Nokia ISAM FGLT-C

8-port GPON line card

The Nokia Intelligent Services Access Manager (ISAM) FGLT-C is a Gigabit Passive Optical Network (GPON) line termination card with 8 GPON interfaces. With a single line card, more than 1,000 subscribers can be connected. Because of this capability, reduction of floor space in IT rooms and lower power consumption are achieved in the most cost-effective way.

The Nokia ISAM FGLT-C supports a total non-blocking capacity of up to 40 Gb/s. Each PON interface delivers 2.5 Gb/s in downstream and 1.2 Gb/s in upstream, and has a reach of up to 60 km (37.3 miles), which makes this card ideal for cost-effective delivery of high-bandwidth IP services to business users.

Features

- 8-port GPON line card.
- Class C+ optics (32 dB link loss budget) and B+ optics (28 dB link loss budget).
- Pluggable optics.
- Received Signal Strength Indication (RSSI) capable optics; embedded OTDR.
- Supports IPTV and RF overlay.
- Supports 1:128 split; support for 30/60 km (18.6/37.3 miles) reach with B+ or C+ optics.
- Type B PON protection.
- OISGv2 and TR-156 compliant for ONT Management and Control Interface (OMCI) interoperability.
- Industrially hardened.

Benefits

- Ultra high-density deployments due to 8 ports and 1:128 split ratio.
- Long reach enables wide coverage area and CAPEX/OPEX savings.
- Flexible deployments (B+ or C+ optics) enabled by pluggable optics.
- OPEX savings with extensive RSSI troubleshooting capabilities and evolution to embedded Optical Time Domain Reflectometer (OTDR).
- Indoor/outdoor deployments.

Technical specifications

External Interfaces

- 8-port GPON interfaces, using pluggable B+ or C+ optics, allowing 28 dB or 32 dB optical loss budget, respectively, based on:

– G.984.1 – GPON service requirements.

– G.984.2 – GPON physical media dependent (PMD) layer.

– G.984.2 – GPON PMD layer, Amendment 1.

– G.984.3 – GPON transmission convergence (GTC) layer; GPON Encapsulation Method (GEM) based.

– G.984.3 – GTC layer, Amendments 1 and 2.

– G.988 – GPON OMCI, Appendices I and II.

– TR-156.

- Support for:

– Advanced Encryption Standard (AES).

– Forward Error Correction (FEC).

– Dynamic Bandwidth Allocation (DBA).

– Configurable delay tolerance.

Forwarding

- Layer 2 forwarding – Generic:

– Ethernet packet types include Ethernet II Encapsulation and Logical Link Control/ Subnetwork Access Protocol (LLC/SNAP).

– Any combination of untagged/priority/single tagged packets, selective Internet Protocol over Ethernet/Point-to-Point Protocol over Ethernet (IPoE/PPPoE) filtering.

- Virtual LAN (VLAN) assignment for untagged/ priority tagged packets based on port and protocol default VLAN, multi-VLAN support at UNI.

- Layer 2 forwarding – CC mode:

– VLAN stacking (S-VLAN CC and S-VLAN/C-VLAN CC).

- Layer 2 forwarding – RB mode:

– VLAN stacking (S-iBridge), selective broadcast.

- Layer 3 multicast:

– High-performance Internet Group Management Protocol (IGMP) processing.

– IGMP proxy.

– Immediate leave.

– Source-specific multicast/any-source multicast (SSM/ASM).

- Active-Active load sharing for up to 2 x 10Gb/s bidirectional aggregate.

Protocols

- Management using Simple Network Management Protocol (SNMP), command-line interface (CLI) and TL1.
- Provisioning and surveillance interface between optical line terminal (OLT) and optical networkterminal (ONT) is assured using standard OMCI.
- User access protocols: Address Resolution Protocol (ARP), IEEE 802.1X authentication, Dynamic Host Configuration Protocol (DHCP) Option 82 insertion, PPPoE relay tag.

Quality of service (QoS)

- QoS classification based on L2/L3/L4 multifield classification.
- Priority bit (re)marking.
- Connection admission control (CAC) at various levels of aggregation.

- Policing.
- Flexible traffic manager combining tail drop/ weighted random early detection (TD/WRED) buffer admission, strict priority/weighted fair queueing (SP/WFQ) scheduling and shaping.
- In-field, upgradeable, fully programmable packet processing.
- Advanced traffic management capabilities for Service Level Agreement (SLA) execution management and control interface (OMCI) interoperability.
- Industrially hardened.

Security

- Protection against malicious Media Access Control (MAC) moves.
- Assignment of virtual MAC address.
- Proxies to avoid downstream multicast/broadcast (ARP).
- IPv4/IPv6 address antispoofing for user data packets/ARP/IGMP/DHCP.
- Access control list (ACL) based on L2/L3/L4 multifield classification.
- Rate control of control packets.

Standard compliance

Environmental

- ETS 300 019-1-1 storage – Class 1.1 (weather protected, partly temperature-controlled locations).
- ETS 300 019-1-2 transport – Class 2.3 (packet, public transportation).
- ETS 300 019-1-3 stationary use – Class 3.1E (temperature-controlled locations), when used in configuration with up to 2 shelves.
- ETS 300 019-1-3 stationary use – Class 3.3 (non temperature-controlled locations), when used in a standalone shelf.

Protection

- ITU-T K.20/K.45.

Safety

- IEC 60950-1/EN 60950-1.
- EMC and ESD: ETS 300 386 V1.3.3 (2005-04) for telecommunication network equipment.
- European directive 2002/95/EC on the restriction of the use of certain hazardous substances (RoHS).

Operating environment

- Temperature, inlet/ambient:

– -5°C to +45°C (23°F to +113°F), when used in configuration with up to 2 FX.

– -40°C to +65°C (-40°F to +149°F), when used in standalone ISAM FX.

- Over-temperature sensors and shutdown.
- Humidity: 10% to 95% (non-condensing).

Dimensions

- Height: 405 mm (15.94 in)
- Width

– Top: 225 mm (8.85 in)

– Bottom: 205 mm (8.07 in)

- Board-to-board pitch: 25 mm (0.98 in)