EPON ONU (ONU-311)
User’s Guide
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# Revision History

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About This Manual

Thank you for purchasing the Gigabit EPON ONU (ONU-311).

ONU-311 is an ONU device for Ethernet Passive Optical Network (EPON). It is designed with one PON port and one standard 10Base-T / 100Base-TX / 1000Base-TX Ethernet port for subscriber access. It can be easily installed and provides high bandwidth to meet application requirements. Users of this product should read this document before using the product.

Notes:

1. The information contained in this document is subject to change without prior notice. Please consult the web site to get further information.
2. Please send all User Guide-related comments, suggestions or questions to us for document improvement. We appreciate your valuable suggestions about the content of this user guide. Thank you very much.
3. You may not reprint or reproduce this document in whole or in part without getting permission.
Safety Warnings

1. This product contains a high output-power Laser. Please do not point the SC optical connector directly to eyes.
2. Do not touch the metal part of components, PCB traces or power connectors.
3. Put this product away from the high-voltage electricity power and make a lighting surge protection on the power distribution system.
4. A minimum radius of 60 mm is better while bending the optical fiber.
5. Always keep the optical fiber connector to be “clean” and put a cover on the optical fiber connector while the optical connector is removed during system maintenance.
1 Product Overview

Broadband services such as high-definition TV (HDTV), media-on-demand (MOD), and online games demand high bandwidth. Ethernet Passive Optical Network (EPON), standardized in IEEE 802.3ah, is the most promising FTTH technology to provide 1 Gbps bandwidth for both upstream and downstream that really addresses future bandwidth needs. An EPON Network consists of the central office Optical Line Terminal (OLT), the customer side Optical Network Unit (ONU), and the passive Optical Distribution Network (ODN).

ONU-311 is an Optical Network Unit of EPON system. It is designed with one PON port (10km or 20km) and a single 10/100/1000Mbps Ethernet ports. ONU-311 is well designed for “Plug-and-Play” application. No software configuration is required during installation. It is controlled by Optical Line Terminal (OLT) remotely. While the input power fail (power electricity shut down or user turns power off), ONU-311 will generate a Dying-Gasp signal to alert the OLT for proper system maintenance. The key features of ONU-311 are described as follows. One example application is depicted in Figure 1

**Key Features and Applications**

- Compliant to IEEE 802.3ah standard
- Support 1 optical interface with distance 10km or 20km
- Support 1 10/100/1000Base-T User Network Interface
- LED indication for easy system maintenance
- Support Desktop and Wall-mounted installation
- All the system operation status and alarm indications are visible from the front panel of the system and be monitored and reported to the Optical Line Terminal (OLT) side.
- Support “remote loop-back test” functionality.
- Flexible QoS management for triple play service
- Flexible VLAN Management to meet operator’s service model
- Support IGMP snooping for efficient multicast
- Support filtering function to permit/deny upstream traffic
- Could be remotely configured through the Network Management System (NMS) in the central office
Figure 1. ONU Application Example
2 Hardware Connections

The Contents in the product box include:

- One set of ONU-311
- Operation Manual
- AC-to-DC power adaptor (100Vac ~ 240Vac to +12Vdc)

The Real panel of ONU-311 is as shown in Figure 2. The interfaces are described as follows:

<table>
<thead>
<tr>
<th>Interface</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PON</td>
<td>SC type connector for connecting to OLT</td>
</tr>
<tr>
<td>RST</td>
<td>Reset button</td>
</tr>
<tr>
<td>10/100/1000M</td>
<td>10/100/1000M Ethernet Port for connecting to CPE devices (eg. L2 Switch, VDSL switch, Home gateway, etc.)</td>
</tr>
<tr>
<td>PWR ON</td>
<td>Power turn on/off switch</td>
</tr>
<tr>
<td>DC12V</td>
<td>DC Power Connector</td>
</tr>
</tbody>
</table>

![Figure 2. ONU-311 Rear Side View](image)

2.1 Power Connection

The AC input voltage range of AC-DC power adaptor is from 100Vac to 240Vac.
Put the AC -DC power adaptor onto the AC power electricity outlet and connect the DC power output plug to the ONU-311DC power socket.
2.2. **ONU-311 Ethernet port Cabling**

The Ethernet port of ONU-311 supports Auto MDI/MDIX cross-over functionality. Connect a Un-shield Twisted Pair (UTP) CAT-5 cable from the RJ-45 connector of ONU-311 to the device which is intended for link up.

2.3. **ONU-311 Fiber port Cabling**

The optical module in ONU-311 is a single fiber, bi-directional Wavelength Division Multiplexer (WDM) optical module with SC connector. The SC type optical adaptor is mounted on ONU-311 Rear Panel. Connect the SC type optical fiber from the optical Splitter, which is connected to the OLT site, to the SC type optical adaptor on ONU-311.

2.4. **Power Switch**

The power switch is used to turn on / off the power of ONU-311. When you finish the installation of all the cables, switch it to the ON position.
3 LED Description

When finishing ONU cabling connection, then power on ONU. No software configuration is required for ONU. You can check the LEDs of ONU to see whether ONU works correctly. The LEDs of ONU-311 is depicted as shown in Figure 3.

![Figure 3. LEDs of ONU](image)

The details of the LEDs are described below.

<table>
<thead>
<tr>
<th>LED indications</th>
<th>Status</th>
<th>LED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>Power is on</td>
<td>Green On</td>
</tr>
<tr>
<td></td>
<td>Power is off</td>
<td>Off</td>
</tr>
<tr>
<td>OPT LNK</td>
<td>ODN-IONU PON optical link is established</td>
<td>Green On</td>
</tr>
<tr>
<td></td>
<td>ODN-IONU PON optical link is down</td>
<td>Off</td>
</tr>
<tr>
<td>OPT ALM</td>
<td>ODN-IONU PON optical link is established</td>
<td>Off Blinking</td>
</tr>
<tr>
<td></td>
<td>ODN-IONU PON logical link is down</td>
<td>Red Blinking</td>
</tr>
<tr>
<td>PON LNK</td>
<td>ODN-IONU PON logical link is sending / receiving data</td>
<td>Green Blinking</td>
</tr>
<tr>
<td></td>
<td>ODN-IONU PON logical link is down</td>
<td>Green Off</td>
</tr>
<tr>
<td>PON ERR</td>
<td>ODN-IONU PON logical link data receiving error</td>
<td>Red On</td>
</tr>
<tr>
<td></td>
<td>ODN-IONU PON logical link data receiving normal</td>
<td>Off</td>
</tr>
<tr>
<td></td>
<td>UNI LAN Port link is on</td>
<td>Green On</td>
</tr>
<tr>
<td>LAN LNK / ACT</td>
<td>UNI LAN Port is off</td>
<td>Off</td>
</tr>
<tr>
<td></td>
<td>UNI LAN Port is sending / receiving data</td>
<td>Green Blinking</td>
</tr>
</tbody>
</table>
## 4 Trouble Shooting

<table>
<thead>
<tr>
<th>Problems</th>
<th>Probably caused by</th>
<th>Solutions</th>
</tr>
</thead>
</table>
| 1. Power LED off | 1. ONU-311 Fail  
2. Power Adaptor loose connection  
3. Power present but power switch OFF | 1. Check Power Adaptor  
2. Turn on power switch  
3. Field return for trouble shooting |
| 2. LAN Link LED off | 1. UTP cable intermittent  
2. UTP cable broken  
3. ONU-311 Failed  
4. The device which ONU connected to is failed | 1. Check UTP cable or change a UTP cable  
2. Check power adaptor  
3. Change connecting to other device  
4. Field return for trouble shooting |
| 3. OPT LNK LED off | 1. Optical fiber or optical connector fail  
2. Optical input power under threshold level  
3. Optical receiver fail  
4. OLT fail  
5. ONU fail | 1. Check optical fiber and SC connector  
2. Check ONU  
3. Check OLT  
4. Field return for trouble shooting |
| 4. OPT LNK LED on, but PON LNK LED off | 1. ONU PON MAC fail  
2. OLT fail | 1. Check ONU  
2. Check OLT PON  
3. Field return for trouble shooting |
| 5. PON ERR LED on | 1. PON MAC fail | 1. Check ONU  
2. Field return for trouble shooting |