

LB-1000-RR

Headend Platform Quad Return Receiver



User Manual

LINDSAY
BROADBAND

Jan 31 2020

TABLE OF CONTENTS

TABLE OF CONTENTS	ii
1.0 PRODUCT OVERVIEW AND FEATURES	1
1.1 Description	1
1.2 Features	1
1.3 Specifications	2
1.4 Block diagram of the LB-1000-RR	3
2.0 SAFETY NOTES	4
3.0 APPLICATION MODULE DESCRIPTION	5
4.0 INSTALLATION.....	6
5.0 LB-1000-RR SETTINGS	8
5.1 LB-1000-RR settings: Using touch screen.....	8
5.2 LB-1000-RR settings: Using Web interface.....	10
6.0 WARRANTY AND RMA POLICY	12

1.0 PRODUCT OVERVIEW AND FEATURES

1.1 Description

Lindsay Broadband LB-1000-RR series is a family of CATV Return Path Receiver Module, converting upstream optical signal into RF signal at the headend or remote hubs. LB-1000-RR return receiver incorporates a low noise PIN detector and RF amplifier chain. Internal selectable RF attenuators can be switched in or out to enable each receiver to handle a very wide range of optical input signals. Module parameters can be monitored and configured through the LB-1000-CM system management module using the touch screen or by using the PC (Web GUI or SNMP agent).

1.2 Features

- Four independent return path receivers in a single module
- Hot-swappable capability
- Bandwidth 5~205 MHz
- -18 to +1dBm: Standard RRx Input Range; -27 to -13dBm: RFoG RRx Input Range
- Optical AGC and MGC mode for Standard RRx, Only MGC mode for RFoG RRx
- High Output level (30dBmV) with low noise
- RF output disabled automatically when no optical signal detected, and each independent channel can also be disabled manually using LB-1000-CM
- Manual attenuation control for each RF port
- RF output test point
- Can monitor and configure functioning parameters using LB-1000-CM

1.3 Specifications

Parameter	Specification
Optical Parameters	
Wavelength	1290-1620 nm
Optical Input Power	-18 to +1 dBm ⁽¹⁾
	-27 to -13 dBm ⁽²⁾
Optical AGC	-18 to +1 dBm ⁽³⁾
Optical Return Loss	> 45 dB
Number of Receivers	4
Optical Connector	SC/APC
RF Parameters	
RF Input Bandwidth	5 -205 MHz
Flatness	± 0.75 dB
RF Return Loss	≥ 16 dB
RF Output Level	≥ 30 dBmV ⁽⁴⁾
RF Output Control	Yes ⁽⁵⁾
RF Test Point	-20 ± 1 dB ⁽⁶⁾
Impedance	75 Ω
Connector	F-female
NPR	≥ 40 dB
Power & Physical	
Power Consumption	≤ 15 W ⁽⁷⁾
Dimensions (H x W x D)	17.4"H x 0.86"W x 4.7"D (44.2H x 2.2W x 11.9D cm)
Weight	1.7 lb (0.8 kg)

NOTES:

- (1)** Standard version
- (2)** RFoG version
- (3)** Standard version (only); no AGC in RFoG version
- (4)** -18 dBm Rx in; 35% OMI
- (5)** Using electronic attenuation
- (6)** Relative to the RF port
- (7)** Powering from the LB-1000-CH chassis

1.4 Block diagram of the LB-1000-RR

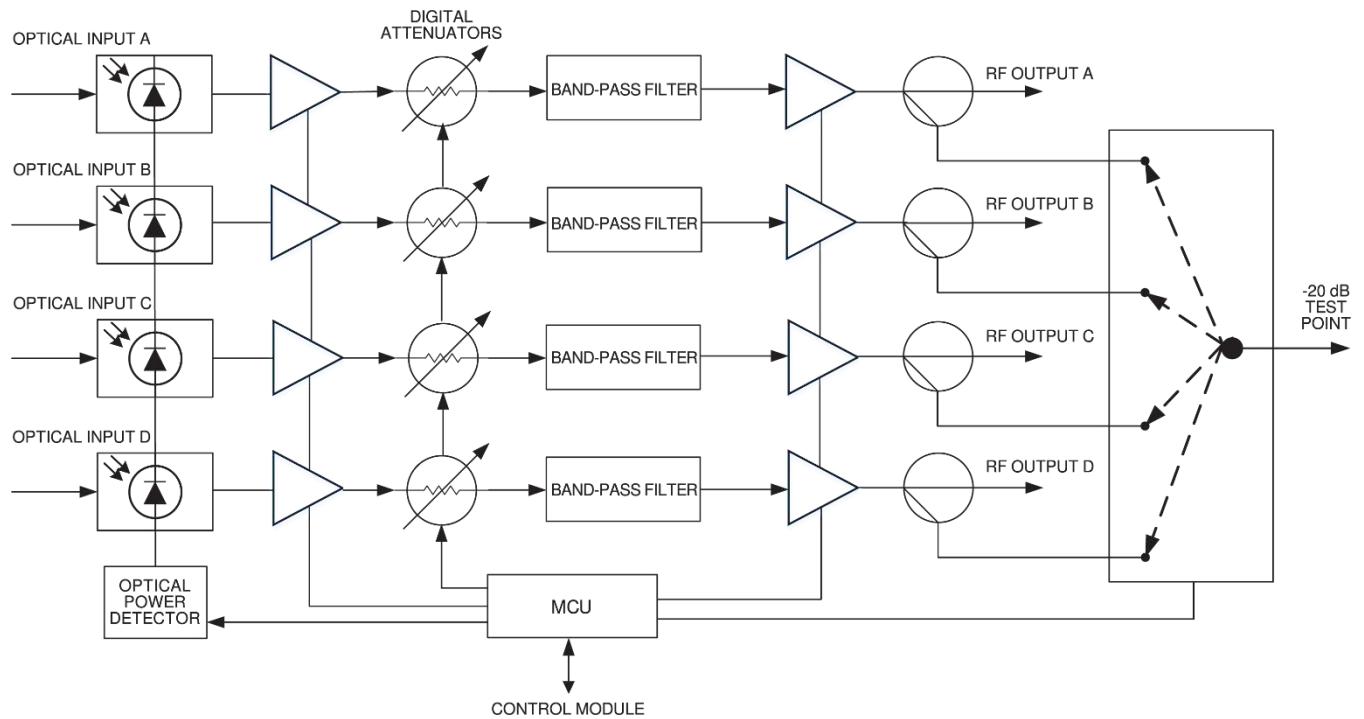


Figure 1: Block diagram of the LB-1000-RR Quad Return Receiver

2.0 SAFETY NOTES

NO SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



DANGER

**INVISIBLE LASER RADIATION! AVOID EYE INJURY!
NEVER LOOK INTO THE OPTICAL CONNECTOR!**



Failure to comply with these safety precautions and with the general or specific safety precautions described elsewhere in the LB-1000 series manual violates the safety standards of the design, manufacture, and intended use of the device. Lindsay Broadband Inc. assumes no liability for the customer's failure to comply with these precautions.

- Invisible optical radiation is emitted from fiber optic connectors which connects to this LB-1000-RR, exposure can cause permanent injury to eyes.
- Avoid direct exposure to the laser light source.
- Never stare directly into a fiber or at any mirror-like surface that could reflect light emitted from an un-terminated fiber.
- Never view an active fiber through optical instruments.

CAUTION: To avoid damaging the touchscreen LCD, please do not tap it with anything sharp or apply excessive pressure to it with your fingertips. It is recommended to use fingers when using the touch screen LCD.

CAUTION: Do not operate the chassis outside of its maximum ratings. Doing so may result in unsatisfactory performance, unit failure, shortened unit life span, or a safety hazard.

3.0 APPLICATION MODULE DESCRIPTION

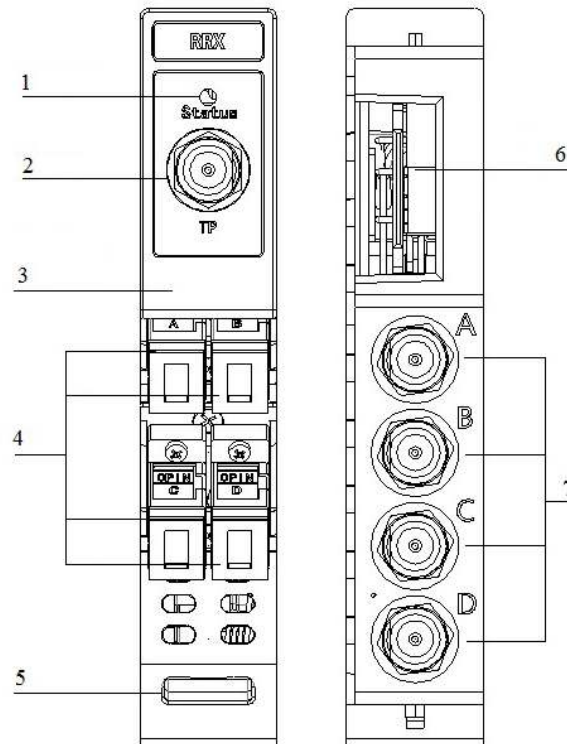


Figure 2: LB-1000-RR Front and Rear Panel

Front Panel:

1. Status LED will be green when the Return receiver module is operating normally and will be red when there is an alarm.
2. The Test Point is a -20dB TP relative to the output port.
3. Module Handle to draw the application module in/out.
4. Optical Inputs: A, B, C and D
5. Latch to secure the module.

Rear Panel:

6. PIN CONNECTOR for DC power and signals to the chassis backplane
7. F-type female port for RF output from the return receiver. Ports A, B, C and D.

4.0 INSTALLATION

Application modules of LB-1000 can be installed in any of the general slots of the rack. Module is inserted into the rack from the front part.

- 1) Gently insert the LB-1000 application module into any general slot (labelled 01 to 18) from the front of the chassis. Be careful to align the metal guide rails on the top and bottom of the module to the chassis housing.
- 2) Using the handle completely push the application module into the slot. Once the module is completely inserted into the slot, the latch on the bottom of the module will lock into place with the LB-1000 chassis securing the module in the rack. Ensure that the application module is securely connected to the LB-1000-CH rear panel and F-connectors. The application module will be automatically power "ON". The Status LED on the front of the module will turn ON and the module will show up on the control module screen or web interface.

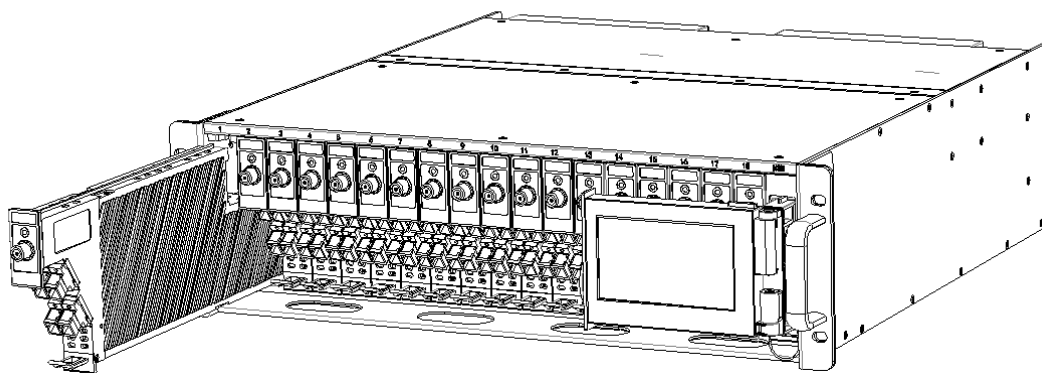


Figure 3: LB-1000 application module installation

- 3) If the module hasn't been properly connected to the LB-1000-CH it will not power up and status LED will be OFF. In such a case, remove the application module from LB-1000-CH slot and reinsert carefully as described in steps 1 and 2 above. See below step for safely removing the module.
- 4) To remove the application module from the slot, press down on the latch located in the bottom front of the module. The application module will unlock from the LB-1000-CH rack and the module can be removed.
- 5) Connect the RF cable to the appropriate RF output connectors on the rear panel of the

LB-1000-CH.

- 6) Carefully clean all the fiber optic connectors and jumper cables. Use appropriate cleaning swabs for fiber optic cables and connectors. Check for contamination/blemish on the fiber cable and connector with a fiber inspecting microscope. Ensure the fiber optic connectors and jumper cables are clean.
- 7) Ensure optical jumper connectors are matched properly to the device adapters. (i.e. SC/APC to SC/APC). Using mismatched connectors will damage the connectors and degrade system performance. Ensure that each fiber has a matching connector.
- 8) Use an optical power meter to verify that the optical input power level to the receiver is within the specification (-18 to +1dBm for Standard receiver; or -27 to -13dBm for RFoG receiver). Connect the Optical fiber to the **OPT IN** connector on the front panel.
- 9) Using the touch screen or web interface via LB-1000-CM the operating parameters for the application module can be monitored and adjusted. Operating parameters and adjustments on the LB-1000-RR are explained in Section 5.

5.0 LB-1000-RR SETTINGS

Once the LB-1000-RR module is successfully connected, powered up and operating normally, you will be able to see the corresponding slot populated with the module on the screen and on the web interface of the LB-1000-CM system management module.

5.1 LB-1000-RR settings: Using touch screen

On the home screen of the LB-1000-CM touch screen, tap/touch the corresponding application module slot (01-18) where the LB-1000-RR is plugged in. The selected application module will be highlighted and the screen will show settings for the LB-1000-RR return receiver.

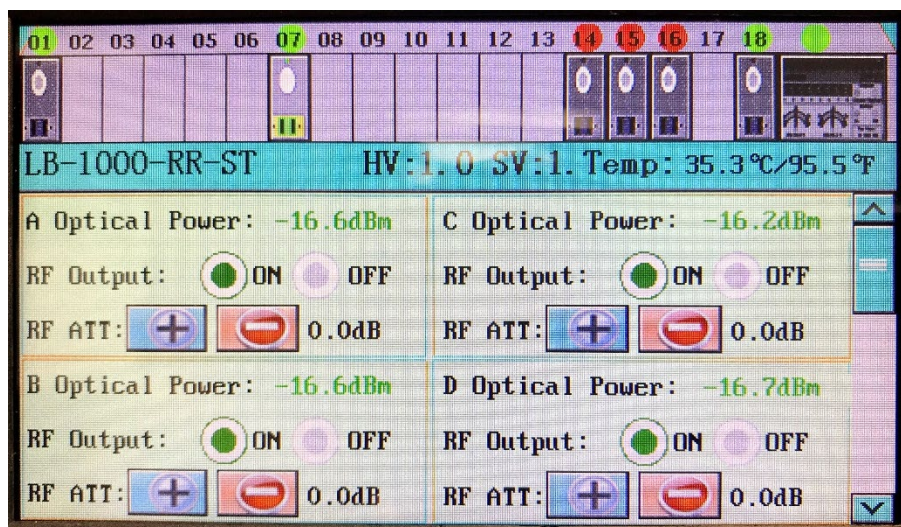


Figure 4: LB-1000-RR settings - Page 1

If a parameter indicates an alarm it will be displayed in **red font**. No alarm, the parameter will be displayed in **green font**.

PARAMETERS	DESCRIPTION
LB-1000-RR	
A / B / C / D Optical Power	Displays the Input Optical power for each of the channels
RF Output ON / OFF	Turn the unused RF Output channel ON/OFF
RF ATT	RF Output control using electronic attenuation. Min value under AGC: 0dB; Max value under AGC: 31dB; Min value under MGC: 0dB; Max value under MGC: 62dB

Laser Temperature	Shows the laser temperature
Gain Mode AGC / MGC	Select Automatic or Manual Gain Control mode for the receiver. Only in Standard version of RRx. RFoG version of RRx is only MGC mode.
RF TP A / B / C / D	Select RF Output Test Point for one of the four channels
AB / CD Switcher	For special functional module only, special order. Not a standard feature of the return receiver. Select main channel for back up operating mode.
Low-Cut Mode ON / OFF	Enable or Disable optical protection mode. Optical/RF channel turned OFF when optical power below a certain level. Only for Standard version. This setting is not available in RFoG version of RRx.
Threshold + / -	Set Optical threshold level for Low-Cut Mode. Min value: -21dBm; Max value: -14dBm. Only for Standard version. This setting is not available in RFoG version of RRx.
Serial Number	Shows the module serial number
Hardware Version	Shows the hardware version
Firmware Version	Shows the firmware version
Temperature	Shows the current module temperature
Running Time	Shows the active run time of the module

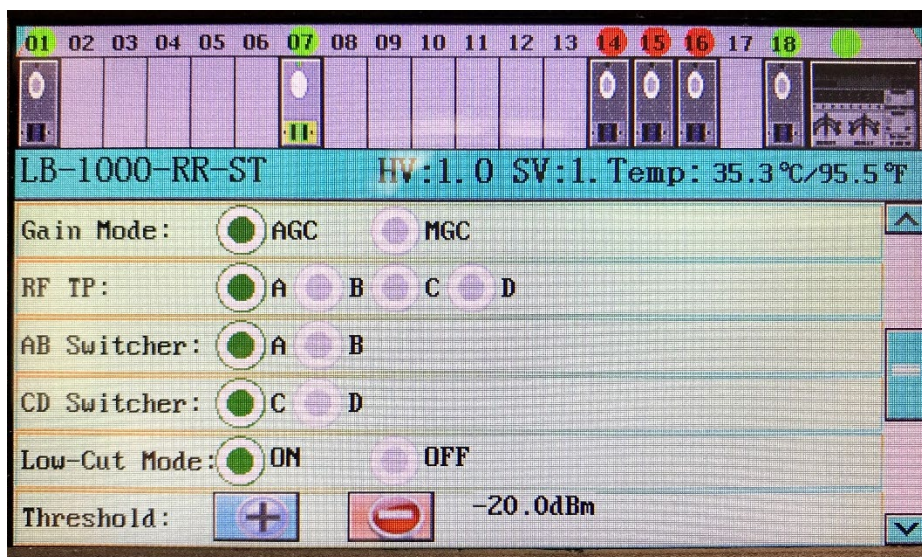


Figure 5: LB-1000-RR settings - Page 2

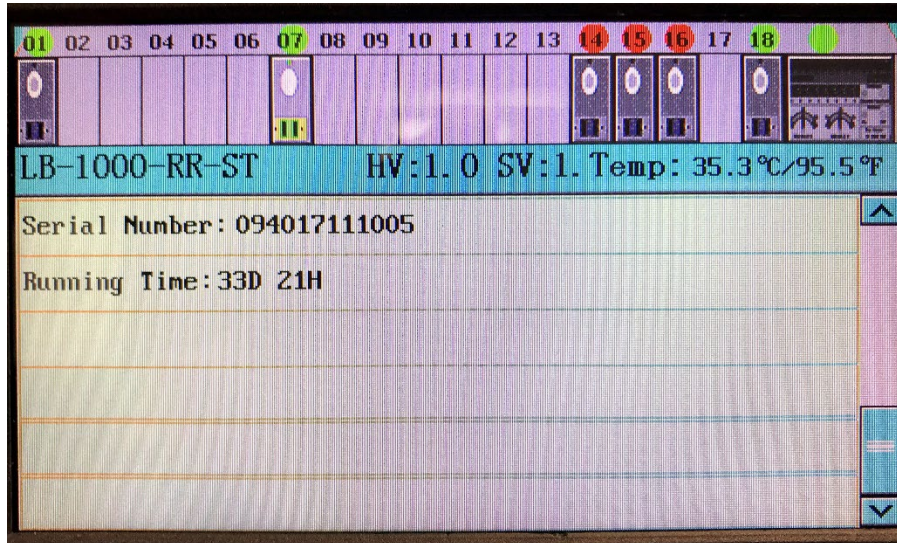


Figure 6: LB-1000-RR settings - Page 3

5.2 LB-1000-RR settings: Using Web interface

Refer to LB-1000-CM manual. Connect your computer to the LB-1000-CM using the RJ-45 LAN port. Login to the LB-1000-CM Web interface.

On the home screen of the LB-1000-CM Web interface, click the corresponding application module slot (#1 - #18) where the LB-1000-RR is plugged in. The selected application module will be highlighted and the screen will show settings for the LB-1000-RR return receiver.

User can monitor parameters and modify the configurable parameters of the LB-1000-RR module in this interface. Press +/- buttons to modify the parameters.

If the application module parameter has an alarm it will be displayed in **red font**. If no alarm, the parameter will be displayed in **green font**. Click the “Alarms” option on the left side of the screen to see the Alarm list. Find alarm information for corresponding slot number and module from alarm list.

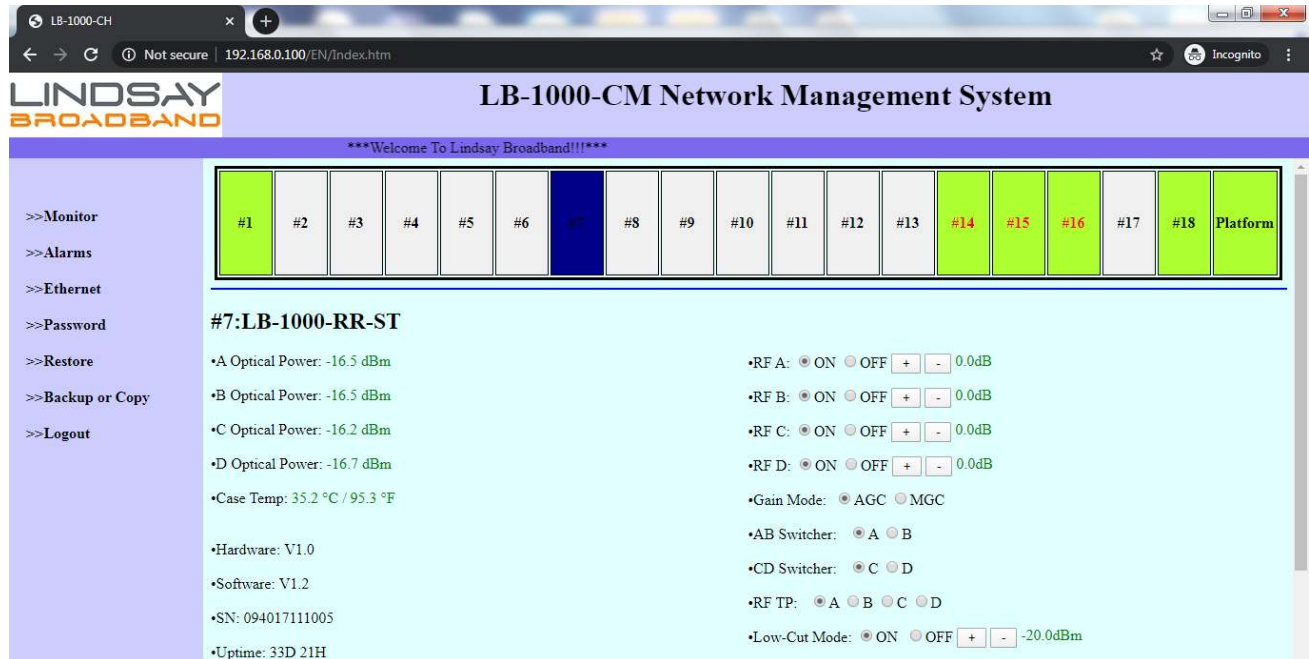


Figure 7: LB-1000-RR Web Interface

6.0 WARRANTY AND RMA POLICY



LIMITED WARRANTY

All equipment manufactured by Lindsay Broadband Inc. ("Lindsay") is warranted to be free from defects in material and workmanship under normal use and service for a period of twelve (12) months from the date of its delivery to the Customer. During the warranty period, the Customer shall promptly notify Lindsay in writing of any claim against the warranty.

This warranty shall not apply to the following:

Any Lindsay product, which shall have been repaired or attempted to be repaired or altered outside of a Lindsay Authorized Service Depot.

- Any Lindsay product, which has been subjected to misuse, damage or operated in any way other than its intended use.
- RF overload - hybrid ICs blown by excess RF level.
- Water damage caused by failure to properly close housing or failure of seal between customer installed connectors and bushing or casting at ports.
- The cost incurred by the Customer for the transportation or expedition of Lindsay products to any Lindsay Authorized Service Depot.
- Any damage to the Lindsay product, which is incurred in transit to and from any Lindsay Authorized Service Depot.
- Any Lindsay product which has been damaged by any acts of God, ie; lightning, floods, earthquakes, tornadoes and the like.
- Under the terms of this warranty, the obligation of Lindsay shall be limited to the repair or the replacement of the product at the discretion of Lindsay.



Lindsay Broadband Return Material Authorization Policy

A Return Material Authorization (RMA) Number is Required On all Product Returns (Regardless if Product is Being Returned to Repair or credit)

**Product Received at the Lindsay Broadband Factory
Without an RMA Number will be Returned to Sender**

RMA number must be used when returning product for credit or repair. Use of RMA numbers will ensure efficient processing. When returning product to Lindsay Broadband, please follow the simple steps below (in the order that they appear):

RETURNS

1. Fill out the Product Return Authorization Form indicating product information. Repair items do not require original invoice information, but it is helpful to determine warranty eligibility.
2. Contact Lindsay Broadband Inc. Service Department in one of three ways:
 - E-mail to: contactus@lindsaybb.com (recommended method) Include all of the information from the product Authorization Form, or,
 - Fax the Product Authorization Form to 1-705-742-7669 or,
 - Call Lindsay Broadband Inc. @ 800-465-7046 Ext 235 / 261
3. After completing Steps 1 & 2, an RMA number will be assigned to you.
4. Securely pack the product and mark the box with your RMA #. If shipping multiple boxes, all boxes should be marked with the RMA #. The RMA # must be placed near your return address in large, bold print (approximately 2" in height). Please see the address label below as an example of the relative size location of the RMA #.

Sample Address label with RMA #

John Smith	
ABC Company	RMA 1234
123 Smith Street	
Anytown, USA 00000	
Lindsay Broadband Inc	
2-2035 Fisher Dr.,	
Peterborough, ON K9J 6X6	

Send your returns to:

**Lindsay Broadband Inc.
2-2035 Fisher Dr.
Peterborough, ON Canada K9J 6X6
Attn: Product Returns**

All shipments are to be pre-paid by the sender. **No COD's will be accepted.**

Service Repair Policy

1. Please contact Lindsay Broadband Service Dept. to obtain an RMA#.
2. Please supply requested information to verify 2warranty coverage.

Credit Return Policy

1. Products are unused and undamaged.
2. Products are accompanied by a one dollar (new purchase) for one dollar (credit return) order.
3. Products were purchased within one year from credit return date and are in a current catalog.
4. Products are subject to a 10% per RMA and \$2.00 per line item.
5. Products that are custom made are subject to an additional charge for conversion of not less than 20% and not more than 50% of the FFP price.
6. Product that require factory repacking are subject to an additional charge for material and labour.
7. Please contact Lindsay Broadband Customer Service to obtain an RMA#.

Note: Products that are judged by Lindsay Broadband Inc. upon receipt as being unacceptable for credit shall be returned to sender at their expense.

1. Make Sure to Obtain an RMA# and mark a box(s) accordingly
2. Ship Only Items Authorized
3. Enclose Packing Slip & Product Return Authorization Form
4. Ship Prepaid Only to :

Company	Contact Name:	
Address:		City:
Prov/State:	Postal Code/Zip:	
Phone: #:	Fax #:	
Email address (if applicable)		

Date:

(To be supplied by Lindsay Broadband)

[illegible]