



## INSTRUCTION MANUAL

# BAVM-860 SAW Series

## *Audio/Video Modulator*

Model	Stock No.	Description
BAVM-860 SAW	5990A	Channelized Audio/Video Modulator

Status	Date	Document No.	Issue No.	Author
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We recommend that you write the following information in the spaces provided below.

Purchase Location Name:	
Purchase Location Telephone Number:	
BAVM-860 SAW Serial Number:	

The information contained herein is subject to change without notice. Revisions may be issued to advise of such changes and/or additions.

Correspondence regarding this publication should be addressed directly to:

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Old Bridge, NJ 08857

Document Number: 651224400A

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This product incorporates copyright protection technology that is protected by U.S. patents and other intellectual property rights. Reverse engineering or disassembly is prohibited.

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## Section 1 — General & Safety Instructions



The STOP sign symbol is intended to alert you to the presence of REQUIRED operating and maintenance (servicing) instructions that if not followed, may result in product failure or destruction.



The YIELD sign symbol is intended to alert you to the presence of RECOMMENDED operating and maintenance (servicing) instructions.



The LIGHTNING flash symbol is intended to alert you to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electrical shock.

**TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT REMOVE COVER FROM THIS UNIT.  
NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.**

**WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE**

### NOTE TO CATV SYSTEM INSTALLER

This reminder is provided to call the CATV System Installer's attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

## Safety Instructions

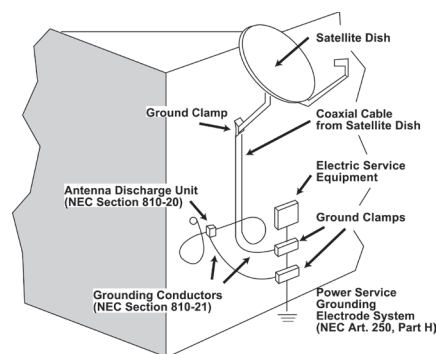


**YOU SHOULD ALWAYS FOLLOW THESE INSTRUCTIONS TO HELP ENSURE  
AGAINST INJURY TO YOURSELF AND DAMAGE TO YOUR EQUIPMENT.**

- Read all safety and operating instructions before you operate the unit.
- Retain all safety and operating instructions for future reference.
- Heed all warnings on the unit and in the safety and operating instructions.
- Follow all installation, operating, and use instructions.
- Unplug the unit from the AC power outlet before cleaning. Use only a damp cloth for cleaning the exterior of the unit.
- Do not use accessories or attachments not recommended by Blonder Tongue, as they may cause hazards, and will void the warranty.
- Do not operate the unit in high-humidity areas, or expose it to water or moisture.
- Do not place the unit on an unstable cart, stand, tripod, bracket, or table. The unit may fall, causing serious personal injury and damage to the unit. Install the unit only in a mounting rack designed for 19" rack-mounted equipment.

## Safety Instructions - continued

- Do not block or cover slots and openings in the unit. These are provided for ventilation and protection from overheating. Never place the unit near or over a radiator or heat register. Do not place the unit in an enclosure such as a cabinet without proper ventilation. Do not mount equipment in the rack space directly above or below the unit.
- Operate the unit using only the type of power source indicated on the marking label. Unplug the unit power cord by gripping the plug, not the cord.
- The unit is equipped with a three-wire ground-type plug. This plug will fit only into a ground-type power outlet. If you are unable to insert the plug into the outlet, contact an electrician to replace the outlet. Do not defeat the safety purpose of the ground-type plug.
- Route power supply cords so that they are not likely to be walked on or pinched by items placed upon or against them. Pay particular attention to cords at plugs, convenience receptacles, and the point where they exit from the unit.
- Be sure that the outdoor components of the antenna system are grounded in accordance with local, federal, and National Electrical Code (NEC) requirements. Pay special attention to NEC Sections 810 and 820. See the example shown in the following diagram:



- We strongly recommend using an outlet that contains surge suppression or ground fault protection. For added protection during a lightning storm, or when the unit is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the lines between the unit and the antenna. This will prevent damage caused by lightning or power line surges.
- Do not locate the antenna near overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing the antenna, take extreme care to avoid touching such power lines or circuits, as contact with them can be fatal.
- Do not overload wall outlets or extension cords, as this can result in a risk of fire or electrical shock.
- Never insert objects of any kind into the unit through openings, as the objects may touch dangerous voltage points or short out parts. This could cause fire or electrical shock.
- Do not attempt to service the unit yourself, as opening or removing covers may expose you to dangerous voltage and will void the warranty. Refer all servicing to authorized service personnel.
- Unplug the unit from the wall outlet and refer servicing to authorized service personnel whenever the following occurs:
  - The power supply cord or plug is damaged;
  - Liquid has been spilled, or objects have fallen into the unit;
  - The unit has been exposed to rain or water;
  - The unit has been dropped or the chassis has been damaged;
  - The unit exhibits a distinct change in performance.
- When replacement parts are required, ensure that the service technician uses replacement parts specified by Blonder Tongue. Unauthorized substitutions may damage the unit or cause electrical shock or fire, and will void the warranty.
- Upon completion of any service or repair to the unit, ask the service technician to perform safety checks to ensure that the unit is in proper operating condition.

### Returning Product for Repair (or Credit)

**A Return Material Authorization (RMA) Number is required on all products returned to Blonder Tongue, regardless if the product is being returned for repair or credit.** Before returning product, please contact the Blonder Tongue Service Department at 1-800-523-6049, Ext. 4256 or visit our website: [www.blondertongue.com](http://www.blondertongue.com) for further information.

## Section 2 — Product Summary

### 2.1 Product Application & Description

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#### Application:

The BAVM-860 SAW is an all solid state audio/video modulator that provides a modulated visual and aural RF carrier output on any single CATV channel 2 to 79. The modulator can be used to put sound and color video on any of the above listed channels in a CATV, MATV or SMATV system.

The modulator accepts standard (sync negative) polarity video at a 0.7-2.5 V P-P level from sources such as a TV camera, video tape recorder, TV demodulator or satellite receiver.

The BAVM-860 SAW features a +55 dBmV RF output level, and IF SAW filtering for adjacent channel operation. All aeronautical channels are offset positive with a tolerance of  $\pm 5$  kHz as required by FCC 21006. For ease of operation, all level controls are located on the front panel.

A block diagram of the BAVM-860 SAW is shown below. The audio/video modulator accepts a baseband video and audio input and outputs an RF CATV channel. The RF level control provides up to +55 dBmV output. The video modulator control sets the depth of modulation of 87.5% over an input video level range from 0.7VP/P to 2.5VP/P. An audio modulation control permits adjustment for  $\pm 25$  kHz peak deviation of the aural carrier.

The BAVM-860 SAW also provides a field-defeatable pre-emphasis network and an aural level control to ensure the proper aural/visual ratio. A six foot cord and a convenience AC outlet on each amplifier permits easy connections between racked units.

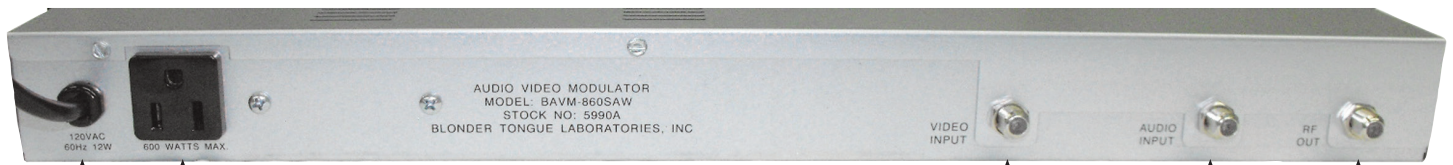
**Description:**

The BAVM-860 SAW is designed with an integral mounting bracket and is supplied with the necessary screws for installing the unit in a standard 19" EIA rack.

Below are the front and rear pictures of the unit:



- [1] **VIDEO LEVEL:** Adjusts depth of modulation.
- [2] **AURAL LEVEL:** Controls amplitude of aural RF carrier to change aural/visual ratio.
- [3] **AUDIO LEVEL:** Adjusts for 25 kHz peak deviation.
- [4] **OUTPUT LEVEL:** Simultaneously adjusts amplitude of aural and visual carriers.
- [5] **"POWER-ON" INDICATOR LIGHT**
- [6] **OUTPUT TEST -30dB:** -30 dB Output test point.

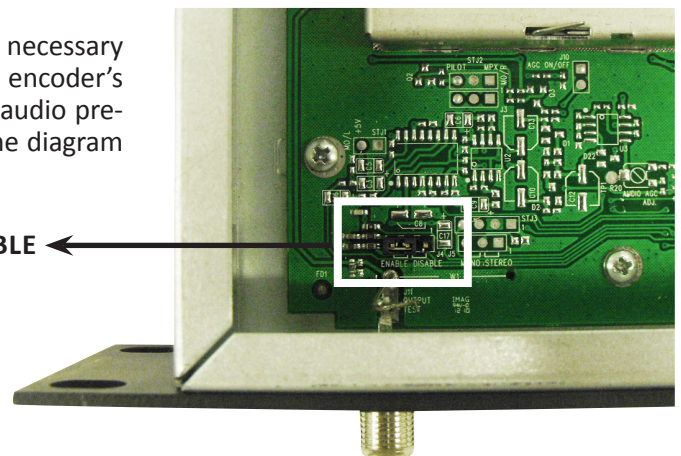


- [7] **LINE CORD**
- [8] **OUTLET**
- [9] **VIDEO INPUT**
- [10] **AUDIO INPUT**
- [11] **RF OUTPUT**

**Stereo Option:**

When using the BAVM-860 SAW with a stereo encoder it may be necessary to disable the audio pre-emphasis circuit. Refer to your stereo encoder's instruction manual for required modulator settings. Should the audio pre-emphasis need to be disabled, move the jumper according to the diagram at the right.

**AUDIO PRE-EMPHASIS ENABLE DISABLE** ←



**NOTE:** Blonder Tongue's SE Series of stereo encoders do not require the audio pre-emphasis to be disabled. When it comes to using the SE Series with a BAVM-860 SAW, keep the jumper as it comes from the factory in the enable position.

## 2.2 Product Specification

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### **RF** **Typical**

Frequency Range: ..... CATV channels 2 to 79  
Output Level: ..... 55 dBmV  
Output Level Range: ..... 15 dB, continuously adjustable  
by front panel Output Level Control  
Audio/Video Carrier Ratio Control:..... -9 dB to -20 dB,  
Frequency Tolerance:..... ±10 kHz - standard channels  
±5 kHz FCC 21006 Offsets  
Audio Carrier Frequency Setting:..... ±1 kHz, Max  
4.5 MHz above video carrier  
RF to Video Response  
from Fv -0.5 MHz to Fv +4.2 MHz:..... 1 dB P/V  
Broadband Noise ..... -90 dB  
Spurious Output in 50 – 860 MHz Range  
@ +55 dBmV Output: ..... -60 dB  
Output Match (Return Loss): ..... 12 dB  
Vestigial Sideband Reponse:  
@Channel Edge ..... -20 dB  
@Adjacent Channel..... -40 dB

### **Video**

Input for 87.5% Modulation: ..... 0.7 V to 2.5 V P-P  
Video Input Return Loss: ..... 18 dB  
Video Carrier-To-Noise Ratio in 4 MHz Bandwidth: .. 60 dB  
P-P Video to 60 Hz RMS Hum Ratio: ..... 60 dB  
Differential Gain at 87.5% Modulation: ..... ≤ 5%  
Differential Phase at 87.5% Modulation: ..... ≤ 5°  
Group Delay..... 170 ± 50 nS

### **Audio**

Input Impedance: ..... 10K Ohms, Unbalanced  
Input for 25 KHz Peak Deviation: ..... 140 mV RMS  
Audio Frequency Response:..... ±1.0 dB  
(50 Hz to 15 kHz ref to std 75 msec pre-emphasis)  
4.5 MHz Intercarrier Stability:..... ±5.0 kHz

### **General**

Power Requirements: ..... 105-130 VAC, 60 Hz, 10 W  
Temperature Range: ..... 0 to 50 degrees C

### **Mechanical**

Dimensions: ..... 19 x 1.75 x 3.5, W x H x D, inches  
Mounting: ..... 19" single rack space  
Line Cord: ..... 3 wire grounded, 3 wire convenience outlet  
Finish: ..... Plated  
Shipping Weight:..... 4 lbs. (approx)

### **Connectors**

Audio In: ..... "F" Type  
Video In: ..... "F" Type  
RF Out: ..... "F" Type  
RF Output Test - 30 dB:..... "F" Type



## Section 3 – Installation & Operation

### 3.1 Note to CATV System Installer

This reminder is provided to call the CATV System Installer's attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

### 3.2 Unpacking and Handling

Each modulator is shipped with all equipment assembled, wired, factory tested, and then packaged in an appropriate shipping container.

Ensure that all accessories are removed from the container and packing material before they are discarded.

### 3.3 Mechanical Inspection

Inspect the front and rear of the equipment for shipping damage. Make sure the equipment is clean, and no wires, cables, or connectors are broken, damaged or loose.

### 3.4 Damage in Shipment

Should any damage be discovered after unpacking the unit, immediately file a claim with the carrier. A full report of the damage shall be made and a copy forwarded to Blonder Tongue Laboratories Inc. The company will then advise what disposition is to be made of the equipment.

### 3.5 Precautions

Adherence to the initial installation precautions outlined in the Table below will help prevent problems arising during the installation and future maintenance of the unit.

#### ***Returning Product for Repair (or Credit)***

**A Return Material Authorization (RMA) Number is required on all products returned to Blonder Tongue**, regardless if the product is being returned for repair or credit. Before returning product, please contact the Blonder Tongue Service Department at 1-800-523-6049, Ext. 4256 or visit our website: [www.blondertongue.com](http://www.blondertongue.com) for further information.

**Table 1 - Installation Precautions Table**

<b>PRECAUTIONS</b>	<b>REQUIREMENTS</b>
Avoid Heat Buildup	Allow (1) EIA rack space (1.75") between powered headend products in the equipment racks.
Ensure easy access to rack wiring.	Allow a minimum of 18 inches behind the equipment rack(s).
Facilitate servicing and maintenance.	Allow a minimum of 36" of clearance in front of the equipment rack(s).
Avoid direct heating or air conditioning.	If unavoidable, use deflector plates.
AC power source outlets.	Locate equipment near sufficient outlets to provide power for test equipment and power tools.
Rack Support.	Make certain rack supports are sufficiently rigid to support racks.
Building leakage.	Beware of dripping water onto equipment from leaky roofs, waveguide roof entries, and cold water pipe condensations.

## Section 4 – Preparation for Use & Typical Application

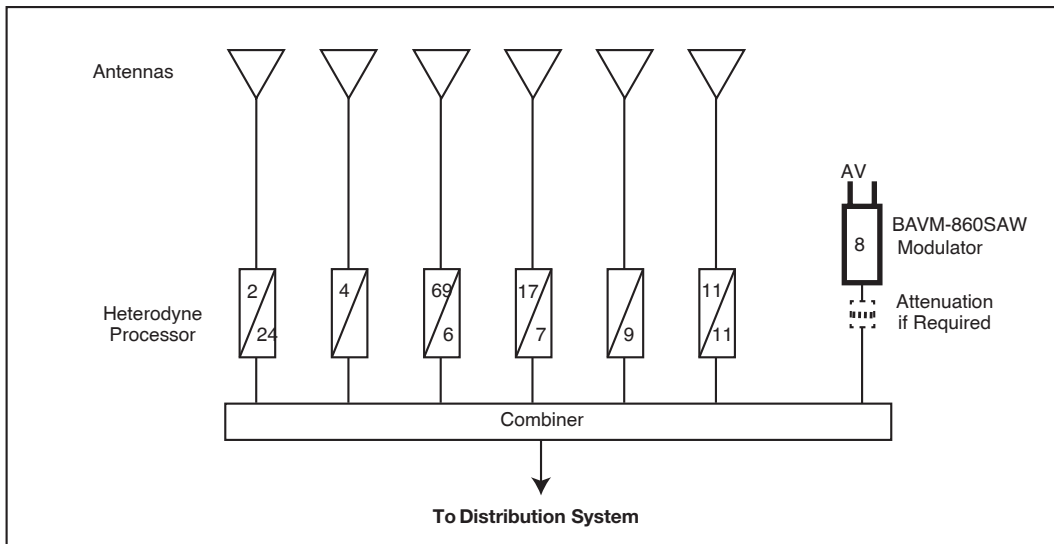
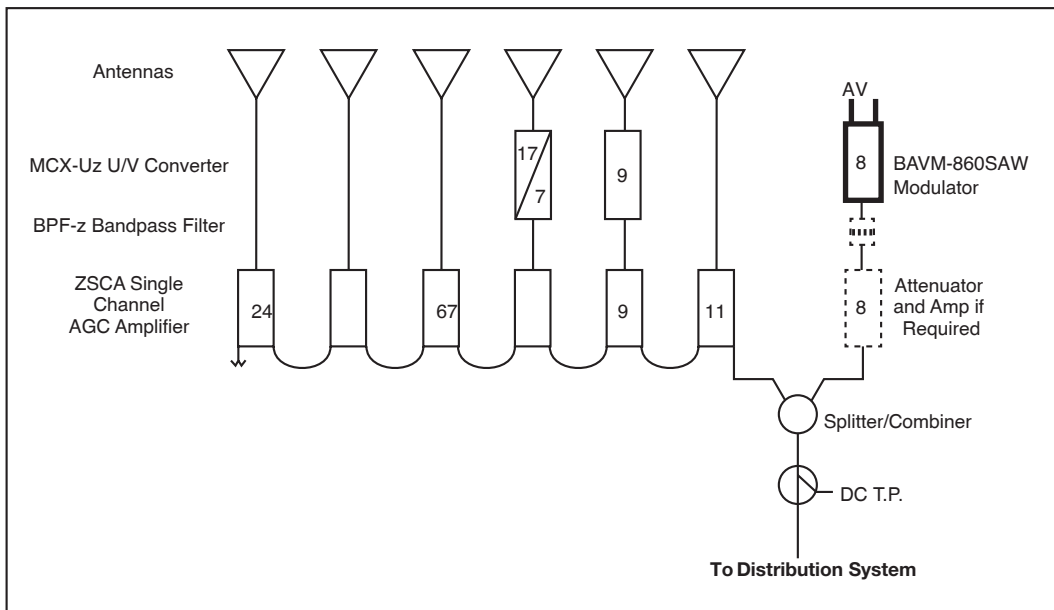
After installing the unit, make the following adjustments:

### 4.1 Audio Modulation

With audio source connected, adjust Audio Modulation control for 25 kHz deviation. In lieu of an audio modulation meter, use a TV set and adjust for equal volume as compared to a known off-air broadcast. Monitor for a few minutes to assure the maximum volume does not over modulate, which can cause picture distortion.

### 4.2 Video Modulation

With a nominal 1 volt P-P video source connected, adjust the Video Modulation control for 85% depth of modulation. If a spectrum analyzer is not available, a TV set can be used to check for proper picture contrast.



### Typical Application

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# Limited Warranty

Seller will at its sole option, either repair or replace (with a new or factory reconditioned product, as Seller may determine) any product manufactured or sold (or in the case of software, licensed) by Seller which is defective in materials or workmanship or fails to meet the applicable specifications that are in effect on the date of shipment or such other specifications as may have been expressly agreed upon in writing: (i) for a period of three (3) years from the date of original purchase for all stock hardware products (other than those specifically referenced herein below having a shorter warranty period); (ii) for a period of one (1) year from the date of original purchase, with respect to all MegaPort™, IPTV products, test equipment and fiber optics receivers, transmitters, couplers and integrated receiver/distribution amplifiers; (iii) for a period of one (1) year from the date of original purchase (or such shorter period of time as may be set forth in the license agreement specific to the particular software being licensed from Seller) with respect to all software products licensed from Seller (other than Core Product Software) that is (a) developed for a specific function or application, (b) complimentary to and does not function without the Core Product Software, and (c) listed with a specific model number and stock number in Seller's Price List ("**Non-Core Software**"); (iv) for a period of ninety (90) days from the date of original purchase, with respect to non-serialized products and accessories, such as parts, sub-assemblies, splitters and all other products sold by Seller (other than Core Product Software and Refurbished/Closeout Products) not otherwise referred to in clauses (i) through (iii) above. The warranty period for computer programs in machine-readable form included in a hardware product, which are essential for the functionality thereof as specifically stated in the published product specifications ("**Core Product Software**") will be coincident with the warranty period of the applicable hardware product within which such Core Product Software is installed.

Software patches, bug fixes, updates or workarounds do not extend the original warranty period of any Core Product Software or Non-Core Software.

Notwithstanding anything herein to the contrary,

(i) Seller's sole obligation for software that when properly installed and used does not substantially conform to the published specifications in effect when the software is first shipped by Seller, is to use commercially reasonable efforts to correct any reproducible material non-conformity (as determined by Seller in its sole discretion) by providing the customer with: (a) telephone or e-mail access to report non-conformance so that Seller can verify reproducibility, (b) a software patch or bug fix, if available or a workaround to bypass the issue if available, and (c) where applicable, replacement or damaged or defective external media, such as CD-ROM disk, on which the software was originally delivered;

(ii) Seller does not warrant that the use of any software will be uninterrupted, error-free, free of security vulnerabilities or that the software will meet the customer's particular requirements; and the customer's sole and exclusive remedy for breach of this warranty is, at Seller's option, to receive (a) suitably modified software, or part thereof, or (b) comparable replacement software or part thereof;

(iii) Seller retains all right, title and interest in and to and ownership of all software (including all Core Product Software and Non-Core Software) including any and all enhancements, modifications and updates to the same; and

(iv) in some cases, the warranty on certain proprietary sub-assembly modules manufactured by third-party vendors and contained in Seller's products, third party software installed in certain of Seller's products, and on certain private-label products manufactured by third-parties for resale by Seller, will be of shorter duration or otherwise more limited than the standard Seller limited warranty. In such cases, Seller's warranty with respect to such third-party proprietary sub-assembly modules, third-party software and private-label products will be limited to the duration and other terms of such third-party vendor's warranty, if any. In addition, certain products, that are not manufactured by Seller, but are resold by Seller, may carry the original OEM warranty for such products, if any. The limited warranty set forth above does not apply to any product sold by Seller, which at the time of sale constituted a Refurbished/Closeout Product, the limited warranty for which is provided in the following paragraph.

Seller will at its sole option, either repair or replace (with a new or factory-reconditioned product, as Seller may determine) any product sold by Seller which at the time of sale constituted a refurbished or closeout item ("**Refurbished/Closeout Product**"), which is defective in materials or workmanship or fails to meet the applicable specifications that are in effect on the date of shipment of that product or fails to meet such other specifications as may have been expressly agreed upon in writing between the parties, for a period of ninety (90) days from the date of original purchase. Notwithstanding the foregoing, in some cases the warranty on certain proprietary sub-assembly modules manufactured by third-party vendors and contained in Seller products, third party software installed in certain of Seller's products, and on certain private-label products manufactured by third-parties for resale by Seller will be of shorter duration or otherwise more limited than Seller limited warranty for Refurbished/Closeout Products. In such cases, Seller's warranty for Refurbished/Closeout Products constituting such third party proprietary sub-assembly modules, third party software, and private-label products will be limited to the duration and other terms of such third-party vendor's warranty, if any. In addition, notwithstanding the foregoing, (i) certain Refurbished/Closeout Products that are not manufactured (but are resold) by Seller, may carry the original OEM warranty for such products, if any, which may be longer or shorter than Seller's limited warranty for Refurbished/Closeout Products. All sales of Refurbished/Closeout Products are final.

To obtain service under this warranty, the defective product, together with a copy of the sales receipt, serial number if applicable, or other satisfactory proof of purchase and a brief description of the defect, must be shipped freight prepaid to Seller at the following address: One Jake Brown Road, Old Bridge, New Jersey 08857.

This warranty does not cover failure of performance or damage resulting from (i) use or installation other than in strict accordance with manufacturer's written instructions, (ii) disassembly or repair by someone other than the manufacturer or a manufacturer-authorized repair center, (iii) misuse, misapplication or abuse, (iv) alteration, (v) exposure to unusual physical or electrical stress, abuse or accident or forces or exposure beyond normal use within specified operational or environmental parameters set forth in applicable product specifications, (vi) lack of reasonable care or (vii) wind, ice, snow, rain, lightning, or any other weather conditions or acts of God.

**OTHER THAN THE WARRANTIES SET FORTH ABOVE, SELLER MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND, EXPRESS OR IMPLIED, AS TO THE CONDITION, DESCRIPTION, FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, OR AS TO ANY OTHER MATTER, AND SUCH WARRANTIES SET FORTH ABOVE SUPERSEDE ANY ORAL OR WRITTEN WARRANTIES OR REPRESENTATIONS MADE OR IMPLIED BY SELLER OR BY ANY OF SELLER'S EMPLOYEES OR REPRESENTATIVES, OR IN ANY OF SELLER'S BROCHURES MANUALS, CATALOGS, LITERATURE OR OTHER MATERIALS. IN ALL CASES, BUYER'S SOLE AND EXCLUSIVE REMEDY AND SELLER'S SOLE OBLIGATION FOR ANY BREACH OF THE WARRANTIES CONTAINED HEREIN SHALL BE LIMITED TO THE REPAIR OR REPLACEMENT OF THE DEFECTIVE PRODUCT F.O.B. SHIPPING POINT, AS SELLER IN ITS SOLE DISCRETION SHALL DETERMINE. SELLER SHALL IN NO EVENT AND UNDER NO CIRCUMSTANCES BE LIABLE OR RESPONSIBLE FOR ANY CONSEQUENTIAL, INDIRECT, INCIDENTAL, PUNITIVE, DIRECT OR SPECIAL DAMAGES BASED UPON BREACH OF WARRANTY, BREACH OF CONTRACT, NEGLIGENCE, STRICT TORT LIABILITY OR OTHERWISE OR ANY OTHER LEGAL THEORY, ARISING DIRECTLY OR INDIRECTLY FROM THE SALE, USE, INSTALLATION OR FAILURE OF ANY PRODUCT ACQUIRED BY BUYER FROM SELLER.**

All claims for shortages, defects, and non-conforming goods must be made by the customer in writing within five (5) days of receipt of merchandise, which writing shall state with particularity all material facts concerning the claim then known to the customer. Upon any such claim, the customer shall hold the goods complained of intact and duly protected, for a period of up to sixty (60) days. Upon the request of Seller, the customer shall ship such allegedly non-conforming or defective goods, freight prepaid to Seller for examination by Seller's inspection department and verification of the defect. Seller, at its option, will either repair, replace or issue a credit for products determined to be defective. Seller's liability and responsibility for defective products is specifically limited to the defective item or to credit towards the original billing. All such replacements by Seller shall be made free of charge f.o.b. the delivery point called for in the original order. Products for which replacement has been made under the provisions of this clause shall become the property of Seller. Under no circumstances are products to be returned to Seller without Seller's prior written authorization. Seller reserves the right to scrap any unauthorized returns on a no-credit basis. Any actions for breach of a contract of sale between Seller and a customer must be commenced by the customer within thirteen (13) months after the cause of action has accrued. A copy of Seller's standard terms and conditions of sale, including the limited warranty, is available from Seller upon request. Copies of the limited warranties covering third-party proprietary sub-assembly modules and private-label products manufactured by third-parties may also be available from Seller on request. (Rev 0713)



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