

SR812ST(R) Fiber Optical Receiver Manual

1. Product Summary

SR812ST(R) is our latest high-grade two-output CATV network optical receiver. The pre-amplifier adopts full-GaAs MMIC, post-amplifier adopts GaAs module. Optimized circuit design coupled with our 10 years professional design experience, make the equipment achieve good performance indexes. Microprocessor control, digital display the parameters, the engineering debug is especially easy. It is the main equipment to build the CATV network.



2. Performance Characteristics

- High response PIN photoelectric conversion tube.
- Optimized circuit design, SMT process production, optimized signal path, make the

photoelectric signal transmission more smooth.

- Specialized RF attenuation chip, with good RF attenuation and equilibrium linear, high accuracy.
- GaAs amplifier device, power doubly output, with high gain and low distortion.
- Single Chip Microcomputer (SCM) control equipment working, LCD display the parameters, convenience and intuitive operation, and stable performance.
- Excellent AGC performance, when the input optical power range is $-9 \sim +2\text{dBm}$, the output level keep unchanged, CTB and CSO basically unchanged.
- Reserved data communication interface, can connect with class II network management responder, access to network management system.
- Return emission can select burst mode to sharply decrease the noise convergence and reduce the forepart receiver number.

3. Technique Parameter

3.1 Link testing conditions

The technique 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.

Testing conditions:

1. Forward optical receive part: with 10km standard optical fiber, passive optical attenuator and standard optical transmitter composed the testing link. Set **59 PAL-D** 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**.
2. Backward optical transmit part: Link flatness and **NPR** dynamic range are the link indexes which is composed of backward optical transmitter and backward optical receiver.

Note: When the rated output level is the system full configuration and the receiving optical power is **-2dBm**, equipment meets the maximum output level of link index. When the system configuration reduce (that is, actual transmission channels reduce), the output level of equipment will be increased.

Friendly Notice: Suggest you setting the RF signal to **6~9dB** tilt output in the practical engineering application to improve the nonlinear index (under the node) of the cable system.

3.2 Technique Parameters

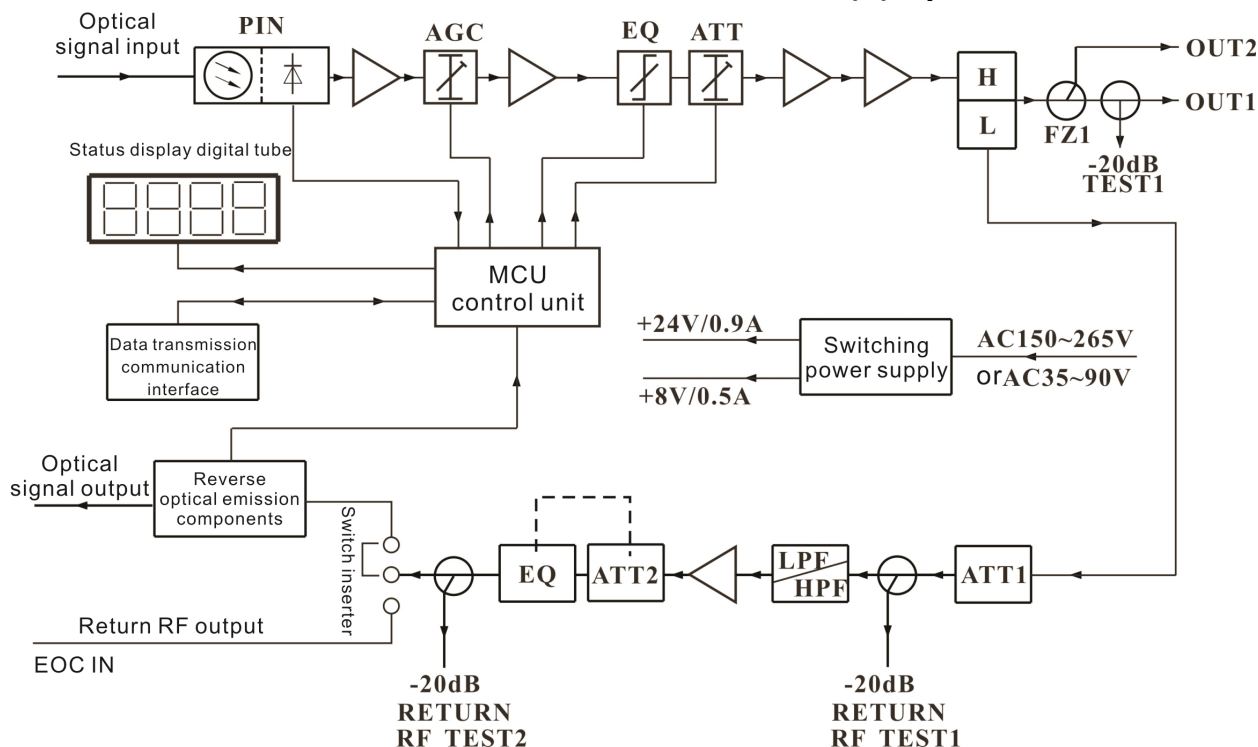
Item	Unit	Technical Parameters
Forward optical receiving part		
Optical Parameters		
Receiving Optical Power	dBm	-9 ~ +2
Optical Return Loss	dB	>45
Optical Receiving Wavelength	nm	1100 ~ 1600
Optical Connector Type		FC/APC, SC/APC or specified by the user
Fiber Type		Single Mode
Link Performance		

C/N	dB	≥ 51 （-2dBm input）	
C/CTB	dB	≥ 65	Output Level 108 dBμV Balanced 6dB
C/CSO	dB	≥ 60	
RF Parameters			
Frequency Range	MHz	45 ~862	45 ~1003
Flatness in Band	dB	±0.75	±0.75
Rated Output Level	dBμV	≥ 108	≥ 108
Max Output Level	dBμV	≥ 114	≥ 112
Output Return Loss	dB	（45 ~550MHz）≥16/(550~1000MHz)≥14	
Output Impedance	Ω	75	75
Electronic Control EQ Range	dB	0~10	0~10
Electronic Control ATT Range	dBμV	0~20	0~20
Return Optical Emission Part			
Optical Parameters			
Optical Transmit Wavelength	nm	1310±10, 1550±10 or specified by the user	
Output Optical Power	mW	0.5, 1, 2	
Optical Connector Type		FC/APC, SC/APC or specified by the user	
RF Parameters			
Frequency Range	MHz	5 ~ 65 （or specified by the user）	
Flatness in Band	dB	±1	
Input Level	dBμV	72 ~ 85	
Output Impedance	Ω	75	
NPR dynamic range	dB	≥15 （NPR≥30 dB） Use DFB laser	≥10 （NPR≥30 dB） Use FP laser
General Performance			
Supply Voltage	V	A: AC （150~265）V； B: AC （35~90）V	
Operating Temperature	℃	-40~60	
Storage Temperature	℃	-40~65	
Relative Humidity	%	Max 95% no condensation	
Consumption	VA	≤ 30	
Dimension	mm	260（L）× 200（W）× 130（H）	

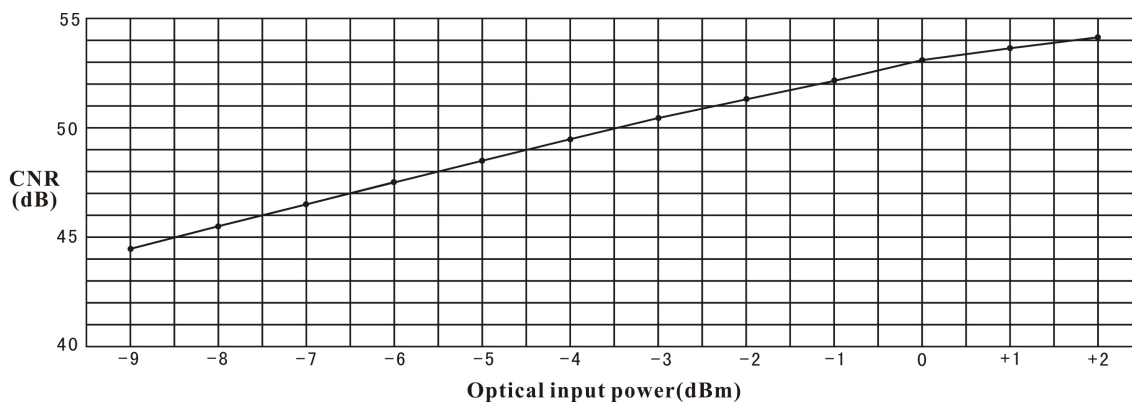
Note: The forward RF parameters are tested under the condition of using GaAs 25dB power doubly module in the last stage. Use other module, the parameters will be slightly different.

Burst Mode (Select this mode, see below)		
Output Optical Power (Close the burst mode)	dBm	-30
Laser Turn On Threshold	dBμV	≥ 70
Laser Turn Off Threshold	dBμV	≤ 62
Laser Turn On Time (t1)	us	$0.5 \leq t1 \leq 1$
Laser Turn Off Time (t2)	us	$0.5 \leq t2 \leq 1.5$

4. Block Diagram



5. Relation Table of Input Optical Power and CNR



6. Function Display and Operating Instruction

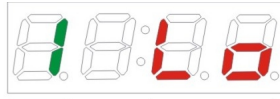
Mode: Mode selection button, total seven operating modes.

▲: up button. Increase the attenuation or equilibrium in the ATT or EQ mode.

▼: down button. Decrease the attenuation or equilibrium in the ATT or EQ mode.

The following is the detailed instructions:

Mode 1:

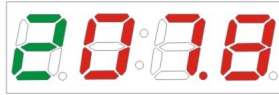


Input optical power (unit dBm)

1.0: Means that the optical power is low or none

1: Means that the displayed data is the input optical power

Mode 2:



The actual value of +8V working voltage

2: Means that the displayed data is the actual value of +8V

Mode 3:



The actual value of +24V working voltage

3: Means that the displayed data is the actual value of +24V

Mode A1:



RF attenuation, can be adjusted by ▲ or ▼ buttons, the maximum range is 20dB

A 1: ATT mode, means that the controlled and displayed data is the RF channel attenuation

Mode E1:



RF equilibrium, can be adjusted by ▲ or ▼ buttons, the maximum range is 10dB

E 1: EQ mode, means that the controlled and displayed data is the RF channel equilibrium

Mode 4:



The actual number of channels enters into the current network system. It can be adjusted by the ▲ or ▼ buttons, the maximum number of channels is 200.

4 : This menu is used to display the actual number of channels enters into the current network system, in order to calculate the RF output level more accurately.

Mode 5:

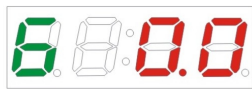


RF output level of the equipment (unit dBuV)

5 : Means that the displayed data is the RF output level under the current system

The following two menus are the states display of reverse optical emission components. Hide when the reverse optical emission parts are not configured; automatically displays when insert the reverse optical emission components.

Mode 6:



Reverse output optical power (unit dBm)

00 : Means that the current output optical power is 1mW

6 : Means that the displayed data is the reverse output optical power

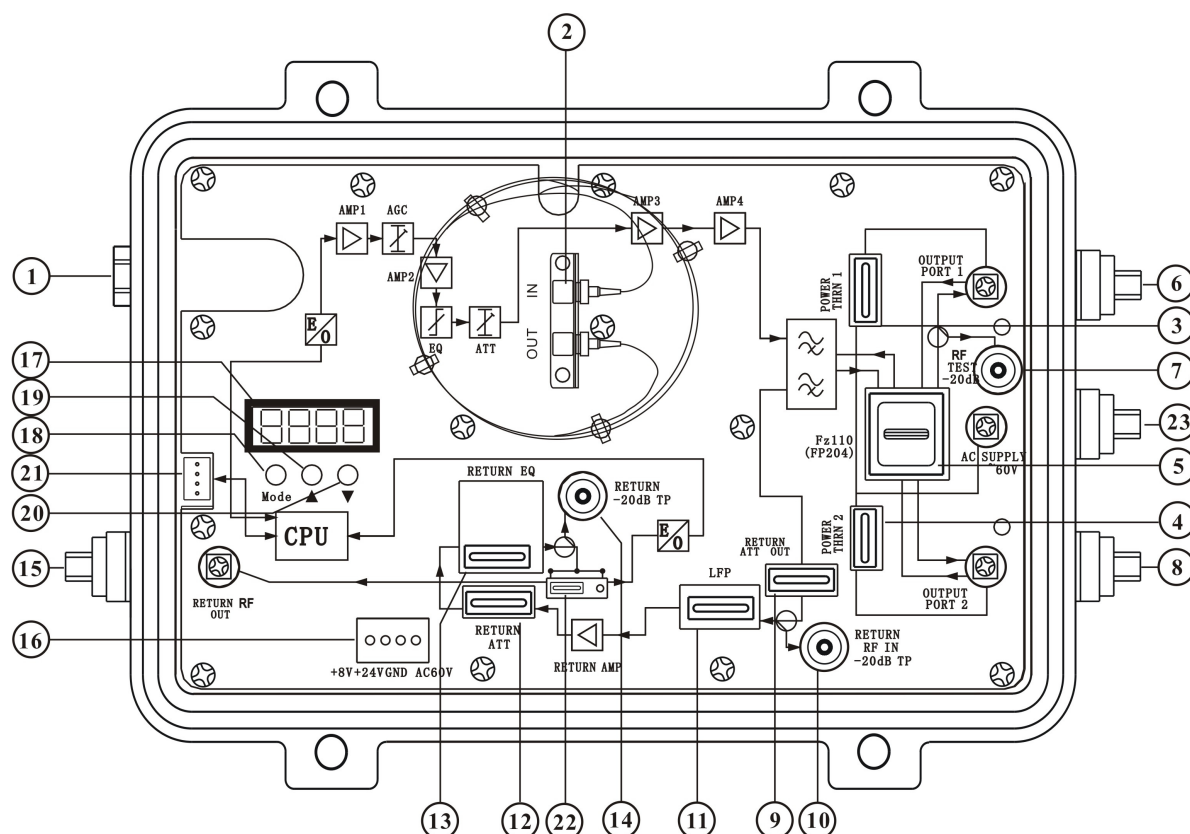
Mode 7:



Bias current of the reverse laser (unit mA)

7 : Means that the displayed data is the bias current of the reverse laser

7. Structure Diagram



1. Optical fiber input	2. Optical fiber flange plate	3. Output1 power pass inserter
4. Output 2 power pass inserter	5. Output tap or splitter	6. RF output1
7. -20dB output RF test port	8. RF output2	9. Backward RF ATT1
10. -20dB backward RF test port	11. Backward low pass filter	12. Backward RF ATT2
13. Backward RF EQ	14. -20dB backward RF test port	15. Backward RF output / EOC signal input
16. Mainboard power input socket	17. Status display digital tube	18. Control mode selection button
19. Parameter adjustment button UP	20. Parameter adjustment button DOWN	21. Network management responder data interface
22. Backward RF output / Backward optical emission output switch inserter	23. AC60V input	