Blonder Tongue

SOLUTIONS FOR ALL YOUR APPLICATIONS

Stock No. 7403C/7404C /7410B USER MANUAL

FIBT/MIBT Series

Fiber Optic 1310nm CATV Transmitters

FIBT (stand alone)

Model	Stock No.	Description
FIBT-S3A-106C	7403C 6	+ 6 dBm, 1000 MHz, FC/APC Connector
FIBT-S3A-108C	7403C 8	+ 8 dBm, 1000 MHz, FC/APC Connector
FIBT-S3A-110C	7404C 10	+10 dBm, 1000 MHz, FC/APC Connector
FIBT-S3A-112C	7404C 12	+12 dBm, 1000 MHz, FC/APC Connector
FIBT-S3A-114C	7404C 14	+14 dBm, 1000 MHz, FC/APC Connector

MIBT (modular)

Model	Stock No.	Description
MIBT-S3A-106B	7410B 6	+ 6 dBm, 1000 MHz, FC/APC Connector
MIBT-S3A-108B	7410B 8	+ 8 dBm, 1000 MHz, FC/APC Connector
MIBT-S3A-110B	7410B 10	+10 dBm, 1000 MHz, FC/APC Connector
MIBT-S3A-112B	7410B 12	+12 dBm, 1000 MHz, FC/APC Connector
MIBT-S3A-114B	7410B 14	+14 dBm, 1000 MHz, FC/APC Connector

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MADE IN THE USA

800-523-6049

www.blondertongue.com

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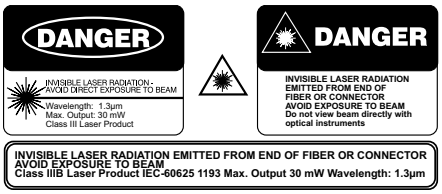


Warning: The optical emissions from the units are laser-based and present eye hazards. Follow all safety precautions

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.

1.0 PERFORMANCE CHARACTERISTICS

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 output of the device BEFORE power is applied. Power should never be applied without an attached fiber output. If the device has a connector 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.

Laser safety classes for the AM/VSB Link:

Class	Wavelength Range	Optical Power Accession Limits
IIIb	180 nm to 400 nm 400 nm to 10^6 nm	Varies with λ and exposure time. 0.5 Watt

1.3 Storing the Unit

If a unit is to be out of use for an extended period of time, the following steps should be taken to ensure the preservation of the unit:

1. The storage temperature range is -20°C to +70°C.
2. A low humidity environment is preferable for long term storage.
3. All connectors should be covered with active device receptacle caps.

1.4 SPECIFICATIONS

Optical / RF

Operating Wavelength:	1310 nm
Required Fiber Bandwidth:	1,000 Min. MHz
Input Return Loss:	=/>16 dB @ 75 Ω
Back Reflection:	-50 min. dB
Optical Output Power:	+6, +8, +10, +12, +14 dBm
Bandwidth:	45 to 1,000 MHz
RF Input Level: (110 Analog Ch. load)	+ 18 dBmV/Ch
CNR: (-1 dBm Input, 77 Ch. Load + QAM 550-1,000 MHz @ -6dB Ref. Analog)	≥ 52 dB
Composite Triple Beat (CTB):	≥ 63 dB
Composite Second Order (CSO):	≥ -60 dB
Side Mode Suppression Ratio (SMSR):	30 dB

Power

Power Supply Voltage:	110/220 VAC
Power Supply Frequency:	50/60 Hz
Power Dissipation:	25 W
MIBT:	Requires MIPS-12C Power Supply

Connectors

RF Input:	"F" Female
Optical Output:	FC/APC *(Also available with SC/APC. User suffix "S" after stock number ie: 7403CS 6)*

General

Dimensions (W x H x D)	
FIBT:	19" x 1.75" x 8.25" (483mm x 45mm x 210mm)
MIBT:	2.19" x 3.5" x 8.25" (56mm x 89mm x 210mm)
Weight	
FIBT:	6 lbs. (2.72 kg)
MIBT:	1.21 lbs. (0.54 kg)
Operating Temperature Range:	0 to +45 °C

Indicators

Power:	LED, Green
Cooler Status:	LED, Bi-colored Green/Red
RF Input Level:	LED, Tri-colored Green/Yellow/Red
Laser Status:	LED, Bi-colored Green/Red

1.5 Specification Notes

1. The FIBT transmitter power entry module on the rear panel can accept voltage levels from 90 to 260 VAC at 50 to 60 Hz.
2. All optical power levels are average values. Transmitter output is Class IIIb laser. See transmitter part numbers in Section 2.1 for available optical power options.
3. Be sure to compute your fiber bandwidth (end-to-end) as well as attenuation.
4. Note that the link CNR is usually specified for a received optical power of -1 dBm or more. Thus, an optical transmitter, with an output of +12 dBm, will provide optimal performance with up to 13 dB of optical loss at full channel loading. If lower channel loading is used, then the link can operate at higher optical losses and still provide exceptional CNR.
5. The recommended RF input level is shown in Figure 3.1. Exceeding the RF input level may damage the transmitter. Actual units do vary several dB's from these curves. The carrier levels should be closely matched to ensure consistent performance on all channels. In all cases, set the composite RF input level so that the RF Level Indicator LED is green. Note that the RF indicator LED only operates for rated channel loading and a flat input spectrum.
6. The transmitter incorporates an optical isolator in the laser package that reduces the effect of optical backreflections on the laser performance. However, all analog lasers are affected by optical backreflections. The FIBT/MIBT can only achieve published performance levels if the fiber between the transmitter and receiver has a maximum optical backreflection of -50 dB. Optical backreflection levels above -50 dB will increase the noise floor of the laser (i.e. decrease the carrier-to-noise ratio), worsen both CSO and CTB performance, increase passband ripple, and dramatically increase cross modulation. The result will be a noisy, grainy picture with diagonal bars.

   Blonder Tongue recommends that all fiber connections be FC/APC, SC/APC or fusion spliced.type or fusion spliced. There is some folklore which suggests that the only critical backreflection is the one closest to the transmitter. Our experience does not support that view. We find that all backreflections matter, regardless of their distance from the transmitter.
7. Most parameters are relatively unaffected by varying temperature. A moving air environment is recommended at ambient temperatures above +35°C.
8. Humidity is RH non-condensing.

1.6 Shipping and Handling Precautions

The units are, in general, very rugged and can withstand the stresses of most shipping and handling circumstances. However, the following precautions should be taken:

1. When the units are shipped they should be wrapped in a protective material, such as bubble wrap to protect against excessive jarring and to prevent damage to the external finish of the units. Always use packing material to separate multiple units that are packaged together.
2. Care should be taken not to drop or strike the units in any way, especially around the optical connectors.
3. The units should never be submersed in any liquid. **SEVERE SHOCK HAZARD!**

2.0 INSTALLATION INSTRUCTIONS

The installation of these units is very simple. There are no special unpacking instructions, except that care should be taken to handle units gently. The unit requires no assembly and no adjustments.

2.1 Part Numbers and Configurations

Transmitter Part Numbers				
Part Number	Tx Optical Output	Recommended Max. Link Loss	CATV Channel Loading	Optical Connector Type*
7403C-6 / 7410B-6	+6 dBm	7 dB	110	FC/APC
7403C-8 / 74108-8	+8 dBm	9 dB	110	FC/APC
7404C-10 / 7410B-10	+10 dBm	11 dB	110	FC/APC
7404C-12 / 7410B-12	+12 dBm	13 dB	110	FC/APC
7404C-14 / 7410B-14	+14 dBm	15 dB	110	FC/APC

* NOTE: SC/APC connectors are available as an option. Order as Blonder Tongue **Stock No. 7403CS-XX, 7404CS-XX, 7410BS-XX**.

2.2 Inspection

Remove the unit from its shipping container. Any in-shipment damage that may have occurred should be visually apparent. Look for bent or damaged connectors or mounting brackets. Claims for damage incurred in shipment should be made directly to the transportation company in accordance with their instructions. Save the shipping cartons until installation and performance verification are completed.

2.3 Transmitter Installation

The FIBT and MIBT (with MIRC 12V) transmitters are designed to mounted in any standard EIA 19" rack. Verify that the power source to the rack is turned OFF before installing the unit in the rack.

2.4 Front Panel Unit Drawings and Diagram Notes

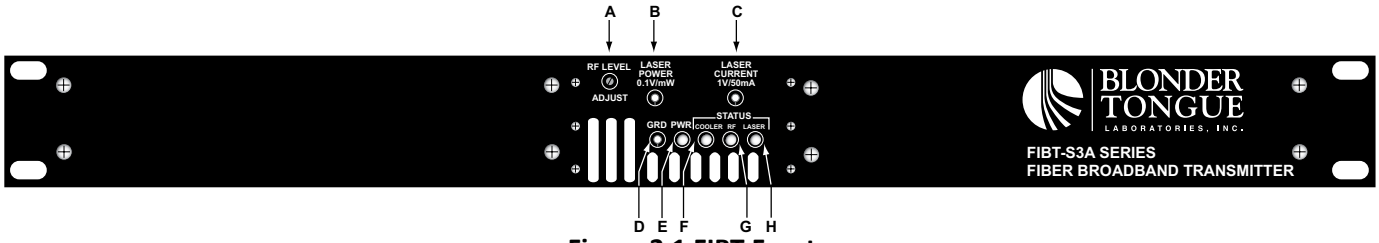


Figure 2.1 FIBT Front

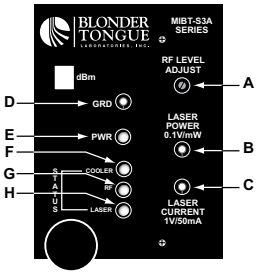


Figure 2.1 MIBT Front

2.4.1 Front Panel Diagram Notes

A. RF Level Adjust - Provides 4 dB of variable attenuation of the RF input level. Allows precise input level adjustment to the nominal level requirements noted in Fig. 3.1 to provide a green indication on the tri-color RF LED.

B. Laser Power Monitor - This jack allows accurate measurements of the optical output power with a standard voltmeter. The voltage is scaled at 0.1VDC per mW of optical output.

Therefore, mW = VDC x 10.
Output level in dBm = 10 x LOG(mW).

Example: A 1.0 VDC reading is therefore a 10 mW or 10 dBm of optical output power. Refer to the table below.

Laser Power Monitor		
0.1 V/mW		
VDC	dBm	mW
0.25	4	2.51
0.32	5	3.16
0.40	6	3.98
0.50	7	5.01
0.63	8	6.31
0.79	9	7.94
1.00	10	10.00
1.26	11	12.59
1.59	12	15.85
2.00	13	19.95
2.51	14	25.12
3.16	15	31.62
3.98	16	39.81

C. Laser Current Monitor - Provides a scaled DC output of 1V per 50 mA of laser current. Nominal current draw varies between lasers. Refer to the transmitter's birth certificate or record the voltage reading upon the initial installation. Lasers draw more current as they age. A sudden change in current or a 20% increase from the initial recorded level indicates a laser problem. If this happens, the transmitter should be returned to Blonder Tongue for servicing.

D. Ground Connection - For laser power and laser current monitors.

E. Power Indicator LED (Green LED) - The LED is on when the unit is receiving AC power and off when there is no power to the unit.

F. Cooler Status LED (Bi-colored Green/Red LED) - When green, this LED indicates that the laser cooler (TEC) is functioning normally, and the laser temperature is stable.

IMPORTANT!

It is normal for this LED to be red or change from red to green in the first ten seconds after power has been applied to the transmitter. If the LED turns red at any time other than in the first ten seconds of operation, the unit should be turned off IMMEDIATELY to avoid laser damage.

G. RF Input Level LED (Tri-colored Green/Yellow/Red) - This LED indicates the RF signal input level into the transmitter. The RF input indicator is green when the RF signal input is within ±1 dB of the optimum input level. When the signal input falls below the optimum ±1 dB range, the LED becomes yellow. When the signal input rises above the optimum range, the LED turns red.

H. Laser Status LED (Bi-colored Green/Red LED) - When green, this LED indicates that the laser is initialized and operating normally.

IMPORTANT!

It is normal for this LED to be red or change from red to green in the first ten seconds after power has been applied to the transmitter. During this ten second initialization period, the laser is held in shut-down mode while the rest of the circuitry initializes. It is then switched to normal operation, and the LED turns green. If the LED turns red at any other time, this may indicate a laser failure.

2.5 Rear Panel Drawing and Diagram Notes

Rear Panels

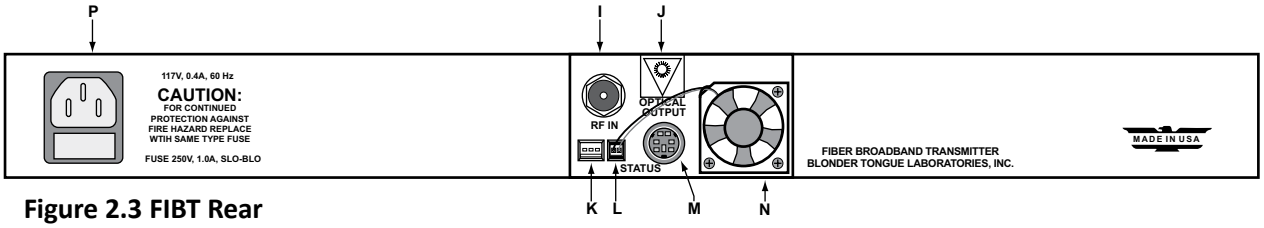


Figure 2.3 FIBT Rear

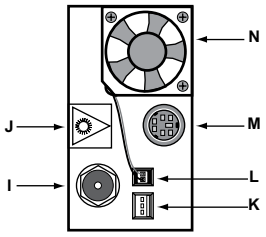


Figure 2.4 MIBT Rear

2.5.1 Rear Panel Diagram Notes

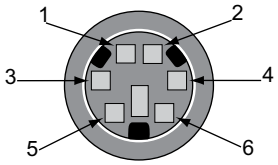
I. RF Input (F Connector) - RF signal input into the transmitter.

J. Optical Output (FC/APC Connector or Optional SC/APC) - Optical output from the transmitter. A dust cover should be placed over the connector when not in use.

K. DC Power Connector (MIBT Only) - MIBT requires MIRC 12V rack chassis with the MIPS 12C power supply.

L. Fan Power Outlet - Provides power to cooling fan.

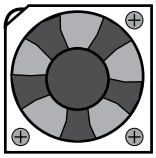
M. Status/Alarm Jack -



Pin 1 = Cooler Alarm
Pin 2 = Optical Alarm
Pin 3 = RF Alarm
Pin 4 = DC Power Alarm
Pin 5 = 5V
Pin 6 = Ground

Under normal operating conditions, the alarm pinouts are at 5 VDC. When a fault occurs, the voltage drops to zero.

N. Cooling Fan.



P. AC Power Via a Detachable Three-wire Grounded Power Cord.

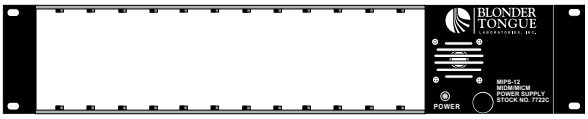
CAUTION

Connect only to a three-wire grounded outlet. Do not defeat the purpose of this ground. The fuse type is 1.0A Slow Blow.

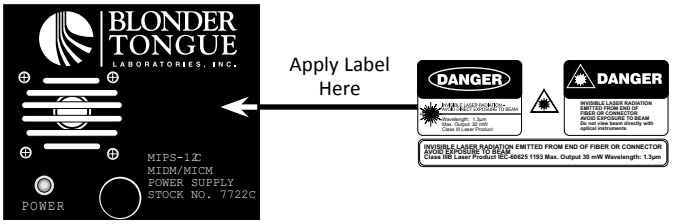
2.6 MIBT "Danger Invisible Laser Radiation" Label Instructions

IMPORTANT!

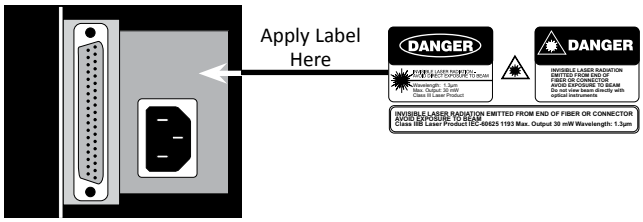
Two additional danger labels are supplied with each MIBT transmitter. The self-sticking labels must be applied to the front and rear of the MIPS-12C power supply which powers the MIBT. See the figures below for the sticker application locations.



Front View - MIPS-12C Power Supply in MIRC-12V Chassis



Front View
MIPS-12C Power Supply



Rear View
MIPS-12C Power Supply

3.0 OPERATION INSTRUCTIONS

3.1 Principles of Operation

The FIBT/MIBT Series of Fiber Optic broadband CATV transmitters provides a robust system for transferring both analog and digital CATV channels over single-mode optical fiber. The transmitters have an expanded RF bandwidth to 1000 MHz. Typical applications are transferring analog channels from 50 to 550 MHz plus CATV QAM channels between 550 and 1000 MHz.

The FIBT transmitters are EIA 19" wide rack mountable with a height of 1.75". The MIBT transmitters utilize the MIRC-12V rack chassis and MIPS-12C power supply for mounting. Each MIBT-S3A occupies 2 slots within the MIRC chassis, therefore up to six (6) MIBT-S3A transmitters can be installed in 2 RU's. Both the FIBT and the MIBT's use efficient switching power supplies that accept utility power from 90 to 260 VAC and 50 to 60 Hz.

3.2 Application Data

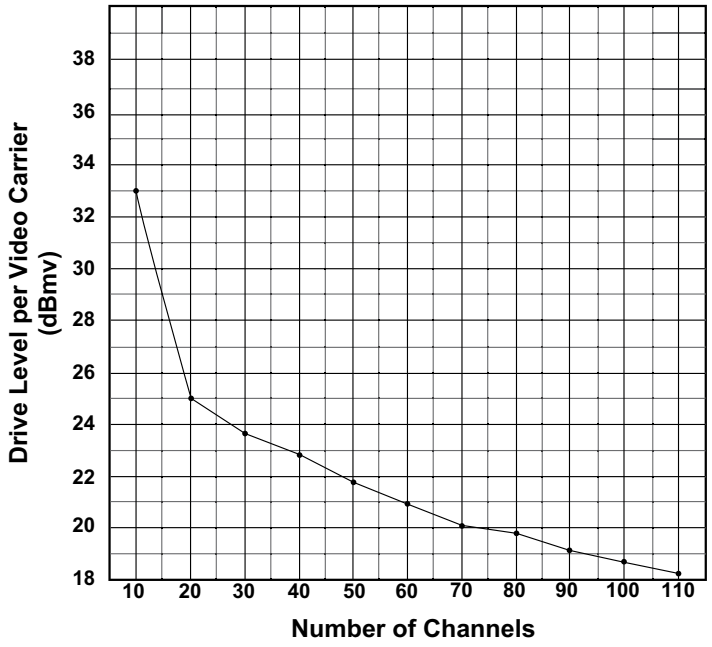


Figure 3.1 – Transmitter Level per Channel vs. Number of Channels

3.3 Operating Instructions

1) Install the links as described in Section 2.0 of this document. Measure the RF level BEFORE making any connections to the transmitter. Clean the optical connectors. See Section 4.2.1 for cleaning instructions.
2) Connect the optical fiber to the transmitter and the receiver. Be sure that the fiber has continuity and less than the maximum allowable optical loss. Also be certain that the fiber is the proper size. This product can only be used with single-mode fiber. The input power to the Rx must be less than +3 dBm. The units will not work back-to-back. The optical input level to the Rx can be ascertained by checking the color of the LOS indicator LED on the Rx.

   Red LED = Too much optical power

   Green LED = Correct optical power level

   Yellow LED = Not enough optical power
3) Connect the RF source (VCR, camcorder, cable television, etc.) to the RF analog input on the transmitter. Input level should be approximately 18 dBmV. Refer to Section 3.2.
4) Connect the RF analog output on the receiver to the monitor input. The monitor input should present a 75 Ohm impedance. When using an integrated receiver/amplifier such as the Blonder Tongue FRDA Series, do not overload the TV monitor. Use appropriate attenuators or couplers as required.
5) Connect the AC power cord to the back of the transmitter. When power is first applied, the “Power” and “RF Input Level” LED’s should light green. The “Cooler Status” and “Laser” LED’s will light red or change from red to green within the first ten seconds of initialization and then change to green to indicate normal operation. If the “RF Input Level” LED is red, this means the RF level is too high. Decrease the input level until the LED is green. If the “RF Input Level” LED is yellow, this means the RF level is too low. Increase the input level until the LED is green.

WARNING!

OPTICAL LASER RADIATION IS PRESENT AT THE OPTICAL CONNECTOR WHEN THE UNIT IS ACTIVATED. AVOID DIRECT EYE EXPOSURE TO THE BEAM.

6) Connect power supply to the receiver. Refer to the receiver’s instruction manual for proper operation. The receiver’s “LOS” LED should be green.

WARNING!

WARNING: OPTICAL LASER RADIATION IS PRESENT AT THE OPTICAL FIBER THAT ATTACHES TO THE RECEIVER’S OPTICAL CONNECTOR WHEN THE UNITS ARE ACTIVATED. AVOID DIRECT EYE EXPOSURE TO THE BEAM.

7) The units are now fully operational. No other user adjustment or attention is required. See Section 4.0 for instructions on maintaining and cleaning the link. See Section 5.0 for information on troubleshooting.

4.0 MAINTENANCE INSTRUCTIONS

4.1 Performance Verification & Maintenance

No user maintenance is required. The fiber optic video link contains no user-serviceable parts and requires no routine service. Contact the factory if the unit requires warranty repair work. See Section 5.0 for Troubleshooting.

4.2 Cleaning

If the units need to be cleaned, avoid the use of all solvents and use low-pressure clean air to remove loose dirt. Use low-pressure clean air to clear the connectors of any debris. Dirty or scratched connector end faces will greatly reduce the unit's performance. Foam-tipped swabs such as the 2.5mm Mini Foam Swab offered by Fiber Instrument Sales (P/N F1-0005) 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.

4.2.1 Connector Cleaning

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. Commercially available isopropyl alcohol is for medicinal use and is diluted with water and a light mineral oil. Industrial grade isopropyl alcohol should be used exclusively.
- 30X Microscope.
- 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 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 microscope 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.

4.2.2 Connector Handling

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.

5.0 TROUBLESHOOTING

5.1 Troubleshooting

A number of indicator LED's are available to assist in trouble-shooting the link. These allow the user to quickly assess the nature of any major unit malfunctions. If problems persist contact Blonder Tongue's System Engineering Department.

Problem	Check	Comments
No optical power out of Tx.	If no AC power is reaching the unit, the "Power" LED on the transmitter will be off. Check Tx power connection.	Verify that the AC power cord is firmly attached to the back of the transmitter. Verify that the primary power source has not been inadvertently turned off.
	If the unit is receiving AC power ("Power" LED is green), check the "Laser" LED. If this is red, check the "Cooler Status" LED. If the "Cooler Status" LED is green, the problem may be in the laser. If the "Cooler Status" LED has also turned red, the TEC cooler has failed and the laser is in danger of overheating. Remove power from the unit immediately.	If the Tx "Laser" LED is red but the "Cooler Status" LED is green, try turning the transmitter off and back on. The "Laser" and "Cooler Status" LED's should light red within the first ten seconds of unit initialization and then turn green. If either of these LED's remains red, contact Blonder Tongue's Systems Engineering Department for additional instructions.
No optical power at the Rx.	Check power at the Tx.	If there is power at the Tx, verify proper fiber is connected to the Rx. If the proper fiber is connected, ensure the integrity of the fiber.
Signal out of Rx is noisy; optical input level status indicator LED is either yellow or red.	Check optical power at the Rx.	If the optical input level status LED is yellow, the receiver incoming signal has fallen below -3 dBm. If the optical input level status LED is red, the signal is above +3 dBm. The optical input range must be between -3 dBm and +3 dBm.

5.0 TROUBLESHOOTING - continued

Problem	Check	Comments
No signal out of Rx:optical input level status indicator LED is either yellow, red or unlit	Verify the input signal at the Tx	The Tx "RF Input Level" LED should be green. If the LED is either red or yellow, the signal input has fallen outside of the +/- 1.0 dB range. If the Tx "RF Input Level" LED is green, the receiver may be in need of repairs. Contact the factory for additional instructions.
	Check the Rx optical input level status indicator LED: if it is dark, no AC power is reaching the receiver. Check the Rx power connection and polarity	
Signal level out of Rx too high	Verify that the Rx output is terminated into 75 Ohms.	Add 75 Ohm terminating resistor. Verify that the Tx input is within the range specified. The Tx "RF Input Level" LED should be green.
	Verify Rx optical input level vs internal attenuator requirements.	Refer to Rx Instruction Manual for attenuator installation.
Signal out of Rx is distorted	Verify input signal at Tx	The Tx "RF Input Level" LED should be green. A high signal will cause distortion. If the RF level is too high, the LED will be red. Adjust the input level until the LED turns green.
	Verify fiber size	Single mode fiber must be used with this product.

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** for further information.

Extended Warranty Program

STANDARD TERMS & CONDITIONS OF THE EXTENDED WARRANTY

A. THE EXTENDED WARRANTY AGREEMENT (EWA)

If during the period following the expiration of the Blonder Tongue Manufacturers' Standard Warranty (Copy Included) the products which constitute the subject matter of the extended warranty, manifest any manufacturing or similar such defects then Blonder Tongue shall at its option repair or replace the product. It is emphasized that the extended warranty is in effect an extension of the Blonder Tongue Warranty and covers the items stipulated in Paragraph B to the exclusion of the terms in Paragraph C of this agreement. Eligibility to purchase EW is limited to 90 days following initial shipment on selected products of sufficient value.

The product/products included in this extended warranty agreement are listed in the invoice that accompanies the EWA. Term of the extension will be _____ year(s). Purchase Order is required for extended warranty coverage.

B. WHAT IS COVERED?

1. If a product has been determined to have failed, which falls within the Terms & Conditions of this EWA, Blonder Tongue Inc. may at its sole discretion repair, modify or replace its component parts that are defective at 100% coverage for parts and labor.
2. A loaner unit may be available on request; PO required.
3. Product is manufactured by Blonder Tongue.
4. Extended warranty period is up to and not to exceed 24 months and sold in increments of 12 months. Order # 9981 for 1 year and #9982 for 2 year extensions.
5. Return of repair or replaced product shipping costs for ground shipments.
6. Firmware upgrades at no charge with automatic notification.

C. WHAT IS NOT COVERED?

1. The warranty does not cover any defects caused by foreign objects /connection errors .
2. Use other than by the customer at the declared address appearing in this document.
3. Failure by the end user to comply with the manufacturers' instructions for installation, maintenance or use.
4. The use of accessories which have not been approved by Blonder Tongue.
5. The application and/or use of any incorrect or abnormal electrical supply to the product.
6. Any defect in wiring or electrical connections which does not form part of the product at the time of the original purchase.
7. Neglect, misuse, or willful abuse of the product.
8. Any repairs or attempted repairs of the product by any person other than Blonder Tongue Service Department.
9. Any modification of the product by any person other than Blonder Tongue Service Department.
10. Fire, flood, war, civil disturbance, industrial action, acts of God or any other causes beyond the reasonable control of Blonder Tongue.
11. Any defect caused by lightning strike or power surges.
12. Shipping costs to return products to Blonder Tongue for warranty service.
13. Blonder Tongue will not in any circumstances be liable for any consequential loss or damages suffered by the customer whether directly or indirectly related defect in the product to the extent permissible by law.
14. Repairs may not be effected without prior authorization from Blonder Tongue Laboratories.

D. GENERAL

1. The customer shall notify Blonder Tongue Laboratories in writing within ten days of any change of his or her address.
2. Customer must provide original ***purchase receipt*** and ***serial number*** to initiate extended warranty coverage.
3. The fee paid for the warranty is not refundable under any circumstances unless cancelled within seven days of purchase.
4. The customer shall take all reasonable precautions to maintain the product is maintained in good working order.
5. The warranty contract ceases to exist if the product is replaced or a credit is given to the customer. Any monies paid for the warranty contract are forfeited and not refundable. This is only applicable when the product is out of the manufacturer's warranty.
6. The extended warranty period as stated on the Extended Warranty Agreement shall be the governing period notwithstanding any additional supplier warranty on specific components.
7. The warranty shall in no way effect the terms and conditions of the sale agreement in terms of which the customer bought the product.
8. The extended warranty is limited to the terms and conditions herein contained
9. No agreement, varying, adding to, amended, deleting, or cancelling this warranty shall be effective unless given in writing (email is acceptable) and signed by or on behalf of both parties.
10. The cost of the extended warranty is 8% of the purchase price for a 1 or 2 year extension beyond the Blonder Tongue standard warranty. e.g. A product price of $1000 will be $80 for the 1st year (12 mos) and additional $80 for 2 year (24 mos) extension for a total of $160.
11. Warranty product return postage paid to:

Blonder Tongue Laboratories, Inc.
Attn: Warranty Service Dept.
1 Jake Brown Road
Old Bridge, NJ 08857

Contact Blonder Tongue at 800-523-6049 ext. 555 to order extended warranty service.

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)**

Blonder Tongue

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