



# ELTEXALATAU

Complete solutions for networking

## NTU-1

User manual, version 1.1 (22 May 2017)

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Optical Network Terminals

IP address: <http://192.168.1.1>

User name: user

Password: user

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[www.eltexalatau.kz](http://www.eltexalatau.kz)

**Firmware version****NTU-1 3.24.1.232**

Document version	Issue date	Content of changes
1.0	20 August 2015	First issue
1.1	22 May 2017	Second issue

**NOTES AND WARNINGS**

The notes contain important information, tips or recommendations on device operation and setup.



Warnings are used to inform users about harmful situations for the device and the user alike, which could cause malfunction or data loss.

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## 1 INTRODUCTION

A GPON is a network of passive optical networks (PON) type. It is one of the most effective state-of-the-art solutions of the last mile issue that enables cable economy and provides information transfer downlink rate up to 2.5 Gbps and uplink rate up to 1.25 Gbps. Being used in access networks, GPON-based solutions allow end users to have access to new services based on IP protocol in addition to more common ones.

The key GPON advantage is the use of one optical line terminal (OLT) for multiple optical network terminals (ONT). OLT converts Gigabit Ethernet and GPON interfaces and is used to connect a PON network with data communication networks of a higher level. ONT is designed to connect terminal equipment of user to broadband access services. ONT can be used in residential estates and offices.

The range of ONT NTU equipment produced by Eltex comprises of the following terminals:

- NTU-1 with one Ethernet *user network interfaces (UNI)* – **1 Ethernet 10/100/1000 Base-T**;
- NTU-2V with two Ethernet *user network interfaces (UNI)* – **1 Ethernet 10/100 Base-T port, 1 Ethernet 10/100/1000 Base-T port** – and one FXS port;
- NTU-RG-1402G-W, which are designed to support four UNI: 10/100/1000Base-T, FXS, Wi-Fi, and USB.

The Operation Manual describes application, key specifications, configuration, monitoring, and software retrofit for NTU-1 optical terminals.

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## 2 DEVICE DESCRIPTION

### 2.1 Application

*NTU-1* GPON ONT (Gigabit Ethernet Passive Optical Network) devices represent high-performance network terminals designed for connection with upstream GPON equipment and providing end user with broadcast access services. GPON connection is established through the PON interface, while Ethernet interfaces are used for connection of terminal equipment. A distinctive feature of the *NTU-1* user terminal is the ability to supply power through the twisted pair cable in an Ethernet network (distance up to 40 meters).

The key GPON advantage is the optimal use of bandwidth. The technology is the next step of high-speed Internet applications for home and office. Being designed for home or office network deployment, these ONT devices provide users, who live and work in distant flat buildings and business centers, with reliable connection with high throughput at large distances.

*NTU-1* devices are designed to support various interfaces and features (see Table 1).

Table 1 – *NTU-1* interfaces

Model Name	WAN	LAN	FXS	Wi-Fi	USB
<i>NTU-1</i>	1xGPON	1x1Gigabit	-	-	-

## 2.2 Device Specification

### *The device has the following interfaces:*

- 1 PON SC/APC port for connection to operator's network.
- 1 Ethernet RJ-45 LAN ports for connection of network devices.

The terminal uses an external adapter for 220 V / 12 V power supply. It is also possible to power the device via the Ethernet-cable UTP CAT-5E (when using GRT-120100A power supply), the maximum distance - 40 meters.

### *The device supports the following functions:*

- Network functions:
  - bridge mode;
  - QoS;
  - IGMP-snooping.
- Firmware update via web interface, OMCI.
- Remote monitoring, configuration, and setup via OMCI.

Fig. 1 shows a diagram of the NTU equipment connection.

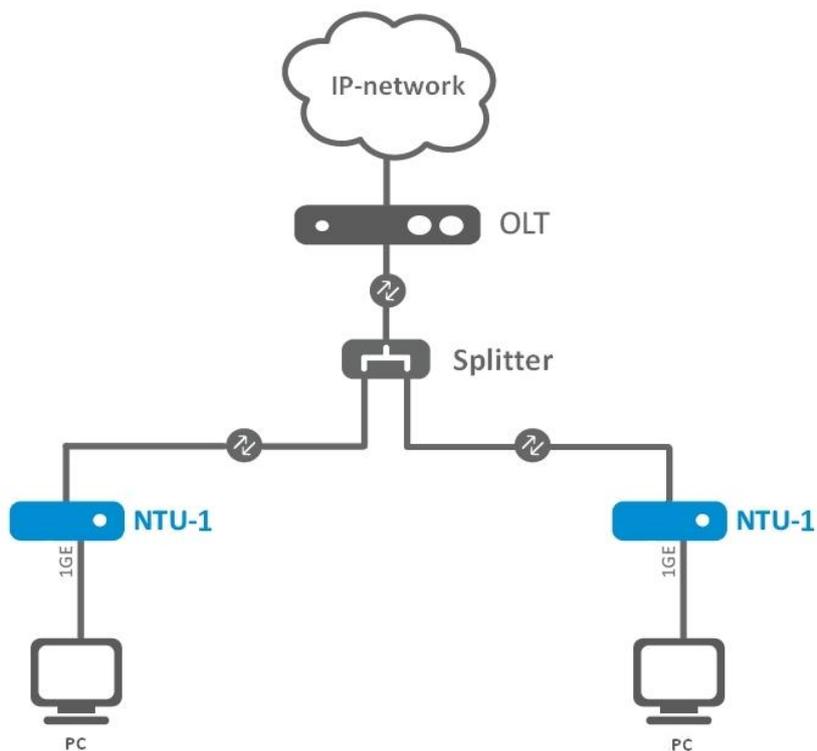


Fig. 1 – Connection of NTU-1

## 2.3 Key Specifications

Table 2 lists key specifications of the terminals.

Table 2– Key Specifications

### Parameters of Ethernet LAN Interface

Number of interfaces	1
Socket	RJ-45
Data rate, Mbps	Autodetection, 10/100/1000 Mbps, duplex/half-duplex
Supported standards	IEEE 802.3i 10Base-T Ethernet IEEE 802.3u 100Base-TX Fast Ethernet IEEE 802.3ab 1000Base-T Gigabit Ethernet IEEE 802.3x Flow Control IEEE 802.3 NWay auto-negotiation

### Parameters of PON Interface

Number of PON interfaces	1
Supported standards	ITU-T G.984.x Gigabit-capable passive optical networks (GPON) ITU-T G.988 ONU management and control interface (OMCI) specification FSAN Class B+ SFF-8472 IEEE 802.1Q Tagged VLAN IEEE 802.1p Priority Queues IEEE 802.1D Spanning Tree Protocol
Connector type	SC/APC according to ITU-T G.984.2
Transmission medium	fibre optical cable SMF-9/125, G.652
Splitting ratio	up to 1:64
Maximum range of coverage	20 km
Transmitter:	1310 nm
Upstream connection speed	1244 Mbps
Transmitter power	from +0.5 to +5 dBm
Optical spectrum width (RMS)	1 nm
Receiver	1490 nm
Downstream connection speed	2488 Mbps
Receiver sensitivity	-28 dBm
Receiver Optical Overload	-4 dBm

### Control

Local control	web interface
Remote control	OMCI
Firmware update	OMCI, HTTP
Access restriction	password

### General parameters

Power supply	– 12 V DC /220 AC power adapter; – Remote power on the Ethernet-cable UTP CAT-5E (up to 40m) <sup>1</sup>
Power consumption	5 W max.
Operating temperature range	from +5 to 40°C

<sup>1</sup> When using the power supply GRT-120100A

Relative humidity	up to 80 %
Dimensions	112x100x32 mm
Weight	0,25 kg

## 2.4 Design

NTU-1 devices are designed as a 112×100×32 mm desktop device in a plastic housing.

Fig. 2 shows NTU-1 rear panel.

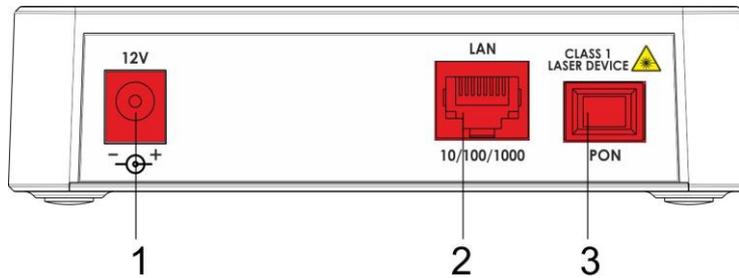


Fig. 2 – NTU-1 Rear Panel

Connectors and controls located on the rear panel of NTU-1 are listed in Table 3.

Table 3 – Description of LEDs and Controls Located on the Rear Panel

Rear Panel Element		Description
1	12V	Power adapter connector
2	10/100/1000	RJ-45 10/100/1000Base-T port for connection of network devices
3	PON	SC port (socket) for connection to PON with GPON interface

Fig. 3 shows a NTU-1 side and top panels.

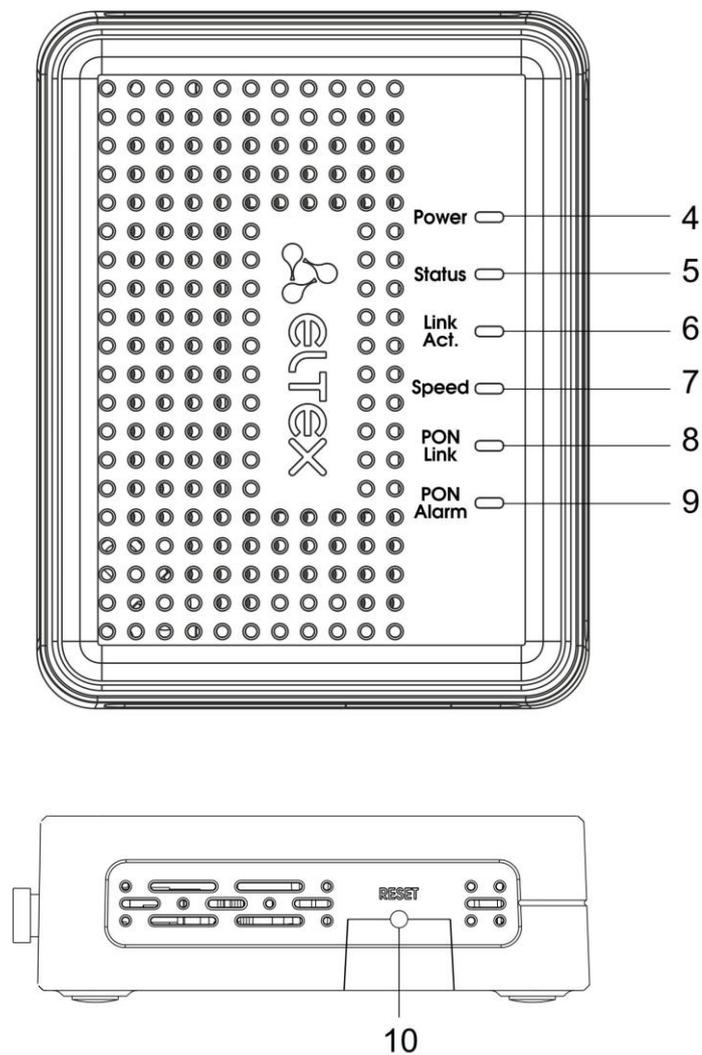


Fig. 3 – NTU-1 Top and Side Panel

Controls and LED indicators located on the NTU-1 side and top panels are listed in Table 4.

Table 4 – Description of LEDs and Controls Located on the Side and Top Panels

Panel Element		Description
4	<b>Power</b>	power on indicator
5	<b>Status</b>	device authentication indicator
6	<b>Link Act.</b>	Ethernet ports indicator
7	<b>Speed</b>	Ethernet-port connection speed indicator
8	<b>PON Link</b>	optical interface indicator
9	<b>PON Alarm</b>	connection with the station indicator optical terminal
10	<b>Reset</b>	a functional key that reboots the device and resets it to factory settings

## 2.5 Light Indication

The **Power, Status, Link Act., Speed, PON Link, PON Alarm, Reset** indicators located on the top panel show the device current status.

Table 5 lists possible statuses of the LEDs.

Table 5 – Light Indication of Device Status

LED	LED Status	Device Status
<b>Power</b>	off	device is disconnected from the power source or faulty
<b>Status</b>	off	during loading device or a default configuration
	orange	the process of getting configuration by OMCI
	red	an error in the configuration process by OMCI
	green	OMCI configuration is completed successfully, the device is working properly
<b>Link Act.</b>	off	there is no connection to the LAN-port
	green	established LAN connection
	flashes	Data transmission process
<b>Speed</b>	off	there is no connection to the LAN-port
	orange	established 1000 Mbps connection
	green	established 10/100 Mbps connection
<b>PON Link</b>	off	no signal from optical line terminal
	flashes slowly	device is not registered on optical line terminal
	flashes rapidly	transferring data packets
	green	a connection between the station and the optical terminal device
<b>PON Alarm</b>	off	a connection between the station and the optical terminal device
	red	no signal from optical line terminal

## 2.7 Reboot and Reset to Factory Settings

For device reboot, press the *Reset* button once on the device side panel. In order to reset the device to factory settings, press the *Reset* button and hold it for 7-10 seconds until the *POWER* LED glows red. Factory settings for IP address are: *LAN – 192.168.1.1, subnet mask – 255.255.255.0.*

## 2.8 Delivery Package

The standard delivery package of *NTU-1* includes:

- NTU-1 optical network terminal;
- 220V/12V power adapter;
- Operation Manual.

### 3 NTU CONFIGURATION THROUGH WEB INTERFACE. USER ACCESS

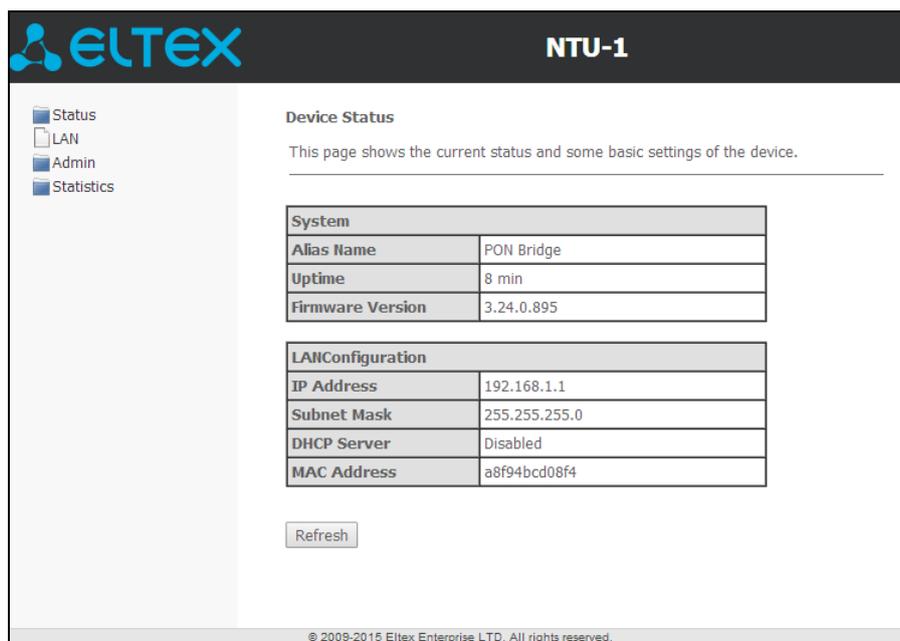
Device configuration requires access to the device by using a web browser (a program for hypertext documents displaying) such as Firefox or Google Chrome. Enter the device IP address in the browser address bar to do this (enter IP-192.168.1.1 and subnet mask – 255.255.255.0 if you have a factory settings).

When the address is entered, the device requires user to log in.

User name: *user*, password: *user*.

In order to prevent unauthorised access to the device, the password is recommended to be changed (see section **(3.3.3)**).

A general view of the web-configuration device window is shown below. There are a navigation tree for object settings on the left pane and the settings editor on the right.



The screenshot displays the ELTEX NTU-1 web interface. On the left is a navigation tree with options: Status, LAN, Admin, and Statistics. The main content area is titled 'Device Status' and includes a description: 'This page shows the current status and some basic settings of the device.' Below this are two tables: 'System' and 'LANConfiguration'. A 'Refresh' button is located below the LANConfiguration table. The footer contains the copyright notice: '© 2009-2016 Eltex Enterprise LTD. All rights reserved.'

System	
Alias Name	PON Bridge
Uptime	8 min
Firmware Version	3.24.0.895

LANConfiguration	
IP Address	192.168.1.1
Subnet Mask	255.255.255.0
DHCP Server	Disabled
MAC Address	a8f94bcd08f4

### 3.1. The Status menu. Information about the device status

#### 3.1.1. The Device submenu. Device General Information

The tab displays the current status and some basic device settings.

**Device Status**

This page shows the current status and some basic settings of the device.

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System	
Alias Name	PON Bridge
Uptime	17 min
Firmware Version	3.24.0.895

LAN Configuration	
IP Address	192.168.1.1
Subnet Mask	255.255.255.0
DHCP Server	Disabled
MAC Address	a8f94bcd08f4

*System- (system parameters):*

- *Alias Name*;
- *Uptime*– operation time from the last device reboot;
- *Firmware Version*- software version.

*LAN Configuration (LAN configuration interface):*

- *IP Address* – device address in local network;
- *Subnet Mask*-subnet mask;
- *DHCP server* – DHCP-server usage status (enabled - Dynamic IP-addresses, disabled - Static IP-addresses);
- *MAC Address* – device MAC address.

Click the *Refresh* button to refresh the information.

#### 3.1.2. The PON submenu. Information about the optical module status

This tab contains detailed information about the PON interface.

**PON Status**

This page shows the current system status of PON.

---

Pon Status	
Vendor Name	Ligent Photonics
Part Number	LTB3468-BC
Temperature	51.714844 C
Voltage	3.385500 V
Tx Power	2.510059 dBm
Rx Power	-inf dBm
Bias Current	14.664000 mA

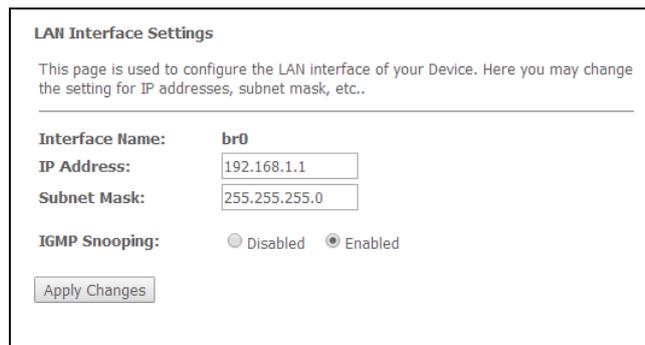
**ONU State**      01

- *Vendor Name* – manufacturing company name of the optical module;
- *Part Number* – optical module model;
- *Temperature* – optical module temperature, °C;
- *Voltage* – supply voltage, V;
- *Tx Power* – transmitted signal level (1310 nm), dBm;
- *Rx Power* – received signal level (1490 nm), dBm;
- *Bias Current* – bias current, mA.

Click the *Refresh* button to refresh the information.

### 3.2. The LAN menu. LAN Interface Settings

Use the tab shown below to configure basic LAN interface settings (for example, IP-addresses, subnet mask and other parameters)



The screenshot shows the 'LAN Interface Settings' page. It includes a title, a descriptive paragraph, and several configuration fields: 'Interface Name' (br0), 'IP Address' (192.168.1.1), 'Subnet Mask' (255.255.255.0), and 'IGMP Snooping' (radio buttons for Disabled and Enabled, with Enabled selected). An 'Apply Changes' button is at the bottom.

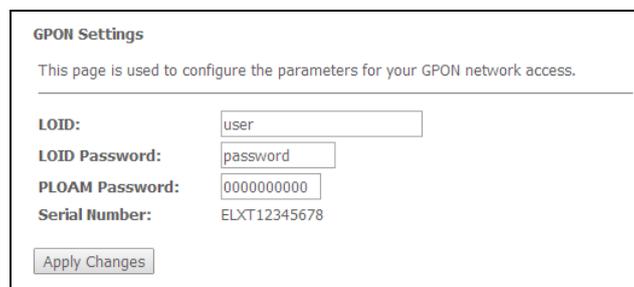
- *Interface Name*;
- *IP Address* – device address in local network;
- *Subnet mask*;
- *IGMP Snooping* – turn on/off (enabled/disabled) IGMP Snooping function to monitor network multicast traffic.

Click *Apply Changes* button to accept changes.

### 3.3. The Admin menu. Administration Settings

#### 3.3.1 The GPON Settings submenu. Settings GPON-network Access

The tab is used to configure the parameters of the GPON network access.



The screenshot shows the 'GPON Settings' page. It includes a title, a descriptive paragraph, and several configuration fields: 'LOID' (user), 'LOID Password' (password), 'PLOAM Password' (0000000000), and 'Serial Number' (ELXT12345678). An 'Apply Changes' button is at the bottom.

- *LOID<sup>1</sup>* – logical object identifier (user name in the GPON);
- *LOID Password<sup>1</sup>* – access password with a logical ID (user password in the GPON network);
- *PLOAM Password* – access password settings on the physical layer for work, terminal management and technical terminal services;
- *Serial Number* –PON serial device number.

<sup>1</sup> Not used

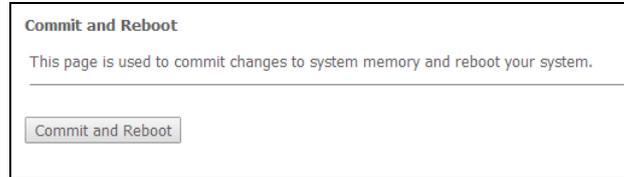
To accept changes, click *Apply Changes* button.



**It's strongly discouraged to modify configurations from this menu by your own forces. It may cause loss of connection to the station device!**

### 3.3.2 *The Commit/Reboot submenu. Commit changes and rebooting the device*

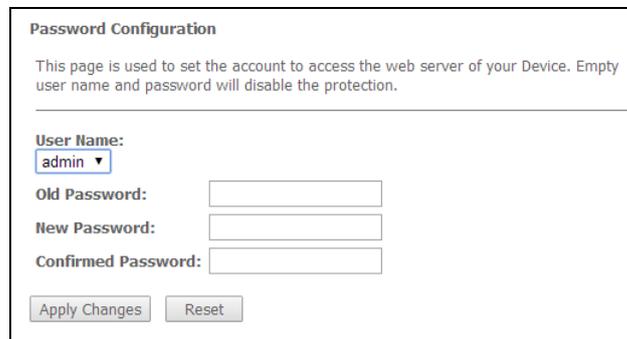
This tab is used to commit changes to system memory and reboot your system.



Click *Commit and Reboot* button to commit changes and reboot the device. Reboot can take a few minutes.

### 3.3.3 *The Password submenu. Access Control Configuration (password settings)*

Use the tab to change device access passwords.



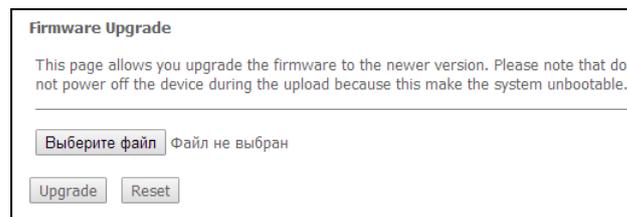
For password changing, select a username, enter the current and new passwords and then confirm new passwords.

Empty user name and password will disable the protection.

Click *Apply Changes* button to accept and save changes and *Reset* button to cancel.

### 3.3.4 *The Firmware Upgrade submenu. Firmware Update*

This tab allows you to update your device firmware.



To update firmware, choose the firmware file in *Software File name* row (by *Select File* button) and click *Update*. If you selected an incorrect file, you can delete it by *Reset* button.



Do not disconnect the device from the power supply or reboot it during firmware updates. The firmware update can take a few minutes after which the device will be rebooted automatically.

### 3.4. Statistics menu

#### 3.4.1 The Interface submenu. Network Interface statistics

This page shows the packet statistics for transmission and reception regarding to network interface.

**Interface Statistics**

This page shows the packet statistics for transmission and reception regarding to network interface.

Interface	Rx pkt	Rx err	Rx drop	Tx pkt	Tx err	Tx drop
eth0	4385	0	0	1208	0	0
nas0_0	0	0	0	30	0	0

- *Interface* – network interface name
- *Rx pkt* – received packets;
- *Rx err* – received packets with errors;
- *Rx drop* – *dropped packets during* receiving;
- *Tx pkt* – transmitted packets;
- *Tx err* – transmitted packets with errors;
- *Tx drop* – *dropped packets during* transmitting.

Click the *Refresh* button to refresh information *and* click the *Reset Statistic* button to reset statistics.

#### 3.4.2 The PON submenu. PON-interface statistics

This tab displays the statistics of received and transmitted packets for the PON interface.

**PON Statistics**

---

Bytes Sent	0
Bytes Received	0
Packets Sent	0
Packets Received	0
Unicast Packets Sent	0
Unicast Packets Received	0
Multicast Packets Sent	0
Multicast Packets Received	0
Broadcast Packets Sent	0
Broadcast Packets Received	0
FEC Errors	0
HEC Errors	0
Packets Dropped	0
Pause Packets Sent	0
Pause Packets Received	0

- *Bytes Sent* – number of the transmitted bytes;
- *Bytes Received* – number of the received bytes;
- *Packets Sent* – number of the transmitted packets;
- *Packets Received* – number of the received packets;
- *Unicast Packets Sent* – number of the transmitted unicast packets;
- *Unicast Packets Received* – number of the received unicast packets;
- *Multicast Packets Sent* – number of the transmitted multicast packets;
- *Multicast Packets Received* – number of the received multicast packets;
- *Broadcast Packets Sent* – number of the transmitted broadcast packets;
- *Broadcast Packets Received* – number of the received broadcast packets;

- *FEC Errors* – number of the errors corrected by the FEC (Forward Error Correction);
- *HEC Errors* – number of the detected checksum errors in the packet headers by the HEC (Header Error Checksum);
- *Packets Dropped*– number of the dropped packets;
- *Pause Packets Sent* – number of the transmitted PAUSE-packets to adjust the bit rate;
- *Pause Packets Received* – number of the received PAUSE-packets to adjust the bit rate.

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**APPENDIX A – POSSIBLE PROBLEMS AND OPTIONS FOR THEIR SOLUTION**

<b>Problem</b>	<b>Possible Cause</b>	<b>Solution</b>
Entering router's IP address (e.g. 192.168.1.1) could not access to the web interface	The PC does not belong to the IP subnetwork for connection to the web interface	Set the address from the 192.168.1.0/24 subnet in the Internet connection options of your computer
	Defective cable	Check the physical connection by checking of the indicator status (all LEDs should be on). When the LEDs are off, use another cable or connect to another port of the device if it is possible. If your computer is switched off, LEDs may also be off.
	Access denied by your firewall	Disable firewall on your computer
Forgotten/incorrect password to the web interface of the device	_____	Reset the router to default settings by using the F button on the rear panel. Unfortunately, all made settings will be lost in this case.

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**ACCEPTANCE CERTIFICATE AND WARRANTY**

NTU-1 Optical Network Terminal with serial number \_\_\_\_\_ satisfies the requirements of technical specification TU6650-100-33433783-2013 and is classified as fit for operation.

The manufacturer, Eltex Ltd., guarantees that the subscriber gateway satisfies the requirements of TU6650-100-33433783-2013 technical specification in case of customer adherence of the operation conditions which are set in this Manual.

The warranty period is 1 year.

The device does not contain precious materials.

Director

signature

A. N. Chernikov  
Name

Head of the Quality Control Department

signature

S. I. Igonin  
Name