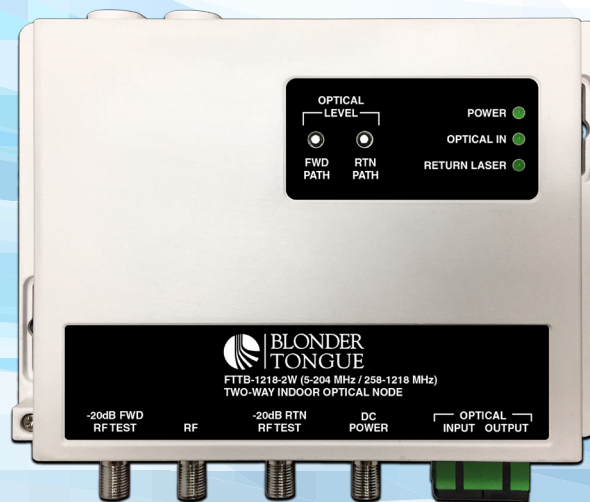


# Fiber Optic 1218 MHz Two-Way Indoor Optical Node



Stock #	Model Name	Description
7630 42	FTTB-1218-2W-42	1218 MHz; 42/54 MHz Split
7630 85	FTTB-1218-2W-85	1218 MHz; 85/105 MHz Split
7630 204	FTTB-1218-2W-204	1218 MHz; 204/258 MHz Split

We recommend that you write the following information in the spaces provided below.

Purchase Location Name:	
Purchase Location Telephone Number:	
FTTB-1218-2W 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:

Blonder Tongue Laboratories, Inc.  
One Jake Brown Road  
Old Bridge, NJ 08857 USA

Document Number: 651248400A

Printed in the United States of America.

All product names, trade names, or corporate names mentioned in this document are acknowledged to be the proprietary property of the registered owners.

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

### Cross-Reference & Hyperlinking Usage

This guide makes use of hyperlinks for the Table of Contents, some cross-reference linking between sections, and external hyperlinking to web addresses. This has been done to assist the reader in finding the information they are seeking in a much quicker way. In addition to hyperlinking, the Table of Contents also makes use of the bookmarking feature present in the Adobe Reader application.

### Product and Documentation Updates

Download the latest User Manual (PDF) by visiting our website. Navigate to the product page by entering the full Model Name or Stock Number in the search field. Upon reaching the product page, the "User Manual" download link will be located beneath the product image. **Firmware Updates** are available under "Tech Support" in the "Resources" section of the website. General instructions for the FTP site, as well as updating your firmware, are provided on this page.

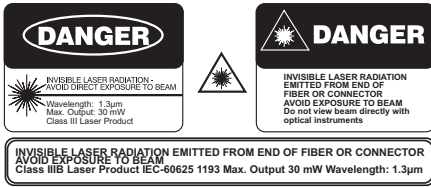
### Returning Product for Repair (or Credit)

**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.

### Troubleshooting

For technical support please contact us at 1-800-523-6049 between the hours of 8am and 5pm EST.

## Section 1 — General & Safety Instructions



**WARNING: The optical emissions from the units are laser-based and present eye hazards. Follow all safety precautions.**



	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.

You should always follow these Instructions to help ensure Against injury to yourself and damage to your equipment.

### 1.1 Safety Precautions

The optical emissions from the units are laser-based Class IIIb, and may present eye hazards if improperly used. **NEVER USE ANY KIND OF OPTICAL INSTRUMENT TO VIEW THE OPTICAL OUTPUT OF THE UNIT.**

As always, be careful when working with optical fibers. Fibers can cause painful injury if they penetrate the skin.

### 1.2 Laser Safety Procedures

**ALWAYS** read the product data sheet and the laser safety label before powering the product. Note the operating wavelength, optical output power, and safety classifications.

If safety goggles or other eye protection are used, be certain that the protection is effective at the wavelength(s) emitted by the device under test **BEFORE** applying power.

**ALWAYS** connect a fiber to the input of the device **BEFORE** power is applied. Power should never be applied without an attached fiber input. If the device has a fiber output, a connector should be attached that is connected to a fiber. This ensures that all light is confined within the fiber waveguide, virtually eliminating all potential hazard.

**NEVER** look in the end of a fiber to see if light is coming out. **NEVER!** Most fiber optic laser wavelengths (1310 nm and 1550 nm) are totally invisible to the unaided eye and will cause permanent damage. Shorter wavelength lasers (e.g. 780 nm) are visible and are very damaging. Always use instruments, such as an optical power meter, to verify light output.

**NEVER, NEVER, NEVER** look into the end of a fiber on a power device with **ANY** sort of magnifying device. This includes microscopes, eye loupes, and magnifying glasses. This **WILL** cause permanent, irreversible burn on your retina.

**ALWAYS** double check that power is disconnected before using such devices. If possible, completely disconnect the unit from any power source.

If you have questions about laser safety procedures, please call Blonder Tongue before powering your product.

## Section 2 — Product Summary

### 2.1 Product Application & Description

#### Application:

The **FTTB-1218-2W Series (Two-Way Indoor Optical Node)** converts the optical signal received from the headend into a +36 dBmV RF output. The compact housing includes an optical receiver, RF AGC, RF amplifier, and return path optical transmitter. Three (3) frequency splits are available to satisfy standard 5-42 MHz, 5-85 MHz, or 5-204 MHz returns for increased return bandwidths required in DOCSIS 3.1 applications.

The **FTTB-1218-2W Series** has one tri-color LED indicating the optical input status, one bi-color LED indicating return transmitter status as well as calibrated DC test points for receive and transmit optical power.

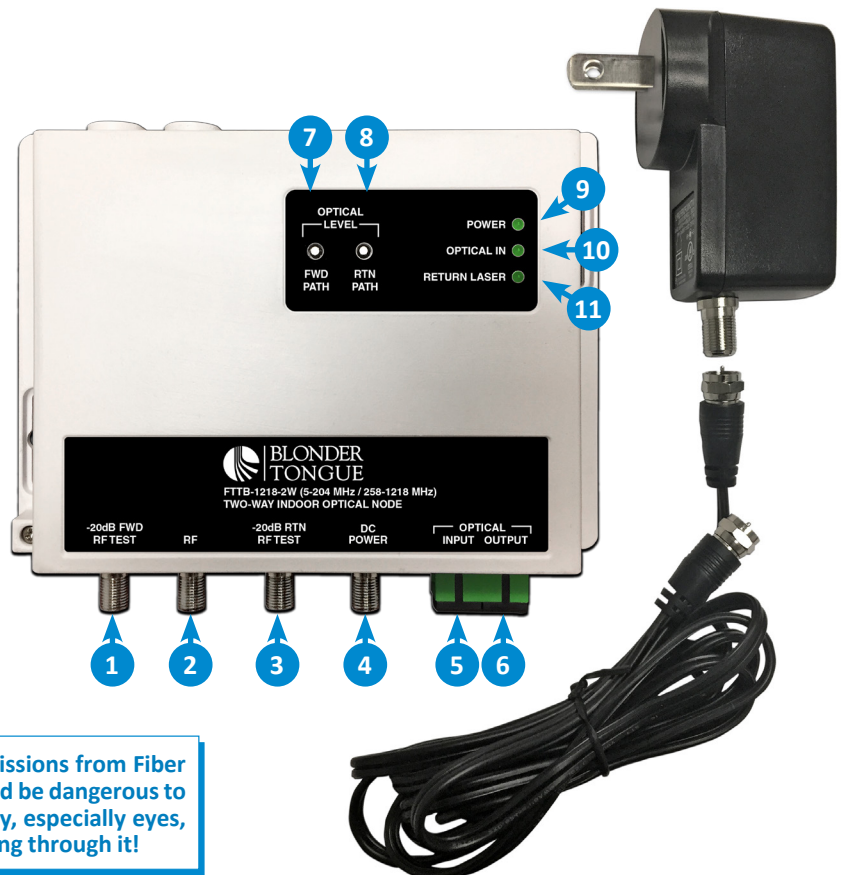
#### Features:

- 1218 MHz forward RF bandwidth for DOCSIS 3.1 compatibility
- Three (3) frequency splits available for all DOCSIS 3.1 applications
- +36 dBmV AGC'd RF output with optical input range from -4 to +3 dBm
- High performance and low power consumption GaAs technology
- 1310 nm 3.0 dBm DFB return path transmitter
- Die-cast aluminum housing for indoor installation
- Tri-color LED indicating optical input status
- Bi-color LED indicating return laser transmitter output status
- Forward and Return -20 dB RF test ports (one each)
- Local/Remote 18 VDC powering from F connector

#### Description:

#### CONNECTORS AND INDICATORS:

- 1 -20 dB Forward RF Test Port
- 2 RF Output (Forward)/RF Input (Return)
- 3 -20 dB Return RF Test Port
- 4 +18 VDC Power Input
- 5 Optical Input Connector (Forward)
- 6 Optical Output Connector (Return)
- 7 Forward 1 V / mW Optical Input Test Point
- 8 Return 1 V / mW Optical Output Test Point
- 9 18 VDC Input Power LED Indicator
- 10 Optical Input LED Indicator
- 11 Return Laser LED Indicator



**CAUTION: There are invisible laser emissions from Fiber output when the laser is active! It would be dangerous to point this port toward the human body, especially eyes, when equipment has power running through it!**

## 2.2 Specifications

### Optical and RF Performance

<b>Optical</b>	
Optical Wavelength:	1210 ~ 1650 nm
Optical Input Connector:	SC/APC; Single Mode
Optical Return Loss:	50 dB
Optical Input Power:	-6 ~ +3 dBm
AGC Effective Optical Input Range:	-4 ~ +3 dBm
Optical Power Test Point:	1 V/mW
<b>RF</b>	
RF Bandwidth:	54 ~ 1218 MHz (42/54 MHz Diplexer)
	105 ~ 1218 MHz (85/105 MHz Diplexer)
	258 ~ 1218 MHz (204/258 MHz Diplexer)
AGC RF Output Level:	+36 dBmV
AGC RF Output Stability Range:	±1.5 dB
RF Slope (54 ~ 1218 MHz):	6 dB
RF Slope (105 ~ 1218 MHz):	6 dB
RF Slope (258 ~ 1218 MHz):	6 dB
RF Flatness:	± 0.75 dB (Relative to Slope)
RF Return Loss:	>16 dB
RF Output Impedance:	75 Ω
RF Test Port:	-20 dB
CNR:	≥ 51 dB at -1.0 dBm
CSO:	<-62 dBc at 77 CW Carriers
CTB:	<-65 dBc at 77 CW Carriers

### Alarms and Monitoring

<b>Optical Input Tri-Color LED</b>	
Green:	Normal: > -4 dBm to < +3 dBm
Orange:	Low: < -4 dBm
Red:	High: > +3 dBm
<b>Return Path Laser Bi-Color LED</b> (Laser Output Power)	
Green:	> +3 dBm
Red:	< +3 dBm

### Optical and RF Performance

<b>Optical</b>	
Optical Wavelength:	1310 nm DFB Laser (Uncooled)
Optical Input Connector:	SC/APC
Optical Output Power:	3 dBm ±1 dB
Optical Return Loss:	50 dB
<b>RF</b>	
RF Bandwidth:	5 ~ 42 MHz / 85 MHz / 204 MHz
RF Input Level:	17 dBmV
RF Flatness:	± 1 dB
RF Return Loss:	>16 dB
RF Test Port:	-20 dB
NPR:	>25 dB

#### Test Conditions

FORWARD PATH: 77 CW carriers (50~550 MHz) and digital channels (550 MHz~1218 MHz, RF level 10 dB lower) at -1 dBm optical input (10 km fiber + optical attenuator).

RETURN PATH: Return path specs are measured in transmitter and receiver composed link.

#### General

<b>Connectors</b>	
Fiber Port:	2x SC/APC Female (Optical Input/Output)
RF Port:	1x F-Female
RF Test Port:	1x -20 dB Forward; 1x -20 dB Return
18 VDC Port:	1x F-Female for DC power input
Chassis Dimensions: (L x W x H)	6.85" x 4.9" x 1.22" (174 mm x 124 mm x 31 mm)
Weight:	1.10 lbs (0.50 kg)
Power Supply:	18V 1.3A DC Adaptor, UL Certified
Power Consumption:	≤ 7 W
Working Temperature:	-4 to 140 °F (-20 to +60 °C)
Storage Temperature:	-40 to 185 °F (-40 to +85 °C)
Relative Humidity:	5%~95% Non-condensing

## Section 3 – Installation & Power-up

### 3.1 Unpacking & Preparation

You will find the following items in the box:

- FTTB-1218-2W Series Optical Node [QTY=1]
- 18 VDC Power Supply [QTY=1]
- Power Cable, 6.5 ft. (2 meters) [QTY=1]



**CAUTION:** If any of the equipment appears to have been damaged, do NOT connect it to a power source. This will only cause additional damage to the unit. Contact Technical Support for further instructions.

The following tools and supplies are recommended for installation:

- An optical power meter
- A digital multimeter
- A cable TV RF meter or spectrum analyzer
- A standard fiber test jumper
- Denatured or 99% pure isopropyl alcohol and lint-free fiber optic cleaning wipes.

### 3.2 Installation

The **FTTB-1218-2W** has an operating temperature range of -20°C to +60°C. It should be mounted in an adequately ventilated area. For a longer life span, it should not be operated at the upper limit of the temperature range. Installation in wet areas or areas of extremely high humidity should be avoided. The FTTB-1218-2W should not be installed in areas that are accessible to children. The FTTB-1218-2W may be installed and operated in any position on a flat surface. The unit has two mounting holes to accommodate either wood screws (#4 or #6 pan-head) or 6-32 pan-head machine screws for tapped mounting holes. These are commonly available at hardware stores.

#### Optical Connectors

The optical input connector is an SC/APC type termination. Should a FC/APC connector be required for your installation, please see Blonder Tongue model FC/APC Adapter (Stock # 7607).

#### Powering

Powering is done via the supplied 18 VDC power supply and a 6.5 ft (2 meters) long wire assembly with F connectors at both ends. In cases where the AC power outlet is not within reach, a longer RG6 cable can be used (up to 50 feet).

## Section 4 – Operational Setup

The FTTB-1218-2W Series will operate at optical input levels as high as +3 dBm however there is little improvement in the C/N performance with optical input levels above 0 dBm. For optimum distortion performance it is recommended that the optical input be kept at or below 0 dBm.

The unit's RF output is fixed over the effective optical input range. If lower output levels are required, use an in-line pad to attenuate the RF output of the unit to maintain optimum C/N performance.

**Optical vs RF Levels**

Optical Input Power (dBm)	Received Power DC Test Point (V)
-4	0.40
-2	0.63
-1	0.79
0	1.00
+1	1.26
+2	1.58
+3	2.00

DC voltage Test point vs Optical input power  
(calibrated at 1310 nm optical input)

## Section 5 – Test Points, Test Ports, and Indicators

The **FTTB-1218-2W** has test points and test ports. **Two in the forward path and two in the return path.**

- The received Forward “Optical Power” test point is calibrated at 1 V per mW and should be measured with a high impedance voltmeter. This test point is for long term monitoring purposes as well as initial setup. The optical power should be measured with a power meter at the time of installation.
- The “Forward” RF Test Port is -20 dB lower than the output level at the RF port of the receiver. If the RF output is +36 dBmV, then the RF test port will be approximately +16 dBmV.

**A tri-color LED is provided for easy status viewing of the optical input. The LED indicates the following:**

- **Green:** > -4 dBm to < +3 dBm (Normal)
- **Orange:** < -4 dBm (Low)
- **Red:** > +3 dBm (High)

The return “Optical Power” test point is calibrated at 1 V per mW and should be measured with a high impedance voltmeter. This test point is for long term monitoring purposes as well as initial setup. The optical power should be measured with a power meter at the time of installation. The nominal laser power is +3 dBm, so the DC voltage would be 2.0 V using the Optical Power/DC Test Point table above.

## Section 5 – Test Points, Test Ports, and Indicators (continued)

The “Return” RF test port is -20 dB lower than the input level at the RF port of the receiver. The optimum return signal level at the RF port is 17 dBmV. Therefore the desired level when measured on the -20 dB test port is -3 dBmV.

A bi-color LED is provided for easy status viewing of the optical input. The LED indicates the following:

- **Green:** > +3 dBm (Normal)
- **Red:** < +3 dBm (High)

## Section 6 – Cleaning and Maintenance

### 6.1 Cleaning the Unit(s)

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If the unit needs to be cleaned, avoid the use of all solvents and use low-pressure clean air to remove loose dirt and to clear the connectors of any debris. Dirty or scratched connector end faces will greatly reduce the unit’s performance. Foam-tipped swabs may be saturated with denatured alcohol\* and inserted into the optical port for cleaning. **DO NOT INSERT A DRY SWAB INTO THE OPTICAL PORT AS THIS MAY DAMAGE THE FIBER END FACE.** Many fiber optic installations experience degraded performance due to dirty optical connector end faces. The following procedure should be used to properly clean the optical connector end faces.

### 6.2 Cleaning the Connector(s)

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#### Required Cleaning Equipment:

- Kimwipes® or any lens-grade, lint-free tissue. The type sold for eyeglasses work quite well.
- Denatured Alcohol

**NOTE:** Use ONLY “**industrial grade**” 99% pure isopropyl alcohol. Because commercially available isopropyl alcohol is for medicinal use, it is diluted with water and a light mineral oil which may leave behind a residue that attracts dust. “**Industrial grade**” isopropyl alcohol should be used exclusively.

- 30X Magnifier
- Canned Dry Air

#### Directions for Cleaning:

- 1) Fold the tissue twice so it is four layers thick.
- 2) Saturate the tissue with alcohol.
- 3) First clean the sides of the connector ferrule. Place the connector ferrule in the tissue, and apply pressure to the sides of the ferrule. Rotate the ferrule several times to remove all contamination from the ferrule sides.
- 4) Now move to a clean part of the tissue. Be sure it is still saturated with alcohol, and it is still four layers thick. Put the tissue against the end of the connector ferrule. Put your fingernail against the tissue so that it is directly over the ferrule. Now gently scrape the end of the connector until it squeaks. It will sound like a crystal glass that has been rubbed when it is wet.
- 5) Use the magnifier to verify the quality of the cleaning. If it isn’t completely clean repeat the steps with a clean tissue.
- 6) Mate the connector immediately! Don’t let the connector lie around and collect dust before mating.
- 7) Air can be used to remove lint or loose dust from the port of a transmitter or receiver to be mated with the connector. Never insert any liquid into the ports.

### 6.3 Connector Handling

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- 1) **NEVER TOUCH THE FIBER END FACE OF THE CONNECTOR.**
- 2) Connectors not in use should be covered over the ferrule by a plastic dust cap. It is important to note that the inside of the ferrule dust caps contains a sticky gelatinous residue that is the by-product of the making of the dust cap. This residue will remain on the ferrule end after the cap is removed. Therefore it is critical that the ferrule end be cleaned thoroughly **BEFORE** it is mated to the intended unit.

# 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.

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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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