

A solid blue vertical bar with rounded ends, positioned to the left of the main title.

ONT NTU-1, ONT NTU-1C

User manual, version 2.0 (13 March 2018)

Firmware version 3.26.1

IP address: **http://192.168.1.1**

User name: **user**

Password: **user**

Document version	Suitable firmware version	Issue date	Content of changes
2.0	3.26.1	13 March 2018	Third issue
1.1	3.24.1.232	22 May 2017	Second issue <ul style="list-style-type: none">• System. IGMP packet losses that were occurred by matching of MAC addresses with IGMP Querier have been fixed• System. Multicast traffic prioritization has been fixed• System. SSDP packets passing has been fixed
1.0	3.24.0.895	20 August 2015	First issue
Firmware version NTU-1(C) 3.26.1			

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.

CONTENTS

NOTES AND WARNINGS	2
1 INTRODUCTION	4
2 DEVICE DESCRIPTION	5
2.1 Application	5
2.2 Device Specification	5
2.3 Key Specifications.....	6
2.4 Design.....	7
2.4.1 NTU-1.....	7
2.4.2 NTU-1C.....	9
2.5 Light Indication.....	10
2.6 Reboot and Reset to Factory Settings.....	11
2.7 Delivery Package	11
3 NTU CONFIGURATION THROUGH WEB INTERFACE. USER ACCESS	12
3.1 The 'Status' menu. Information about the device status	12
3.1.1 The 'Device' submenu. Device General Information	12
3.1.2 The 'PON' submenu. Information on the status of the optical module.....	13
3.2 The 'LAN' menu. LAN Interface Settings.....	14
3.3 The 'Admin' menu. Administration Settings.....	14
3.3.1 The 'GPON Settings' submenu. Settings GPON network Access.....	14
3.3.2 The 'Commit/Reboot' submenu. Commit changes and rebooting the device	14
3.3.3 The 'Password' submenu. Access Control Configuration (password settings)	15
3.3.4 The 'Firmware Upgrade' submenu. Firmware Update	15
3.4 The 'Statistics' menu	16
3.4.1 The 'Interface' submenu. Network Interface statistics	16
3.4.2 The 'PON' submenu. PON interface statistics	16
APPENDIX A – POSSIBLE PROBLEMS AND OPTIONS FOR THEIR SOLUTION	18
ACCEPTANCE CERTIFICATE AND WARRANTY.....	19

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-1C 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-2W with two Ethernet *user network interfaces (UNI)* – **1 Ethernet 10/100 Base-T port, 1 Ethernet 10/100/1000 Base-T port** – and also Wi-Fi and USB interfaces;
- NTU-RG-1402G-W, which are designed to support four UNI: 10/100/1000Base-T, FXS, Wi-Fi, and USB;
- NTU-RG-1421G-Wac, 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, NTU-1C optical terminals.

2 DEVICE DESCRIPTION

2.1 Application

NTU-1, NTU-1C 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, NTU-1C user terminals 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, NTU-1C devices are designed to support various interfaces and features (see Table 1).

Table 1 – Interfaces configuration

Model Name	WAN	LAN	FXS	RF	Wi-Fi	USB
NTU-1	1xGPON	1x1Gigabit	-	-	-	-
NTU-1C	1xGPON	1x1Gigabit	-	1	-	-

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;
- 1 RF port for CaTV service provisioning¹.

The terminal uses an external adapter for 220V/12V 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 for NTU-1 and 25 meters for NTU-1C.

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.

¹ Only for NTU-1C

Fig.1 shows a diagram of the NTU-1, NTU-1C equipment connection.

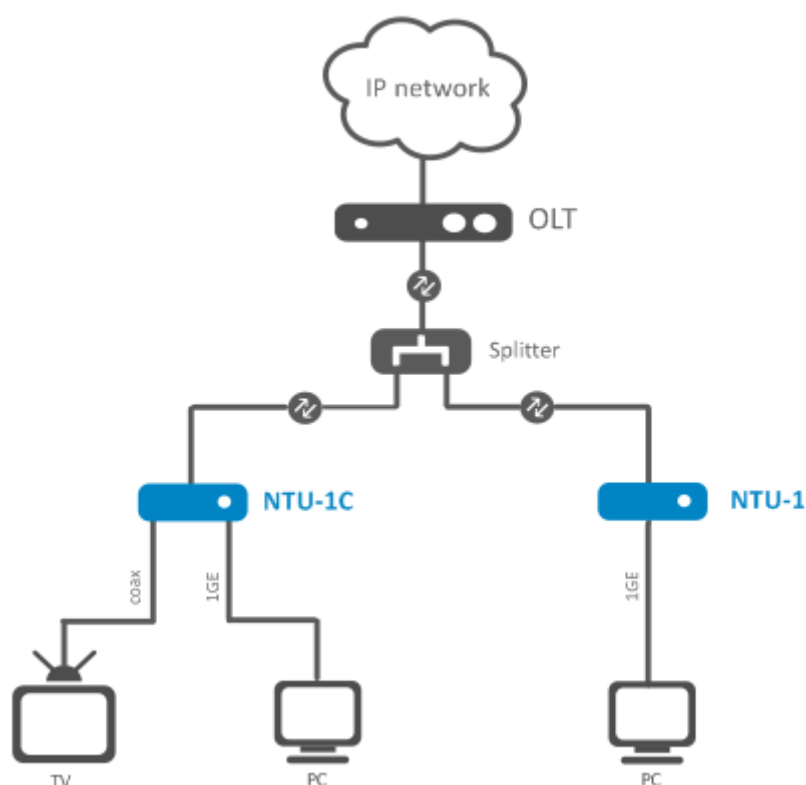


Figure 1 – Connection of NTU-1, NTU-1C

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	12V DC/220 AC power adapter;	
	Remote power on the Ethernet-cable UTP CAT-5E;	
	NTU-1	NTU-1C
	up to 40m ¹	up to 25m ¹
Power consumption	5W max	
Operating temperature range	from +5 to 40°C	
Relative humidity	up to 80 %	
Dimensions	NTU-1	112x100x32 mm
	NTU-1C	160x120x40 mm
Weight	NTU-1	0.250 kg
	NTU-1C	0.265 kg

2.4 Design

2.4.1 NTU-1

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

Fig. 2 shows NTU-1 rear panel.

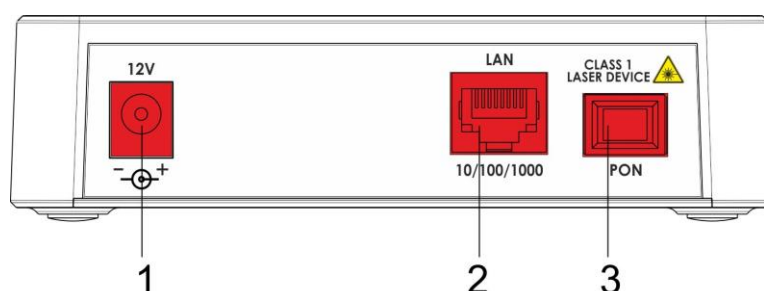


Figure 2 – NTU-1 Rear Panel

¹ When using the power supply GRT-120100A

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

Table 3 – Description of connectors and control elements 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 NTU-1 side and top panels.

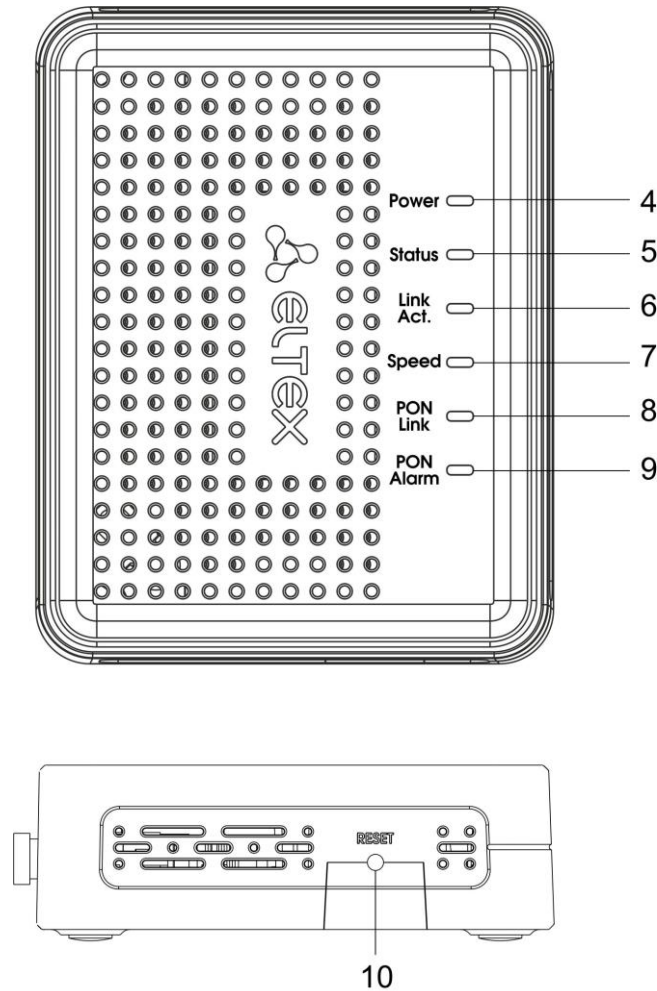


Figure 3 – NTU-1 Top and Side Panel

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

Table 4 – Description of LEDs and control elements located on the side and top panels

Panel Element		Description
4	Power	Power on indicator
5	Status	Device authentication indicator
6	Link Act.	Ethernet ports indicator
7	Speed	Ethernet-port connection speed indicator

8	PON Link	Optical interface indicator
9	PON Alarm	Connection with the station indicator optical terminal
10	Reset	A functional key that reboots the device and resets it to factory settings

2.4.2 NTU-1C

NTU-1C series devices are designed as a 160×120×40 mm desktop device in a plastic housing.

Fig. 4 shows NTU-1C rear panel.

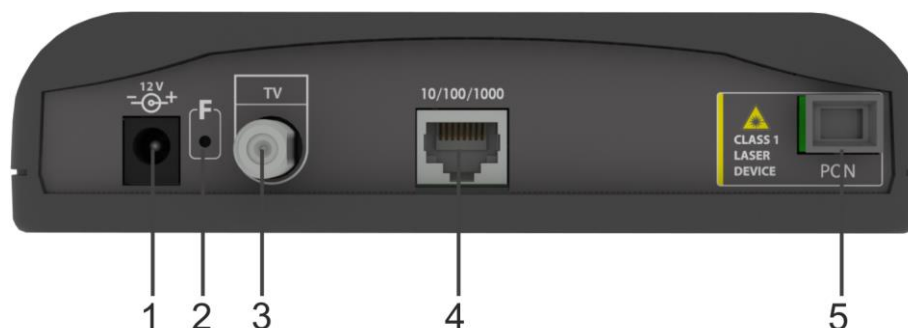


Figure 4 – NTU-1C Rear Panel

Connectors and control elements located on the rear panel of NTU-1C are listed in Table 5.

Table 5 – Description of connectors and control elements located on the rear panel

Элемент задней панели		Описание
1	12V	Power adapter connector
2	F	Function Reset button
3	RF port	A TV connector for watching cable TV
4	10/100/1000	RJ-45 10/100/1000Base-T port for connection of network devices
5	PON	PON SC port (socket) for connection to PON with GPON interface

Fig. 5 shows NTU-1C top panel.

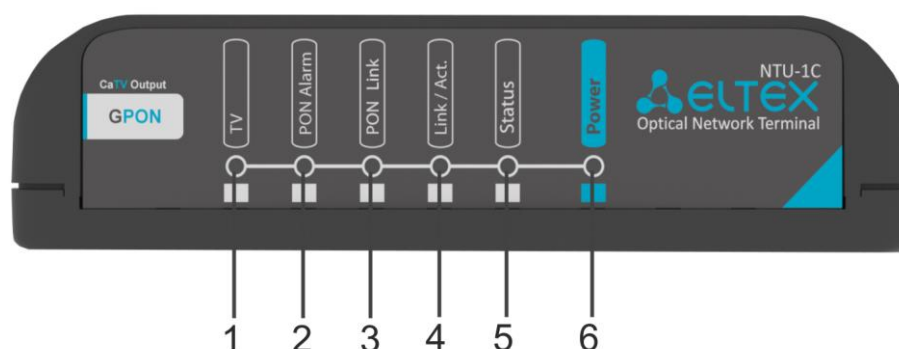


Figure 5 – NTU-1C Top Panel

Table 6 – Description of LEDs located on the top panel

Top panel element		Description
1	TV	CaTV signal indicator

2	PON Alarm	Connection with the station indicator optical terminal
3	PON Link	Optical interface indicator
4	Link/Act.	Ethernet ports indicator
5	Status	Device authentication indicator
6	Power	Power on indicator

2.5 Light Indication

The indicators located on the top panel show the device current status.

Tables 7, 8 list possible statuses of the LEDs.

Table 7 – Light Indication of NTU-1 Status

LED	LED Status	Device Status
Power	off	Device is disconnected from the power source or faulty
Status	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
Link Act.	off	There is no connection to the LAN-port
	green	Established LAN connection
	flashes	Data transmission process
Speed	off	There is no connection to the LAN-port
	orange	Established 1000 Mbps connection
	green	Established 10/100 Mbps connection
PON Link	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
PON Alarm	off	A connection between the station and the optical terminal device
	red	No signal from optical line terminal

Table 8 – Light Indication of NTU-1C Status

LED	LED Status	Device Status
TV	off	There is no CaTV signal in carrier network
	red	CaTV signal power < -10 dBm or > +3 dBm
	orange	CaTV signal power in the range of -10 dBm .. -8 dBm or +2 dBm .. +3 dBm
	green	-8 dBm < CaTV signal power < +2 dBm
Power	off	Device is disconnected from the power source or faulty
Status	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
Link Act.	off	There is no connection to the LAN-port
	green	Established LAN connection
	flashes	Data transmission process
PON Link	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
PON Alarm	off	A connection between the station and the optical terminal device
	red	No signal from optical line terminal

2.6 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.

2.7 Delivery Package

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

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

3 NTU CONFIGURATION THROUGH WEB INTERFACE. USER ACCESS

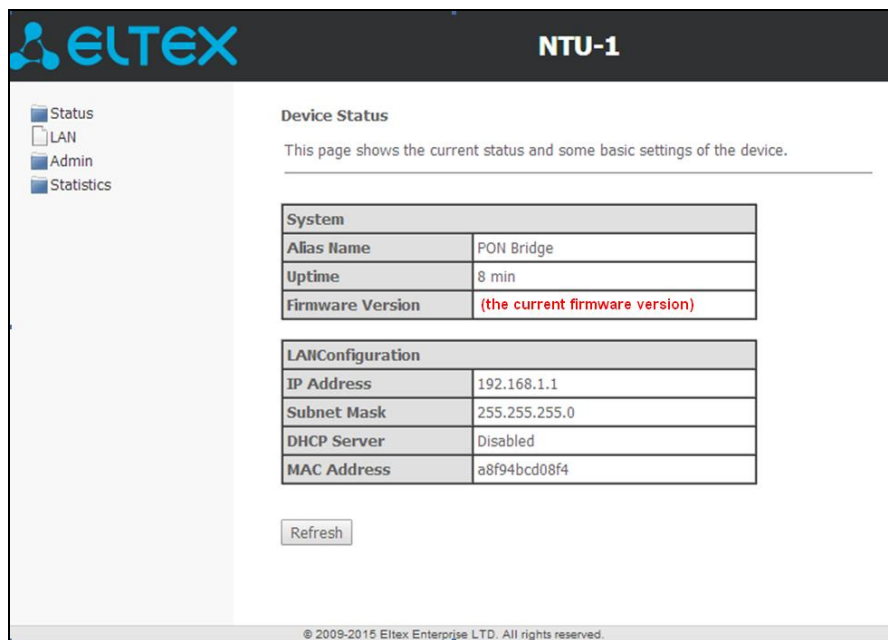
Device configuration requires accessing the device through a Web browser (a program for hypertext documents displaying) such as Firefox or Google Chrome. Enter the device IP address in the browser address bar to do this (enter *IP-192.168.1.1* and *subnet mask – 255.255.255.0* if you have factory settings).

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

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

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

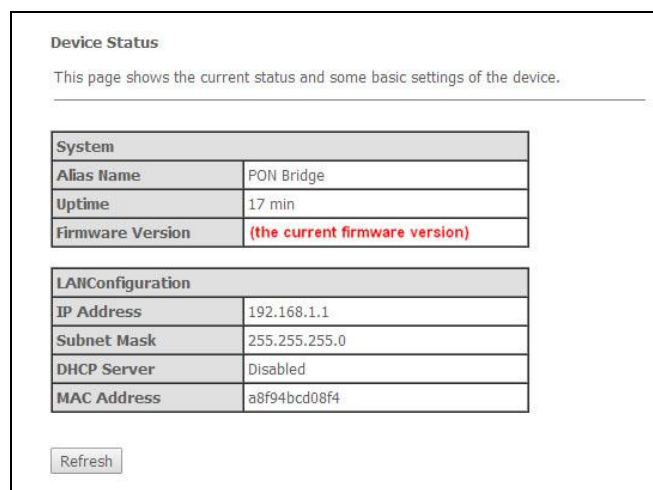
Given below is a general view of the device configuration window. A navigation tree for object settings is on the left pane, while the settings editor is on the right one.



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.



System:

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

LAN Configuration:

- *IP Address* – device address in local network;
- *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 on the status of the optical module

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
O1

- *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 this tab to configure basic LAN interface settings (for example, IP-addresses, subnet mask and other parameters).

LAN Interface Settings

This page is used to configure the LAN interface of your Device. Here you may change the setting for IP addresses, subnet mask, etc..

Interface Name:

IP Address:

Subnet Mask:

IGMP Snooping: ☐ Disabled ☒ Enabled

- *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 the *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.

GPON Settings

This page is used to configure the parameters for your GPON network access.

LOID:

LOID Password:

PLOAM Password:

Serial Number:

- *LOID*¹ – logical object identifier (user name in the GPON);
- *LOID Password*¹ – password to access with a logical ID (user password in the GPON);
- *PLOAM Password* – set a password to access the physical layer to work, terminal management and technical services;
- *Serial Number* – device PON serial number.

Click the *Apply Changes* button to accept changes.



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

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

¹ Not supported in the current firmware version

Commit and Reboot

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

Commit and Reboot

To commit changes and reboot the device, click *Commit and Reboot* button. The rebooting process takes a few minutes to complete.

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

Use the tab to change device access passwords.

Password Configuration

This page is used to set the account to access the web server of your Device. Empty user name and password will disable the protection.

User Name:

admin ▼

Old Password:

New Password:

Confirmed Password:

Apply Changes

Reset

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 the *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.

Firmware Upgrade

This page allows you upgrade the firmware to the newer version. Please note that do not power off the device during the upload because this make the system unbootable.

Выберите файл

Файл не выбран

Upgrade

Reset

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 using the *Reset* button.



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

3.4 The '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

Refresh Reset Statistics

- *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

The 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* – the number of bytes transmitted;
- *Bytes Received* – the number of bytes received;
- *Packets Sent* – the number of packets transmitted;
- *Packets Received* – the number of packets received;
- *Unicast Packets Sent* – the number of unicast packets transmitted;
- *Unicast Packets Received* – the number of unicast packets received ;
- *Multicast Packets Sent* – the number of multicast packets transmitted ;
- *Multicast Packets Received* – the number of multicast packets received ;
- *Broadcast Packets Sent* – the number of broadcast packets transmitted;
- *Broadcast Packets Received* – the number of broadcast packets received;
- *FEC Errors* – the number of errors corrected using the FEC (Forward Error Correction);
- *HEC Errors* – the number of errors corrected using the HEC (Header Error Checksum);
- *Packets Dropped* – the number of packets dropped;

- *Pause Packets Sent* – the number of PAUSE packets transmitted to adjust the bit rate;
- *Pause Packets Received* – the number of PAUSE packets received to adjust the bit rate.

APPENDIX A – POSSIBLE PROBLEMS AND OPTIONS FOR THEIR SOLUTION

Problem	Possible Cause	Solution
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 status LEDs (all LEDs should be on). If the LEDs are off, use another cable or connect to another port of the device if available. 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.

ACCEPTANCE CERTIFICATE AND WARRANTY

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

The manufacturer, Eltex Ltd., guarantees that the subscriber gateway meets the requirements of TU6650-100-33433783-2013 technical specification, provided that the operating rules, specified in the operating manual, are met by a consumer.

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