

GPS over Fiber Timing Distribution System

OS Series



Remote unit(OS208R)



Local unit(OS208L)

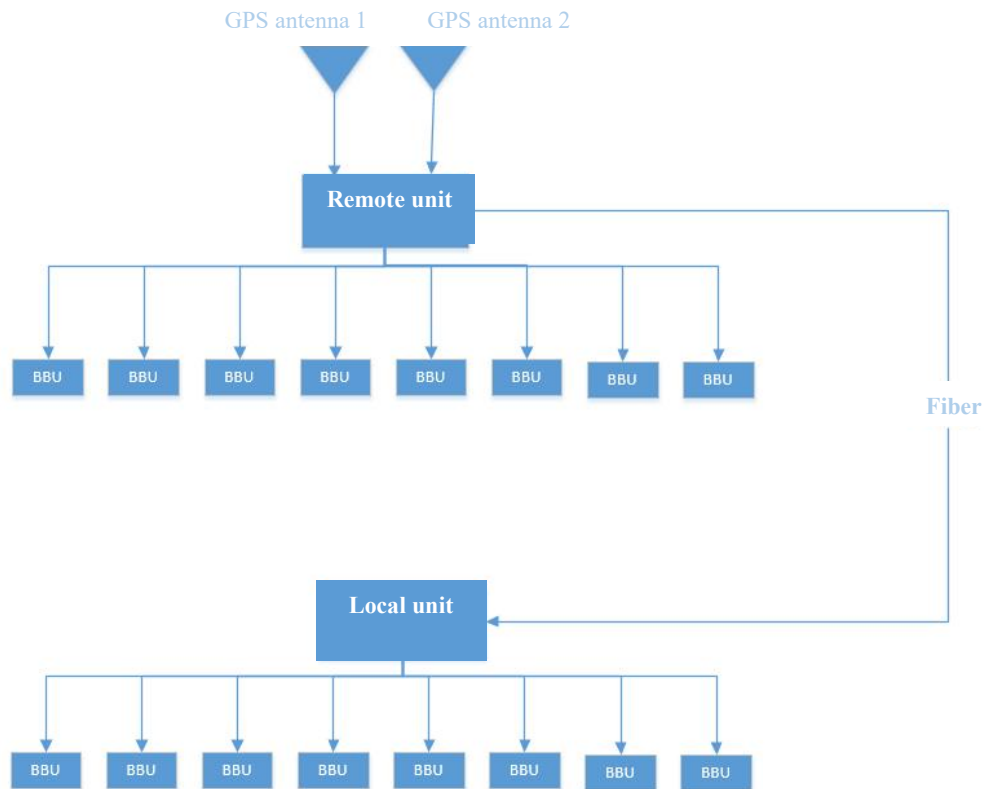
Product Introduction

This system consists of Remote unit and near-end host. The Remote unit receives input through two ends and possesses 1 to 8 optional optical fiber interfaces through which signals are transmitted to near-end hosts. The Local unit outputs signals to GPS device through 1-8/16 ports. The satellite signals received by Local unit from the Remote unit through optical fiber are amplified and distributed to the output ports, which, at the same time, offer GPS signals to 8/16 ports. After entering GNSS signal system management terminal and setting IP, this system can display the connection status of each port, number of visible GPS satellites and C/No value, number of visible Beidou satellites and C/No value, position, etc.

The system averagely distributes the signals received by active GPS receiving antennas to 8-way output ports and supplies them to GPS receiving equipment. With gain of 30dB and dual antennas for the far-end host, the system integrity is guaranteed. In this application solution, the system can configure its output port as DC output port for supplying power to active GPS antennas that are connected to the input port. Other output ports will have a 200 Ohm DC load for simulating the DC loss of any receiver antenna connected to those ports.

Optical fiber interface is used as an independent interface for signals transmission between Remote unit and Local unit via optical fibers.

System connection



Basic Features:

- ✧ Dual antennas, auto and manual switching function (far-end host);
- ✧ Gain: 30dB fixed gain;
- ✧ Status monitoring and alarm of antennas and output ports;
- ✧ Standard configuration of far-end host: 1 optical transmitting port (maximum optional 8);
- ✧ Standard configuration of near-end host: 1 optical receiving port;
- ✧ ((Near-end host) 2-way dry contact alarm function (RJ45 interface);
- ✧ (Far-end host) 4-way dry contact alarm function (RJ45 interface);
- ✧ Buzzer alarm function;
- ✧ Standard configuration of output port: 8 ports (12/16 ports optional);
- ✧ Real-time display of information of GPS/Beidou2 B1
- ✧ Dual 48V DC power supply support;
- ✧ Software management, network management and monitoring;
- ✧ Support LNA backup and testing;
- ✧ Long-distance optical fiber transmission of signals;

Electrical parameters Working temperature: -20 to 65°C; storage temperature: -30 to 80°C

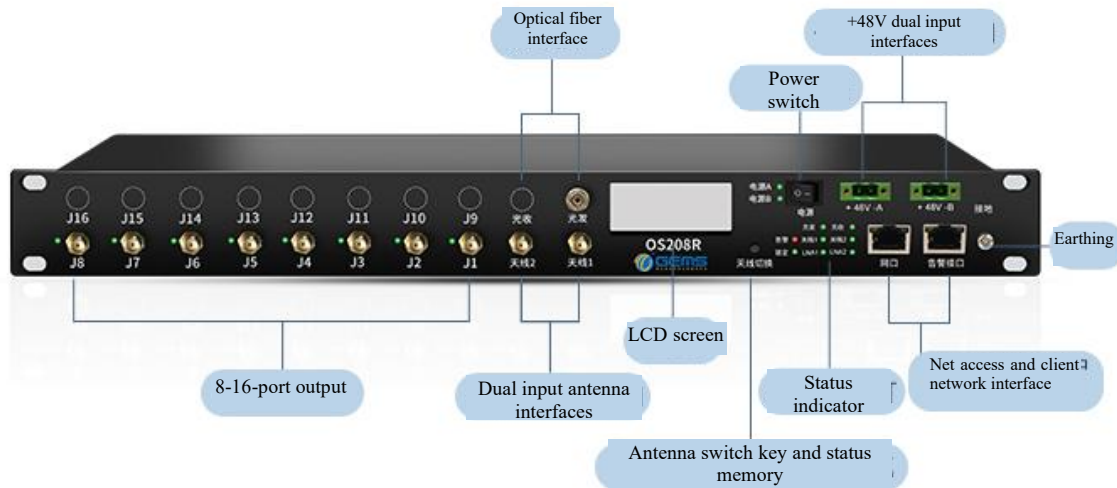
Parameter		Specification	Min.	Nominal	Max.	Unit
Frequency range		Antenna - Any port (far-end port)	1557.5		1587.5	MHz
I/O impedance		Input, all output ports		50		Ω
Gain	30dB	Input -output, unused port - 50 Ω load	30			dB
Input voltage standing wave ratio (far-end host)		All ports - 50 Ω load			1.5:1	-
Output voltage standing wave ratio		All ports - 50 Ω load			1.5:1	-
Noise factor					4	dB
Pass band ripple		Antenna - any port, unused port - 50 Ω load			3	dB
Maximum output power		Antenna - any port, unused port - 50 Ω load			-30	dBm
Frequency error				5		$\times 10^{-8}$
Out-of-band spurious		9KHz - 150KHz			-36	dBm /100KHz
		150KHz - 30MHz			-36	
		30MHz - 1GHz			-36	
		1GHz - 12.75GHz			-30	
DC input		DC blocking, output port has a 200 Ω load		5		VDC
		Dual DC 48V	39	48	57	Opt
Current		Remote unit		150	200	mA
Current		Local unit		80	100	mA

Optical wavelength	Sending	1310		nm
	Receiving	1100~1620		nm
Optical fiber transmission distance			60	Km
Optical Power	Sending		8	dBm
Optical Power	Receiving	-30		dBm

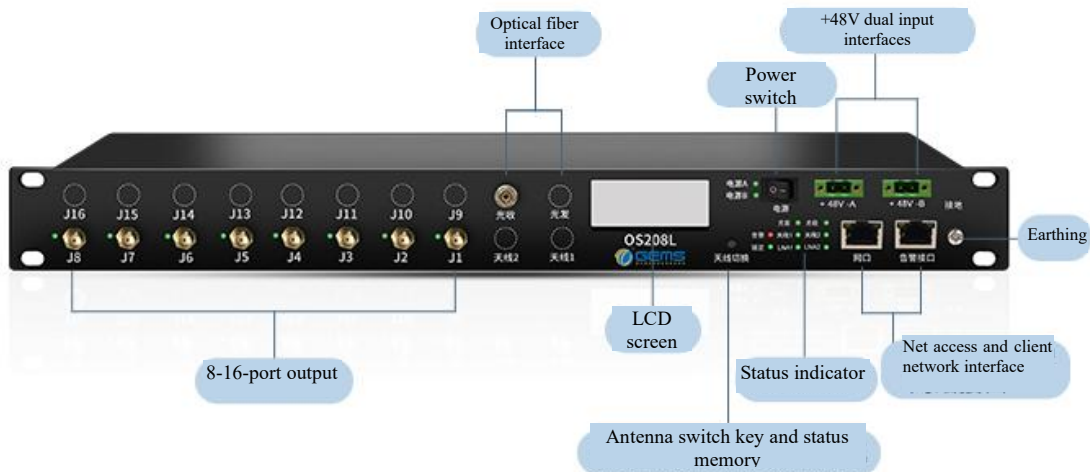
Performance Index

No.	Function	Description	Remarks
1	Compatibility of timing system	Support two timing systems: Beidou/GPS and able to automatically switch to another timing system in case of fault of any system, and manual intervention is not required.	
2	Load capacity	Can connect up to 8/12/16 BBUs normally	
3	Expandability	With full configuration (one 16-port host +16 slaves), the equipment supports maximum 256 synchronous signal ports of BBU.	
4	Antenna fault testing function of far-end host	Step 1: Plug in the antenna of channel 1 and then the device indicator on the antenna 1 will be normally on; step 2: pull out the antenna on channel 1 and then the indicator on antenna 1 will be off. When the above operation requirements are satisfied, the antenna runs normally; otherwise, antenna fault is judged; the operation method of channel 2 is same to that of channel 1.	
5	Working status indicator	The equipment can indicate the onsite working status via the indicator, reflect whether the main circuit and the standby circuit run normally and send alarm for fault.	
6	Dry contact alarm function of Remote unit	Provide 4-way dry contact alarm signals and support power failure alarm. Prompt alarm information to the network management center, covering: Antenna 1, antenna 2, power supply, host output.	
	Dry contact alarm function of Local unit	Provide 2-way dry contact alarm signals and support power failure alarm. Prompt alarm information to the network management center, including: Power supply, host output.	
7	Buzzer alarm function	Prompt fault of this machine by sound and the fault alarm sound can be turned off manually.	
8	Network management and monitoring function	Mainly used to monitor the working status of this machine on the network management server.	
9	Positioning information indication	The equipment can indicate the positioning information of main circuit, e.g. the longitude and latitude, by LCD.	
10	BBU connection indication function	After BBU device is connected to the system interface, the system can automatically indicate that the device is connected and runs normally.	

11	Output port connection indication function	With host output port connection indication function, this equipment can respectively reflect the connection status of host output port to BBU and slaves and the suspension status through indicators.	
12	LNA testing	Two independent low noise amplifiers (LNA) are available inside the host. In case of fault of any LNA, the equipment runs normally. The indicator is normally on when LNA runs normally or off in case of LNA fault.	
13	Time source self-timing	With internal self-timing function, the equipment can implement self-timing of time source when external GPS satellite time source is disabled.	
15	Sending and receiving remote optical signals	Realize remote transmission of signals in km and lower down the level of difficulty in cabling.	



Remote unit



Local unit

Operating Instructions

This system supports dual+48V power supply. After power on, the indicators of power supply A and power supply B light on. Two input ports of Remote unit are connected to GPS antennas. Upon successful connection, antenna 1 and antenna 2 indicators are on. The optical fiber interface is round FC-APC interface. When the optical fiber module runs normally, the optical transmitting indicator light is on and the 8/12/16 output ports can be connected to BBU or GPS device. When the output port is connected to each BBU device, corresponding output indicator is on. When the satellite signal is locked, the lock indicator lights up. RJ45 network interface can be connected to client and client's PC so that operator can view the equipment connection state and change the equipment state in real time via the client. Equipment alarm is realized through the alarm interface. After the equipment is connected, either antenna 1 indicator or antenna 2 indicator will flash, indicating the antenna is in service. The key "Switch" can be used to switch between two antennas and it has automatic and manual mode. Under automatic mode, the system automatically selects the antenna with stronger signals. In manual mode, press down the key to select the antenna for running manually. Operator can view the basic parameters of running antenna and equipment on the LCD screen.

① Power supply: Support dual 48V power supply and adopt dual power supply modules design. In the event of fault of any power supply module, standby module can be used to guarantee the normal running of equipment; the equipment provides burn-proof function so that the equipment parts won't be burned out if the positive pole and negative pole of power supply are reversely connected.

②

Antenna switch: Remote unit supports antenna switching by the antenna switch button, alarm reset and memory function. By long-pressing the key, the connection status of existing device ports are recorded. In case of device alarm, long-press the key to reset the device manually. Local unit only supports memory and alarm function.

③

Alarm: Red alarm light will flash all the time unless two power supply units and two antennas are connected properly. Only after power supply and antennas are connected properly, the alarm light can be disabled by pressing down the antenna switch button for 5s.

④

Satellite lock indicator: When a satellite is locked, the satellite lock indicator is normally on.

⑤ Optical fiber indicator: The indicator is on, indicating the optical fibers are in normal use; the indicator is off in case of optical fiber fault.

⑥ Antenna indicator: When two-way antennas are connected normally, corresponding indicator will be normally on.

⑦

LNA indicator: When it is on, it indicates that LNA functions normally; when it is off, it means fault of LNA function and it's required to check if device output is short circuited.

⑧Network management alarm interface: Connect network management through RJ45 network interface to monitor the device; RJ45 interface is dry contact interface through which the device sends alarm for fault.

Antenna selection and status display:

Select antenna mode actively: Select “Auto” or other antenna mode. The indicators on the panel will indicate the operation mode. If “Auto” mode is selected, the “Antenna 1” flashes green while the Antenna 2 is normally on; it’s same when “Antenna 1” mode is selected, the “Antenna 1” flashes green and the Antenna 2 is normally on; when “Antenna 2” mode is selected, “Antenna 2” green light flashes and “Antenna 1” is normally on; antenna mode can be selected by pressing keys on the device front panel. Press down the key “Antenna Switch” to switch between three antenna modes alternately. The LCD will display the antenna mode in use. When the optical module runs normally, you can check whether the optical module runs normally via the LCD screen or corresponding indicator. If the indicator is on, it means the module runs normally.



If antenna encounters open circuit or short circuit, the green light of “Satellite lock” on the front panel will be off and the red “Alarm” light flashes, giving warning. If the memory output port (BBU or slave) is disconnected, the red light on the front panel flashes and buzzer sends alarm sound.

Alarm: The red alarm light device will flash all the time unless two power supply units and two antennas are connected properly. Only after power supply and antennas are connected properly, the alarm light can be disabled by pressing down the antenna switch button for 5s.

Antenna indicator: When the lock indicator lights on, it means the satellite has been locked; when the antenna 1 indicator flashes, it reflects that antenna 1 is in use; it’s also same to antenna 2. The device LNA functions normally when the LNA indicator is on; when the indicator is off, it indicates LNA fault.

Alarm light is on when no device is connected to the antenna output port



4-way Dry Contact Alarm Function (Far-end Host)

Power supply alarm: When the power supply is connected normally, pin 1 and pin 2 are closed. In case of open circuit or short circuit of any power supply, pin 1 and pin 2 are disconnected.

Output port alarm: The alarm of output port takes effects only with memory. After output port is connected normally, pin 1 and pin 3 are disconnected. If any port is disconnected or short circuited, pin 1 and pin 3 are closed.

Antenna port alarm: When antenna 1 is connected normally, pin 1 and 4 are disconnected; if the antenna 1 is disconnected or short circuited, pin 1 and pin 4 are closed; when antenna 2 is connected normally, pin 1 and pin 5 are disconnected; in the event of disconnection or short circuit of antenna 2, pin 1 and pin 2 are closed.

Definition of dry contact alarm function

Pin	Definition
1、8 1, 8	COM (common terminal)
2	Power alarm
3	Output port alarm
4	Antenna 1 alarm
5	Antenna 2 alarm

2-way dry contact alarm function (Near-end host)

Power supply alarm: When the power supply is connected normally, pin 1 and pin 2 are closed. In case of open circuit or short circuit of any power supply, pin 1 and pin 2 are disconnected.

Output port alarm: The alarm of output port takes effects only with memory. After output port is connected normally, pin 1 and pin 3 are disconnected. If any port is disconnected or short circuited, pin 1 and pin 3 are closed.

Definition of dry contact alarm function

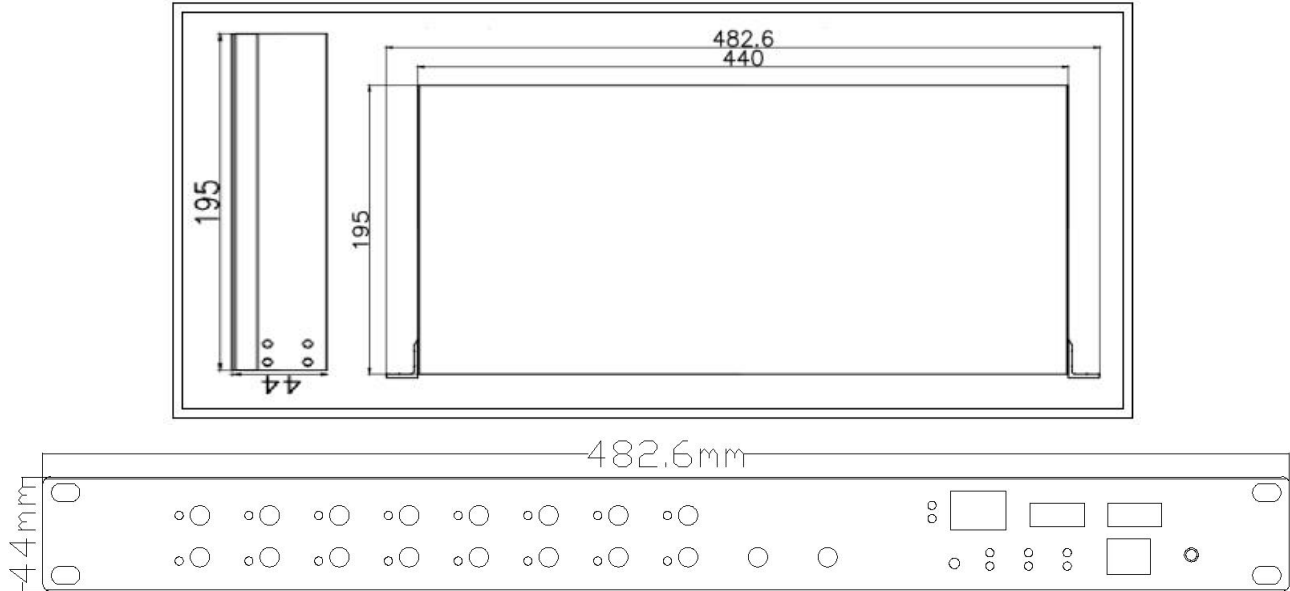
Pin	Definition
1、8 1,8	COM (common terminal)
2	Power alarm
3	Output port alarm

Common Faults Troubleshooting

Fault	Cause	Handling Method
Alarm light flashes	Device interface is disconnected and fault is not reset	Check if antenna power interface is connected successfully, if the output is normal. Long press the key to reset the fault.
Antenna indicator is off	Poor connection of antennas	Check if antennas are connected properly and if the interface is in good contact.
LNA light is off	Short circuit of input port	Check the antenna input port and antennas for short circuit
Buzzer alarm	No reset after eliminating fault	Long press the Reset key.

Product Dimensions

Device dimensions: 482.6mm × 195mm × 44 mm (D*W*H)



(Remote unit and Local unit are of same dimensions)

Ordering Informations

OS208-L-X

Blank: One optical ports;
2: 2 Optical ports ;
4: 4 Optical ports;

R:Remote unit;
L: local unit
RL: Reapter unit,

208: 2 antennas ports, 8 outputs RF ports;
212: 2 antennas ports, 12 outputs RF ports;;
216: 2 antennas ports, 16 outputs RF ports;