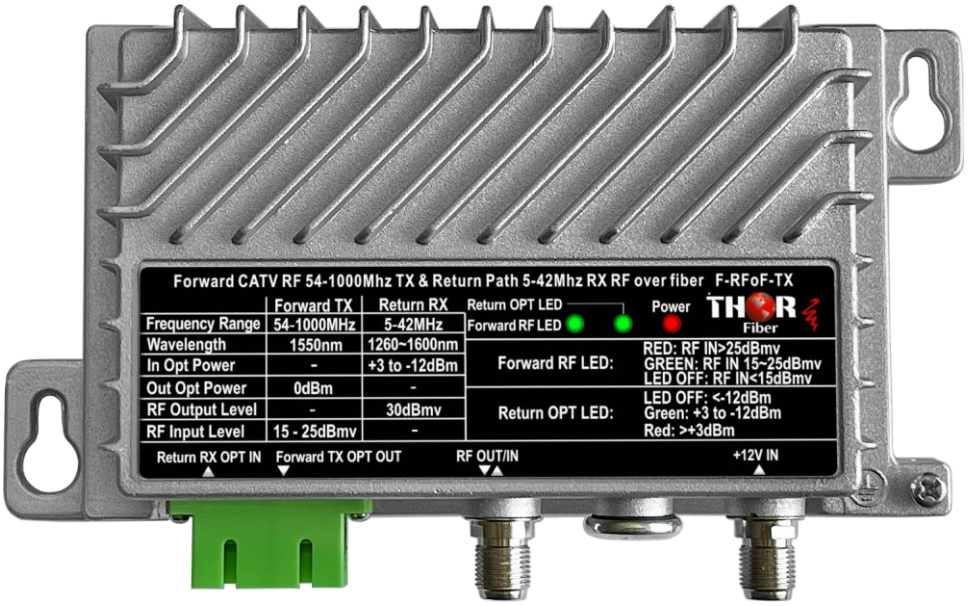
THOR BROADCAST

User Manual



COAX Cable Bi-Directional CATV RF Transmitter and Receiver over 2 Single Mode Fibers

45-1000Mhz Forward and Return Path 5-42Mhz

F-RFoF-TxRx

A Note from Thor Broadcast about this Manual

Intended Audience

This user manual has been written to help people who have to use, integrate and to install the product. Some chapters require some prerequisite knowledge in electronics and especially in broadcast technologies and standards.

Disclaimer

The contents of this document are subject to revision without notice due to continued progress in methodology, design and manufacturing. Thor shall have no liability for any error or damage of any kind resulting from the use of this document.

Copy Warning

1. INTRO

Cable TV over coax cable service has bi-directional communication on different frequencies, forward path and return path. Copper Coax is a great transmission medium, but it is losing a lot of transmission power over long-distance runs, single mode fiber solves that problem.
Thor Fiber has a solution for it and provides TX and RX devices, to replicate the bi-directional RF Point to Point over 2 single mode Fibers.

Very useful for extending point to point, any CATV interactive service and Fast Cable Internet Service where bi-directional signals are being sent back and forth. These devices convert electrical RF to optical in both directions simultaneously, it supports encrypted CATV, Clear QAM, and ATSC modulated RF. It also supports Analog modulated RF PAL and NTSC.
Compatible with Cable TV and Internet Coax services like Comcast, Spectrum, Charter, Xfinity, Cox Communications and more. Unit requires 2 single-mode fibers, and need to be interfaced with SC/APC fiber connectors to eliminate any reflections.

The F-RFoF-TX is a dual-purpose device; Forward RF 45-1000Mhz fiber optic TX on one fiber, and also CATV RF Return Path 5-42Mhz RX on the second fiber.
The F-RFoF-RX does the opposite; Forward RF 45-1000Mhz fiber optic RX on one fiber and Return Path 5-42Mhz TX on the second single mode fiber.

Using in pairs allows you to replace Coaxial Cable for long-distances up to 10Km.
Can also be used as a Fiber Break for copper to fiber isolation for secure areas (ie a SCIF room)
- Bi-directional RF communication
- Replicates, simulates copper Coax RF communication over two singlemode fibers
- A Side sends forward RF and receives return path RF, B side receives forward RF and sends back return path.

2. FEATURES

- Adjustable AGC range +2 ～-7dBm
- Working range: 5-42MHz & 54-1000MHz
- GaAs amplifier
- Ultra low noise technology.
- Compact and easy install.
- Red-LED for power supply indication.
- Return Optical LED：
- (Non-lit: optical power<-15dBm;Green:-12dBm<optical power<+3dBm;Red:optical power>+3dBm)
- Forward RF-LED (Input RF signal indication)

RED: RF IN>85dBμV,
GREEN: RF IN 75~85dBμV,
LED OFF: RF IN<75dBμV).

3. SPECIFICATIONS

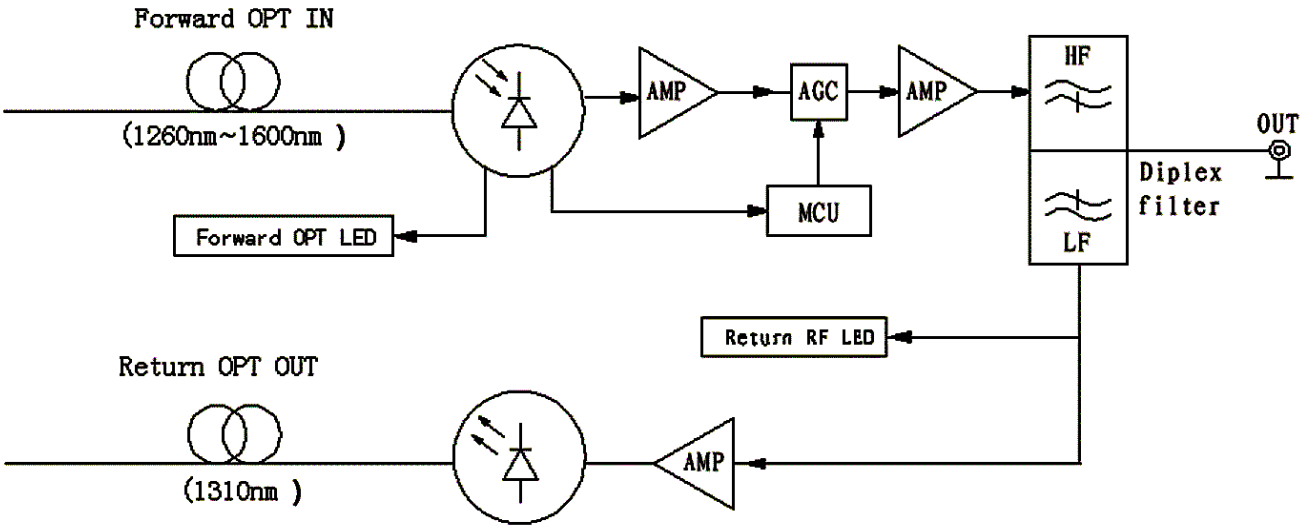
Item	Unit	Specifications	
Return Path Optical Receiver Parameter			
Optical Parameter			
Input Optical Power	dBm	-12 ~ +3	
Optical AGC	dBm	+2 ～ -7	
Optical Return Loss	dB	>45	
Input wavelength	nm	1260 ~ 1600	
Optical Connector		SC/APC	
Optical Fiber Type		Single Mode	
RF Parameters			
Frequency Range	MHz	5~42	
Flatness	dB	±0.5	
Output Level	dBμV	≥90（-1dBm）	
Output Return Loss	dB	≥14	
Output Impedance	Ω	75	
NPR Dynamic Range	dB	≥30 dB	
Forward Path Optical Transmitter Parameter			
Optical Parameter			
Laser Type		DFB	
Output wavelength	nm	1550±10	
Output Optical Power	mW	1(0dBm)	
Optical Return Loss	dB	>45	
Optical Connector		SC/APC	
RF Parameter			
Frequency Range	MHz	54~1000	
Flatness	dB	±0. 5	
Input Level	dBμV	80±5	
Input Return Loss	dB	≥14	
Input Impedance	Ω	75	
C/N	dB	≥ 51	Note 1
C/CTB	dB	≥ 60	
C/CSO	dB	≥ 60	
Other Parameter			
Power Supply		12V/1.5A	
Working Temperature	℃	-25~+60	
Storage Temperature	℃	-40~+65	
Power Consumption	W	<4	
Dimension	mm	173（L）* 102（W）* 40（H）	

Note 1: F-RFoF-TX configures 59 PAL-D analog channel signals in 550MHz frequency range, and transmits digital signals in 550-862/1000MHz frequency range. The level of the digital signal (within 8MHz bandwidth) is 10dB lower than the carrier level of the analog signal, and its input optical power is -1dBm, output level is 80dBuV.

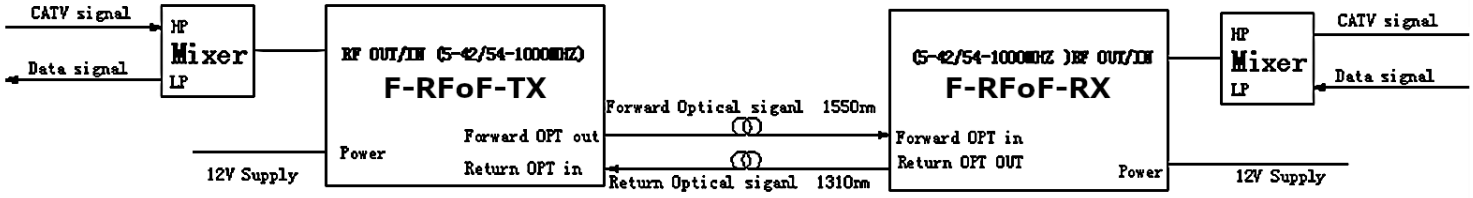
Item	Unit	Specification	
Forward Path Optical Receiver Parameter			
Optical Parameter			
Input Optical Power	dBm	-12 ~ +3	
AGC Range	dBm	+2 ～ -7	
Optical Return Loss	dB	>45	
Input wavelength	nm	1260 ~ 1600	
Optical Connector		SC/APC	
Optical Fiber Type		Single Mode	
RF Parameter			
C/N	dB	≥ 51	Note:1
C/CTB	dB	≥ 60	
C/CSO	dB	≥ 60	
Frequency Range	MHz	54 ~1000	
Flatness	dB	±0.75	
Output Level	dBμV	≥80	
Output Return Loss	dB	≥14	
Output Impedance	Ω	75	
Return Path Optical Transmitter Parameter			
Optical Parameter			
Laser Type		DFB	
Output wavelength	nm	1310±10	
Optical Return Loss	dB	>45	
Output Optical Power	mW	1(0dBm)	
Optical Connector		SC/APC	
RF Parameter			
Frequency Range	MHz	5~42	
Flatness	dB	±0. 5	
Input Level	dBμV	75~85	
Input Return Loss	dB	≥14	
Input Impedance	Ω	75	
NPR Dynamic Range	dB	≥30 dB	
Other Parameter			
Power Supply		12V/1.5A	
Working Temperature	℃	-25~+60	
Storage Temperature	℃	-40~+65	
Power Consumption	W	＜4	
Dimension	mm	173（L）* 102（W）* 40（H）	

Note 1: F-RFoF-RX configures 59 PAL-D analog channel signals in 550MHz frequency range, and transmits digital signals in 550-862/1000MHz frequency range. The level of the digital signal (within 8MHz bandwidth) is 10dB lower than the carrier level of the analog signal, and its input optical power is -1dBm, output level is 80dBuV.

4. Principle block diagram



5、Two-way connection system diagram



5. SAFETY INSTRUCTIONS

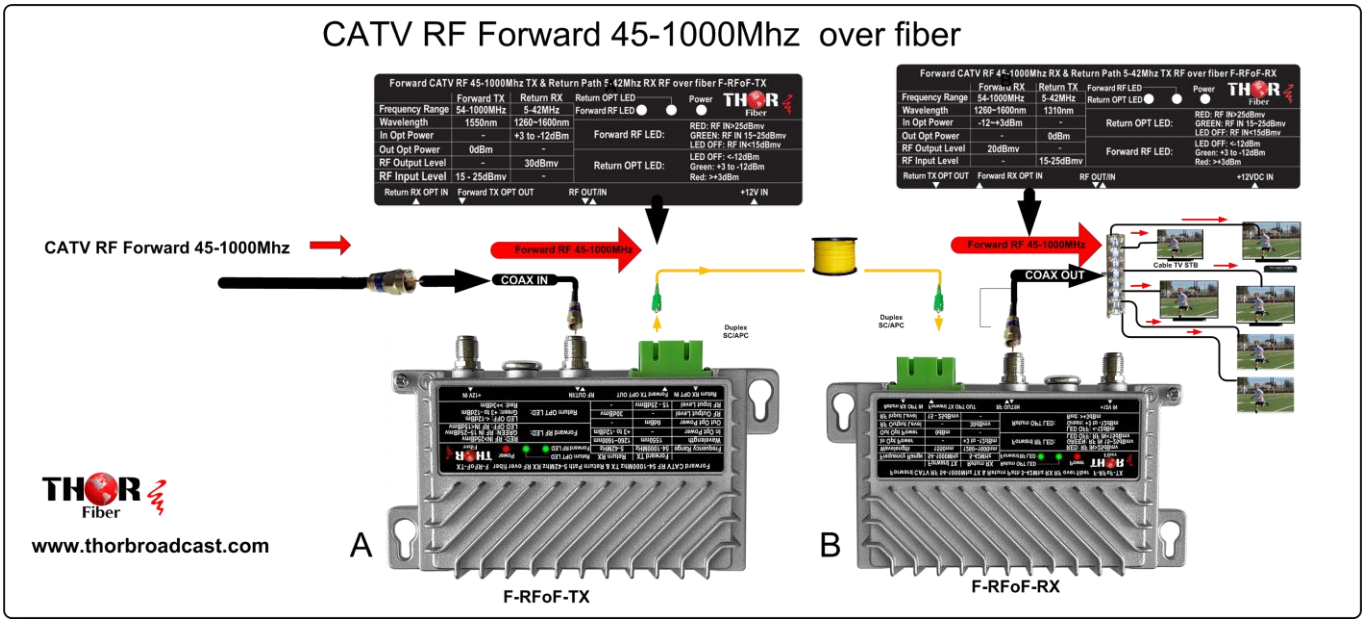
1. Read all safety and operating instructions before you operate the device
2. Retain all safety and operating instructions for future reference
3. Heed all warnings on the modulator and in the safety and operating instructions
4. Follow all installation, operating and use instructions.
5. Unplug the unit from the AC power outlet before cleaning. Do not use accessories or attachments not recommended by us, as they may cause hazards, and will void the warranty
6. We strongly recommend using an outlet that contains surge suppression or ground fault protection. For added protection during a lightning storm, or when the device is left unattended for long periods of time, unplug it form the wall outlet or PDU and disconnect the lines between the modulator and its source. This will prevent damage caused by lightning or power line surges.
7. Do not overload wall outlets or extension cords, as this can result in a risk of fire or electrical shock.
8. Never insert objects of any kind into the modulator through openings as the objects may touch dangerous voltage and will void the warranty. Refer all servicing to authorized service personnel.

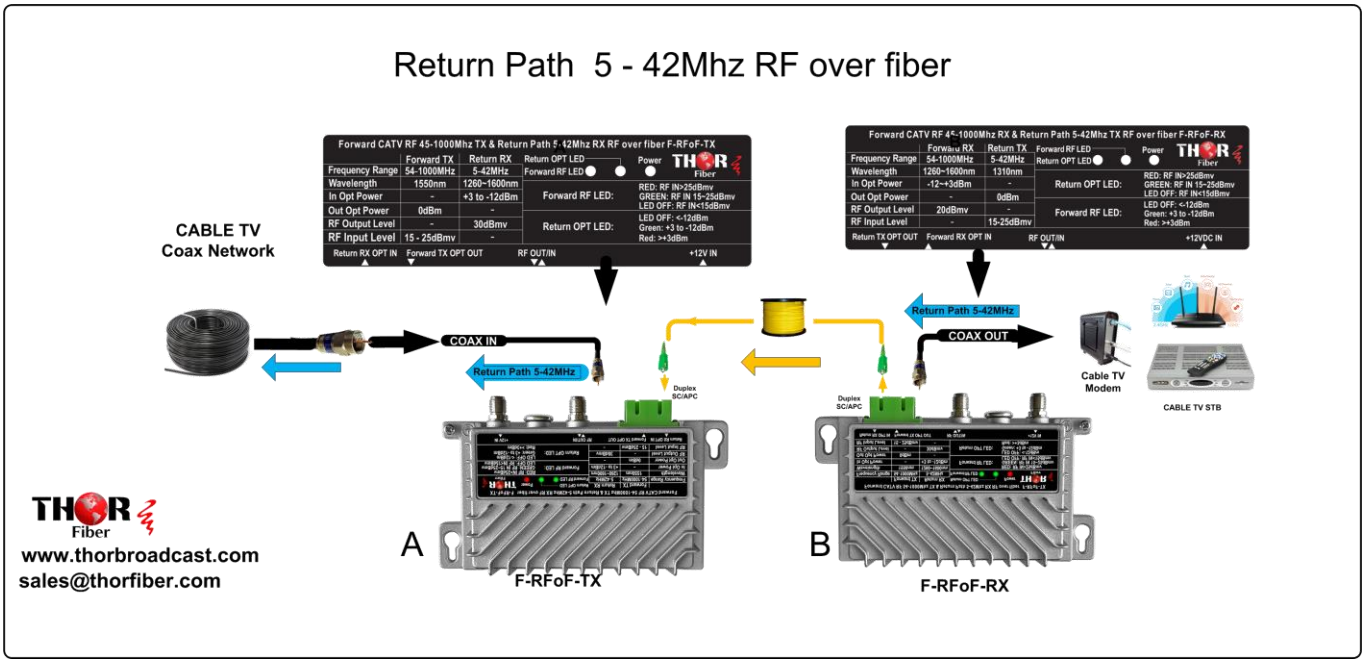
9. Unplug the unit from the wall outlet or PDU and refer servicing to authorized service personnel whenever the following occurs:

- The power supply cord or plug is damaged
- Liquid has been spoiled or objects have fallen into modulator
- The modulator has been exposed to rain or water
- The modulator has been dropped or the chassis has been damaged
- The modulator exhibits a distinct change in performance

10. When replacement parts are required, ensure that the service technician uses replacement parts specified by us. Unauthorized substitutions may damage the modulator or cause electrical shock or fire, and will void the warranty.
11. Should any damage be discovered after unpacking the unit, immediately file a claim with the carrier. A full report of the damage shall be made and a copy forwarded to Seller.

6. INSTALLATION





Attention: invisible infrared light is mostly used in optical communication systems, thus it is absolutely forbidden to direct exposure to beam. Otherwise, it can cause damage to retina or cause blindness.

Packing List

Optical Transmitter F-RFoF-TX	1PC
Users' Manual	1PC
12V DC Power Supply	1PC

For Further Tech Support

1-800-521-Thor (8467)

support@thorfiber.com