

**VideoEase™**

**Active VGA Balun II Family**

**500140: Active VGA Balun II Kit (Tx & Rx)**

**500142: Active VGA Balun II, Rx, no PSU**

**500144: Power Supply for 500142**



***Installation Guide***

P/N: 94-000622-B SE-000604-B

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***MuxLab***

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# 1. Overview

## 1.1. Description

The Active VGA/Component Balun II Kit allows VGA or component video to be transmitted via cost-efficient unshielded copper twisted cable in a point-to-point configuration.

The product supports remote power pass-thru and is DDC compliant with all “plug-and-play” laptops, PCs and displays. The product supports up to 1920 x 1200 pixels and 1080p resolution and features manual gain adjustment and local monitor output for added versatility.

The product converts the VGA signal from an unbalanced signal to a balanced signal and amplifies and equalizes the signal at the receiving end. It provides excellent image quality and minimizes distortions due to smearing, propagation delay and phase deviation. The transmitter and receiver are shown in the photo below.

Applications include; Digital signage, residential, boardroom, classroom, and medical imaging video systems.

## **1.2. Features**

- Up to 600 ft (180m) via Cat5E/6 @ 1920 x 1200
- Up to 600 ft (180m) via Cat5E/6 @ 1080p
- Remote power pass-thru up to 150 ft (46m)
- DDC1/DDC2 (Plug-and-Play) Compliant
- Manual gain compensation
- Local monitor output
- Up to four (4) transmitters may be cascaded

# 2. Technical Specifications

<b>Environment</b>	VGA. VESA VP&D 1.0, VIP ver 2.0. DDC1 and DDC1.	
<b>Devices</b>	PCs, laptops, CRT monitors, LCD monitors, plasma screens, DLP projectors.	
<b>Transmission</b>	Transparent to the user.	
<b>Bandwidth</b>	Up to 220 MHz (1920 x 1200 resolution), 1080p	
<b>Input Impedance</b>	HD15; 75 ohms	
<b>Output Impedance -</b>	Cat5: 100 ohms	
<b>Connectors – Transmitter</b>	VGA/Component Input (PC): DB15HD-F VGA/Component Output (Local Monitor): DB15HD-F VGA/Component Output (Cat5): RJ45 shielded	
<b>Connectors – Receiver</b>	VGA/Component Input (Cat5): RJ45 shielded VGA/Component Output (Display): DB15HD-M	
<b>Maximum Distance – Remote Power</b>	150 ft (46m) (Tx Balun unpowered, Rx balun powered) 150 ft (46m) (Tx Balun powered, Rx balun unpowered)	
<b>Max. Distance – VGA via Cat 5 (or better) Twisted Pair</b>	640 x 480 (VGA): 1000 ft (305m) 800 x 600 (SVGA): 1000 ft (305m) 1024 x 768 (XGA): 1000 ft (305m) 1280 x 1024 (SXGA): 850 ft (260m)	1600 x 1200 (UXGA): 800 ft (245m) 1366 x 768 (WXGA): 850 ft (260m) 1680x1050 (WSXGA): 850 ft (260m) 1920 x 1200 (WUXGA):600 ft (180m)
<b>Max Distance – Component Video (YPbPr) via Cat 5 (or better) Twisted Pair</b>	480i/p: 1,000 ft (305 m) 1080i: 850 ft (260 m) 1080p: 600 ft (180 m) * VGA-to-component video cables required (not included)	
<b>RJ45 Pin Configuration Reverse Polarity Sensitive</b> <i>Use EIA/TIA 568 A or B, straight-through wiring</i>	Red: Pin 7 (R) Pin 8 (T) Green: Pin 3 (R) Pin 6 (T) Blue: Pin 1 (R) Pin 2 (T) DDC/Remote Power: Pin 4 (R) Pin 5 (T)	
<b>Gain Adjustment</b>	Gain control via DIP switches on receiver (factory default setting: all OFF)	
<b>LED Indicators</b>	Tx Balun: Power: One (1) green LED Sync: One (1) green LED Rx Balun: Power: One (1) green LED	
<b>Cable</b>	Category 5 or better twisted pair cable. Transmitter requires additional VGA jumper cables (not included)	
<b>Power Supplies</b>	110-240V/12VDC/0.5. Removable AC blades included for North America and Continental Europe. 12VDC power jacks.	
<b>Temperature</b>	Operating: 0° to 40° C. Storage:-10° to 70° C. Humidity: up to 95% non-condensing.	
<b>Enclosure</b>	Black. ABS fire retardant plastic	
<b>Dimensions</b>	4.5" x 3.8" x 1.25" (11.4 cm x 9.7 cm x 3.2cm)	
<b>Weight</b>	2 lbs, .9 Kg	
<b>Regulatory</b>	FCC/CE, RoHS	
<b>Warranty</b>	Two (2) years	
<b>Order Information</b>	500140: Active VGA Balun II Kit 500142: Active VGA Balun II, Receiver Only (Display), No PSU 500144: Power Supply 100-240V/12VDC/.5A for 500142	

## **3.** **Installation Procedure**

### **3.1. Parts List**

The Active VGA Balun II Kit (500140) comes with the following parts. Please verify that all pieces are present before proceeding.

- Transmitter
- Receiver
- Two (2) External Power Supplies (12 VDC, 0.5A)
- Blades for North America, Continental Europe and UK
- Installation Guide

The Active VGA Balun Receiver (500142) and Power Supply (500144) are also sold separately for use with the VGA Hub (500150).

VGA jumper cables and Category 5e/6 cable are not included.

## 3.2. Product Overview

The external connections and diagnostic indicators of the Active VGA Balun II are detailed in the following diagrams. Please familiarize yourself with them before installing the components.



**Figure 1: Transmitter**



**Figure 2: Receiver**



### **3.3. Pre-Installation Checklist**

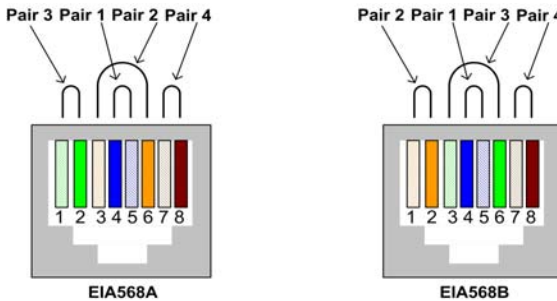
There are two (2) components: the transmitter and the receiver.

1. The transmitter is connected to the video source, usually a PC, by a VGA jumper cable (not included).
2. A local monitor can be connected to the transmitter by a VGA jumper cable (not included).
3. The transmitter is connected to the receiver by Category 5e/6 (or higher) UTP cable (not included).
4. The receiver is connected to the display equipment, usually a projector or screen, by a VGA jumper cable (not included) or directly on the equipment.
5. Verify that the desired image resolution is within the specification of the Active VGA Balun II Kit.

### 3.4. Installation Procedure

Verify that the distance between the Active VGA Balun II transmitter and receiver are within MuxLab specifications (see Technical Specifications). In order to install the transmitter, please follow the steps below:

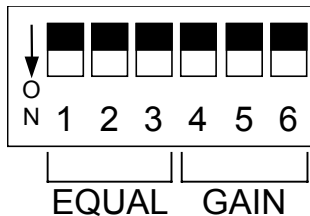
1. Connect the transmitter to the video source with a VGA jumper cable.
2. (Optional) Connect a local monitor to the transmitter with a VGA jumper cable.
3. Connect a length of Category 5e/6 (or higher) UTP cable to the transmitter. Ensure the wiring is according to EIA 568 A or B. and straight-thru.



4. Connect the 12 VDC power supply first to the transmitter and then plug the power supply into an AC power outlet. If power is present, the green power LED will be ON.

To install the receiver, please follow the steps below:

5. Connect the Active VGA Balun II receiver to the display equipment.
6. Connect the UTP cable to the Video IN/UTP connector of the receiver.
7. If the distance exceeds MuxLab's specified limit for remote power, connect the second 12 VDC power supply to the receiver and then plug the power supply into an AC power outlet. If power is present, then the green power LED will be ON.
8. To adjust the picture quality, toggle the gain adjustment DIP switches on the rear panel of the Active VGA Balun II receiver. The factory default position is "all OFF" (up position).



**Figure 3: DIP switches for gain adjustment**

9. The following table provides suggested DIP switch settings for Gain adjustments.

<b>GAIN settings</b> (switches 4, 5 & 6)	<b>Actual gain or loss</b>
000	-50%
001	-35%
010	-15%
011	0%
100	+15%
101	+35%
110	+45%
111	+50%

**Table 1: DIP switch settings for Gain adjustment**

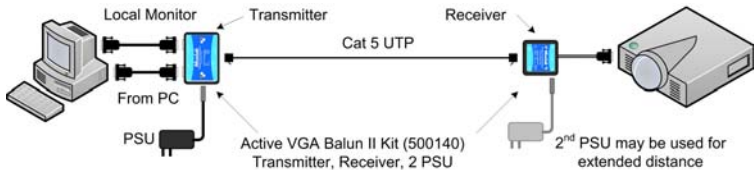
10. The following table provides suggested DIP switch settings for equalization adjustments.

<b>EQUAL settings</b> (switches 1, 2 & 3)	<b>Distance (ft)</b> (resolutions up to 1024x768)	<b>Distance (ft)</b> (resolutions above 1024x768)
000	Up to 200ft	Up to 200ft
001	200ft to 350ft	200ft to 350ft
010	350ft to 600ft	350ft to 500ft
011	600ft to 800ft	500ft to 650ft
100	800ft to 900ft	650ft to 750ft
101	900ft to 1000ft	750ft to 800ft
110	900ft to 1000ft	800ft to 900ft
111	1000ft +	900ft to 1000ft +

**Table 2: DIP switch settings for Equalization adjustment**

**Note:** For display equipment with automatic gain control (for example, certain models of projectors), complete all installation procedures and ensure that all DIP switches are OFF before turning the display equipment on. Otherwise, the display could override the adjustable gain feature of the VideoEase Active VGA Balun Kit.

11. DIP switch positions 1 to 3 adjust the equalization to compensate for high frequency signal loss due to the Cat5E/6 cable.
12. The DIP switch positions 4 to 6 adjust the luminance level to compensate for low frequency signal loss due to the Cat5E/6 cable.
13. The following diagram shows the final configuration.

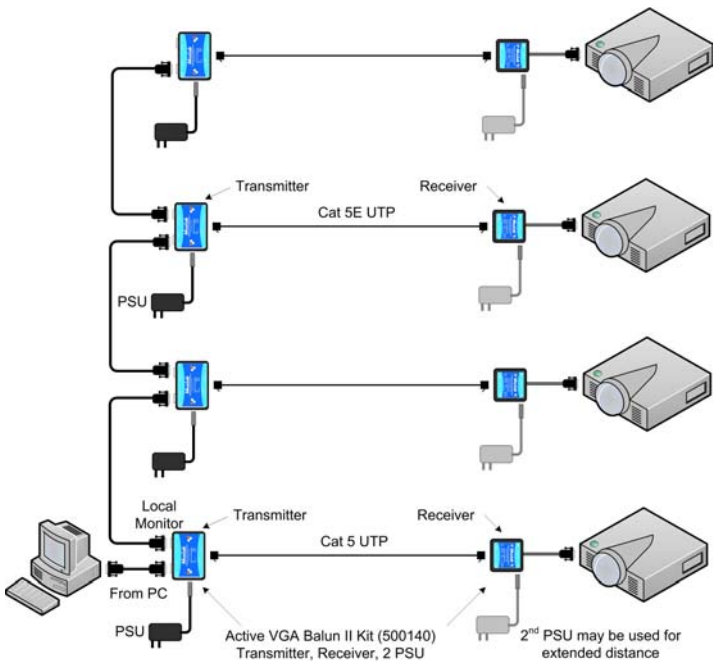


**Figure 4: Typical Configuration – Remote Power**

14. Upon boot-up, the Active VGA Balun II reads the DDC information from the Local Monitor (if connected) and sets the monitor size and resolution according to the Local Monitor.
15. If the Local Monitor is not connected, the Active VGA Balun II reads the DDC information from the remote screen and sets the size and resolution according to the remote screen.

### 3.5. Cascadability

In order to distribute one (1) VGA source to more than one (1) display, up to four (4) transmitters may be cascaded via the Local Monitor port as shown in the following diagram.



## 4. Troubleshooting

The following table describes some of the problem symptoms, the probable causes and possible solutions. If the information below does not solve the problem, the technical support contact information can be found at the end of this section.

Picture	LED (TX) Power Sync	LED (RX) Power	Probable Cause	Possible Solution
No Image	OFF OFF	OFF	No power	Check power connections
No Image	OFF OFF	ON	No power at Transmitter	Check power connections. Check distances for remote powering
No Image	ON ---	OFF	No power at Receiver	Check power connections. Check distances for remote powering
No Image	ON OFF	ON	PC not present or cable problem	Check VGA IN cable
No Image	ON ON	ON	Cat 5 Cable	Check continuity Check correct wiring
Smearing	ON ON	ON	Exceed cable length	Reduce cable length Adjust Gain and Equalization
Ghosting	ON ON	ON	Impedance mismatch	Check cabling Try different VGA card or display
Wrong colors	ON ON	ON	Swapped pairs	Check wiring
Loss of detail	ON ON	ON	Exceed cable length	Reduce cable length Adjust Equalization
Image shakes	ON ON	ON	Too much gain	Reduce cable length Adjust Gain and Equalization

When contacting your nearest MuxLab dealer or MuxLab Technical Support please have the following information ready:

- Unit model number.
- Cabling layout. Include model of PC and display used, cable length and type.
- Description of problem.
- List of tests performed.



## 5. Product Warranty Policy

### Items under warranty - Company Policy

MuxLab guarantees its products to be free of defects in manufacturing and workmanship for the warranty period from the date of purchase. If this product fails to give satisfactory performance during this warranty period, MuxLab will either repair or replace this product at no additional charge, except as set forth below. Repair and replacement parts will be furnished on an exchange basis and will be either reconditioned or new. All replaced parts and products become the property of MuxLab. This limited warranty does not include repair services for damage to the product resulting from accident, disaster, misuse, abuse, or unauthorized modifications or normal decay of battery driven devices. Batteries if included with the product, are not covered under this warranty.

Limited warranty service can be obtained by delivering the product during the warranty period to the authorized MuxLab dealer from whom you purchased the product, or by sending it to MuxLab. MuxLab will not accept any such product for repair without a Return Material Authorization number (RMA#) issued by its Customer Service Department and a proof of purchase date. If this product is delivered to MuxLab by mail, you agree to assume risk of loss or damage in transit, to prepay shipping charges to the warranty service location, and to use the original shipping container or equivalent.

THE ABOVE LIMITED WARRANTY IS THE ONLY WARRANTY COVERING YOUR MUXLAB PRODUCT. THERE ARE NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. SOME STATES DO NOT ALLOW LIMITATIONS ON IMPLIED WARRANTIES, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

IF THIS PRODUCT IS NOT IN GOOD WORKING ORDER, YOUR SOLE REMEDY SHALL BE REPAIR OR REPLACEMENT AS PROVIDED FOR ABOVE. IN NO EVENT SHALL MuxLab BE LIABLE TO YOU FOR ANY DAMAGES, INCLUDING ANY LOSS OF PROFITS, LOST SAVINGS, OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OF OR INABILITY TO USE THIS PRODUCT, EVEN IF MUXLAB OR AN AUTHORISED MuxLab DEALER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES; NOR WILL MUXLAB BE LIABLE FOR ANY CLAIM BY ANY OTHER PARTY. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR CONSUMER PRODUCTS, SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS. YOU MAY ALSO HAVE OTHER RIGHTS WHICH MAY VARY FROM STATE TO STATE.

**Warranty Periods**

*Any product found to be defective within three (3) months of invoice, including one (1) month shelf life, may be returned for replacement by a new unit or a satisfactory repair within one (1) month of receiving any returned product. The customer must provide MuxLab with the serial number and proof of purchase of the defective unit being returned. All R.M.A.'s issued are subject to inspection by MuxLab, and will be returned to customer if not properly package – units must be returned in original container or equivalent. MuxLab will not accept any such product for repair without an authorization for its Technical Support department and without a return authorization number issued by MuxLab Customer Service department. For credit & replace R.M.A., customer will be liable to pay replacement invoice if defective products are not returned.*

Product more than six months old, including shelf life.

The defective unit must be returned prepaid to MuxLab and then the unit will be repaired or if repair is not possible, replaced by an equivalent unit and returned to the customer within one (1) month of receiving any returned product. There is no charge for repair (parts and labor) during the full warranty period.

**Items Defective and not under Warranty**

*For products which are no longer under warranty the policy is repair and return. An amount of 25% of the products published list price at the time of purchase will be charged. Customer must issue a purchase order to cover the cost of repair.*

*Each unit will be returned to the customer within one (1) month from receipt of the unit by MuxLab. The defective unit must be returned prepaid to MuxLab. The repaired unit will be returned to the customer FOB MuxLab. The repaired unit has a 90 day warranty.*



## ***MuxLab***

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