Nokia ISAM FGLT-B

16-port GPON line card

The Nokia Intelligent Services Access Manager (ISAM) FGLT-B is a Gigabit Passive Optical Network (GPON) line termination card with 16 GPON interfaces. With a single line card service providers can connect more than 2,000 subscribers or 32,000 subscribers in a fully filled rack configuration. Because of this capability broadband coverage goals are reached in the most cost-effective way — by reducing the central office space and lowering power consumption.

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

Features

- 16-port GPON line card
- Class C+ optics (32dB link loss budget) and B+ optics (28dB link loss budget)
- Pluggable optics
- Received signal strength indication (RSSI) capable optics; embedded optical time domain reflectometer (OTDR)
- Supports IPTV and RF overlay
- Supports 1:128 split; support for 30km/60km (18.6mi/37.3mi) reach with B+ or C+ optics
- Type B PON protection
- OISGv2 and TR-156 compliant for ONT management and control interface (OMCI) interoperability
- Industrial hardened

Benefits

- Ultra high-density deployments due to 16 ports and 1:128 split ratio
- Long reach enables wide coverage area for CO consolidation 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 OTDR
- Indoor/Outdoor deployments

Technical specifications

External interfaces:
- 16-port GPON interfaces, using pluggable B+ or C+ optics, allowing 28dB or 32dB 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, Appendixes 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 4 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 network terminal (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 at various levels
- In-field, upgradeable, fully programmable packet processing
- Advanced traffic management capabilities for service level agreement (SLA) execution

Security

- Protection against malicious media access control (MAC) move
- 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

Standards 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 FX or 2 FD shelves
- ETS 300 019-1-3 stationary use – Class 3.3 (not temperature-controlled locations), when used in standalone ISAM FX or ISAM FD 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 or 2 FD shelves
  - -40°C to 65°C (-40°F to 149°F), when used in standalone ISAM FX or FD shelf
- Over-temperature sensors and shutdown
- Humidity: 10% to 95% (non-condensing)

Dimensions

- Height: 405mm (15.94in)
- Width
  - Top: 225mm (8.85in)
  - Bottom: 205mm (8.07in)
- Board-to-board pitch: 25mm (0.98in)