

VP14-3ATI processes one of many possible video inputs on Port 1, with automatic analog and digital input mode detection. Up to 4 windows can be assigned to the selected input, with mode-independent or mode-dependent window size, location, area-of-interest, and rotation. Resolutions up to WUXGA.

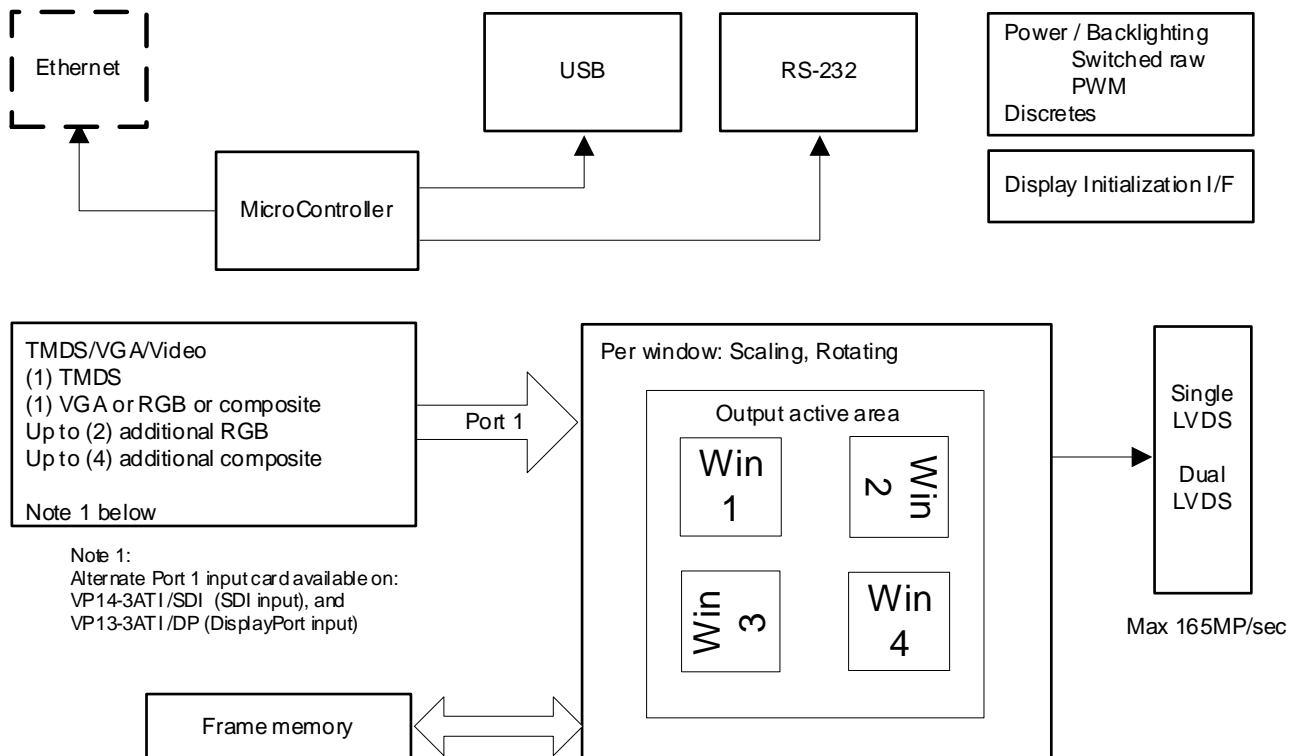


Figure 1 VP14-3ATI Block Diagram

## VP14-3ATI LCD Controller

The VP14-3ATI LCD Controller (see Figure 1) is the ideal LCD controller for applications requiring a 3ATI form factor and resolutions up to 1920x1200. Up to (4) windows can be populated by a single input selected from Input Port 1. The Mode Control Handler detects pre-defined modes, and content is assigned to Windows via both mode dependent and mode independent parameters, including size, location, area-of-interest, rotation, etc.

Supported outputs are single or dual pixel LVDS (up to 165 MPixels/sec). Various Serial command interfaces are also supported for display initialization and other display-specific communication.

## Enhancements

The VP14-3ATI includes several enhancements over the VP7-3ATI LCD controller. In particular, the VP14-3ATI offers:

- Input resolutions up to WUXGA (DVI and analog RGB)
- RoHS compliance
- Improved re-sizing
- Built-in Mode Handling to automatically detect different video formats
- Up to 4 windows can be populated by Input Port 1. Each window may be rotated 90/180/270 degrees
- Single/Dual LVDS outputs up to 165 MPixels/sec at 8 bits/color
- USB, RS-232, or Ethernet (optional) controls
- Serial interfaces for display initialization

## User Programmable Input Modes

Modes define the video type (RGB, DVI, etc) and timing of a video input. With fully customizable input mode definitions for video input port 1, programmable panel output timing and power sequences, and full control of window size and location within the output area-of-interest, you can configure the VP14-3ATI for your unique application.

### Port 1 Multi-Standard Decoder (VP14-3ATI)

The TMDS/VGA/Video Multi-Standard Decoder (MSD) on Port 1 offers multiple unique inputs, including both TMDS (SL-DVI) and analog video. Possible analog video configurations include:

- 1x RGBHV input and 4x NTSC/PAL composite (CVBS) inputs
- 5x NTSC/PAL CVBS inputs
- 4x S-Video (Y/C) inputs, or
- 3x component (YPbPr) inputs.

Figure 2 below shows possible connections. The number after the designation defines the sub-channel. For example, R1 is the Red component of RGB sub-channel #1. Automatic mode detection is possible among the Orange sub-channels, and the TMDS input.

VP14-3ATI pin	VGA (RGB)	YPbPr	s-video (YC)	Composite (CVBS)
J17- 1	R1	Pr3		
J17- 3	G1	Y3	Y4	CVBS5
J17- 5	B1	Pb3	C4	
J17- 7	VS1			
J17- 9	HS1			
J24- 1	R2	Pr1	C2	
J24- 5	G2	Y1	Y2	CVBS3
J24- 3	B2	Pb1	C3	
J24- 13			Y3	CVBS2
J24- 7	G3	Y2	Y1	CVBS4
J24- 9	B3	Pb2	C1	
J24- 11	R3	Pr2		CVBS1

Figure 2 Analog Video Input Possibilities

The VP14-3ATI also supports specialty formats such as RS-343, RS-170, STANAG, and custom video formats.

### Video Conversion and Synchronization

- Digitization of computer-generated video sources with separate syncs or sync-on-green.
- Non-interlaced and interlaced RGB inputs.
- DVI (TMDS) input.
- Digitization and de-interlacing of consumer video formats, including NTSC and PAL Composite, S-Video, and Component Video.
- Frame rate conversion: free running or genlocked output. A Genlocked output provides the lowest possible latency.
- Incoming video gain and offset adjustments. Fine phase clock adjustment for pixel sampling.

### Port 1 SDI (VP14-3ATI /SDI)

An alternate input board is offered on the VP14-3ATI /SDI. This version accepts various standard SDI formats, up to 3G (1080P / 60Hz). Please contact the factory for more information.

### Port 1 DisplayPort (VP14-3ATI /DP)

An alternate input board is offered on the VP14-3ATI /DP. This version accepts various standard DisplayPort formats, up to 1080P / 60Hz. Please contact the factory for more information.

## Features

Based on state-of-the-art processing technology, the VP14-3ATI LCD Controller capabilities include:

### Configuration Utility and Commands

The VP14-3ATI is configured via the VP14 configuration utility. This utility also supports in-the-field firmware, FPGA and parameter (BIOS) updates. Commands are sent to the unit through the RS-232, USB, or optional Ethernet interface. Parameters are stored in non-volatile memory to retain desired settings. Westar also supplies a command line description document, so that customer software can send dynamic programming commands to the VP14.

### Input mode detection and multiple windows

- Video input port 1 can be pre-configured with multiple input modes defining input type, timing, resolution, etc.
- The built-in Mode Handler Control function is programmed to either:
  - monitor a particular input type and sub channel (eg RGB1), or
  - automatically cycle thru sub-channel 1 of each pre-configured input type (eg TMDS1 >> RGB1 >> CVBS1) until valid video is detected.
- Up to 4 windows can be placed in the output active area. (Each window is assigned to Input Port 1). Input modes are mapped to the window according to the window's mode-dependent and mode-independent parameters, including size, location, input area-of-interest, and rotation (90, 180, or 270 degrees)
- If a pre-defined timing mode is not detected for an input port, then windows assigned to that input are programmed to either display a specific RGB color or disappear.

### Video Synchronization

- Frame rate conversion: free running or genlocked output. A Genlocked output provides the lowest possible latency.

### Programmable

- Remote interface for both initial configuration and, if required, dynamic operational control.
- Commands defined in Command Line Description document.
- Programmable power and "loss of video" sequences with user-defined "On Screen Display" Messages.

## Display Interfaces

- Supports most single and dual LVDS panels.
- Supports LDI and SPWG LVDS bit mappings.
- Serial interfaces (SPI, etc) for specialty displays.
- 165 MPixel/sec-capable LVDS, single or dual, using Thine fast LVDS transmitters.

## Test Patterns/Messages

- Test Patterns include: flood field, color wedge, checkerboard, color bar, each highly programmable
- Test pattern overlay: outline, lines, and pixel.
- Up to 8 on-screen messages using built-in 8x10 pixel character generator based on ASCII character set. Each message has:
  - up to 64 characters
  - 1x, 2x, 4x, 8x character size multiplier
  - programmable location in x and y

## VP14 Configuration Utility, (view of a portion of the GUI)

The VP14 Configuration utility provides a graphical method for setting up the VP14-3ATI. The utility supports definition of the output, inputs, windows, and much more. Figure 3 below is a sample screenshot of the “Windows” tab, where parameters such as sizing and rotation can be defined. The executed text commands are shown in the right window.

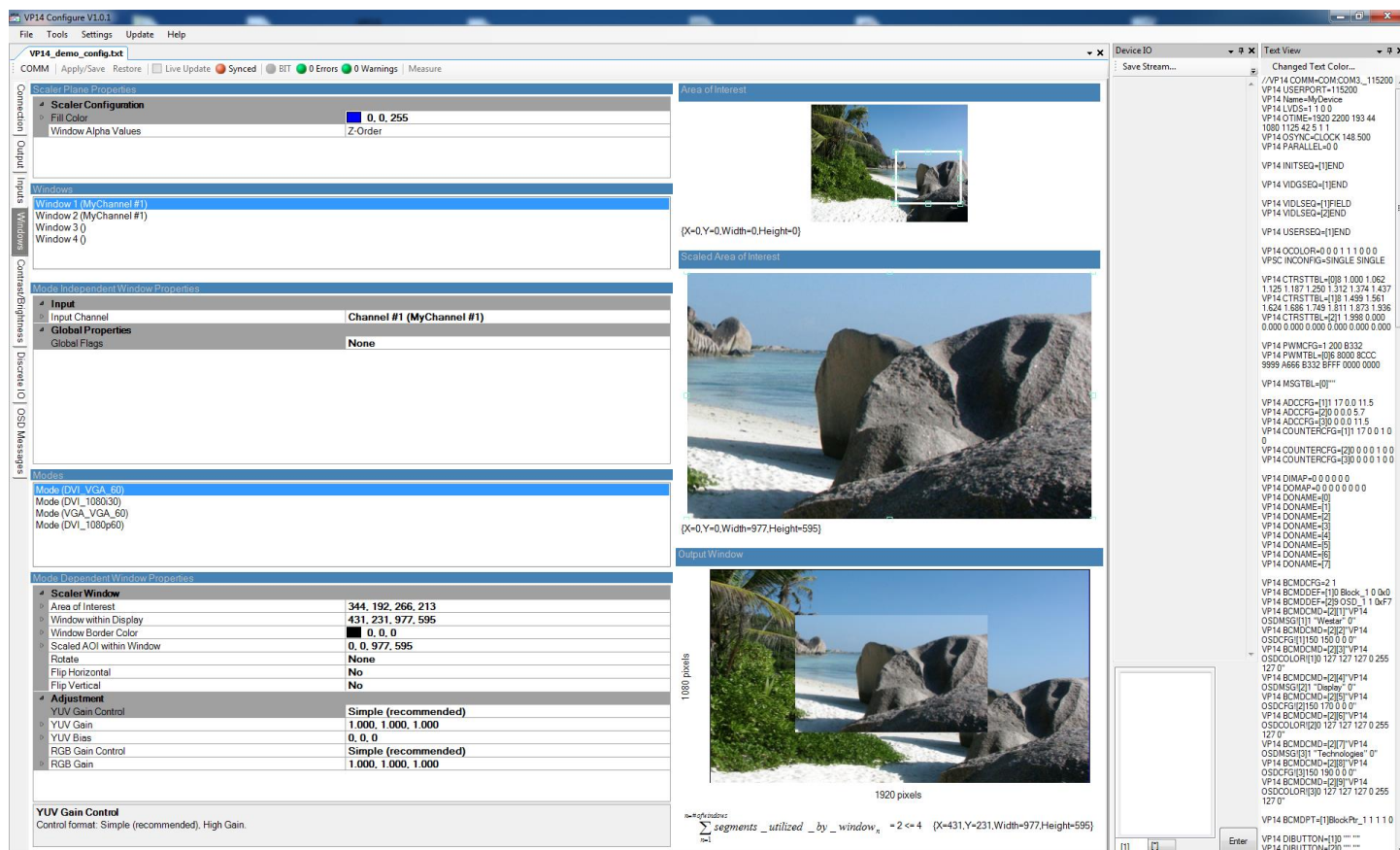


Figure 3 Windows tab of VP14 Configuration application

## Specifications

Figure 4 below shows the high level specifications for VP14-3ATI. Figure 5 lists the VP14 connectors.

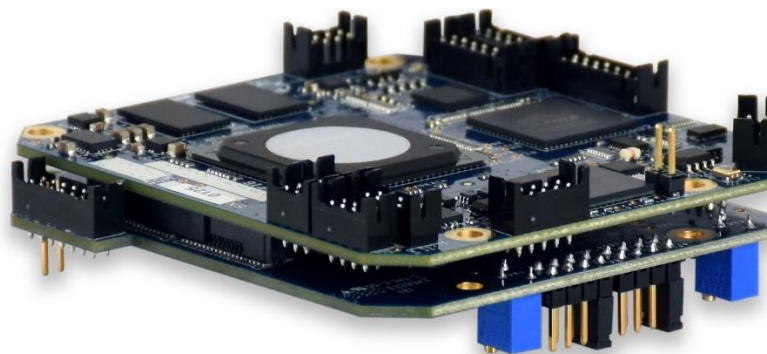
<b>Physical Dimensions</b>	2.9" x 3.0" x 0.8"
<b>Temperature Range</b>	Operating: 0°C to +70°C (additional data available) Storage: -40°C to +100°C
<b>Video Inputs (VP14-3ATI)</b>	RGB (up to WUXGA resolutions @ 60Hz), DVI (up to 165 MHz) NTSC/PAL (composite or S-Video), Component Synchs (Digital Separate, Digital Composite, Analog Composite)
<b>Video Inputs (VP14-3ATI /SDI)</b>	Common SDI resolutions up to 3G SDI, including: 1080P, 720P, etc
<b>Video Inputs (VP14-3ATI /DP)</b>	Common DisplayPort resolutions up to 1080P or UXGA
<b>Video Outputs</b>	Single or Dual LVDS (up to 165MPixel/sec). Optional parallel TTL output is available. Please contact the factory
<b>Input Power</b>	+12 VDC, 10 Watts
<b>Control Interface</b>	(2) RS-232, USB, Ethernet (via optional Ethernet interface assembly) Maintenance RS-232 interface fixed at 115kbps for Configuration Application User RS-232 interface has programmable baud rate

Figure 4 VP14-3ATI Specifications

Conn	Type	Description	Conn	Type	Description
J1	DF11-6DP	USB Interface	J18	DF11-16DP	Discrete I/O
J2	1 position jumper	Inverter Voltage Select	J24	DF11-14DP	Component/Composite Video In
J3	DF11-6DP	Ethernet Module Interface	J25	DF11-12DP	TMDS in
J5	DF11-10DP	Factory Use Only	J28	1 position jumper	Factory Use Only
J6	DF11-10DP	RS-232	J29	DF11-10DP	Factory Use Only
J7	DF11-8DP	LED Interface	J32	DF11-14DP	LVDS Out 1 – Dual Pixel
J8	4 position jumper	Inverter Power Select	J33	DF11-14DP	LVDS Out 2 – Single Pixel
J9	4 position jumper	UUT Power Select	J34	DF11-4DP	TMDS EDID
J10	DF11-18DP	Inverter Interface	J36	DF11-8DP	Analog to Digital Converter Input
J13	DF11-6DP	Power In	J37	1 position jumper	Factory Use Only
J17	DF11-10DP	VGA Video In			

Figure 5 VP14-3ATI Connector definition

Note: VP14-3ATI /SDI and VP14-3ATI /DP have different input connectors. See the Installation Manual





Figures 6 and 7 below shows the two board set comprising VP14-3ATI.

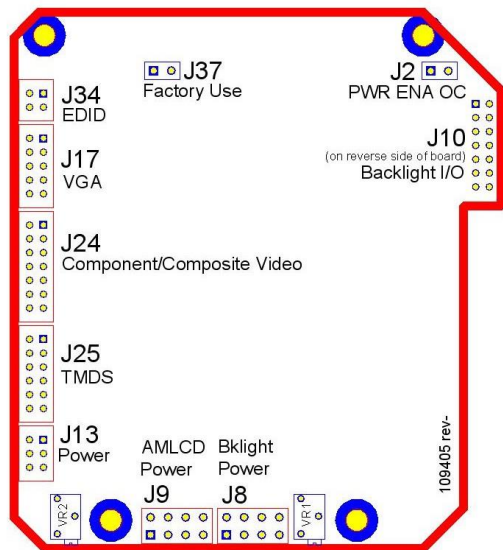


Figure 6 VP14-3ATI (side away from display)

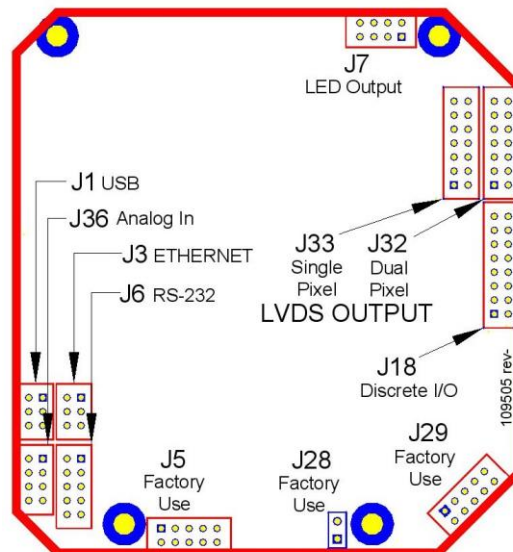


Figure 7 VP14-3ATI (side facing display)

## VP14-3ATI Operation

Typically, the VP14-3ATI operates as follows:

1. Upon power up, the VP14-3ATI configures itself based on its internal BIOS. The BIOS includes various input mode definitions and an output mode (timing, electrical format, video combining definition, etc.)
2. If valid video is detected at the input port based on the currently selected input type and sub-channel, all windows mapped to that mode will be displayed per the mode parameters. If valid video is not detected, the windows will display a pre-defined color (blue-screen) or disappear altogether to reveal the background color

4. The only alternative for jumpers is a) soldered shorting wire or no-pop.
5. The only alternative for a potentiometer is a no-pop

The Figure 8 below identifies additional configurations and summarizes the differences.

Config#	Description
tbd	Some DF11's switched to gold contacts or no-pop, shorting jumpers either no-pop or soldered wires, removed potentiometers

Figure 8 Alternative Mechanical Configurations

## VP14-3ATI Mechanical Configurations

Westar offers other mechanical configurations in addition to the standard VP14-3ATI. The standard configuration is always the lowest price, and is optimal for most applications. Westar recognizes, however, that some applications require more robust connectors and jumpers, connectors mounted on back-side versus top-side, right angle connectors versus straight, or elimination of unused parts to reduce the bill-of-material. In all cases, the same PWB's as the standard VP14-3ATI are used.

A few important points about configurations:

1. All configurations share the same Configuration Application and Command Line description. There are no changes to firmware and FPGA files.
2. If an input connector is not populated then any associated functions with that connector cannot be used, even though the function may still appear in the application.
3. the only other option for DF11 connectors listed in Figure 5, are a) DF11 with gold-plated contacts, or b) no-pop (not populated)

Please contact the factory for more details.

## Ordering Configuration

VP14-3ATI	VP14-3ATI (standard)
VP14-3ATI /SDI	VP14-3ATI (with SDI input)
VP14-3ATI /DP	VP14-3ATI (with DisplayPort input)
VP14-3ATI-Cxxx	VP14-3ATI with mechanical configuration xxx

Optional Ethernet is available via a cable assembly with built-in Ethernet port

Optional parallel TTL output is available. Please contact the factory

## Contact Us

Call us for additional product info and pricing.

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