ASCENT
Communication Technology

ARF122B
1.2GHz MDU
RF Amplifier

Quick Reference Guide

Revision A

ACT ARF122B RF Amplifier

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ACT Document Number: ACT AT5026 External Modulation Optical Transmitter

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This document is produced to assist professional and properly trained personnel with installation and maintenance issues for the product. The capabilities, system requirements and/or compatibility with third-party products described herein are subject to change without notice.

For more information, contact ACT: support@ascentcomtec.com

Revision History

Revision	Date	Reason for Change
A	11/13/2016	Initial release

Table of Contents

1 Overview

ARF120B Series 1.2G 1 or 2 RF outputs, GaAs MDU amplifier is part of ACT Advanced Fiber Deep HFC solution, which has been designed to deliver interactive CATV, high capacity DOCSIS and other advanced services. The cost effective MDU amplifier platform helps operators expand bandwidth of their existing HFC network while minimizing capital investment. The ARF120B compact housing has compact housing with embedded RF module and is suitable for MDU, FTTB or FTTC applications with outputs up to 108 dBμV.

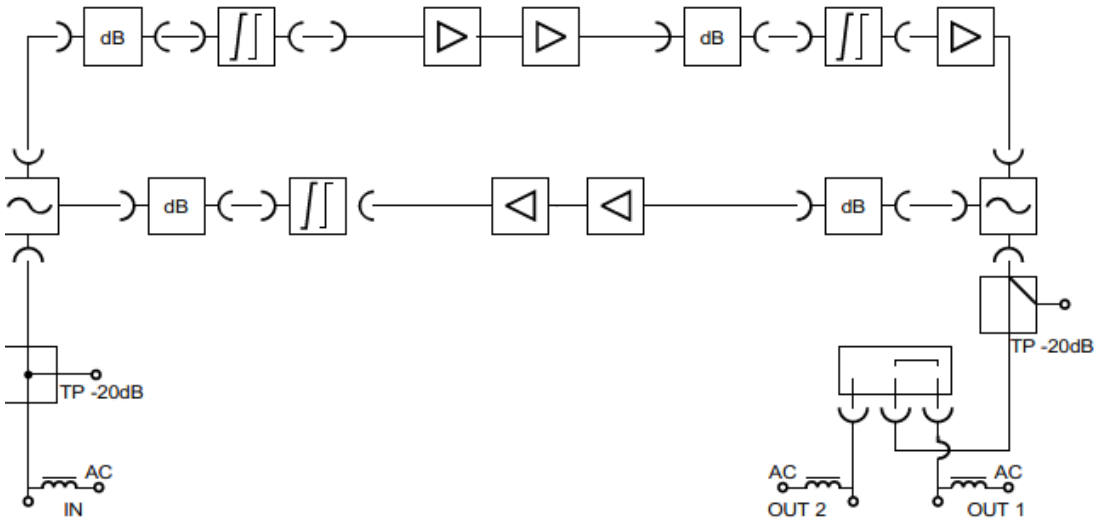
The ARF120B 1.2 GHz MDU amplifier has field upgradeable diplexers and filters with JXP style plug-in PADs and EQs along with plug-in diplex filter for band split upgrade to DOCSIS 3.1.

ARF120B amplifier uses GaAs technology which offers the excellent CTB and CSO performance. Both output level and slope can be adjusted using standard JXP PADs to minimize the spares. It suits the last mile fiber deep access networks. It has low power consumption and supports local or remote power options. Combined with ACT's converged headend AH1000 optical system and AON node series, ARF120B is an ideal product to provide MSOs with an economical, flexible HFC access solution.

1.1 Features

- Supports 1.2 GHz bandwidth
- On site changing freq small and exquisite
- GaAs technology in use
- Improved ESD and Surge protection
- Low noise figure
- Standard JXP plug-in PADs for all adjustments of attenuation and equalization
- Second output can be selected via splitter or tap
- uency split
- Compact design,

1.2 Block Diagram



1.3 Specifications

Forward Path Specifications

Item	Value
Pass Band	85/258 MHz to 1208 MHz
Gain	42 dB
Frequency Response	±0.75 dB
Input Attenuator Control Range	0 dB to 20 dB, 1 dB step
Input Equalizer Control Range	0 dB to 22 dB, 1 dB step
Cable Simulator	0 dB to 9 dB, 1 dB step
Mid-stage Slope	0 dB to 10 dB, 1 dB step
Mid-stage Gain	0 dB to 10 dB, 1 dB step
Umax(112 QAM Chs)	108 dBμV
Return Loss	16 dB @ 85 MHz to 1000 MHz
	14 dB @ 1001 MHz to 1200 MHz

RF Test Point	-20 dB
Noise Figure	5.6 dB
Group Delay	2 ns
Output Level, CTB CENELEC 41 Chs	112.0 dBµV
Output Level, CSO CENELEC 41 Chs	113.0 dBµV
Output Level, XMOD CENELEC 41 Chs	119.0 dBµV
CTB 105 / 72 Chs	66.0 dBc
CSO 105 / 72 Chs	63.0 dBc
XMOD 105 / 72 Chs	59.0 dBc

Return Path Specifications

Item	Value
Pass Band	5 MHz to 65/204 MHz
Gain	25 dB
Input / Output Gain Control Range	0 dB to 20 dB, 1 dB step
Output Equalizer	0 dB to 12 dB, 1 dB step
Frequency Response	±0.75 dB
Return Loss	18 dB
RF Test Point	-20 dB
Noise Figure	5.6 dB
Output Level,	119.0 dBµV
BER	$<1 \times 10^{-8}$
MER	>35 dB

General Specifications

Item	Value
Power Consumption (High Gain / Low Gain)	14.5 W
Supply Voltage	26 V_{AC} to 65 V_{AC}
RF Connectors	F-female
Dimensions (W × H × D)	230 mm × 164 mm × 84 mm
Weight	1.5 kg
Water/Dust Ingress Protection Rating	IP 54
Operating Temperature	-40 °C to +55 °C
Storage Temperature	-40 °C to +80 °C
Relative Humidity	5 % to 95 % (non-condensing)
EMC Compatibility	EN 60728-2
Safety	EN 60728-11
ESD / Surge	6 kV / 6 kV

Note: Unless otherwise noted, all specifications reflect typical performance and are referenced to 20°C.

2 Installation and Configuration

2.1 Precautions

- Ensure adequate cooling and ventilation as specified.
- The installation and operation manual should be read and understood before units are put into use.
- Dangerous voltages are present within the unit at all times. **Mains power kills.**
- Do not operate unit without all covers and panels properly installed. **Mains power kills.**

Cleaning

Use only a damp cloth for cleaning front panel. Use a soft dry cloth to clean top of unit. Do not use spray cleaner of any kind.

Overloading

Overloading wall outlets and extension cords can result in a risk of fire or electric shock. Use approved electrical cords.

Damage requiring service

Unplug unit and refer servicing to Ascent Communication Technology qualified service personnel only.

Servicing

Do not attempt to service this unit yourself. Refer all servicing to Ascent Communication Technology qualified service personnel only.

2.2 Equipment Inventory

On receiving your new ARF122B, you should carefully unpack and examine the contents for loss or damage that may have occurred during shipping. Refer to warranty registration if loss or damage has occurred. The ARF122B should consist of the following:

Qty	Description
1	ARF122B unit
1	Product user manual (Optional)
1	Certificate of performance (includes test result sheet)

2.3 Packaging and Transportation

Keep all packing boxes and packaging of the ARF122B for future transport.

Use only the original packaging of the ARF122B when transporting. This packaging has been specifically designed to protect the equipment.

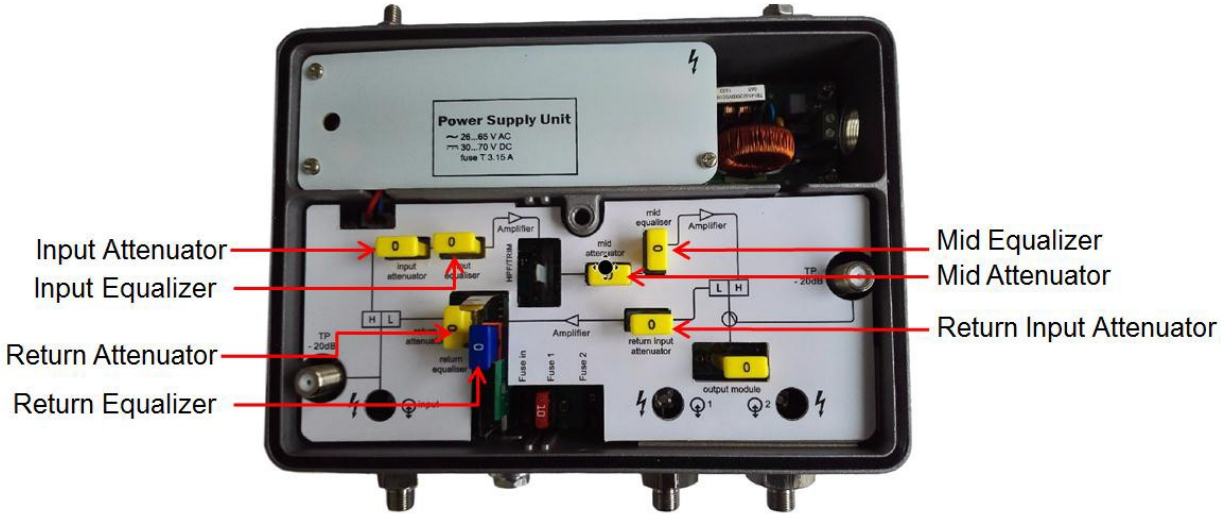
2.4 Opening the Unit

After undoing the center lid bolt, lift the lid of the unit and fold it open. If the case will not open with normal force, a flat-bladed screwdriver can be used to lever the case apart. The screwdriver must be carefully inserted between the case halves.

2.5 Unit Installation Points

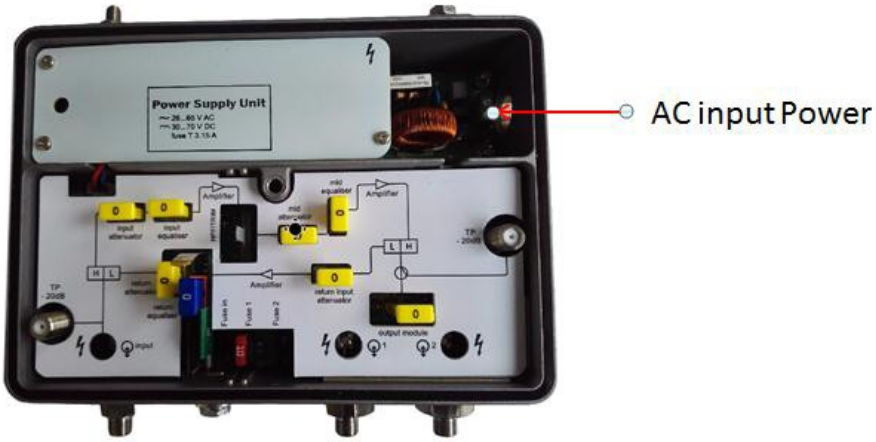
- The unit must always be mounted with the heat dissipating fins vertical and nothing obstructing the flow of air through the fins.
- A clearance of 50 mm must be left between the sides of the unit and any obstruction.
- The unit MUST be grounded.
- If attenuator and or equaliser plug-in modules are incorrectly installed, the frequency response of the unit may be negatively affected. Ensure that the plug-in modules are installed in the correct orientation and are pushed in firmly.

2.6 Install and Check the Accessories

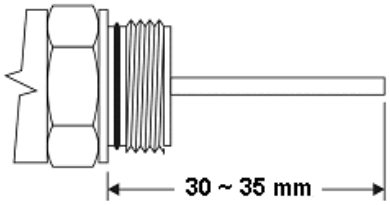


2.7 System Power and RF Port Connectors

The AC input power to the amplifier is shown as below.



When plugging the RF and power adaptors into AC input power port above, please make sure that the centre pin is between 30 mm and 35 mm when measured from the seating area of the connector to the tip of the centre pin (see below). If the pin is any longer there is a risk of not achieving a proper seal and/or damaging the ARF122B.



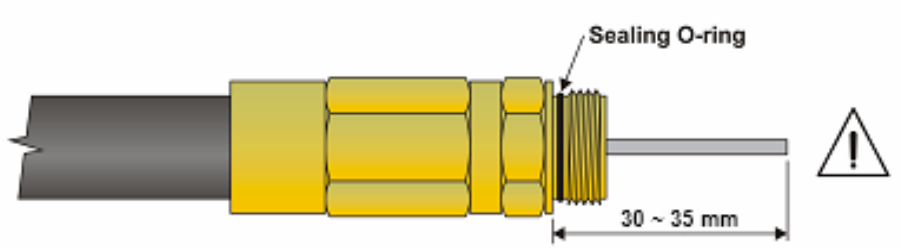
Centre pin length

Note:

RF adaptors are factory installed.

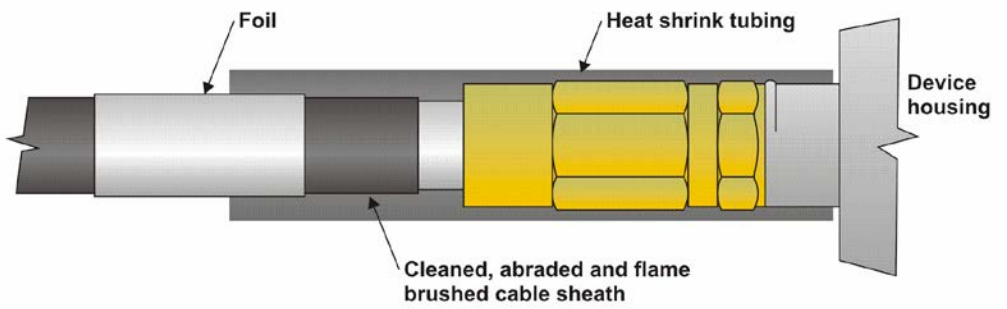
RF Connectors

When plugging the RF and power adaptors into ports 1 through to 3, ensure that the centre pin is between 30 mm and 35 mm long. If the pin is any longer there may be a risk of damaging the unit. The sealing O-ring must be on the connector and in good condition (see below).



Sealing O-ring location and centre pin length

Apply water-tight, adhesive-lined heat shrink tubing (as per manufacturer's instructions) to cover the whole connection from the unit flange to the cable jacket (see below). Failure to do so will result in water ingress into the amplifier inside.

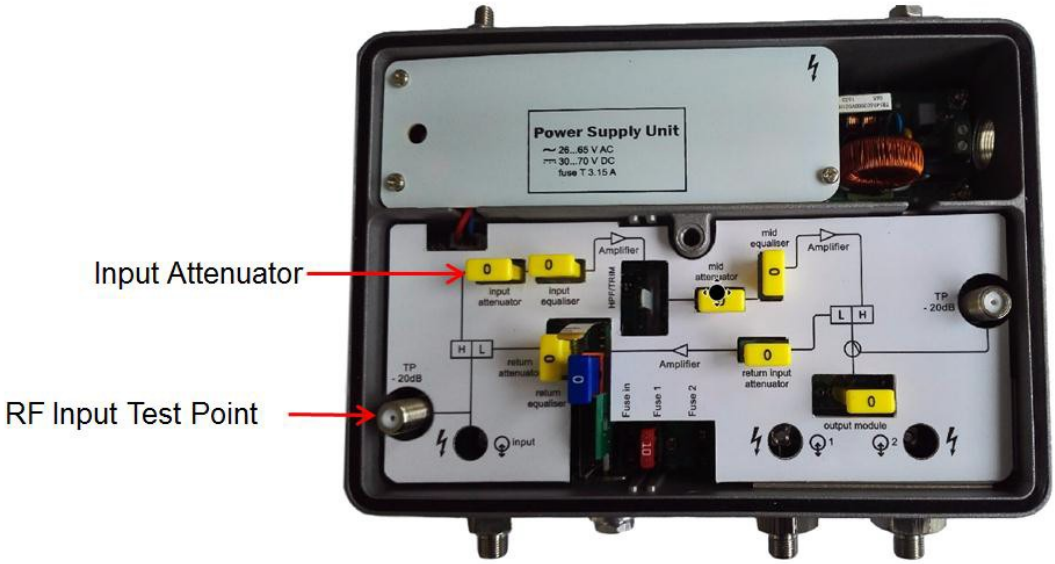


RF connector sealing

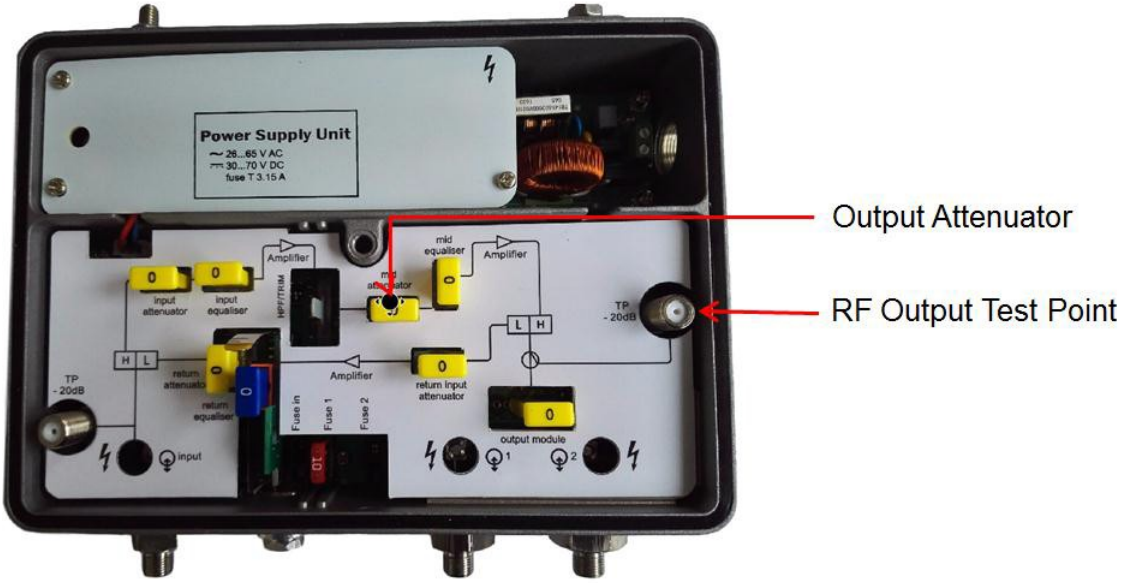
2.8 Balancing and Setup

1. Balancing the Forward Path

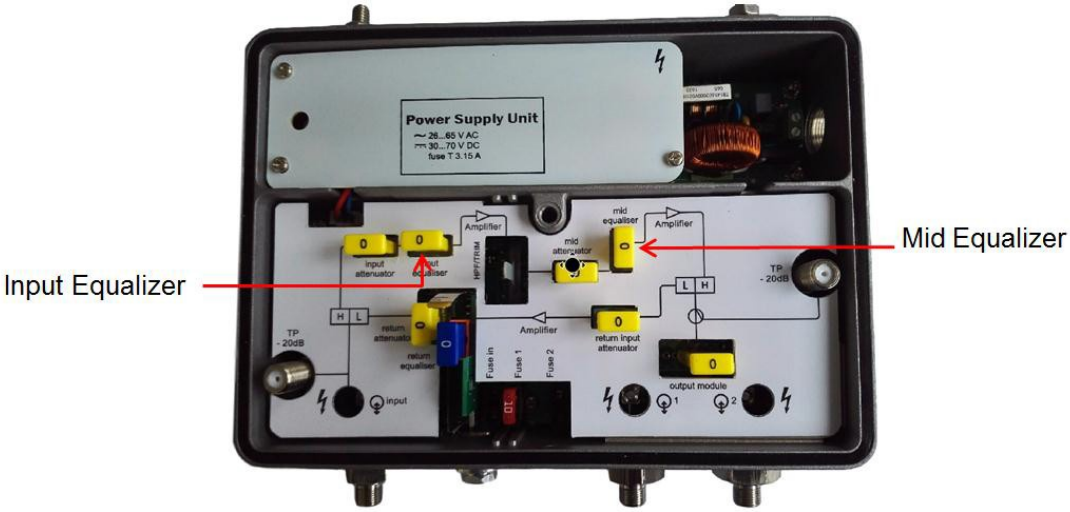
   a. Verify the forward input level via RF input Test Point, measure the signal level, if it is not specified in the system design, you must adjust the Input level higher or lower.



b. Verify the forward output level via RF input Test Point, measure the signal level, if it is not specified in the system design, you must adjust the Input level higher or lower.

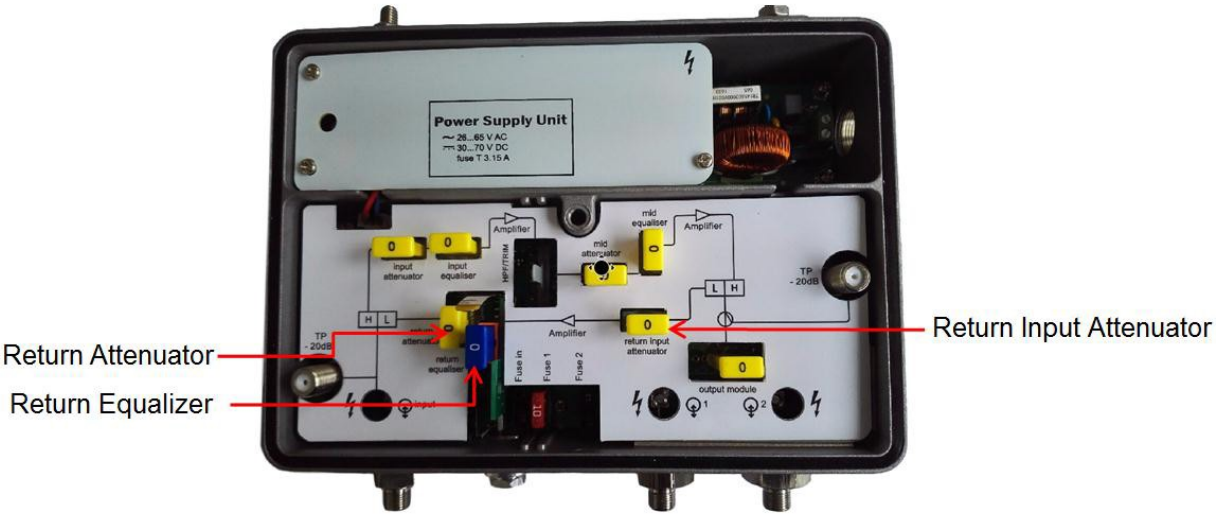


c. Set up the tilt. If the high-frequency signal reduced in the course of transmitting, you may adjust the variable equalizer EQ to get a suitable equalization.



2. Balancing the Reverse Path

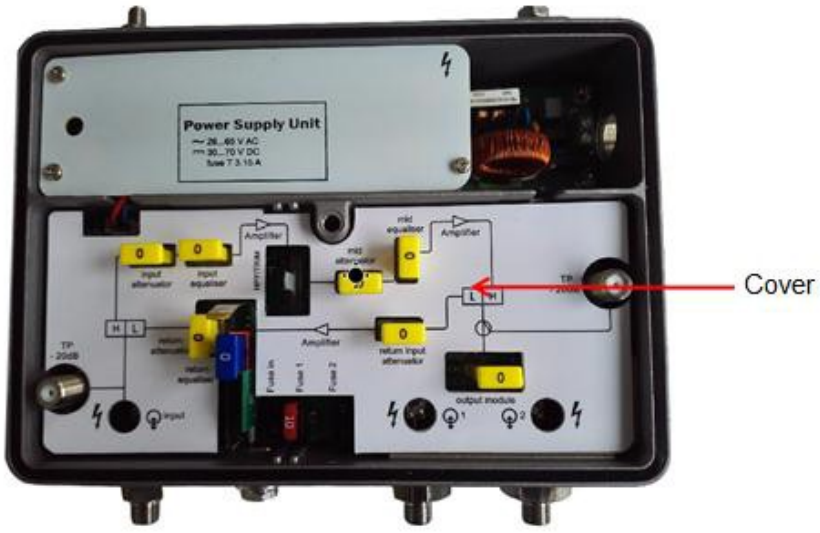
Verify the Reverse input level and reverse output lever via RF Test Point, measure the signal level, if it is not specified in the system design, you must adjust the Input level higher or lower.



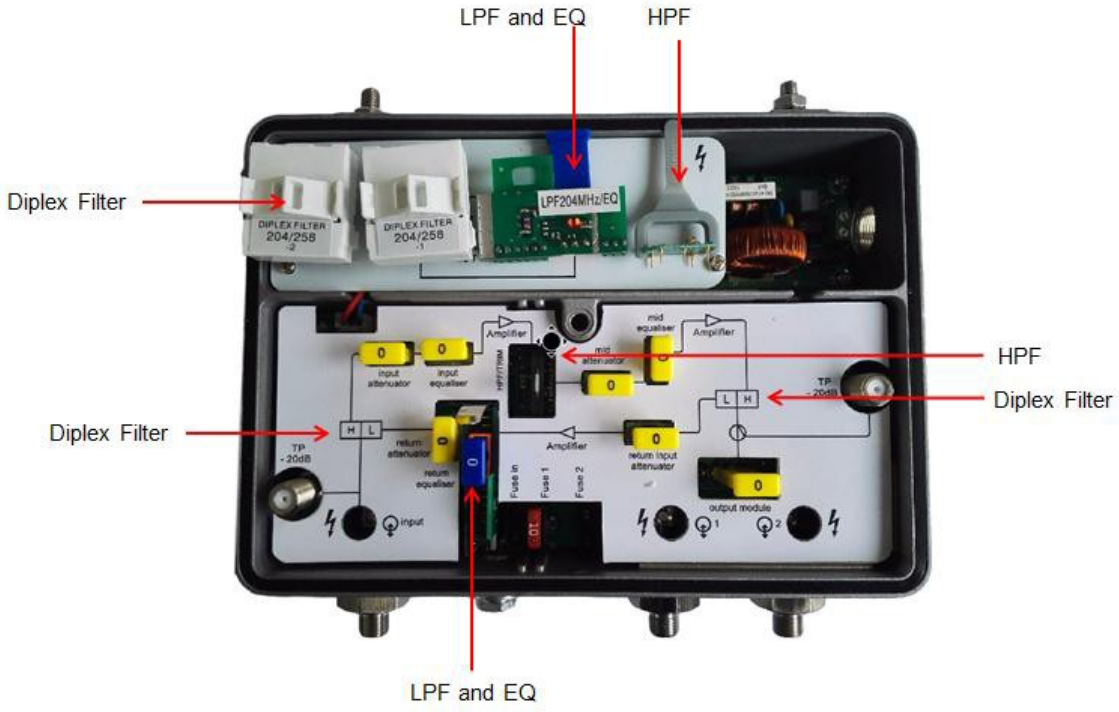
If the high-frequency signal reduced in the course of transmitting, you may adjust the variable equalizer EQ to get a suitable equalization.

2.9 Product Split Upgrade

1. Move cover



2. Must change the Diplex (2pcs), HPF, LPF and EQ



3. Mount Cover

2.10 Closing the Unit

Note:

> Prior to closing the unit, refer to **Section 4** for configuration instructions.

Prior to closing the unit, inspect the mating surfaces of the sealing edge. The ridge (see opposite) must be continuous and not damaged or scratched in any way, and the sealing gasket must be in good condition.

> **IMPORTANT:**
>
> **The IP67 rating of the ARF122B is dependent on the proper sealing of all external unit interfaces. This includes all RF connectors.**

3 Product Warranty

Ascent Communication Technology warrants its equipment to be free of manufacturing defects in material and workmanship for a period of one year from date of shipment, provided it is installed and operated in accordance with factory recommendations.
The liability of Ascent Communication Technology under this warranty is solely limited to repairing; replacing or issuing credit provided that:

The warranty does not cover the following:

1. Products purchased from someone other than an authorised Ascent Communication Technology dealer.
2. Damage caused by accident, negligence, misuse, abuse, improper operation or failure to operate the equipment within the manufacturer's specifications.
3. Damage caused by fluctuation in electrical current, lightning, power surges, etc.
4. Damage resulting from overhaul, repair or attempt to repair caused by someone other than Ascent Communication Technology's qualified service personnel.
5. Any product, in which the serial number has been defaced, modified or removed.
6. Any product that has been opened or modified without prior written permission from ACT.
7. Replacement of parts necessitated by normal wear and tear.
8. Any consequential or implied damages.

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Ver. ACT_ARF122B_RF_Amplifier_QRG_V1b_Aug_2017