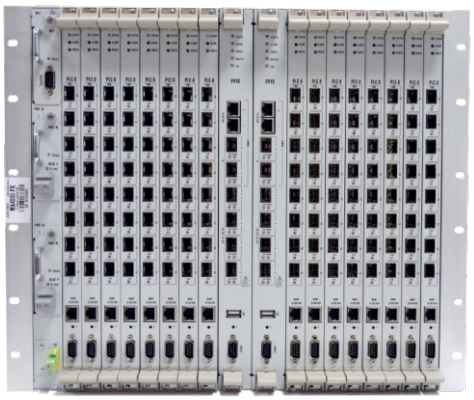
– **Modular device, form factor: 19" 9U Eurorack**
– **2 Switches (Uplink Controllers) with Hot Standby 1:1**
– **Up to 16 GPON modules (128 GPON ports)**
– **Up to 8192 ONT per node**
– **Switching Capacity: 680 Gbps**
– **Low power consumption**
– **2 separate power supplies**



Multi-service access and aggregation node MA4000-PX allows to construct access networks based on GPON technology. The OLT allows an operator to construct scalable, failsafe "last mile" networks, ensuring high safety requirements in either urban or rural areas. MA4000-PX controls customer stations, traffic switching and transport network access.

A core element of the MA4000-PX is a scalable Ethernet L2+ switch (PP4X) that interacts with optical interface access modules PLC8 to connect customer devices via GPON technology.

The modules are installed in a standard 19" 9U Eurocase. The 9U case has two slots for PP4X switch circuit control modules installation and 16 slots for linear PCL8 modules (GPON). A single system can have one or two PP4X central switch control modules.

Installation of two modules improves the fault-tolerance on account of switch redundancy and improves the bandwidth capacity of the system through the distribution of data streams between modules via stacking.

The modules interact via 10Gbit/s interfaces.

Types of modules

– PP4X: switching and control module
– PLC8: 8 x GPON 2,5Gbps interface module
– The quantity of interface modules: up to 16
– Bus type and performance: 34x10GBASE-KX (XAUI), 680Gbps

Management and monitoring

– Single management interface via CLI (Telnet, SSH, serial), SNMP
– Processing of configuration data of all modules
– Support for RADIUS, TACACS+

Specifications

Modules	up to 16 PLC8 modules up to 2 PP4X modules
Number of power supply inputs	2
Power supply voltage	36..72V
Power consumption of full chassis	no more than 833 W
Power consumption of empty chassis	no more than 35 W
Power consumption of PP4X	no more than 70 W
Power consumption of PLC8 without SFP	no more than 30 W
Power consumption of PLC8 with SFP	no more than 40 W
Power consumption of fan panel	no more than 18 W
Weight of full chassis	no more than 25 kg
Dimensions (HxWxD)	480x400x350 mm
Ambient operating temperature and humidity	from -10° to +45° C, humidity to 80%

Features and capabilities

Aggregation switch functions with the following capabilities:
– MAC address learning /aging
– MAC address limiting
– Processing of unknown MAC addresses
– Broadband traffic limiting
– Multicast traffic limiting
– Number of multicast groups - 1024
– Support for Q-in-Q in compliance IEEE 802.1ad
– STP, RSTP, MSTP
– Static routing
– Port isolation, port isolation within the same VLAN
– LAG and LACP, including interfaces of PP4X module
– Port mirroring, VLAN mirroring
– QoS: 802.1p, DSCP, WRR
– IGMP/MLD Fast Leave
– IGMP/MLD Proxy
– IGMP/MLD Snooping
– IGMP/MLD Querier
– DHCPv4 Snooping
– IPv4 Source guard
– DHCPv4/DHCPv6 Relay Agent (Option 82, IP helper)
– LLDP (802.1ab)
– PPPoE Intermediate agent
– Utilization by ONT services

Standards compliance

– IEEE 802.3 10BASE-T Ethernet
– IEEE 802.3u 100BASE-T Fast Ethernet
– IEEE 802.3ab 1000BASE-T Gigabit Ethernet
– IEEE 802.3z Fiber Gigabit Ethernet
– ANSI/IEEE 802.3 NWay auto-negotiation
– IEEE 802.3x Full Duplex and flow control
– IEEE 802.3ad Link aggregation
– IEEE 802.1p Protocol for Traffic Prioritization
– IEEE 802.1Q Virtual LANs
– IEEE 802.1ad Provider Bridges (QinQ)
– IEEE 802.1v VLAN Classification by Protocol and Port
– IEEE 802.3ac VLAN tagging
– IEEE 802.1d MAC bridges
– IEEE 802.1w Rapid Reconfiguration of Spanning Tree
– IEEE 802.1s Multiple Spanning Trees
– IEEE 802.1x Port Based Network Access Control
– ITU-T G.988 GPON
– ITU-T G.984x GPON

Management and switching hardware board PP4X

The module of the central switch, PP4X, is a main platform element performing management and diagnostics of periphery modules, switching and aggregation of traffic.

The installation of two modules improves fault-tolerance due to switch redundancy and increases the system's bandwidth capacity due to distribution of data streams between modules via stacking.

The module interaction is realized via two 10 Gbps interfaces distributing the load and ensuring redundancy.

CPU

– Marvell MV78x00, ARMv5TE architecture, 2 cores
– Core frequency - 1000 MHz
– RAM - DDR2 SDRAM 512 MB 800 MHz
– Non-volatile memory - 2 GB NAND Flash

Interfaces

– USB (compatible with USB 2.0)
– SATA II (SSD connection is available)

Network interfaces

– External connections:
  – 4 x 10GBase-X (SFP+)/1000Base-X (SFP)
  – 2 x 10/100/1000Base-T/1000Base-X (SFP)
– Interface modules connection:
  – 16 x 10G XAUI (10GBASE-KX4)
– Central switch modules connection:
  – 2 x 10G XAUI (10GBASE-KX4)
– Optical transceivers - 1G SFP, 10G SFP+ (Copper Direct Attach connection is available)
– Console port - RS-232

Switch

– Ethernet switch - Marvell Packet Processor
– Bandwidth - 480 Gbps
– MAC address table - 32K entries
– Support for up to 4K VLANs according to 802.1Q
– Quality of Service
– 8 priority output queues per port
– Quantity of ports - 24 ports, up to 10 Gbps per port

Port modes

– Duplex/half-duplex mode 10/100/1000 Mbps for electric ports
– Duplex mode for 1/10 Gbps for optical ports

Management and monitoring

– Interaction with external control and monitoring systems via Telnet, SSH, SNMP
– Access rights limiting: by password, IP address, MAC address, privilege level
– Support for RADIUS, TACACS+
– Collection of alarm data on interface modules and the whole device. Generation of notification and alarm messages for monitoring systems.
– Device temperature control, fan system management
– Software update management for all device modules

GPON interfaces module PLC8

PLC8 module is intended to provide broadband access to the data network via GPON technology with data rate up to 2.5 Gbps downlink. The module is designed for a last mile connection and allows connecting up to 512 end users (ONT). The support of RSSI provides measuring of optical line parameters.

Network interfaces

– Connection with the central switching module:
  – 2 x 10G XAUI (10GBASE-KX4)
– PON:
  – 8 ports of 2.5/1.25 Gbps GPON (SFP)

Port modes

– Duplex/half-duplex 10/100/1000 Mbps for electric ports
– Duplex mode 1/10 Gbps for optic ports

Processor

– Processor - Marvell, ARMv5TE architecture
– Core frequency - 800 MHz
– 1 core
– RAM - DDR2 SDRAM 256 MB 320 MHz
– Non-volatile memory - 2 x 32 MB SPI Flash

Switch

– Ethernet switch - Marvell Packet Processor
– Switch bandwidth - 128 Gbps
– MAC address table- 16K entries
– Support for up to 4K VLANs according to 802.1Q
– Quality of Service

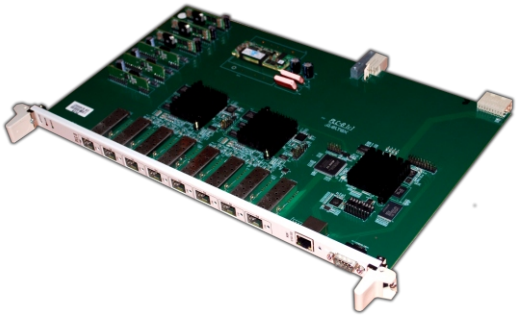
SFP PON parameters[1]

– Transmission media - optic cable SMF - 9/125, G.652
– Split ratio - up to 1:64
– Received Signal Strength Indication (RSSI)
– DDM support (parameters output to CLI):
  – Digital RSSI
  – Module Temperature
  – Supply Voltage
  – Laser Bias Current
  – Tx Optical Power Output

Class B+:
– Compliance with ITU-T G.984.2, FSAN Class B+, SFF-8472
– Maximum operating distance: 20 km
– Transmitter: 1490nm DFB Laser
  – Data rate: 2488 Mbps
  – Average launch power: +1,5..+5 dBm
  – Spectral line width: -20 dB 1.0 nm
– Receiver: 1310nm APD/TIA
  – Data rate: 1244 Mbps
  – Receiver sensitivity: -28 dBm
  – Receiver optical overload: -8 dBm

Class C++:
– Compliance with ITU-T G.984.2, FSAN Class C++, SFF-8472
– Maximum operating distance: 40 km
– Transmitter: 1490nm DFB Laser
  – Data rate: 2488 Mbps
  – Average launch output: +7..+10 dBm
  – Spectral line width: -20 dB 1.0 nm
– Receiver: 1310nm APD/TIA Detector/Amplifier
  – Data rate: 1244 Mbps
  – Average launch output: -32 dBm
  – Receiver optical overload: -12 dBm
  – Receiver Burst Mode Dynamic Range: 20 dB

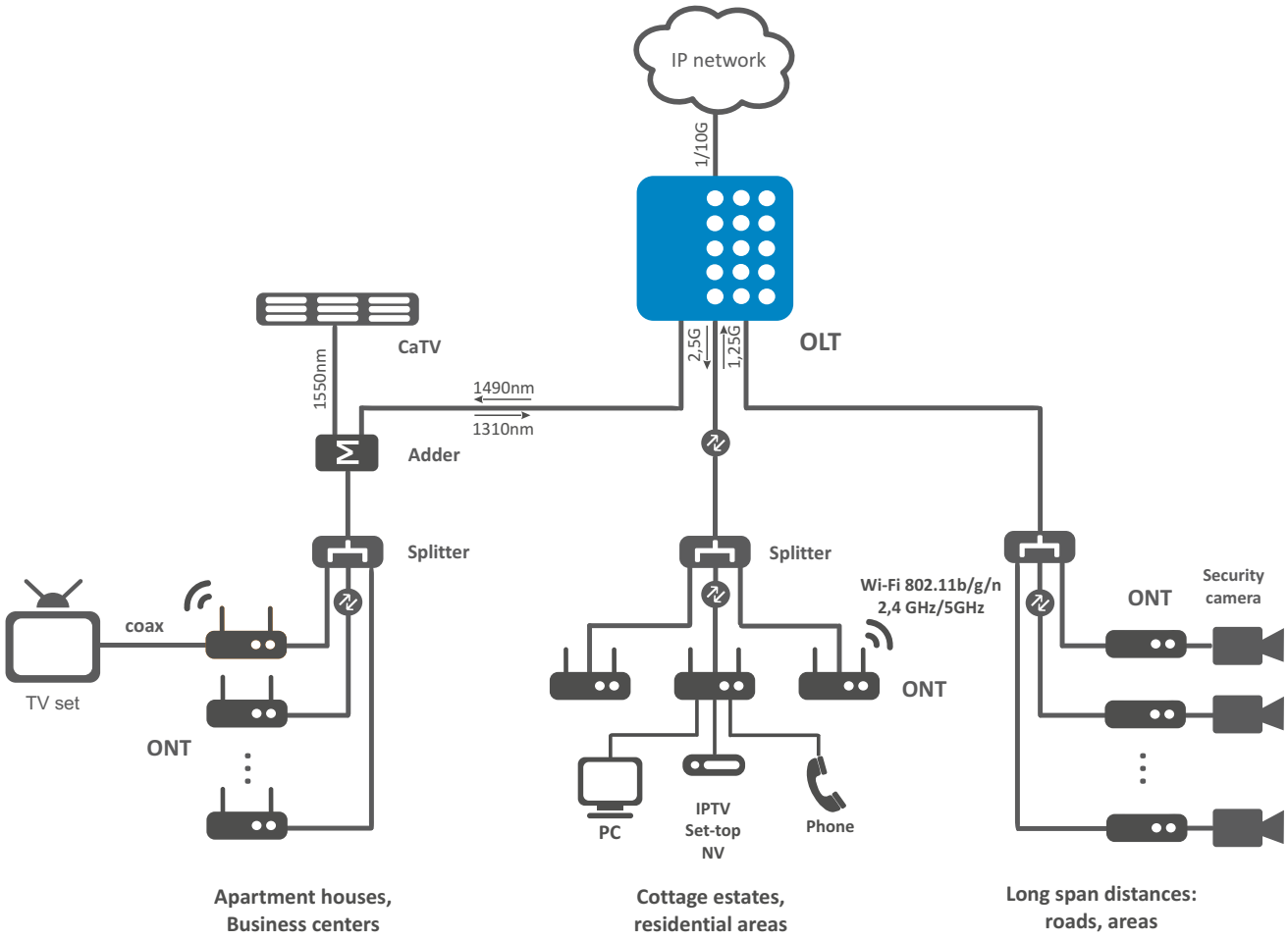
Management and switching board PP4X



GPON interfaces module PLC8

[1] Upon a request

Use case



Ordering information

Name	Description
MA4000-PX chassis	OLT MA4000-PX switching unit frame
PP4X	Ethernet switch PP4X, 2 ports of 10/100/1000Base-T/1000Base-X (SFP), 4 ports of 10GBase-R (SFP+)/1000Base-X (SFP), L2+
PLC8	OLT GPON optical access module, 8 ports of SFP-xPON, RSSI
Power supply devices	
UEP2-3 frame	19" frame, 3U, enables installing of up to 3 MP800 modules, 48V or 60V[1]
MP800	Power supply module, 13A, 48V, 48V or 60V[1]
Relating software	
EMS-MA4000	EMS-MA4000 option of Eltex.EMS system for Eltex network elements management and monitoring: 1 network element - MA4000-PX

[1] Upon a request

Contact us

+7 (383) 274 10 01
+7 (383) 274 48 48

eltex@eltex-co.ru

www.eltex-co.ru

About Eltex

Eltex company is a leading Russian developer and manufacturer of telecommunication equipment with 25 years of history. Integrity of solutions and seamless integration capability into Customer infrastructure is a priority area of company development.