

### SR812S Series Optical Receiver Manual



## 1. Product Summary

SR812S series are our universal CATV network optical receiver with network management responder. The pre-amp adopts all-GaAs MMIC amplify and the post-amp adopts GaAs power double amplify module (This series has two models, M model RF attenuation and equilibrium adopt the continuously adjustable design, MF model with different fixed attenuation and equilibrium inserters for user option. Users can also choose more targeted high quality modules according to actual requirements). Optimized circuit design, coupled with our years professional RF design experience, the equipment achieve high performance index. It is an ideal model for CATV network.

## 2. Performance Characteristics

- High response PIN photoelectric conversion tube.
- 1G bandwidth design.
- Ten bar LED optical power indicators, more accurately display the optical power.
- Optimized circuit design, the pre-stage adopts SMT processing, while post-stage adopts module amplify typical circuit that makes the photoelectric signal transmission more smooth.
- Power double output, high gain and low distortion.
- Optical AGC control, when the input optical power range is  $-7 \sim +2\text{dBm}$ , the output level, CTB and CSO basically unchanged.
- Can be extended with a remote network management, convenient access to the network management system.

## 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:

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 **108dB $\mu$ V**, with **9dB** output tilt, measure the **C/CTB**, **C/CSO** and **C/N**.

**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.

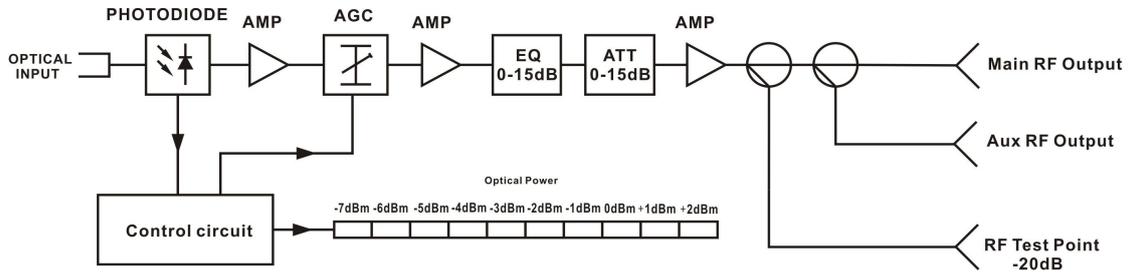
### 3.2 Technique Parameters

Item	Unit	SR812S-B	SR812SH-B	SR812SF-B	SR812SFH-B
		SR812S-B-1G		SR812SF-B-1G	SR812SFH-B-1G
<b>Optical Parameters</b>					
Receive Optical Power	dBm	-7 ~ +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			
<b>Link Performance</b>					
C/N	dB	≥ 51 (-2dBm input)			
C/CTB	dB	≥ 65			
C/CSO	dB	≥ 60			
<b>RF Parameters</b>					
Frequency Range	MHz	45~862 or 45~1000			
Flatness in Band	dB	±0.75			
Rated Output Level	dBμV	≥105(-7~2dBm)	≥108(-7~2dBm)	≥105(-7~2dBm)	≥108(-7~2dBm)
Max Output Level	dBμV	≥ 105	≥114	≥105	≥118
EQ	dB	0~15 adjustable		Fixed EQ inserter (selectable)	
ATT	dB	0~15 adjustable		Fixed ATT inserter (selectable)	
Output Return Loss	dB	≥14			
Output Impedance	Ω	75			
<b>Generic characteristic</b>					
Power Voltage	V	AC (130~265) V or AC(35~85)V			
Operating Temperature	°C	-40~60			
Consumption	VA	≤ 15			
Dimension	mm	185 (L) × 140 (W) × 91 (H)			

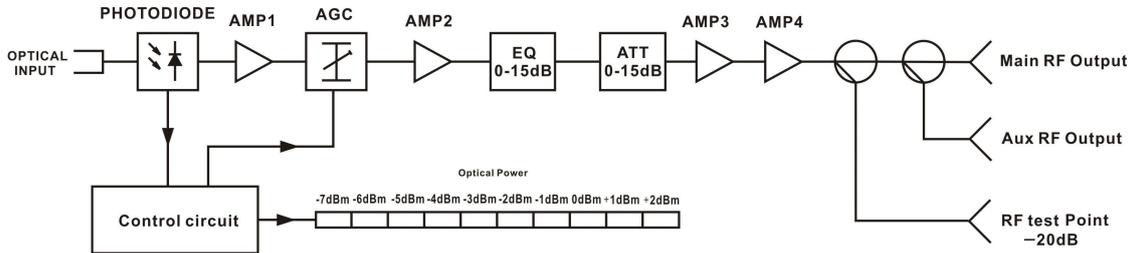
**Note :** 1. Different modules, different parameters; 2. Those have the H suffix are high level output model (SR812SH, SR812SFH); 3. This series have 862MHz and 1000MHz two bandwidths for option. Those have the “-1G” suffix are 1000MHz products.

## 4. Block Diagram

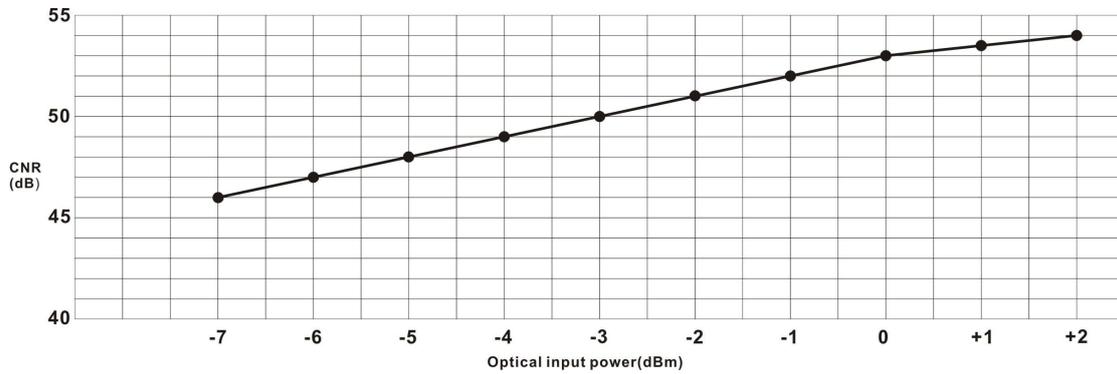
### 1. SR812S-B/ SR812SF-B/SR812SH-B



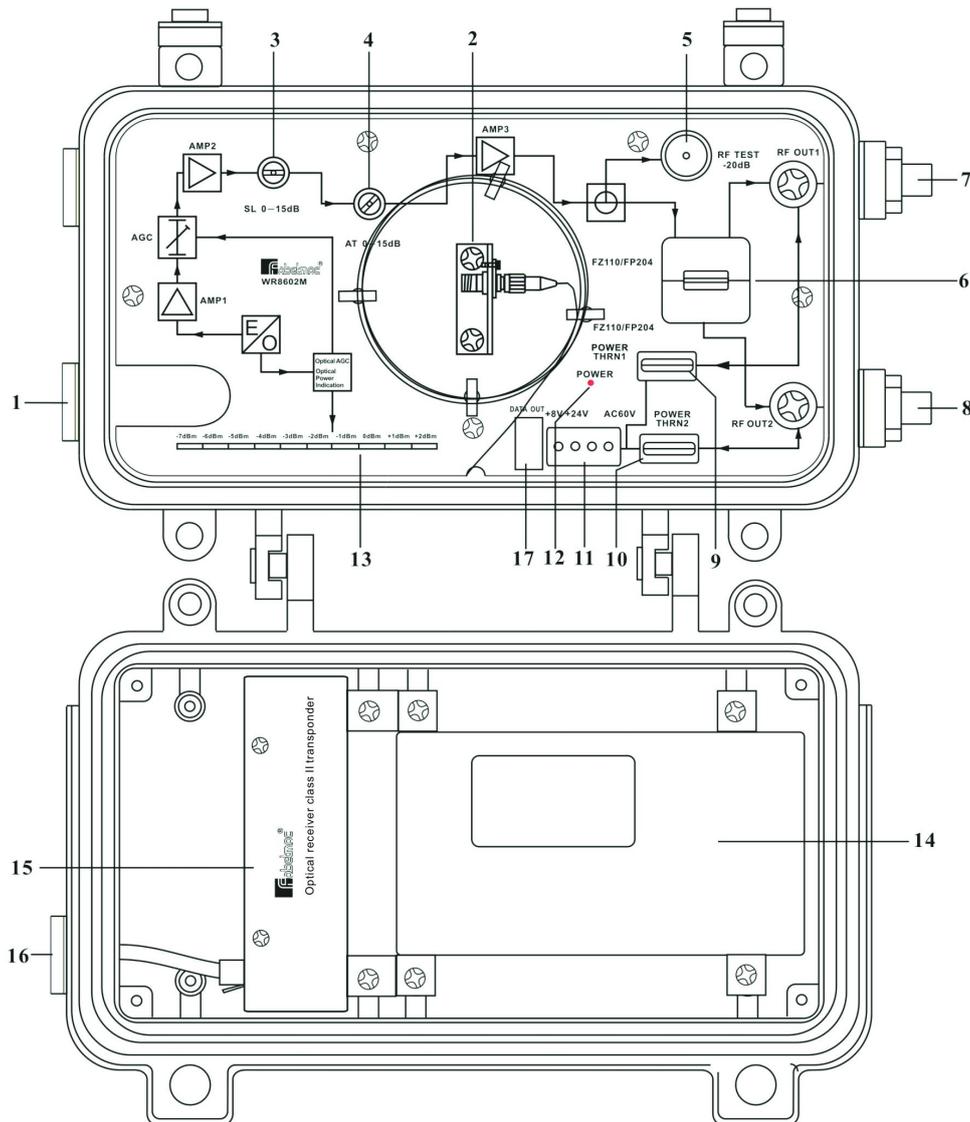
### 2. SR812SFH-B



## 5. Relation Table of Input Optical Power and CNR



## 6. Structure Diagram



1. Optical Fiber Input	2. Optical Fiber Adapter	3. M model: Adjustable EQ; MF model: Fixed EQ Inserter
4. M model: Adjustable ATT; MF model: Fixed ATT Inserter	5. -20dB RF Test Port	6. Output Tap or Splitter
7. RF Output 1	8. RF Output 2	9. Power Overcurrent Inserter 1
10. Power Overcurrent Inserter 2	11. Main Board Power Interface	12. Power Indicator
13. Optical power indicator	14. Switching power supply	15. Network Management Responder
16. Network Cable access port	17. Data interface	

## 7. Order Guide

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Product model:

## 8. Common Failure Analysis and Troubleshooting

Failure phenomenon	Failure cause	Solution
<p>After connecting the network, the image of the optical contact point has obvious netlike curve or large particles highlights but the image background is clean.</p>	<ol style="list-style-type: none"> <li>1. The input optical power of the optical receiver is too high, make the output level of the optical receiver module too high and RF signal index deteriorate.</li> <li>2. The RF signal (input the optical transmitter) index is poor.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check the input optical power and make appropriate adjustments to make it in the specified range; or adjust the attenuation of optical receiver to reduce the output level and improve index.</li> <li>2. Check the front end machine room optical transmitter RF signal index and make appropriate adjustments.</li> </ol>
<p>After connecting the network, the image of the optical contact point has obvious noises.</p>	<ol style="list-style-type: none"> <li>1. The input optical power of the optical receiver is not enough, result the decrease of C/N.</li> <li>2. The optical fiber active connector or adapter of the optical receiver has been polluted.</li> <li>3. The RF signal level input the optical transmitter is too low, make modulation degree of the laser is not enough.</li> <li>4. The C/N index of system link signal is too low.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check the received optical power of the optical contact point and make appropriate adjustments to make it in the specified range.</li> <li>2. Recover the received optical power of the optical contact point by cleaning the optical fiber connector or adapter etc methods. Specific operation methods see “Clean and maintenance method of the optical fiber active connector”.</li> <li>3. Check the RF signal level input the optical transmitter and adjust to the required input range. (When the input channels number less than 15, should higher than nominal value.)</li> <li>4. Use a spectrum analyzer to check the system link C/N and make appropriate adjustments. Make sure the system link signal <math>C/N &gt; 51\text{dB}</math>.</li> </ol>
<p>After connecting the network, the images of several optical contact points randomly appear obvious noises or bright traces.</p>	<p>The optical contact point has open circuit signal interference or strong interference signal intrusion.</p>	<ol style="list-style-type: none"> <li>1. Check if there is strong interference signal source; change the optical contact point location if possible to avoid the influence of strong interference signal source.</li> <li>2. Check the cable lines of the optical contact point, if there is shielding net or situation that the RF connector shielding effect is not good.</li> <li>3. Tightly closed the equipment enclosure to ensure the shielding effect; if possible add shielding cover to the optical contact point and reliable grounding.</li> </ol>

After connecting the network, the images of several optical contact points appear one or two horizontal bright traces.	Power supply AC ripple interference because of the bad earth of equipment or power supply.	Check grounding situation of the equipment, make sure that every equipment in the line has been reliably grounding and the grounding resistance < 4Ω.
After connecting the network, the received optical power of the optical contact point is unstable and has large continuous change. The output RF signal is unstable, too. But the detected output optical power of the optical transmitter is normal.	The optical fiber active connector types do not match, maybe the APC type connect to PC type, make the optical signal cannot normal transmission. The optical fiber active connector or adapter may be polluted seriously or the adapter has been damaged.	1. Check the type of optical fiber active connector and adopt the APC type optical fiber active connector to ensure the normal transmission of optical signal. 2. Clean the polluted optical fiber active connector or adapter. Specific operation methods see “Clean and maintenance method of the optical fiber active connector”. 3. Replace the damaged adapter.

## 9. 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 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.

## 10. After-sales service description

1. We promise: Free warranty for thirteen months (Leave factory time on product qualification certificate as the start date). The extended warranty term based on the supply agreement.

We responsible for lifetime maintenance. If the equipment fault is resulted from the users' improperly operation or unavoidable environment reasons, we will responsible maintenance but ask suitable material cost.

2. When the equipment breaks down, immediately contact local distributor
3. The site maintenance of the fault equipment must be operated by professional technicians to avoid worse damage.

**Special notice:** If the equipment has been maintained by users, we will not responsible free maintenance. We will ask suitable maintenance cost and material cost.