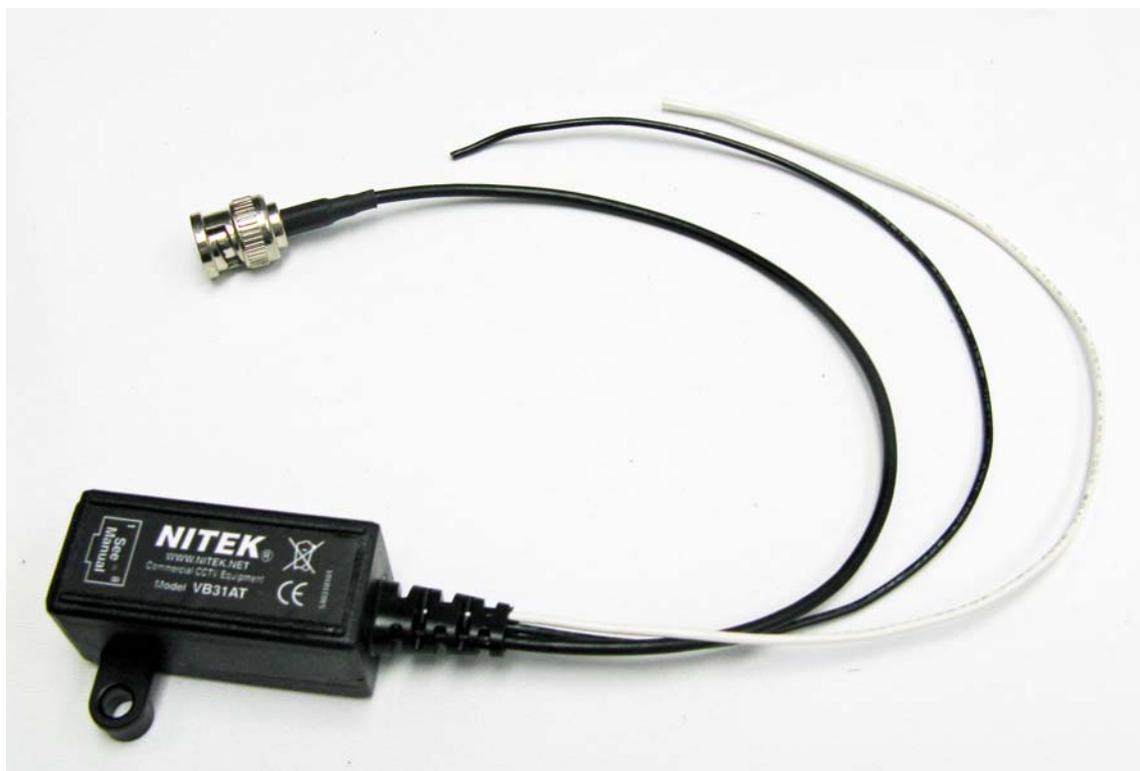


# INSTALLATION GUIDE

## VB31AT Video Balun Combiner for Twisted Pair



### Description

Video Balun Combiner for twisted pair up to 750 feet (225 meters) in conventional UTP applications, 100 meters in TIA/EIA 568 applications.

The VB31AT is a unique transmission device which provides an economical means of sending video and camera power over a standard Category cables. Video is sent over one pair and camera power is sent over the two of the remaining pairs. A mini-coax pig-tail with male BNC is used on the VB31AT. A pair of wires are provided for power connection. Connections to the Category cable are made via an RJ45 connector.

The VB31AT Video Balun provides the same high immunity to noise and interference as all of the Nitek baluns. This simplified wiring scheme provides a convenient method of powering the camera, allowing for quicker and easier installations. The RJ45 modular jack uses standard 568B wiring so spare network cables can be used.

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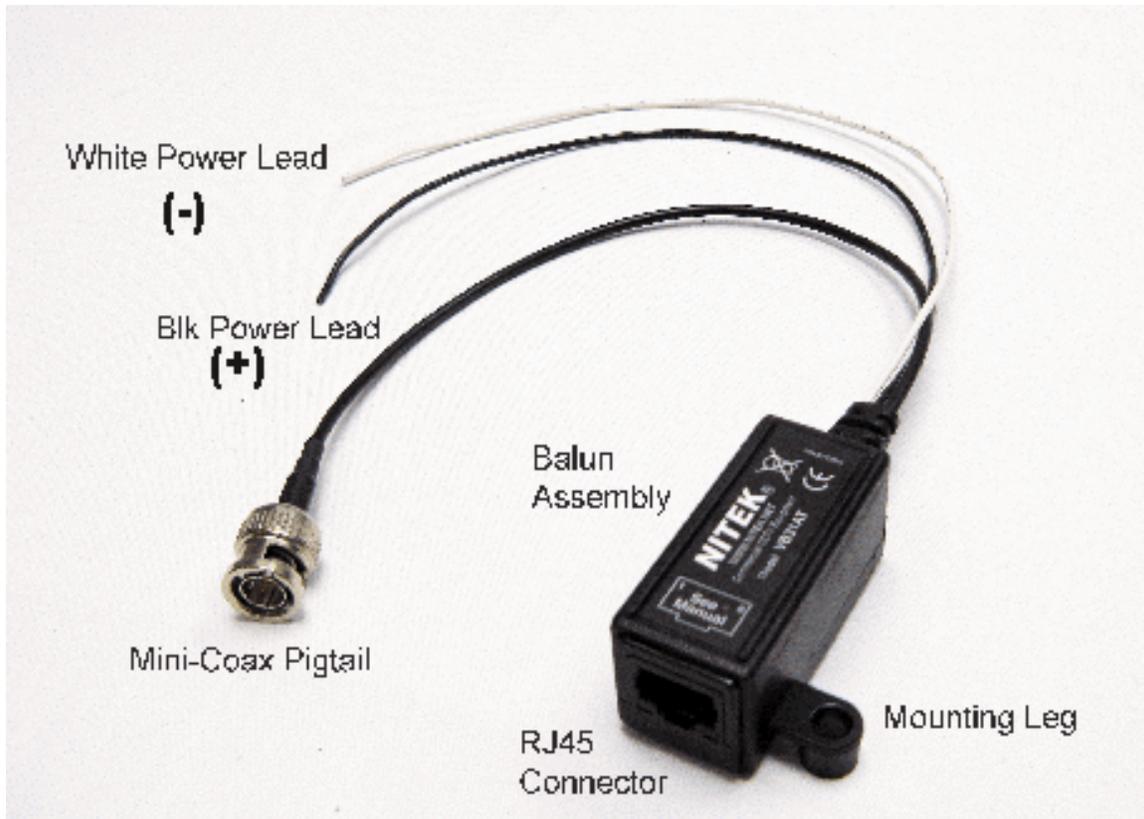
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## Important Safety Instructions

1. Be sure to read these Safety Instructions.
2. Keep the Instructions for future reference.
3. Be sure to HEED all Warnings.
4. Follow ALL instructions.
5. DO NOT use this device or any of the equipment described, near water.
6. Clean this device ONLY with a dry cloth.
7. DO NOT block any ventilation openings.
8. Install in accordance with the manufacturer's instructions.
9. DO NOT install near any heat sources such as radiators, heat registers, stoves or other apparatus (including amplifiers) that produce heat.
10. DO NOT defeat the safety purposes of polarized or grounding type plugs. A polarized plug has two blades, with one blade wider than the other. A grounding plug has two blades and has a third grounding prong. The wide blade and the grounding prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
11. Protect the power cord from being walked on or pinched especially at plugs, convenience receptacles and other points where they exit from the device.
12. Only use attachments and/or accessories specified by the manufacturer.
13. Refer all servicing to qualified service personnel. Servicing is required when the device has been damaged in any way, such as the power supply cord or plug is damaged, liquid has been spilled on, or objects have fallen into the device, the device has been exposed to rain or moisture, does not operate normally or has been dropped.
14. **WARNING:** To reduce risk of fire or electric shock, do not expose this apparatus to rain or moisture.
15. Installation shall be performed ONLY by qualified personnel and must conform to all local codes.
16. Unless the device is specifically marked as a NEMA 3, 3R, 3S, 4, 4X, 6 or 6P enclosure, it is designed for indoor use ONLY and it must not be installed where exposed to rain or moisture.

## Parts of the VB31AT



## Installation & Setup

### Installation Considerations

**Wire and Cable Recommendations.** The VB31AT is designed for use with unshielded twisted pair (UTP) wiring. Although the system will operate over wire gauges from 23 AWG through 24 AWG, all NITEK UTP system designs are optimized for 24AWG and all adjustment and setting information assumes use of 24 AWG. Individually shielded pairs should be avoided, as they drastically reduce the operating range of the systems. Multi-pair cable (25-pair or more) with an overall shield are acceptable. Video can be operated in the same communication cable coexistent with telephone, computer, control signals, power voltages and other video signals. While video may be routed through telephone punch-down block terminals, any bridge-taps, also called T-taps and any resistive, capacitive or inductive devices **MUST BE** removed from the pair.

For more specific information regarding wire types, gauges and proper installation techniques, please call Tech Support at 800-528-4343.

**Video.** The VB31AT is designed to transmit or receive video at a maximum distance of 750 feet with a companion NITEK Balun over Category wire of 24 AWG or up to 3,000 feet with an appropriate active NITEK receiver. Before commencing installation be sure that the cable length does not exceed the recommended lengths. If the length of cable is not known, then a measurement of "Loop Resistance" of the cable can be made using a reliable ohmmeter. Short the pair together at one end and measure the resistance of the "Loop" across the pair at the opposite end of the cable. The resistance values shown below are for 750 feet of the most commonly used UTP cables.

## Installation & Setup

### Unshielded Twisted Pair (Loop Resistance at 750 feet)

AWG	23	24
Loop Resistance	32 Ohms	39 Ohms

**Power.** Before making any connections be sure that the power source is correct for the camera being installed and that the length of Category cable is within the maximum specifications allowed for the camera power requirements. If not, sufficient power may not be available at the camera. NITEK provides a convenient Voltage Drop Calculator at the web address below to simplify determining the maximum allowable cable distance to send power over category cabling.

<http://www.nitek.net/calculator.html>

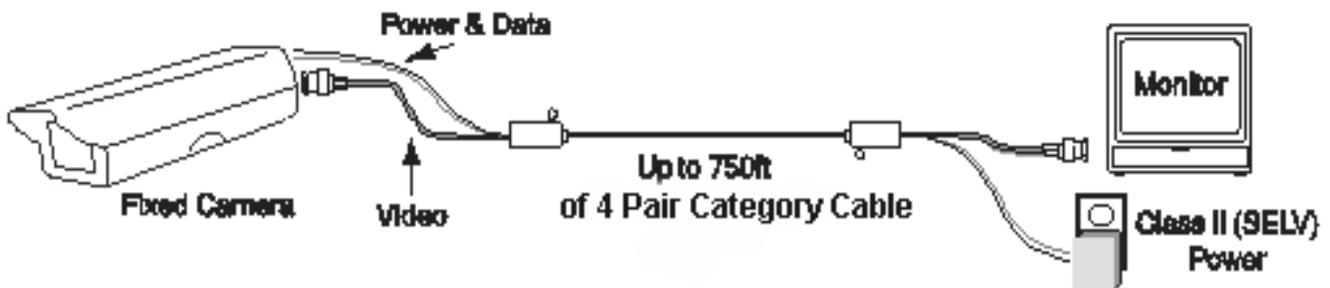
### Mounting

The VB31AT can be mounted external to a camera housing by use of the mounting leg, or can be placed inside the camera housing.

When mounting the VB31AT externally, the placement should be sufficiently close to the camera housing so that the mini-coax and power cables can be conveniently routed into the camera housing. The mounting leg of the VB31AT can be used to secure the device either with a screw or wire wrap. The mini-coax plugs onto the BNC camera video input and the White and the Black power wires connect to the appropriate camera power inputs.

When mounting the VB31AT inside a camera housing a hole of sufficient size must be available to pass the RJ45 terminated video/power cable through. The cable must be of sufficient length to be routed back to the power source and video crossover. As with external mounting, the mini-coax video cable will connect within the housing to the camera video BNC input and the White and the Black power wires will connect to the appropriate power inputs on the camera.

## Hook-Up

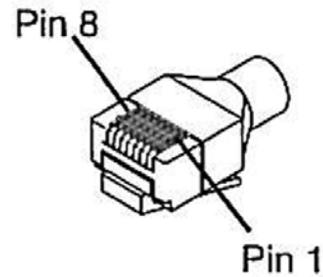


In the diagram shown above, two VB31AT devices are used; one at the Head-End (monitor location) and the second at the camera location. Voltage is provided (over 2 pairs) from the monitor location, over 750 feet of 4-pair UTP cable to the camera and passed through the VB31AT devices at each end. Video is sent back to the monitor over a third pair of the UTP cable by means of the two baluns operating as video transceivers.

Hook-up wiring chart for the RJ45 connectors is shown on the following page.

## Hook-Up

Standard 568B Wiring		
PIN	Color Code	Signal
1	WHT/ORG	VIDEO +
2	ORG	VIDEO -
3	WHT/GRN	Power COM
4	BLU	N/A
5	WHT/BLU	N/A
6	GRN	Power LIVE
7	WHT/BRN	Power COM
8	BRN	Power LIVE



## Troubleshooting

### PROBLEM

No video at receiver

Ghost image to the right,  
Horizontal smearing

Video will not sync,  
wide white jagged area

### POSSIBLE CAUSE

Check that camera video and coax connections are correct  
Check the Unshielded Twisted Pair cable for opens or shorts  
Check that power supply is connected and outputting the correct voltage  
Check that all power connections are correct  
Check that the camera is receiving power  
Check that camera power meets manufacturers specifications

Check the cable for possible "T" taps or bridge taps and remove them

Twisted pair wires for video are reversed; correct wires on UTP connection

For Tech Support Call **800-528-4343**

# Specifications

## Transceiver Unit

Size	0.9" H x 1.0" W x 2.0" D (not including coax)
Input	1 Vpp composite video (monochrome or color)
Output	Balanced low voltage current loop

## System (two transceivers required)

Video Format	RS170, PAL, SECAM, NTSC, CCIR (color or B/W)
Video Input	1 Vpp Composite Video (monochrome or color)
Operating Frequency	DC to 10MHz
Common Mode Rejection	>60dB
Wire Size	23 to 24 AWG unshielded twisted pair
DC Loop Resistance	51 ohms per 1,000 feet (max)
Nominal Capacitance	17 pF/foot
Impedance	100 ohms + or - 20%
Category Wire	Category 3 or better
Temperature Range	-40 degrees C to +85 degrees C
Humidity range	0 to 98% non-condensing
Enclosure Material	Black, ABS flame retardant plastic
Twisted Pair Connection	RJ45 Connector
Shipping Weight	1 Lb.



# Product Warranty and Return Information

## Lifetime Limited Warranty Video Balun Transceiver Products

NITEK warrants the original consumer purchaser that the Video Balun Transceiver products that it sells will be free from defects in material and workmanship. If any such product proves defective by our inspection, after sale to the original consumer purchaser, NITEK, at its option, will either repair the defective product without charge for parts and labor or will provide a replacement in exchange for the defective product.

The purchaser shall be responsible for packaging and shipping the defective product to the service location designated by NITEK with shipping charges prepaid. NITEK shall pay for the return of the product to the purchaser if the shipment is to a location within the U.S.A. The purchaser shall be responsible for paying all shipping charges, duties and taxes if the product is returned from a location outside the U.S.A.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance or care, or to any product which shall have been repaired or altered outside our plant in any way, or which has been operated in a manner exceeding its specifications, or which has had the serial number removed. NITEK shall not be obligated to furnish service under this warranty: a) to repair damage resulting from attempts by personnel other than NITEK representatives to repair or service the product; b) to repair damage resulting from improper use or connection to incompatible equipment; or c) to service a product that has been modified or integrated with other products when the effect of such modification or integration increases the time or difficulty of servicing the product.

This warranty is given by NITEK with respect to the Video Balun Transceiver products in lieu of any other warranties, express or implied. NITEK disclaims any implied warranties of merchantability or fitness for a particular purpose. NITEK's responsibility to repair or replace a defective product is the sole exclusive remedy provided to the purchaser for breach of this warranty. NITEK will not be liable for any indirect, incidental or consequential damages irrespective of whether NITEK has advance notice of the possibility of such damages.

## Return Policy

- A. All returns for warranty, repair, credit or any other reason must be pre-authorized. A return merchandise authorization (RMA) form must be requested from the NITEK Customer Service Department. The form, which will be emailed to the customer, must be filled out completely and emailed back to the sender at NITEK for approval. An RMA number will be assigned if the request is approved. In any event, the customer will be notified by NITEK customer service of the outcome. All approved returns must be shipped freight prepaid, insured and properly packaged. A copy of the approved RMA form must be enclosed in the shipping container with the goods being returned and the RMA number must be marked in a visible area on the exterior of the container.
- B. Credit Returns must have been purchased within the last 30 days of the date of the receipt of the equipment at NITEK. Credit returns must be current products listed on the NITEK published price list, in effect at the time of the return and must be in new and saleable condition, with all factory packaging. All Credit returns are subject to a restocking charge of up to 40%. Additional restocking and/or refurbishing charges may be assessed upon inspection. If it is determined by NITEK that the returned equipment does not meet these conditions, a credit will not be issued.