



Optical Receiver Manual

OP-OR212JSE



Shenzhen Optostar Optoelectronics Co., Ltd

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1. Summary

OP-OR212JSE optical receiver is the latest 1GHz dual-way switch optical receiver. With wide range receiving optical power, high output level, low power consumption and compact structure, easy to install. It is the ideal equipment to build the high-performance NGB network.

2. Features

- Adopt advanced optical AGC technique, optical AGC control range: +2dBm~-9/-8/-7dBm adjustable;
- Two-way optical signal received, back up each other, can automatic switch according to the pre-set switching threshold, and can also manual forced switch;
- Forward working frequency extended to 1GHz, RF amplifier part adopts the high performance low power consumption GaAs chip, the maximum output level up to 116 dB μ V;
- EQ and ATT both use the professional electric control circuit, make the control more accurate, operation more convenient;
- Built-in the Ethernet responder, support remote network management (optional);
- The optical output port and network management interface are external or internal (optional);

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 **-1dBm**, the RF output level is **108dB μ 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 **-1dBm**, 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

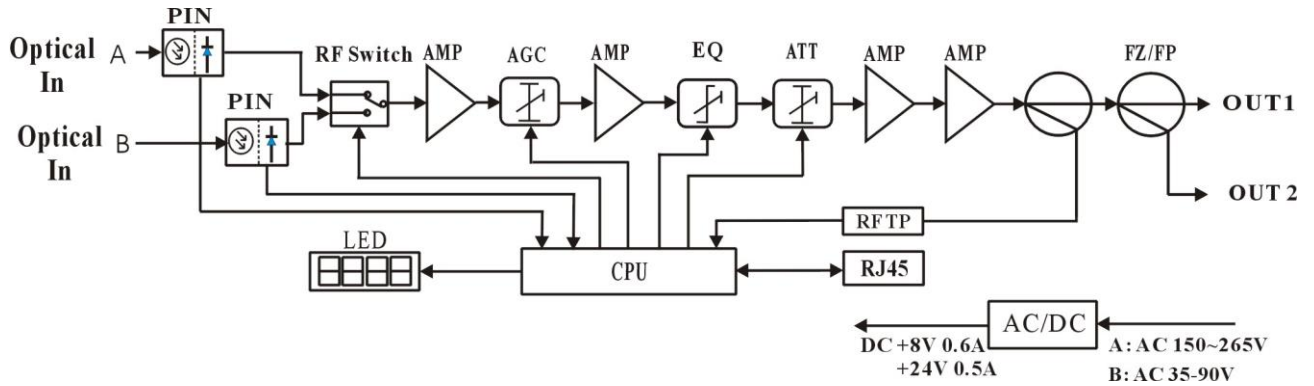
practical engineering application to improve the nonlinear index (under the node) of the cable system.

3.2 Technique Parameters

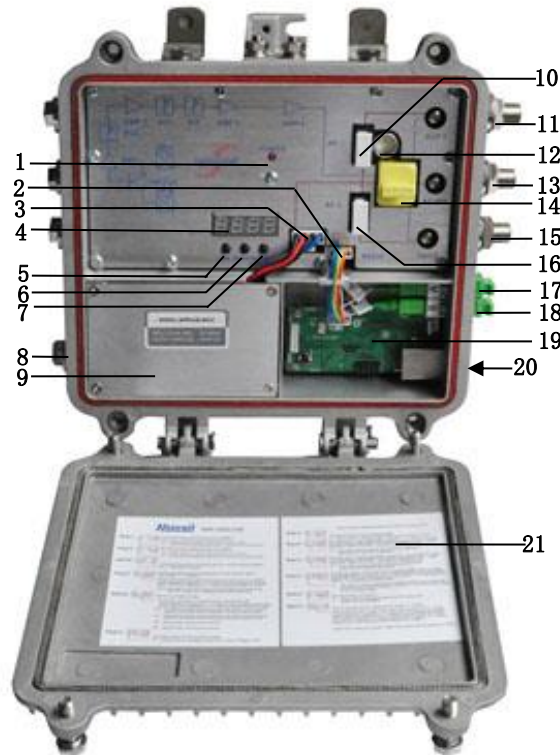
Item	Unit	Technical Parameters	
Optical Parameters			
Receiving Optical Power	dBm	-9 ~ +2	
Optical AGC Control Range	dBm	+2 ~ -9/-8/-7 (adjustable)	
Optical Return Loss	dB	>45	
Optical Receiving Wavelength	nm	1100 ~ 1600	
Optical Connector Type		SC/APC or specified by the user	
Fiber Type		Single mode	
Link Performance			
C/N	dB	≥ 51	EQ 8dB, Output level 108 dBμV (FZ110)
C/CTB	dB	≥ 67	
C/CSO	dB	≥ 62	
RF Parameters			
Frequency Range	MHz	45 ~862/1003	
Flatness in Band	dB	±0.75	
Rated Output Level	dBμV	≥ 108	
Max Output Level	dBμV	≥ 112 (-9 ~ +2dBm Optical power receiving)	
		≥ 116 (-7 ~ +2dBm Optical power receiving)	
Output Return Loss	dB	≥16	
Output Impedance	Ω	75	
Electrical control EQ range	dB	0~15	
Electrical control ATT range	dBμV	0~15	
General Characteristics			
Power Voltage	V	A: AC (150~265) V B: AC (35~90) V	
Operating Temperature	℃	-40~60	
Consumption	VA	≤14	
Dimension	mm	220 (L) * 205 (W) * 65 (H)	

Note: The forward RF indexes above are tested when adopt NEC module. Use other module, the indexes will be a little different.

4. Block Diagram



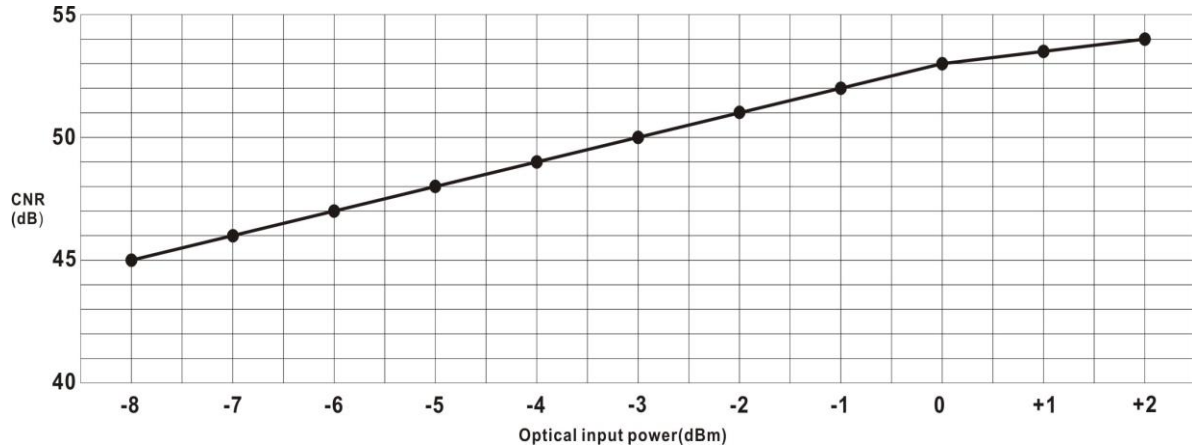
5. Structure Description



1	Working indicator	2	Transponder connecting wire	3	Power interface
4	LED digital display tube	5	Enter key	6	Down key
7	Up key	8	AC220V input port (when AC220V power supply)	9	Switching power supply
10	AC60V power-pass inserter port	11	OUT 1	12	-20dB test port (A channel)
13	AC60V feed port	14	FZ110 or FP204	15	OUT2
16	AC60V power-pass inserter port	17	A channel optical receiving port (or internal, optional)	18	B channel optical receiving port (or internal, optional)

19	Transponder	20	RJ45 interface (or internal, optional)	21	Menu operating instruction
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6. Relation Table of Input Optical Power and CNR










7. Function Display and Operating Instruction

Mode: Mode selection button, total twelve modes, press the mode selection button to enter the corresponding status display, twelve modes to cycle.

The following is the detailed instructions:

- Mode1:**  A channel input optical power (unit dBm)
Lo : Means that the A channel optical power is low or none
! : Means that the displayed data is the A channel input optical power
- Mode2:**  B channel input optical power (unit dBm)
Lo : Means that the B channel optical power is low or none
2 : Means that the displayed data is the B channel input optical power
- Mode CH:**  The actual operating channel under the current network system.
CH: Operating channel
- Mode F:**  Set the automatic switching threshold of A/B channel (dBm)
 (Set range +1 ~ -12dBm)
 Means the automatic switching threshold of A/B channel is -6dBm
 If need adjustment, press the ▲ or ▼ button for a few seconds until the data flicker. Then can be adjusted by ▲ or ▼ button and press "Mode" to confirm.
 Note: This menu work only under the automatic switching mode, not work under the manually force switching mode
- Mode Sl:**  Switching mode setting
 Means the automatic A channel priority switching mode
 If need adjustment, press the ▲ or ▼ button for a few seconds until the letter flicker. Then can be adjusted by ▲ or ▼ button and press "Mode" to confirm.
AF : Automatic A channel priority switching mode: When A and B channels signal are both larger than the threshold, default A channel priority.
bF : Automatic B channel priority switching mode: When A and B channels signal are both larger than the threshold, default B channel priority.
A : Manual mode, forced to the A channel;
b : Manual mode, forced to the B channel;

- Mode3:**  The actual value of +8V working voltage
3: Means that the displayed data is the actual voltage of +8V
- Mode4:**  The actual value of +24V working voltage
4: Means that the displayed data is the actual voltage of +24V
- ModeE1:**  RF equilibrium, if need adjustment, press the ▲ or ▼ button for a few seconds until the data flicker. Then can be adjusted by ▲ or ▼ button and press "Mode" to confirm. The maximum range is 15dB.
E1: EQ mode, means that the controlled and displayed data is the RF channel equilibrium.
- ModeA1:**  RF attenuation, if need adjustment, press the ▲ or ▼ button for a few seconds until the data flicker. Then can be adjusted by ▲ or ▼ button and press "Mode" to confirm. The maximum range is 15dB.
A1: ATT mode, means that the controlled and displayed data is the RF channel attenuation.
- Mode C:**  The actual number of channels enter into the current network system. If need adjustment, press the ▲ or ▼ button for a few seconds until the data flicker. Then can be adjusted by ▲ or ▼ button and press "Mode" to confirm. The maximum number is 200.
C: The menu is used to display the actual number of channels enter into the current network system, in order to calculate the RF output level more accurately.
- Mode5:**  RF output level (unit dBuV)
5: Means that the displayed data is the RF output level under the current system.
- ModeAC:**  AGC range adjustment (adjustment range -7~-9dBm)
Means that the AGC range under the current system is +2~-9dBm
If need adjustment ,press the ▲ or ▼ button for a few seconds until the data flicker. Then can be adjusted by ▲ or ▼ button and press "Mode" to confirm.
For example, adjust to -7, means that the AGC range is +2~-7 dBm;
adjust to -8, means that the AGC range is +2~-8 dBm;

Note: AGC range per reduce 1 dBm, the output level is raised by 2 dBuV.

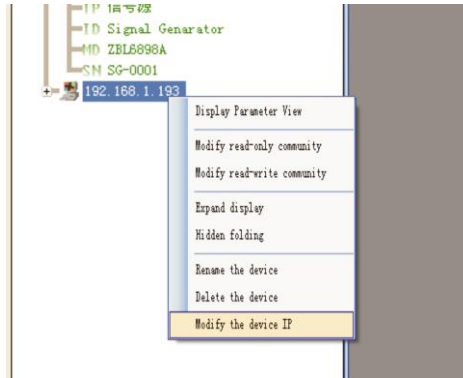
8. NMS setup instructions

If users configured the network management responder, need to do the following settings:

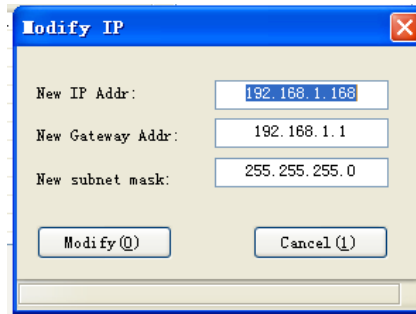
Responder IP setup instruction:

Network management directly modify:

1. Default IP is 192.168.1.168, default gateway is 192.168.1.1, default subnet mask is 255.255.255.0
2. Connect the computer and responder (can be direct connected), and change the computer IP to 192.168.1.XXX (XXX is any number from 0 to 255 except 168); start upper computer network management software, then search the device and log in.
3. Right-click device icon and choose modify the device IP.



4. Enter new IP address, gateway and subnet mask.



5. Click modify, then exit, it is done. There will show new IP address and gateway on operational logbook.

Log Number	Log Type	Log Contents	Login time
1752	ChangeIPAddress	Modify equipment192.168.1.168 IP address: New IP: 192.168.1.167;New gateway:192.168.1.1	2009-9-9 12:39:03

6. Reboot the responder, the new IP take effect (Click the reboot button in the network management software or power on again)



9. Common Failure Analysis and Troubleshooting

Failure phenomenon	Failure cause	Solution
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<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"> 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. 2. The RF signal (input the optical transmitter) index is poor. 	<ol style="list-style-type: none"> 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. 2. Check the front end machine room optical transmitter RF signal index and make appropriate adjustments.
<p>After connecting the network, the image of the optical contact point has obvious noises.</p>	<ol style="list-style-type: none"> 1. The input optical power of the optical receiver is not high enough, results in the decrease of C/N. 2. The optical fiber active connector or adapter of the optical receiver has been polluted. 3. The RF signal level input the optical transmitter is too low, make modulation degree of the laser is not enough. 4. The C/N index of system link signal is too low. 	<ol style="list-style-type: none"> 1. Check the received optical power of the optical contact point and make appropriate adjustments to make it in the specified range. 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”. 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.) 4. Use a spectrum analyzer to check the system link C/N and make appropriate adjustments. Make sure the system link signal C/N > 51dB.
<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"> 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. 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. 3. Tightly closed the equipment enclosure to ensure the shielding effect; if possible add shielding cover to the optical contact point and reliable grounding.
<p>After connecting the network, the images of several optical contact points appear one or two horizontal bright traces.</p>	<p>Power supply AC ripple interference because of the bad earth of equipment or power supply.</p>	<p>Check grounding situation of the equipment, make sure that every equipment in the line has been reliably grounding and the grounding resistance must be < 4Ω.</p>

<p>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.</p>	<p>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.</p>	<ol style="list-style-type: none"> 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.
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10. 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 pull 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 connect 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 pull 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 pull 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.

11. 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 or directly call our technical support hotline 86-0755-26400198
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.

Contact OPTOSTAR

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