

GPON OLT FD1508GS

GPON Optical Line Terminal Equipment

Installation User Manual

V.1.0

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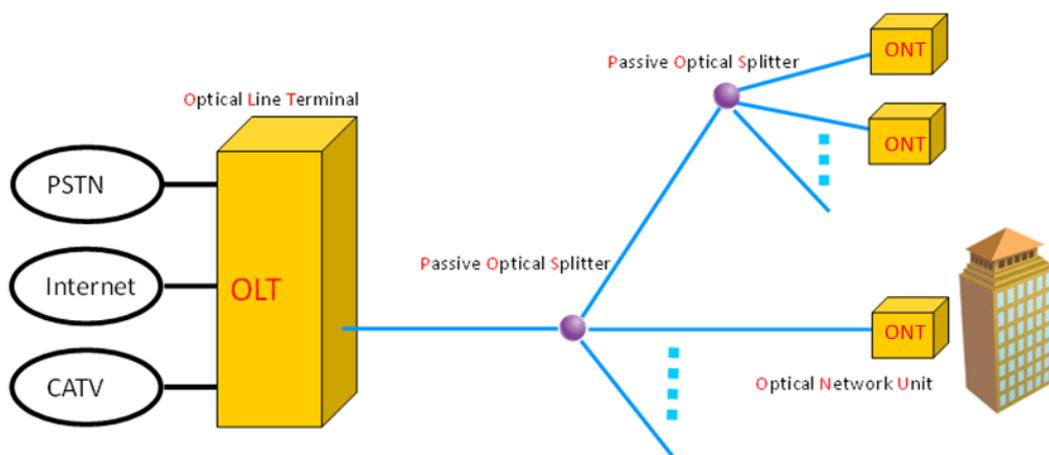
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1 Product Introduction

1.1 Brief Introduction

C-DATA presents the industry's leading GPON solution of FD1508GS, which complies with the relevant standards of ITU G.984.x and FSAN. FD1508GS is 1U Rack mount equipment, 8pon ports, 8 GE uplink optic ports, 8 GE uplink electric ports. The maximum optical coupling ratio of 1:128, up to 1024 GPON ONTs. The down link band width is 2.5Gbps and uplink bandwidth is 1.25Gbps. The product is in compact design and convenient for flexible using, easy to deploy with high performance. It can meet the requirements of equipment performance and compact volume of the room environment. It can also satisfy the requirements of the access network and enterprise network that enhancing the network function, improving the reliability and reducing power consumption. The product is suitable for the "triple play" service, the resident of optical access network, video surveillance network, enterprise network and the Internet of the network applications.



FD1508GS in GPON system

1.2 Functional Features

Comply with ITU-T G.984/G.988 standards and China's Telecom industry GPON standards

Support OMCI remote management of ONT/ONT, compatible with ITU-984.4 OMCI protocol

Standalone 1U 8PON compact design of OLT products

FD1508GS provides 8 GPON ports, 8 uplink GE optical ports + 8 uplink GE electric ports, 10 Gigabit card expansion slot provides 2*10Gigabit SFP+ uplink port. Each PON port supports 128 ONT, total 1024 ONT for one chassis. Support dual power supply redundancy, 220VAC and -48VDC mixed.

The complete layer 2 switching function

OLT is with powerful layer 2 switching capacity and complete layer 2 protocol. Supporting with the exchange, isolation and One By One working mode. Supporting port aggregation, VLAN, port speed, queue technology, flow control technology and ACL rich two layer function. Offering the technical support for the development of the multi-service fusion.

The QoS security

GPON products is with complete DBA function and excellent ability of QoS service. DBA provides a variety of QoS for the GPON system by means of four types of bandwidth and five types of T-CONT. It can meet different business flow of time delay, jitter and packet loss rate of different QoS requirements.

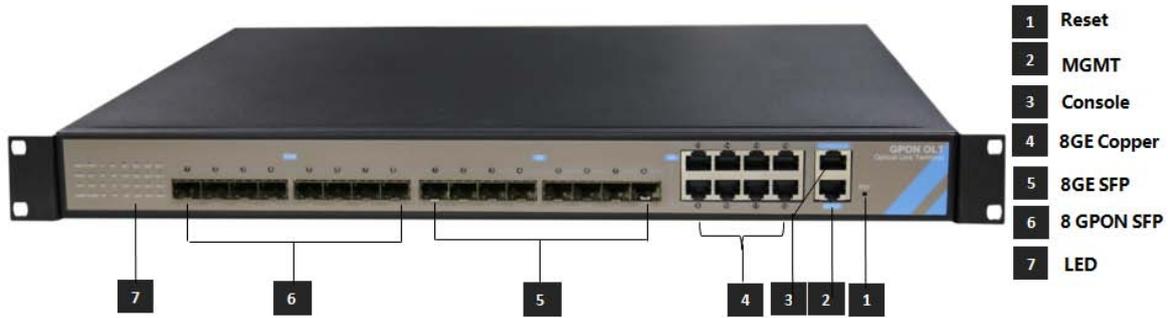
Easy-to-use management system

Support CLI management. complying with OMCI standard. Realizing the business management through OMCI channel protocol, including the ONT function parameters, type and number of T-CONT business, QoS parameter, configuration request information and performance statistics, automatic notification running event system, the realization of OLT on ONT configuration, fault diagnosis, performance and security management.

1.3 Appearance and Interface

The FD1108S 1U high Pizza-Box, can be mounted into the standard 19" rack. Demission of machine frame: 440mm(L)*391mm(W)*44mm(H).

As shown below:



Front View of FD1508GS

see the following table:

Item		Specification
Chassis	Slots	1*10 Gigabit uplink card slot 2 power module slot
	Uplink Port	
	Copper	8*10/100/1000M auto-negotiable
	SFP	8 SFP slots (1000BASE-TX interface)
	10 Gigabit card	2 SFP (optional)
PON Port	QTY	8
	Physical Interface	SFP Slots
	Connector Type	ITU-TG.984.2Class B+ or ITU-TG.984.2Class C+
	Max splitting ratio	1:128
Management Ports		1 MGMT port 1 CONSOLE port
Reset		Reset OLT equipment

Please refer to Table about LED and button on the front panel of OLT .

Type	Identification	Status	Indication
Power supply indicator	PWR n (n = 1/2)	Green , Always ON	Normal Power supply
		OFF	Power supply is unconnected or breaks down
System status	SYS	Flash per second	System normally operate
management port	MGMT	Green , Always ON	Management port is connected
		OFF	Management port isn't connected
10 Gigabit Uplink Card	S_PRS	Green , Always ON	10 Gigabit Uplink Card installed
		OFF	10 Gigabit Uplink Card uninstalled
PON port indicator	P n (n=1/2/3/4/5/6/7/8)	Flash	There is communication data at GPON port(n)

		Green , Always ON	There are ONT register on OLT port(n) and the optical fiber link is normal.
		OFF	NO ONT link with the OLT port(n)
Uplink port indicator	GE n (n=1/2/3/4/5/6/7/8/9/ 10/11/12/13/14/15/16)	Flash	There is the communication data at the uplink port(n)
		Green , Always ON	The uplink port(n) is connected
		OFF	The uplink port(n) isn't connected
Alarm	ALARM	Always ON	One fan doesn't work
		Slow Flash	Two fan doesn't work
		Fast Flash	More than three fan doesn't work
		OFF	All the fan work



Back View of FD1508GS

Item	Specification
Grounding Terminal	One, it's in the left of the front panel and is used to grounding for machine frame
10 Gigabit Uplink Card	Support Pluggable type 10 Gigabit uplink card, two 10 Gigabit uplink port, optional
Power module	Support Pluggable type two power module. You can chose AC or DC power supply, optional

2 Pre-Installation Preparation

2.1 Power Requirement

The input voltage must be stable, no EMI noise and distortion.

When use DC power supply, the input voltage is -48VDC, the allowed range is -36 ~ -72 VDC.

When use AC power supply, the input voltage is 110/220VAC, the allowed range is 90 ~ 264VAC.

Note: Follow all security specification and the rule about the electricity in the locality or the building. All power supply must be legal.

2.2 Equipment Ground

The grounding body must be configured in the machine room, the grounding resistance value is less than 1Ω . It can be realized by layout of the anti-static copper mesh.

2.3 Room Design Requirements

The environment of the equipment operation has a very big effect on its long-term reliable operation. Room design requests to up to the following standards:

- The device allows room temperature is $0^{\circ}\text{C} \sim 40^{\circ}\text{C}$. To ensure that equipment works in the normal temperature environment (25°C or so), should try to make the equipment away from the main heat source (such as power supply, etc.), if the environment temperature is higher than 40°C , should try to improve the ventilated condition of the room, such as install fan in the frame or air conditioning in the room. The ventilation pipe in the room should be swept clean and ventilated, etc.;
- There must be the good cable wiring and go line space in the room. Cable and optical cable wiring (including fiber splicing work) are already in place.
- The related humidity $10\% \sim 95\%$, No condensation, no frost;
- The dust particles density with more than $5\mu\text{m}$ in diameter $\leq 3.0 \times 10^4/\text{m}^3$; Dust particles is a non-conductive, the non-magnetic and the non-corrosive;

3. Hardware Installation

3.1 Open package and checkout

According to the packing list or supply contract, check and verify the goods, if any component is loss, wrong or damaged, please contact with your customer manager.

The list includes the following content normally:

- 1 OLT Machine(1 Pcs)
- SFP modules are ordered according to user requirement
- AC power line or DC power line according to user requirement
- RJ-45-to-DB-9 console cable

3.2 Pre-installation Preparation

Verify the following working environment and installation requirements

1 Power Supply Requirement:

- DC power supply: -48V DC , the allowed range: $-36\text{VDC} \sim -72\text{VDC}$
- AC power supply: $110/220\text{V AC}$, the allowed range: $90 \sim 264\text{VAC}$

- 2 The equipment should be equipped in the dry, cool place, at least have 10 centimeters at both sides for the ventilation space.
- 3 Avoid the direct light, far away from the heat source or the place with the stronger electromagnetic interference
- 4 If want to install OLT inside the rack, ensure that have the necessary mounting screws and nuts and necessary tools.
- 5 Check the required cable and connectors for installation
- 6 In the system management, need connect the following equipment with OLT:
 - A management platform, such as PC
 - RJ45/DB9 RS232 Console line

3.3 OLT Installation

OLT can be put in the bigger horizontal surface or within the standard EIA 19 " rack.

3.3.1 Plane stack installation

Step I: Pre-Installation Validation

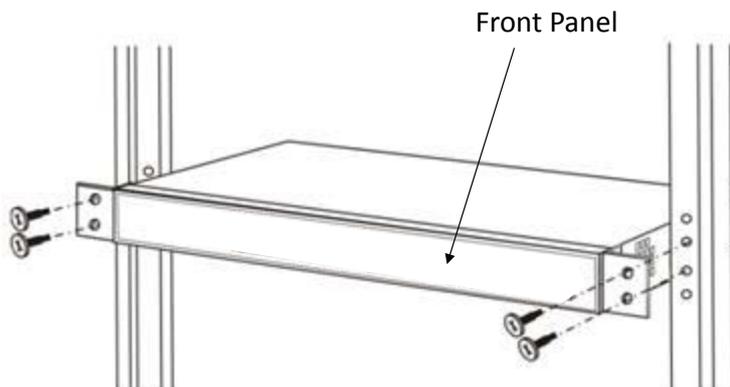
- Ensure the worktable is strong enough to support the weight of the device and cables.
- Ensure no obstacles on the worktable and the surroundings affecting the installation of the device exist.
- Prepare the OLT device to be installed and move the device to the place where is near the work table and facilitates the handling.

Step II: Lift the OLT device and slowly move to the front of the worktable.

Step III: Move the OLT device to the location slightly higher than the worktable and then place the OLT device to the specified location on the worktable.

3.3.2 Rack Installation

OLT equipment can be installed inside 19" rack which is compliance with ETSI standard. OLT rack diagram as shown in below.



The installation process is as follows:

Step I: Pre-Installation Validation

- Ensure the cabinet is fixed and the installation location of the OLT device in the cabinet is well arranged, and no obstacles inside the cabinet and the surroundings affecting the installation of the device exist.
- Prepare the OLT device to be installed and move the device to the place where is near the cabinet and facilitates the handling.

Step II: Lift the OLT device and slowly move the device to the front of the cabinet.

Step III: Lift the OLT device to the location slightly higher than the tray or sideway of the cabinet, place the OLT device to the tray or sideway of the cabinet and then push it to the cabinet.

Step IV. Use screws to fix the suspension loops of the cabinet to the square holes of the 19-inch cabinet column and to fix the OLT device to the cabinet.

3.4 Port and Connection

The chapter describes the port and power supply connection situation in OLT system, mainly include the following parts:

- Uplink Port
- PON Port Connection
- Ground Cable Connection
- Management Port Connection

Please carefully read the following introduction before connecting each port of OLT:

3.4.1 Uplink Port

3.4.1.1 Port Explanation

OLT offers eight GE electrical port, eight GE SFP optical port and two 10 Gigabit port for uplink. Electrical port and optical port can combination at the sometime, you can use direct-through, cross cable or fiber connection of the OLT and uplink equipment.

SFP module can be the optical module or the electrical module, and follow standards below:

- 1000Base-LX (Long wave length)
- 1000Base-SX (Short wave length)
- 10/100/1000Base-TX (Electrical port)

When use the single mode optical fiber, the maximum transmission distance can be up to 10-40km; when use the multimode fiber, the maximum transmission distance is less than 500 meters.

Gigabit Ethernet uplink port supports the duplex mode and flow control auto negotiation.

But need note that the maximum length of the optical fiber is related

with work mode of the optical fiber:

- Maximum length of 1000Base-LX fiber is depend on duplex mode
- Maximum length of 1000Base-SX fiber is the same in both full duplex and half duplex mode

3.4.1.2 Port Connection

There are two kinds of uplink network connection:

- Cable with RJ45 connectors at both sides
- Cable with LC connector at both sides

Decide the port type of OLT according to the port type of the uplink device (Switch or Route)

3.4.1.3 Method of making cable

If you use SFP optical module, cable specification: the optical cable with LC connector at both sides.

If you use GE copper interface, cable specification: Category 5 cable or Category5 super cable with RJ45 connector at both sides

The below the reference for making STP (Shielded Twisted-Pair) cable with RJ45connector at both sides



3.4.2 PON Port Connection

FD1508GS support eight GPON SFP slots, every SFP GPON slots can mount a GPON

SFP module and provides one PON port.

Caution: When insert into optical cable, please confirm the connector is inserted into the correct position, thus guarantee the good contract.

SFP PON slots installs standard ITU-TG.984.2Class B+ or ITU-TG.984.2Class C+OLT SFP .The OLT SFP interface is SC/PC. Please use the patch cord with SC/PC connector to connect between the OLT and the ODN networking .

3.4.3 Ground Cable Connection

Ensure the safety and reliable working of OLT. FD1508GS should be connected with the ground if necessary. Grounding screws are located in the rear panel. While connecting, you should use screwdriver to loosen the grounding screw first, then connect the ground cable, finally tighten the screws.

3.4.4 Management Port Connection

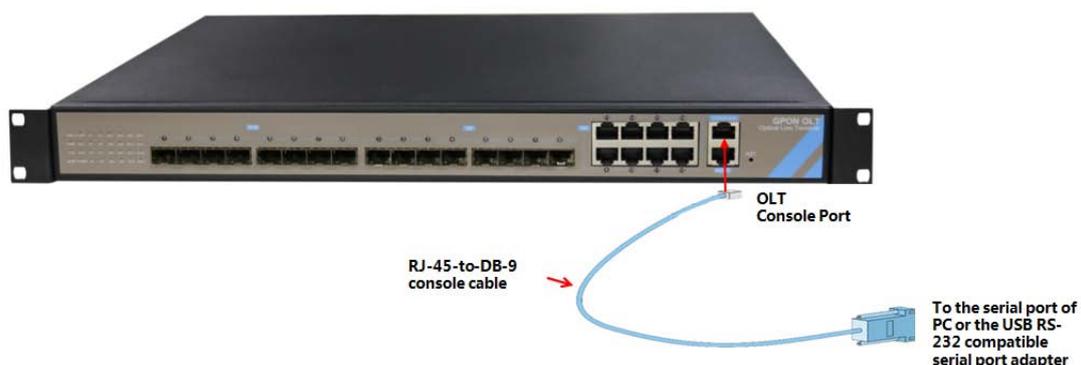
OLT FD1508GS equipment provides console interface (marked as “CONSOLE” RJ45 type port) and MGMT management internet access (marked as “MGMT” RJ45 type port).

Console access is really only required when initially configuring a device, or if remote access fails.

Console access requires:

- Console cable: RJ-45-to-DB-9 console cable
- Terminal emulation software: HyperTerminal

The cable is connected between the serial port of the host and the console port on the device. Most computers and notebooks no longer include built-in serial ports. If the host does not have a serial port, the USB port can be used to establish a console connection. A special USB-to-RS-232 compatible serial port adapter is required when using the USB port.



Port on Computer	Cable Required	Port on OLT
Serial Port	RJ-45 to DB-9 Console Cable	RJ-45 Console Port
USB Type-A Port	<ul style="list-style-type: none"> ● USB to RS-232 compatible serial port adapter (Adapter may require a software driver) ● RJ-45 to DB-9 Console Cable 	



RJ-45 to DB-9 Console Cable



USB to RS-232 compatible serial port adapter

When starting the management, please use straight and cross Ethernet cable, connecting “Console” management interface to network or managed PC.

MGMT access requires:

- RJ45 cable
- Terminal emulation software: HyperTerminal



3.4.5 Power Supply

3.4.5.1 Connecting the AC Power Cable

The two AC power supply units in the FD1508GS allow for 1 + 1 power redundancy. If one power supply unit fails, then the system will continue to operate using the remaining power supply unit. Additionally, to ensure true AC line input redundancy for the OLT, you should connect each AC power cable to a different AC power source. You can also connect an uninterruptible power supply (UPS) between each AC power source and the OLT to increase the availability of the OLT.

1. Get the supplied AC power cords from the OLT's shipment kit.
2. Connect one end of each AC power cord into the AC power inlet connectors located

at the rear of the OLT.

3. Connect the other ends of the power cords into AC wall outlets. Connect each AC power cord to a different AC power source if you want AC line input power redundancy.



3.4.5.2 Connecting the DC Input Power Cable

1. Identify the parts that you will use to assemble the DC input power cable
The following DC connection cable is required to assemble one or more DC power input cables. These cables connect the -48V DC input source(s) to the power supply units.

2. Turn off power from the DC power source through the circuit breakers.

Caution - Do not proceed with these instructions until you have turned off the power from the DC power source through the circuit breakers.

3. Get a DC input plug from the ship kit.
4. Locate the four wires coming from the DC power source that will be used in the connection to your unit::

- 48V: negative terminal
- 48V : Return (positive terminal)
- 48V: Earth ground

5. Unscrew the screws, the cable wire fixed on the DC screw.
6. Repeat Step 5 for the other two wires to complete the assembly of the DC input power cable.

3.5 OLT working status checkout

3.5.1 Check out power supply

Before you connect the power supply, double check the power supply if it is accord with the power supply requirements, If each module and card are installed correctly , If the equipment is in reliable grounding or not. After checking everything is OK, you can turn on the power supply sources.

3.5.2 Check out OLT's working status

Please check if the OLT's working status from following aspects:

- Check the power LED. The power LED will be on.
- The SYS LED will flash per second
- If the uplink equipment is connected to the uplink port, the relevant connection LED is on.

3.5.3 Network Management Checkout

Local Command Line Interface Management:

Use the RJ45/DB9 Serial Port cable (in package) to link management PC with FD1508GS CONSOLE or MGMT port. Management computer can access to OLT equipment from Super terminal interface of the PC for configuration..

※Please refer to relevant CLI user manual.

4 Default Configuration

4.1 Network Parameter Configuration

Management Port

IP Address: 192.168.1.100

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.1.1

4.2 CONSOLE Parameter Configuration

Band Rate:9600

Data Bit: 8

Parity Check: NO

Stop Bit: 1

Flow Control: NO

4.3 Default Username and Password

Local Command Line

Username: root

Password: admin



5 Appendix : OLT Specification

Item		Specification
Chassis	Rack	1U 19 inch standard box
	Slots	1*10 Gigabit uplink card slot 2 power module slot
Uplink Port	Copper	8*10/100/1000M auto-negotiable
	SFP	8 SFP slots (1000BASE-TX interface)
	10 Gigabit card	2 SFP (optional)
PON Port	QTY	8
	Physical Interface	SFP Slots
	Connector Type	ITU-TG.984.2Class B+ or ITU-TG.984.2Class C+
	Max splitting ratio	1:128
Management Ports		1 MGMT port 1 CONSOLE port
PON Port Specification (Apply to C-Data PON module)		Transmission Distance :20KM, PON port speed: Downstream Data Rate: 2.5Gbps, Upstream Data Rate: 1.25Gbps, Wavelength: 1490nm TX,1310nm RX, Connector: SC, Fiber Type: 9/125μm SMF, TX Power: +1.5~+5dBm, Rx Sensitivity: -28dBm, Saturation Optical Power: -8dBm
Management Mode		CLI
Management Function		Support for state monitoring, configuration management, equipment log, equipment upgrades, equipment management, user management.Layer-2 switch configuration such as Vlan, Trunk, RSTP, IGMP, QOS, etc. PON management function: DBA ,ONT authorization, ACL, QOS, etc. Online ONT configuration and management. User management. Alarm management
Dimension		440mm(L)*391mm(W)*44mm(H)
Weight		4kg
Power Supply	220VAC	AC: 90V~240V, 47/63Hz
	-48DC	DC:-36V~-72V
Power Consumption		65W

Operating Environment	Working Temperature	0~50°C
	Storage Temperature	-40~85°C
	Relative Humidity	5~90%(non condensing)

6 Ending

Thanks very much for deploying C-DATA equipment.

Should have any doubt or problem to know about our products installation, please don't hesitate to contact us.

C-DATA Technology Co., Ltd.

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