User's Manual

THOR Fiber

F-RF-RX Series

Broadband Fiber Optic transport Receiver

Installation and User Guide

OPTICAL RECEIVER

Caution

These servicing instructions are for use by qualified personnel only. To reduce the risk of electrical shock, please do not perform any serving other than that contained in the installation manual unless you are qualified to do so. Refer all servicing to qualified service personnel.

1. GENERAL DESCIPTION

F-RF-RXR is an advanced broadband optical receiver designed to HFC network architectures It converts the optical signal to RF signal on forward path.

2. FEATURES

(1) RF bandwidth 45-862MHz
(2) Pre-Amplifier compatible
(3) Optical Receiving Module
(4) There is a Low-power alarm Indicator, Power Indicator, Optical Power monitor.
(5) RF test points on the front Panel

Function Display and Operating Instruction

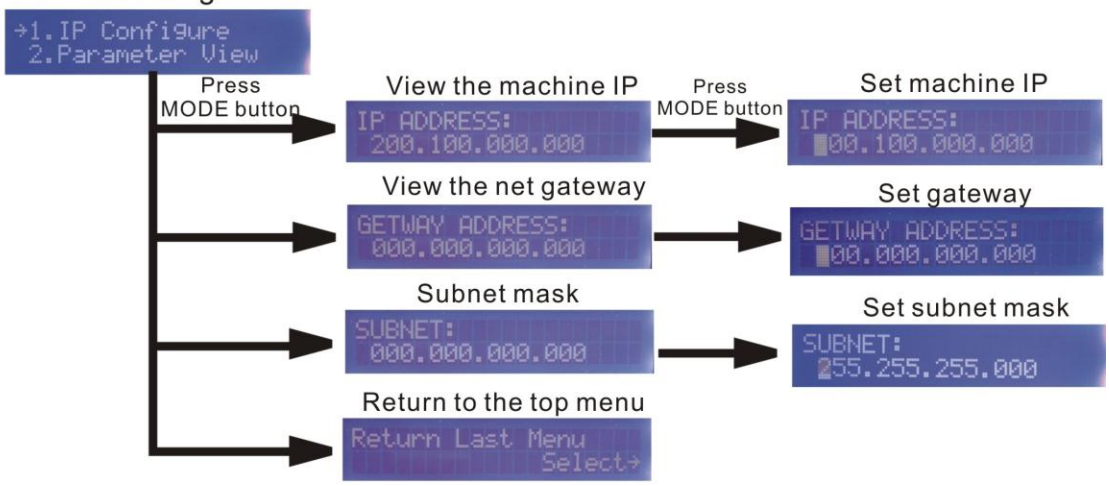
Mode: Mode selection button.

▲ : up button, increase the value of parameters.

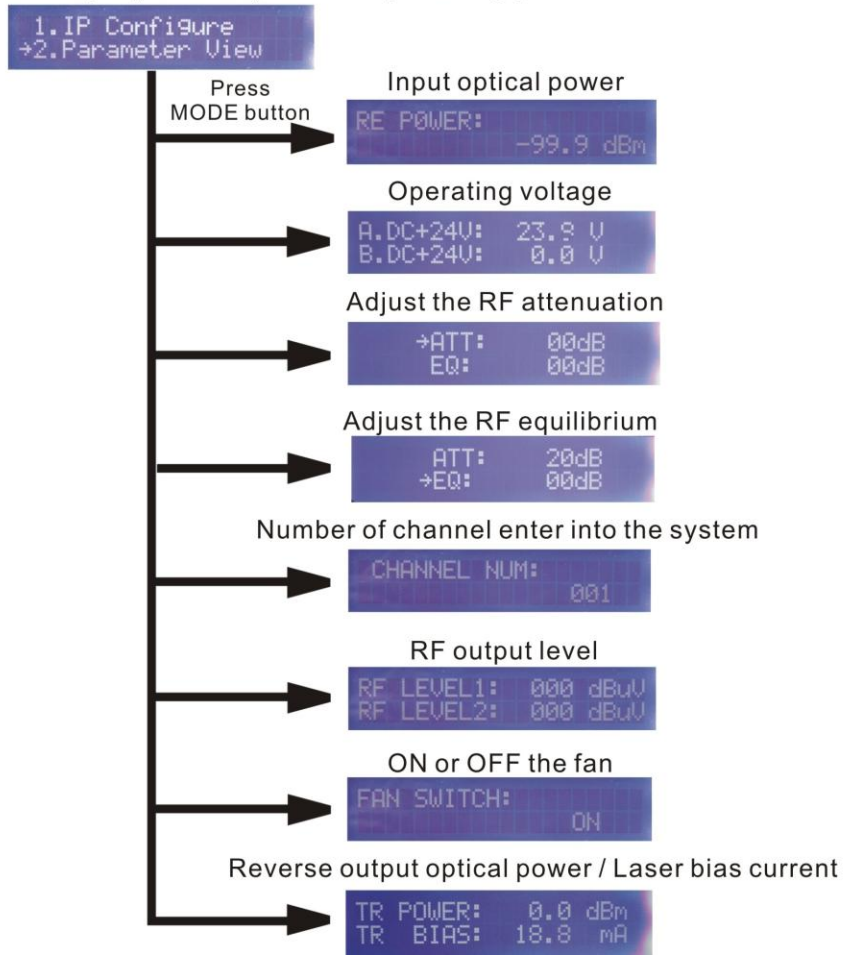
▼ : down button, decrease the value of parameters.

The following is the detailed instructions：

1. IP setting



2. Display and adjust the operating parameters



3.SPECIFICATIONS

Electric Characteristics

Optical Wave length:	1290-1600nm
Optical Receiver sensitivity	+3dbm – (-7dbm)
Optical Input Maximum:	2mW-3dBm
Saturation level	>+3dbm
Optical Return Loss:	>45dB
Response of Receive Module:	0.85A/W(1310nm standard)
Fiber Type:	Mono (9/125μm)
Fiber Connector:	SC/APC
Optical Receiving Power Monitor Voltage:	2V/mW
Noise Equivalence Power:	8PA/√Hz

RF Characteristics

Frequency Range:	45-862MHz	
RF Flatness:	Forward:	±0.75dB(fH-862MHz)
	Return:	±0.75dB(5- fL MHz)
RF Return Loss:	Forward	≥16 dB (fH-550MHz)
		≥14 dB (550MHz-862MHz)
	Return:	≥14 dB (5MHz- fL MHz)
Max Output Level:	102dBμ (0dBm of input optical power)	
Link Specification:	C/N ≥ 51dB	
	C/CTB ≥ 65dB	
	C/CSO ≥ 60dB	
Test Port:	-20dB	
RF connector:	F connector	
Power supply:	~110V (85-135VAV)	
Power consume:	≤30W	

Circumstance

Storage Temperature: -20C——+40C

Operating Temperature: -20C——+40C

Dimension- 482mm 330mm 44mm

Weight- 3.2kg Maximum

Performance Characteristics

-High response PIN photoelectric conversion tube.
-Optimizing circuit design, SMT production process, optimizing the whole signal path, makes the photoelectronic signal transmission more fluent.
-Professional RF attenuation chips, good RF attenuation and equilibrium linear, high precision.
-GaAs amplifier device, power doubly output, high gain and low distortion.
-Singlechip controls the whole work, digital display the parameters, easy and intuitive operation, and stable performance.
-Excellent AGC characteristic, when the input optical power range is - 9 ~ + 2dBm, the output lever remain unchanged, CTB and CSO basically unchanged.
-Reserved the data communication interface, can connect the Ⅱ class network management responder, access to the network management system.

4. NOTICE (WARNING)

1) Do not look into the end of the optical connector, the invisible optical beam can damage eye tissue.

2) Please do not touch the module and laser with your hand without electrostatic protection.

3) Power off, carefully remove the protective cap from the end of the FC/APC / SC/APC connector, insert the clean optical connector into the mating receptacle and tighten the connector securely. Clean connector ends with a lint free tissue and alcohol (above 99%) before mating.

4) The optical power should be less than 3dBm, otherwise the optical module would be damaged.

5) The circle of the optical fiber should not be too small, to protect the fiber from breaking off or the optical power be decreased.

6) Please do not power on or off continuously in a short time, or the equipment could be damaged.

7) This unit should be safely grounded.

8) There should be a 40mm spacing above and below the equipment for superior heat dissipation.

5.BOARD ILLUSTRATION

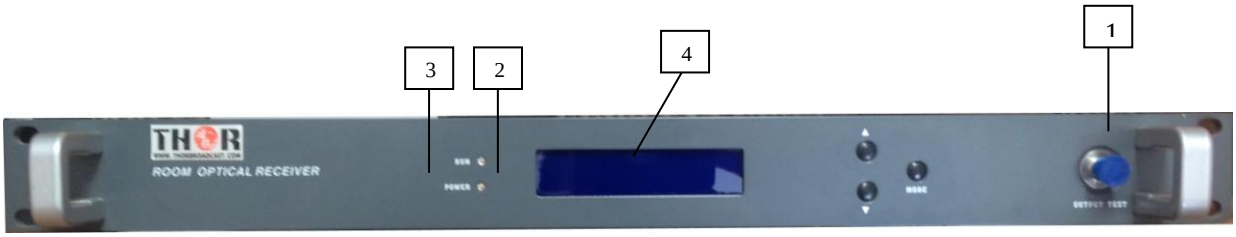
Front panel:

(1)Return RF test port: F connector, used for the test of the RF Level of the return optical laser, the test result is 20 dB lower than the actual RF Level for the Laser.

(2)Power Supply: Power Indicating green LED shows the normal working of the Power Supply

(3) The LED blinks green (for internal test purpose indicator)

(4) IP setting (Only for the units with the IP option)



Rear panel:

(1) Optical Connector Input - SC /APC

(2)RF Output Port 1 and Output Port 2: F type socket, Return RF Output Port. Two output ports are independent, see the Max RF Lever in the chart. Important: Any output should be connected with the 75Ω load when it was not in use, or it would interrupt the performance of the other output ports.

(3)Power Connector -110VAC 50Hz: AC Input power socket.

6. OPERATION

Install the F-RF-RXR into the CATV network according steps below.

Fiber connection

Turn off the power and take down the bolt in Fiber Input Port and perform the following steps:

1. Carefully remove the protective cap from the SC/APC connector.
2. Test the input optical power with an Optical Test Meter
3. Be sure that the optical input power is less than 2mW (+3dBm), or it would cause the damage of the Optical Receiving Module or Pin Diode.

For short fiber distance applications use optical attenuators
4 Be sure the optical output power is not more than (-7dbm)
4. Insert the connector into the receptacle of the SC/APC adapter.
5. If the difference of two values is obvious, clean the end of the connector with a lint free tissue moistened with 99.99% alcohol.
6. Power on, the Power Indicating Lamp lit red when the power is normal. Otherwise, turn off the power immediately (and so on in the abnormal power in the future), and contact with supplier.

This machine should be safely ground.

Link testing conditions

The performance parameters of this manual according to the measuring method of GY/T 194-2003 < Specifications and methods of measurement on optical node used in CATV systems >, and tested in the following conditions.
Test conditions:
1. Forward optical receive part: with **10km** standard optical fiber, passive optical attenuator and standard optical transmitter composed the testing link. Set **59** analog TV channel signal at range of **45/87MHz ~ 550MHz** under the specified link loss. Transmit digital modulation signal at range of **550MHz ~ 862/1003MHz**, the digital modulation signal level (in **8 MHz** bandwidth) is **10dB** lower than analog signal carrier level. When the input optical power of optical receiver is **-2dBm**, the RF output level is **108dBμV**, with **9dB** output tilt, measure the **C/CTB**, **C/CSO** and **C/N**.

Chart “Optical Input Power vs Voltage vs Output

O.Input Power (mW/dBm)	Voltage (V)	Output Level (dBμV)	
		Standard	Maximum
2.00/3.0	4.00	102	104
1.58/2.0	3.16	100	102
1.26/1.0	2.52	98	100
1.00/0.0	2.00	96	98
0.79/-1.0	1.58	94	96
0.63/-2.0	1.26	92	94
0.50/-3.0	1.00	90	92
0.40/-4.0	0.80	88	90
0.32/-5.0	0.64	86	88
0.25/-6.0	0.50	84	86

Clean and maintenance method of the optical fiber active connector

In many times, we misjudge the decline of the optical power or the reduce of optical receiver output level as the equipment faults, but actually it may be caused by the incorrect connection of the optical fiber connector or the optical fiber connector has been polluted by the dust or dirt. Now introduce some common clean and maintenance methods of the optical fiber active connector.

1. Carefully screw off the optical fiber active connector from the adapter. The optical fiber active connector should not aim at the human body or the naked eyes to avoid accidental injury.
2. Wash carefully with good quality lens wiping paper or medical degrease alcohol cotton. If you use the medical degrease alcohol cotton, still need to wait 1~2 minutes after wash, let the connector surface dry in the air.
3. The cleaned optical fiber active connector should be connected to optical power meter to measure output optical power to affirm whether it has been cleaned up.
4. When screw the cleaned optical fiber active connector back to adapter, should notice to make the force appropriate to avoid the ceramic tube in the adapter crack.
5. If the output optical power is not normal after cleaning, should screw off the adapter and clean the other connector. If the optical power still low after cleaning, the adapter may be polluted, clean it. (Note: Be carefully when screw off the adapter to avoid hurting inside fiber.**)**
6. Use the dedicated compressed air or degrease alcohol cotton bar to clean the adapter. When use the compressed air, the muzzle of the compressed air tank should aims at the ceramic tube of the adapter, clean the ceramic tube with compressed air. When use degrease alcohol cotton bar, carefully insert the alcohol cotton bar into the ceramic tube to clean. The insert direction should be consistent, otherwise can not reach ideal cleaning effect.