-overscan	576 x 720	Composite/S-Video
A5	ATSC 480p	480 x 720	Component
A6	ATSC 720p	720 x 1280	Component
A6	ATSC 720p (component)	720 x 1280	Component
A8	NTSC	480 x 640	Component
A9	NTSC-overscan	480 x 640	Component
A10	PAL	576 x 720	Component
A11	PAL-underscan	576 x 720	Component
A12	PAL-overscan	576 x 720	Component
R0	VGA, 640 x 480	480 x 640	DVI/VGA
R1	SVGA, 800 x 600	600 x 800	DVI/VGA
R2	XGA, 1024 x 768	768 x 1024	DVI/VGA
R3	WXGA, 1280 x 768	768 x 1280	DVI/VGA
R4	WXGA, 1360 x 768	768 x 1360	DVI/VGA
R5	SXGA, 1280 x 960	960 x 1280	DVI/VGA
R6	SXGA, 1280 x 1024	1024 x 1280	DVI/VGA
R7	SXGA+, 1400 x 1050	1050 x 1400	DVI/VGA
R8	UXGA, 1600 x 1200	1200 x 1600	DVI/VGA
R9	WUXGA, 1920 x 1200, reduced blanking	1200 x 1920	DVI/VGA
S0	SD 480i60	480 x 720	SDI
S1	SD 480i50	576 x 720	SDI
S2	HD 720p60	720 x 1280	SDI
S3	HD 720p50	720 x 1280	SDI
S4	HD 1080i60	1080 x 1920	SDI
S5	HD 1080i50	1080 x 1920	SDI

Section 11: Replacement Parts

11.1 Daktronics Exchange and Repair & Return Programs

To serve customers' repair and maintenance needs, Daktronics offers both an exchange program and a repair & return program.

Exchange Program
Daktronics unique Exchange Program is a quick service for replacing key parts in need of repair. If a part requires repair or replacement, Daktronics sends the customer a replacement and the customer sends the defective part to Daktronics. This decreases display downtime.

Before Contacting Daktronics
Identify these important part numbers:

Display Serial Number: _____

Display Model Number: _____

Contract Number: _____

Date Installed: _____

Location of Sign (Mile Marker Number): _____

Daktronics Customer ID Number: _____

To participate in the Exchange Program, follow these steps.

1.   **Call Daktronics Customer Service.**

Market Description	Customer Service Number
Schools (primarty through community/junior colleges), religious organizations, municipal clubs, and community centers	877-605-1115
Universities and professional sporting events, live events for auditoriums and arenas	866-343-6018
Finicial institutions, petroleum, sign companies, gaming and wholesale/retail establishments	866-343-3122
Department of Transportation, mass transits, airports, and parking facilities	800-833-3157

2. **When the new exchange part is received, mail the old part to Daktronics.**
   If the replacement part fixes the problem, send in the problem part which is being replaced.

   a. Package the old part in the same shipping materials in which the replacement part arrived.

   b. Fill out and attach the enclosed UPS shipping document.

   c. Ship the part to Daktronics.

3. **A charge will be made for the replacement part immediately, unless a qualifying service agreement is in place.**
   In most circumstances, the replacement part will be invoiced at the time it is shipped.

4. **If the replacement part does not solve the problem, return the part within 30 working days or the full purchase price will be charged.**
   If, after the exchange is made the equipment is still defective, please contact Customer Service immediately. Daktronics expects *immediate return* of an exchange part if it does not solve the problem. The company also reserves the right to refuse parts that have been damaged due to acts of nature or causes other than normal wear and tear.

Repair & Return Program
For items not subject to exchange, Daktronics offers a Repair & Return Program. To send a part for repair, follow these steps:

1. **Call or fax Daktronics Customer Service:**
   Refer to the appropriate market number in the chart listed on the previous page. **Fax:** 605-697-4444

2. **Receive a Return Materials Authorization (RMA) number before shipping.**
   This expedites repair of the part.

3. **Package and pad the item carefully to prevent damage during shipment.**
   Electronic components, such as printed circuit boards, should be placed in an antistatic bag before boxing. Daktronics does not recommend packing peanuts in packaging.

4. **Enclose**
   - Contact name

   - Address

   - Phone numbers

   - The RMA number

   - A clear description of symptoms

Shipping Address

Daktronics Customer Service
PO Box 5128
331 32nd Ave
Brookings, SD 57006

11.2 Daktronics Warranty and Limitation of Liability

The Daktronics Warranty and Limitation of Liability is located in the **Appendix.** The Warranty is independent of Extended Service agreements and is the authority in matters of service, repair, and display operation.

Section 12: Acronyms/Nomenclature

1080i: high-definition signal with 1080 scanning lines and interlaced ("i") scanning. This contains up to six times the detail of conventional TV pictures.

720p: high-definition signal with 720 active scanning lines and progressive ("p") scanning. Used in digital television broadcasting, it provides three times the detail of conventional TV pictures.

Active Input architecture: properties of the video processor that allow for displaying multiple channels, zoning, blending, and switching.

Analog: any signal that varies continuously, as opposed to a digital signal, which contains discrete levels. A system or device that operates primarily on analog signals.

Aspect ratio: the ratio of a picture's width to height. Most video monitors and televisions display a 4:3 image; however, widescreen displays 16:9.

BNC: a type of coaxial cable connector, often used for component video inputs.

Brightness: the overall light level of an image. Brightness measures the difference in range when comparing white to dark tones and colors. It is also called black level and black reference.

Calibar: pocket-size, portable video calibration device that produces 24 test pattern functions.

Chrominance: the color component of a video signal, abbreviated C. Chrominance is combined with the black-and-white signal (luminance) in composite video connections, but kept apart in S-Video and component connections. For higher quality, the single chrominance signal can also be divided into B-Y and R-Y components in Y/PB/PR component connections, or into the primary colors of Red, Green, and Blue for R/G/B component connections.

Color Space Conversion: a video processor feature that changes NTSC and PAL color values to LED color values, ensuring accurate color reproduction.

Component video connections (Y/PB/PR): the best method for connecting analog video signals. Y/PB/PR is ideal for DVD players and compatible satellite receivers. It uses separate connections for luminance (Y), blue color difference (PB), and red color difference (PR).

Component video connections (R/G/B): the best method for connecting analog video signals. R/G/B is ideal for HDTV receivers and computer signals. It uses separate connections for Red (R), Green (G), and Blue (B).

Composite (COMP): a video signal in which the luminance (black and white information) and chrominance (color information) are combined on the same wire using one of the coding standards: NTSC, PAL, SECAM, etc. Picture quality is lost whenever chrominance and luminance are stripped apart.

Contrast: the range of light-to-dark values of an image proportional to the voltage difference between the black and white voltage levels of the video signal. The contrast control is an adjustment of video gain. Contrast is also called white bar or white reference.

Daktronics LED video display: Daktronics-trademarked video displays that use RGB LED technology to create full-color images. The displays are capable of showing video and animation in 4.4 trillion colors, depending on display technology.

DDR (Digital Disc Recorder): a type of recording system that utilizes a high-capacity hard disk to record digital audio or digital video.

DMP 7000: Self-contained hardware/software playback component used in a digital display control system.

DVI (Digital Video Interface): a digital interface standard used to convert analog signals into digital signals to accommodate both analog and digital monitors.

Frames Per Second (fps): a measure of how much information is used to store and display film and digital motion video. Each frame is a still image; displaying frames in rapid succession creates the illusion of motion. The more frames per second, the smoother the motion appears. The NTSC video format, for example, displays 30 interlaced frames per second.

Gamma correction: a process used with video images to correct brightness and internal micro-contrast within the image. Changing the value of the gamma affects middle ranges, while leaving the full white and full black of the image unaltered.

Genlock: short for **gen**erator **lock**ing device; a device that enables a composite video machine, such as a TV, to accept two signals simultaneously. A genlock locks one set of signals while it processes the second set. This enables a computer to combine graphics with video signals from a second source, such as a video camera.

HD-SDI (High-Definition Serial Digital Interface): a digital video interface used with high-definition video.

Hue: the actual color of an object. Hue defines color on the basis of its position in the color spectrum; i.e., red, blue, and green.

Interlaced scanning: the opposite of progressive scanning. Interlaced scanning is the technology behind conventional television signal, which shows half of a frame's scanning lines every $1/60$ second. First the odd-numbered lines display, then the even-numbered lines.

IRE (Institute of Radio Engineers): units of measurement that divide the area from the bottom of sync to the peak white level into 140 equal units. 140 IRE equals 1 volt, peak-to-peak. The range of active video is 100 IRE. Typically, this measurement is only used for NTSC video.

Key color: a color in a video image replaced by elements of a second image.

Luminance: the black-and-white component of a video signal, abbreviated Y. Luminance is combined with the color signal (chrominance) in composite video connections, but kept apart in S-Video and component connections.

Noise: random, unwanted interference with signal, resulting in "snow," random flecks, or specks of unwanted color.

NTSC (National Television Standards Committee): color video signal that uses 525 scan lines with 30 frames/60 fields per second. All United States broadcasting uses the NTSC standard.

Overlay: keyed insertion of one image into another. Overlay is used, for example, to superimpose computer-generated text on top of a video image. In video, overlay requires synchronized sources for proper operation.

PAL (Phase Alternating Line): A color TV standard developed in Germany that broadcasts 25 interlaced frames per second (50 half frames per second) at 625 lines of resolution. Brazil uses PAL M, which broadcasts 30 fps. PAL is used throughout Europe and China as well as in various African, South American and Middle Eastern countries. PAL's color signals are maintained automatically.

PLUGE (Picture Line-Up Generation Equipment): Used for aligning monitors and other video devices. In some versions of color bars, PLUGE is the black set at the bottom of the red bar that contains bars that are blacker-than-black, black, and whiter-than-black. Users adjust monitor brightness by watching the PLUGE so the whiter-than-black bar is just visible, and both the black and blacker-than-black bars are no longer distinct.

Progressive scanning: the opposite of interlaced scanning. Progressive scanning shows each scanning line in sequence for a more seamless, film-like image.

Saturation: the color intensity of an image. An image high in saturation appears very bright. An image low in saturation appears duller and more neutral. A 100-percent saturated color does not contain any white; adding white reduces saturation. An image without any saturation is also referred to as a grayscale image.

SDI (Serial Digital Interface): a digital video interface used with broadcast-grade video.

SECAM (Système Electronique Couleur Avec Memoire): A color TV standard from France that broadcasts 25 interlaced frames per second (50 half frames per second) at 625 lines of resolution, 576 of which are the visual frame. Used in France and Russia and other countries in Africa, Eastern Europe and the Middle East, several countries have switched from SECAM to PAL, and production equipment for SECAM is no longer made. Today, almost all work is done in component video systems that support 576 scanning lines (SECAM and PAL) or composite video (PAL) and converted to SECAM for transmission.

SMPTE (Society of Motion Picture & Television Engineers) Bars: a multi-purpose test pattern used as an adjustment reference and a verification of correct video display operation.

S-Video (Super-Video, Y/C Video): a technology for transmitting video signals over a cable by dividing the video information into two separate signals: one for color (chrominance), and the other for brightness (luminance). When sent to a television, S-Video produces sharper images than composite video, where the video information is transmitted as a single signal over one wire; this is because televisions are designed to display separate Luminance (Y) and Chrominance (C) signals.

SXGA (Super eXtended Graphics Array): a standard monitor resolution of 1280 × 1024 pixels.

Sync: the portion of an encoded video signal that occurs during blanking and synchronizes the operation of cameras, monitors, and other equipment. Horizontal sync occurs within the blanking period in each horizontal scanning line, and vertical sync occurs within the vertical blanking period.

Tera Term®: a computer program that obtains diagnostic information through a COM port. Tera Term® allows users to see the communication between the computer and the VIP 4500.

Time constant: sensitivity level to changes in incoming horizontal frequency. VTR is less sensitive than TV.

True PixelSM **processing:** video processing technology that improves image clarity and color.

Vectorscope: a vector display unit that allows visual checking of the phase and amplitude of the color components of a video signal.

Venus 7000 controller: Daktronics-designed software that controls displays.

VGA (Video Graphics Array): a graphics display system for PCs developed by IBM. VGA uses analog signals rather than digital signals. VGA computer monitors have a resolution of at least 640 x 480 pixels.

Viewable Area (VA): the video area a sign displays. The VA is smaller than the total video signal area because a black (or blank) border of about 50 to 100 extra pixels is built into the signal.

VMax signal: the proprietary signal used with Daktronics displays.

VIP 4500: acts as an interface between the Venus 7000 controller, the video equipment, and the Daktronics LED video display, enabling the complete video signal to appear on a display. The processor also provides aspect ratio versatility, allowing either a 16:9 (widescreen) or a 4:3 (standard) format.

Waveform monitor (WFM): a vectorscope that examines the waveform of a video signal and the synchronizing pulses.

XGA (eXtended Graphics Array): a proprietary video card developed by IBM that produces a resolution of 1024 x 768 pixels.

Y, Cr, Cb: color difference signal designation used for various purposes, such as the CCIR/SMPTE standard digital component video signal set (CCIR601, RP-125). Y corresponds to luminance, Cr corresponds to the R-Y signal and Cb corresponds to the B-Y signal

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Z-Order: the ordering of overlapping two-dimensional objects on a screen or display; determines which object will appear atop the other

Appendix: Daktronics Warranty and Limitation of Liability

Refer to **SL-02374** for a complete **Warranty and Limitation of Liability**.