

# TEST GPON/1GE

## EXTRALINK NEPTUN



### NEPTUN GPON/1GE

- ROUTING/NAT FUNCTION

- 1 X GIGABIT ETHERNET

- 1 X GPON PORT, FSAN G.984.2

DOWNLINK 2,448 GBIT/S, UPLINK 1,244 GBIT/S  
COMPATIBLE WITH ITU-T G.984  
AES 128 ENCRYPTION WITH G.984 STANDARD

- CHIPSET ZTE

We have tested **EXTRALINK NEPTUNE GPON / 1GE**. The test was performed in the following steps concerning: performance, compatibility and functionality of hardware and software. All the tests are compatible with technical standards of GPON devices.

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1. Description of a test, equipment and network diagram
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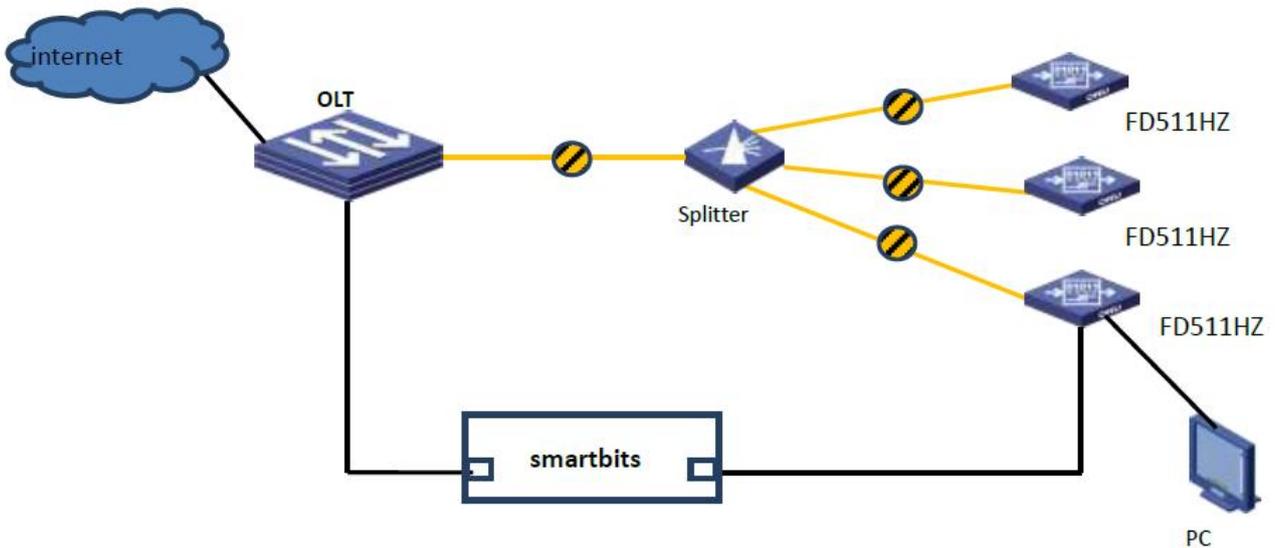
- 5. Extralink GPON NEPTUN 1GE compatibility
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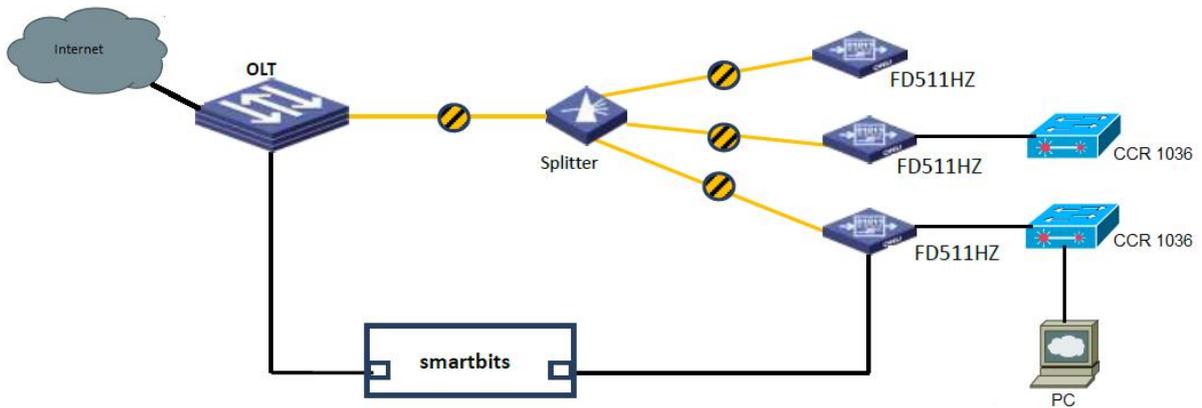
**1. Description of the equipment and network diagram**

Tests were performed using the following equipment:

Device	Model/Version
OLT HUAWEI MA5683T	Software Version: V800R008
ONU	Extralink Neptun GPON FD511HZ (1GE)
MIKROTIK ROUTERBOARD	CCR1036-12G-4S-EM
Smartbits	Smartwin8.51
PC	System: Windows 10

Network diagram:





## 2. ONU functional tests

Function	Specs of a tested element	Testsituation	Test Passed	
			Yes	No
<b>Visibility of necessary information</b>	GPON ONU adopts MAC and LOID + password for online registration	Function completed	V	
	GPON ONU automatic search	Function completed	V	
	Once turned on, ONU indicates information about status (online status, configuration status)	Function completed	V	
	Once ONU is connected to OLT, information about MAC, LOID, ID and version are visible	Function completed	V	
	Information about optical module and ports	Function completed	V	
<b>Test of necessary functions</b>	Reboot test	Function completed	V	
	Registration test	Function completed	V	
	IP Address Management Test	Function completed	V	
	OLT restarts ONU to the default settings	Function completed	V	
	OMCI update test	Function completed	V	
	Power-fail test	Function completed	V	
<b>Port test</b>	Port auto negotiation test	Function completed	V	
	Port stream control function	Function completed	V	
	Port status management function	Function completed	V	
<b>QoS function</b>	QoS	Function completed	V	
	IGMP and Proxy (open/closed)	Function completed	V	

<b>IGMP function test</b>	IGMP V2 and V3 function test	Function completed	V	
	Basic Multicast service test	Function completed	V	
	Test concerning adding and removing special Multicast address	Function completed	V	
	TAG STRIP function test	Function completed	V	
<b>Layer2 transmission functions</b>	Frame filter: based on a physical port, source and destination of MAC address, Ethernet data frame filter between a physical port and a source and MAC address destination	Function completed	V	
	UNI loop detect function	Function completed	V	
<b>Control diodes status</b>	PON diode status	Function completed	V	
	LOS diode status	Function completed	V	
	LAN diode status	Function completed	V	
	Power diode status	Function completed	V	

### 3. Test of basic services

Function	Specs of a tested element	Test situation	Test Passed	
			Yes	No
<b>Router function test</b>	WAN port adopts DHCP to surf the Internet	Function completed	V	
	WAN port adopts STATIC IP to surf the Internet	Function completed	V	
	WAN port adopts PPPoE to surf the Internet	Function completed	V	
<b>IGMP service test</b>	IGMP V2 V3 Configuration	Function completed	V	
	IGMP quickly leave function	Function completed	V	
	ONU combine gauge to send multicast streams	Function completed	V	
	ONU combines VLC to simulate multicast	Function completed	V	

#### 4. Performance and durability test

Function	Specs of a tested element	Test situation	Test passed	
			Yes	No
Performance and durability	Running for a long time (>12h), Checking whether normal for data transfer services, voice services and multicast	Service is normal	V	
	Gauge test flow rate through a long time (64 128 512 bytes) , flow rate is more than 90%	No drop packet , system is normal	V	
	Big packets sending of broadcast and multicast type through a long time	System is normal	V	
	Fiber optic plugging in and out, and multiple software and hardware rebooting	System is normal	V	
	Multiple web interface refreshing	System is normal	V	

#### 5. Extralink GPON NEPTUN 1GE compatibility

Function	Specs of a tested element	Test situation	Test passed	
			Yes	No
Compatibility test	HUAWEI OLT connection test	Test is normal	V	
	ZTE OLT connection test	Test is normal	V	
	BDCOM OLT connection test	Test is normal	V	

#### 6. Bandwidth test

Bandwidth tests were conducted using two **EXTRALINK NEPTUN GPON/1GE** devices , two **Mikrotik RouterBoard CCR1036-12G-4S-EM** devices and **OLT HUAWEI MA5683T**.

In order to check the bandwidth (tcp/udp) we used in-build **Mikrotik Bandwidth Test** mechanism.

## Mikrotik BandwidthTest UDP both

Bandwidth Test (Running) □ ×

Test To:

Protocol:  udp  tcp

Local UDP Tx Size:

Remote UDP Tx Size:

Direction:  ▾

---

TCP Connection Count:

Local Tx Speed:  ▼ bps

Remote Tx Speed:  ▼ bps

Random Data

---

User:  ▲

Password:  ▲

---

Lost Packets:

Tx/Rx Current:

Tx/Rx 10s Average:

Tx/Rx Total Average:

The graph displays two data series: Tx (blue) and Rx (red). The Tx series shows a steady increase in bandwidth usage, reaching a peak of 936.1 Mbps. The Rx series shows a similar trend, reaching a peak of 918.5 Mbps. The graph is overlaid on a grid.

Series	Current Value
Tx	936.1 Mbps
Rx	918.5 Mbps

running...

## Mikrotik BandwidthTest UDP receive

Bandwidth Test (Running) □ ✕

Test To:

Protocol:  udp  tcp

Local UDP Tx Size:

Remote UDP Tx Size:

Direction:  ▾

---

TCP Connection Count:

Local Tx Speed:  ▾ bps

Remote Tx Speed:  ▾ bps

Random Data

---

User:  ▲

Password:  ▲

---

Lost Packets:

Tx/Rx Current:

Tx/Rx 10s Average:

Tx/Rx Total Average:

Legend:  
Tx: (blue bar)  
Rx: 953.0 Mbps (red bar)

running...

## Mikrotik BandwidthTest UDP send

Bandwidth Test (Running) □ ✕

Test To:

Protocol:  udp  tcp

Local UDP Tx Size:

Remote UDP Tx Size:

Direction:  ▾

TCP Connection Count:

Local Tx Speed:  ▾ bps

Remote Tx Speed:  ▾ bps

Random Data

User:  ▲

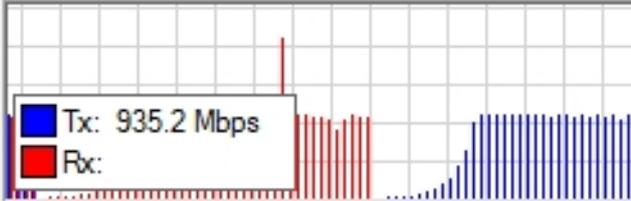
Password:  ▲

Lost Packets:

Tx/Rx Current:

Tx/Rx 10s Average:

Tx/Rx Total Average:



The graph displays a bar chart of bandwidth usage over time. The x-axis represents time, and the y-axis represents bandwidth in Mbps. A legend indicates that blue bars represent Tx (Transmit) and red bars represent Rx (Receive). The Tx rate starts at 0, then rises to a peak of 935.2 Mbps, and then fluctuates between approximately 600 and 900 Mbps. The Rx rate remains at 0 bps throughout the test.

running...

## Mikrotik BandwidthTest TCP receive

Interface <sfp1>

Overall Stats Rx Stats Tx Stats Status Traffic ...

Tx/Rx Rate:	813.7 Mbps	/	3.9 Mbps
Tx/Rx Packet Rate:	67 409 p/s	/	8 123 p/s
FP Tx/Rx Rate:	0 bps	/	3.9 Mbps
FP Tx/Rx Packet Rate:	0 p/s	/	8 123 p/s
Tx/Rx Bytes:	17.3 GiB	/	17.2 GiB
Tx/Rx Packets:	12 847 424	/	13 745 707
Tx/Rx Drops:	0	/	0
Tx/Rx Errors:	0	/	0

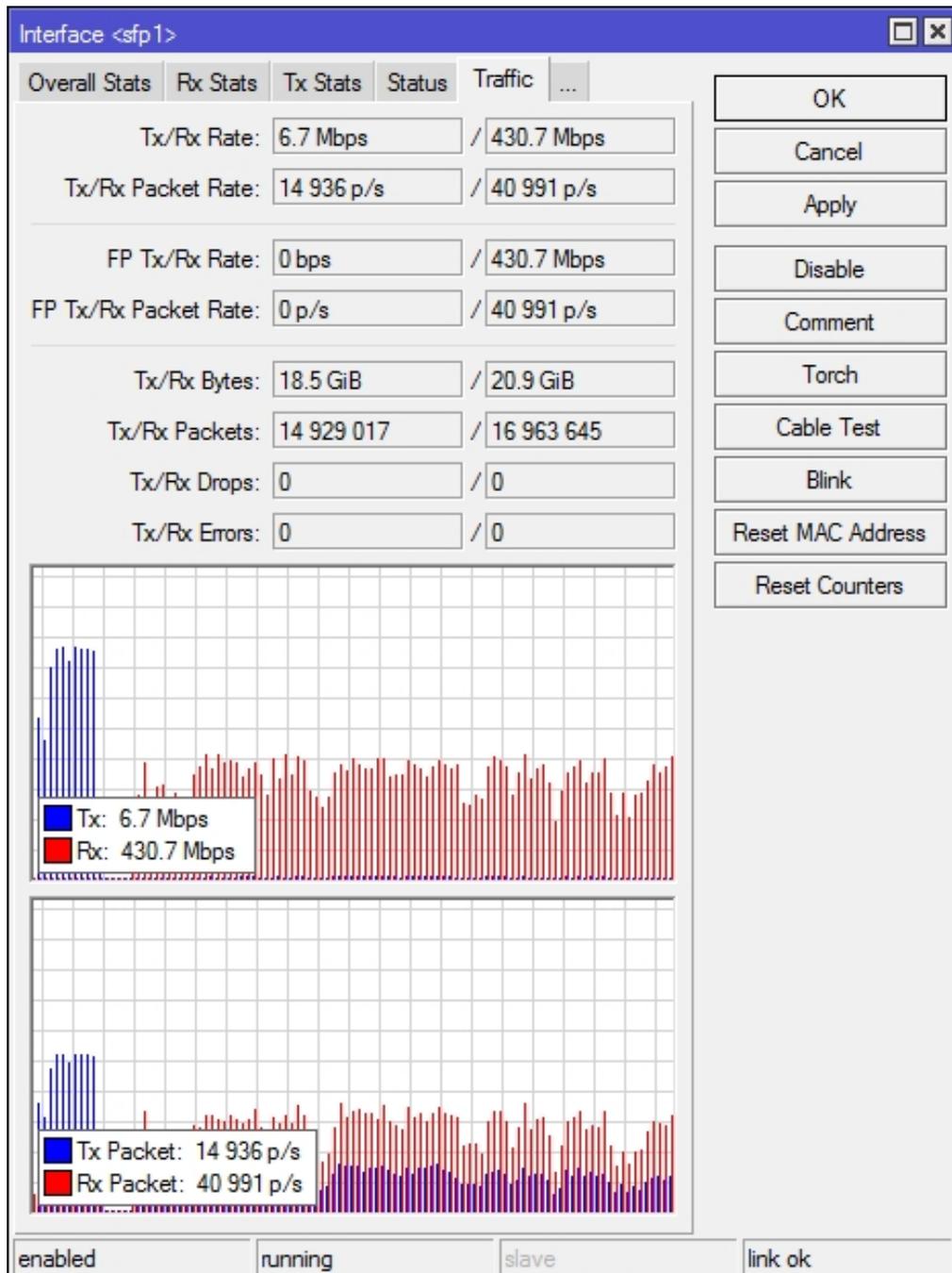
Legend for top graph:  
Tx: 813.7 Mbps  
Rx: 3.9 Mbps

Legend for bottom graph:  
Tx Packet: 67 409 p/s  
Rx Packet: 8 123 p/s

enabled running slave link ok

OK  
Cancel  
Apply  
Disable  
Comment  
Torch  
Cable Test  
Blink  
Reset MAC Address  
Reset Counters

## Mikrotik BandwidthTest TCP Send



### 7. Web interface

Web interface is very clear and easy to use. Navigating through the particular configuration functions of a device doesn't cause any problems and all the necessary options are arranged in an intuitive way. It is also worth to mention about the option of turning off the LEDs and the fact that introducing any changes doesn't require constant device restarting.

Below we present an overview of the most important configuration options.

### WAN Connection(1)

The screenshot shows a network configuration interface for a WAN connection. The interface is organized into several sections:

- Navigation Menu (Left):** Includes 'WAN' (with 'WAN Connection' selected), 'LAN', 'PON', 'Routing(IPv4)', and 'Port Configuration'.
- Top Navigation Bar:** Contains 'Status', 'Network', 'Security', 'Application', 'Administration', and 'Help'.
- Main Configuration Area:**
  - Connection Name:** A dropdown menu showing 'Create WAN Cor'.
  - New Connection Name:** An empty text input field.
  - Enable VLAN:** A checked checkbox.
  - VLAN ID:** An empty text input field.
  - 802.1p:** A dropdown menu showing '0'.
  - Type:** A dropdown menu showing 'Route'.
  - Service List:** A dropdown menu showing 'INTERNET'.
  - MTU:** A text input field showing '1500'.
  - Link Type:** A dropdown menu showing 'IP'.
  - IP Version:** A dropdown menu showing 'IPv4'.
  - IP Type:** A dropdown menu with 'Static' selected. A sub-menu is open, showing 'Static', 'DHCP', and 'Static'.
  - IPv4 Section:** A green arrow icon points to this section, which includes:
    - Enable NAT:** A checked checkbox.
    - IP Address:** An empty text input field.
    - Subnet Mask:** An empty text input field.
    - Gateway:** An empty text input field.
    - DNS Server1 IP Address:** An empty text input field.
    - DNS Server2 IP Address:** An empty text input field.
    - DNS Server3 IP Address:** An empty text input field.
- Right Side:** Contains 'Help' and 'Logout' buttons.
- Bottom Bar:** Contains 'Create' and 'Cancel' buttons.

## WAN Connection(2)

Status | **Network** | Security | Application | Administration | Help

WAN  
WAN Connection  
LAN  
PON  
Routing(IPv4)  
Port Configuration

Connection Name    
New Connection Name   
Enable VLAN   
VLAN ID   
802.1p    
Type    
Service List    
MTU   
Link Type    
   
   
Username   
Password   
Authentication Type    
Connection Trigger    
IP Version    
PPP TransType    
   
Enable NAT

# LAN / DHCP SERVER



Status | Network | Security | Application | Administration | Help

- WAN
- LAN
  - DHCP Server**
- PON
- Routing(IPv4)
- Port Configuration

NOTE: 1. The DHCP Start IP Address and DHCP End IP address should be in the same subnet as the LAN IP.

LAN IP Address   
Subnet Mask

Help

Logout

Enable DHCP Server   
DHCP Start IP Address   
DHCP End IP Address   
Assign IspDNS   
DNS Server1 IP Address   
DNS Server2 IP Address   
DNS Server3 IP Address   
Default Gateway   
Lease Time  sec

Allocated Address

MAC Address	IP Address	Remaining Lease Time	Host Name	Port
There is no data.				

Submit Cancel

## IGMP

MultiCast

- IGMP Mode
- Basic Configuration
- VLAN Configuration
- Tag Configuration
- Maximum Address Configuration

BPDU

DNS Service

Port Forwarding

Multicast Mode

- Disable
- Snooping Mode
- CTC IGMP

Help

Logout

Submit Cancel

## VLAN

Status | Network | Security | Application | Administration | Help

WAN

LAN

PON

Routing(IPv4)

Port Configuration

- Mode
- Port Isolation
- Rate Limiting
- Flow Control
- MAC Configuration
- VLAN

Attention: changing the vlan mode will clear the old vlan list!

Port

VLAN Mode

- transparent
- tag
- translation
- trunk

Help

Logout

Submit Cancel

## FIREWALL (1)

Status | Network | Security | Application | Administration | Help

Firewall

Firewall

Service Control

MAC Filter

Enable Anti-Hacking Protection

Firewall Level

Off Help  
 Low  
 Middle Logout  
 High  
 Custom >>

Submit Cancel

## FIREWALL (2)

Status | Network | Security | Application | Administration | Help

Firewall

Firewall

Service Control

MAC Filter

IP Version IPv4

Name

Enable  Help

Order  (0 ~ 31)

Protocol TCP Logout

State ANY

Source IP Address ANY

Source IP Mask INVALID

Start Source Port NEW

End Source Port ESTABLISHED

RELATED

RELATED AND ESTABLISHED

Destination IP Address

Destination IP Mask

Start Destination Port

End Destination Port

The direction of data flow WAN->CPE

Mode Discard

Add

Name	Protocol	Source IP Address / Mask	Source Port	Order	The direction of data flow	Modify	Delete
Enable	State	Destination IP Address / Mask	Destination Port	Mode			
There is no data, please add one first.							

Back

## PORT FORWARDING

Status | Network | Security | Application | Administration | Help

MultiCast

BPDU

DNS Service

Port Forwarding

Port Forwarding

Enable

Name

Protocol TCP

WAN Host Start IP Address

WAN Host End IP Address

WAN Connection

WAN Start Port  (1 ~ 65535)

WAN End Port  (1 ~ 65535)

LAN Host IP Address

LAN Host Start Port  (1 ~ 65535)

LAN Host End Port  (1 ~ 65535)

Enable	Name	WAN Host Start IP Address	WAN Start Port	LAN Host Start Port	WAN Connection	Modify	Delete
	Protocol	WAN Host End IP Address	WAN End Port	LAN Host End Port	LAN Host Address		
There is no data, please add one first.							

## LED CONTROL

Status | Network | Security | Application | Administration | Help

User Management

Login Timeout

System Management

Diagnosis

Loopback Detection

Led Control

Led Control

Turn Off Leds