Introduction to the HG813

Introduction to GPON

The gigabit-capable passive optical network (GPON) is defined in the ITU-T G.984.x series standards. The downstream rate of GPON can reach up to 2.4 Gbit/s and the upstream rate of GPON can reach up to 1.2 Gbit/s.

As a point to multi-point (P2MP) passive optical network, GPON complies with the wavelength allocation of 1310 nm in the upstream direction and 1490 nm in the downstream direction, which is defined in the ITU-T G.984.2. GPON and the optical network terminal (ONT) implement the single-fiber bi-directional data transmission. To separate the signals of different users in both directions over the same optical fiber, the following multiplexing technologies are adopted:

- The broadcast technology is adopted in the downstream direction and thus each ONT only receives the data of its own.
- The time division multiple access (TDMA) technology is adopted in the upstream direction and thus each ONT only transmits the data in the specified timeslot allocated to it.

The features of GPON are as follows:

- GPON supports high-bandwidth transmission, which solves the bandwidth bottleneck problem of the access through twisted pairs and meets the requirements of users for high-bandwidth services, such as high definition television (HDTV) and live program.
- GPON supports long-distance access, which solves the problem of long-distance access through twisted pairs and reduces the number of network nodes.
- GPON adopts the passive optical transmission technology and mainly applies to the scenarios, such as fiber to the home (FTTH) and fiber to the building (FTTB) to provide various services:
  - Voice
  - Data
  - Video
  - Leased line
  - Distributed service

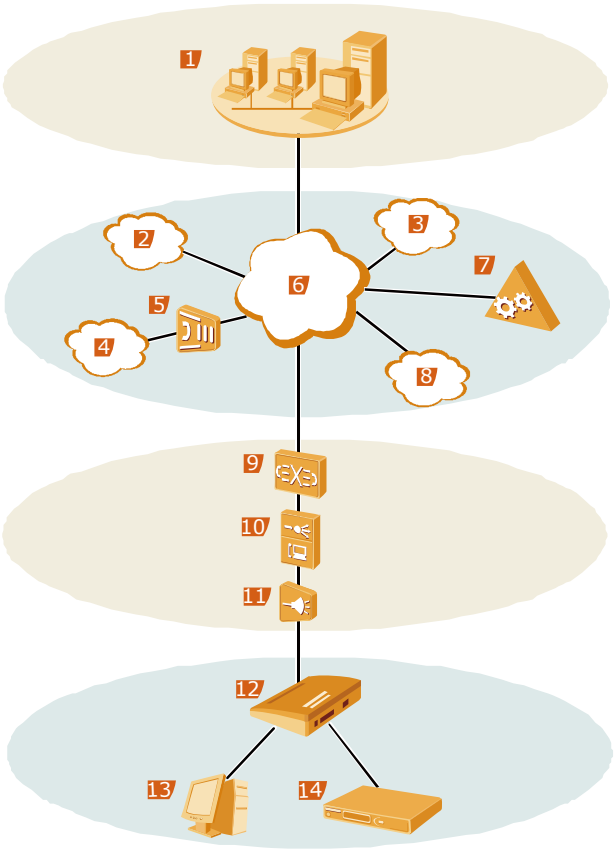
Networking

The HG813 is an ONT designed for home users and SOHO users at the user access layer of GPON. Adopting the GPON technology, the HG813 connects the home users and SOHO users to the Internet through the optical upstream port.

The HG813 supports the ONT management and control interface (OMCI) technology, which can facilitate the automatic and remote service provision for service providers, and the remote maintenance and management for network maintenance staff.

Figure 1-1 shows the networking of the HG813.

Figure 1-1 Networking of the HG813



1	NMS	2	Internet	3	IPTV
4	PSTN	5	TMG	6	IP network
7	Softswitch	8	VoIP	9	Switch
10	OLT	11	Optical splitter	12	HG813
13	PC	14	IP STB		

NOTE

- In Figure 1-1,
- OLT: optical line terminal
- PSTN: public switched telephone network
- TMG: trunk media gateway
- NMS: network management subsystem

Front Panel

NOTE

The actual front panel and rear panel of the HG813 may be different from those shown in this document. The functions of the HG813, however, are the same.

Figure 1-2 shows the front panel of the HG813.

Figure 1-2 Front Panel of the HG813

Table 1-1 and Table 1-2 describe the LEDs of the HG813.

Table 1-1 LEDs of the HG813

LED	Status	Description
POWER	On	The HG813 is powered on.
	Off	The HG813 is powered off.
LINK	See Table 1-2.	See Table 1-2.
AUTH	See Table 1-2.	See Table 1-2.
LAN 1-LAN 4	On	The connection on the Ethernet port is normal.
	Off	No connection is set up on the Ethernet port.
	Blinks	Data is being transmitted on the Ethernet port.

The status of the LINK LED and the AUTH LED indicates the connection and registration of the HG813 to the OLT.

Table 1-2 Status of the LINK LED and the AUTH LED

LED Status		Description
LINK	**AUTH**	
Off	Off	The HG813 is in the initiation state.
Blinks (1 Hz)	Off	The HG813 is ready.
Blinks (3 Hz)	Blinks (1 Hz)	The HG813 is in the SN authentication state.
Blinks (3 Hz)	On	The HG813 is in the distance test state.
On	On	The HG813 is in the operation state (normal working state).
Blinks (3 Hz)	Off	The HG813 is in the suspended state.
On	Off	The HG813 is in the emergency-stop state.

Rear Panel

WARNING

To prevent injury to your eyes, do not look directly at the optical port.

Figure 1-3 shows the rear panel of the HG813.

Figure 1-3 Rear panel of the HG813

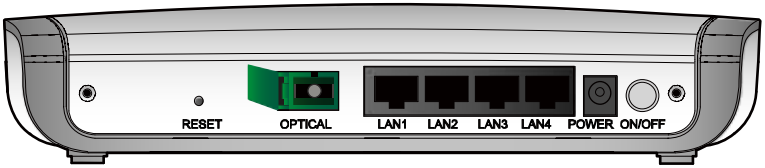


Table 1-3 describes the ports and buttons on the rear panel of the HG813.

Table 1-3 Ports and buttons on the rear panel of the HG813

Port/Button	Description
RESET	Reset button
OPTICAL	GPON port (SC/APC type), connected with optical fibers to transmit services in the upstream direction
LAN 1-LAN 4	Auto-sensing 100Base-T Ethernet port (RJ-45), connected with the switch or home gateway (HG), or directly with the PC or IP STB

Port/Button	Description
POWER	Power port, connected with the power adapter or batteries
ON/OFF	On/Off switch, used to power on or power off the HG813