

# Nokia ISAM FANT-G

## Network Termination card

The Nokia Intelligent Services Access Manager (ISAM) FANT-G Network Termination (NT) card is a controller board that provides service and network intelligence in the Nokia 7360 ISAM FX access node. It has a 1.28 Tb/s switching matrix and delivers 40 Gb/s throughput to each line card, making it ideal for delivery of high capacity services in fiber networks.

## Product overview

The Nokia ISAM FANT-G NT card provides 100 Gb/s, 10 Gb/s and 1 Gb/s links, which can be used for network interfaces, user connection or subtending. It supports applications that require a high stability clock, Building Integrated Timing Supply (BITS) interface, Synchronous Ethernet (SyncE) and Time of Day (ToD IEEE 1588). The FANT-G NT card runs the same field-proven IP protocol stack as the Nokia aggregation routers and supports Ethernet, IPv4, IPv6 and Multiprotocol Label Switching (MPLS).

Two FANT-G NT cards can be run in active-active redundancy mode, ensuring system reliability and enhancing a total system switching capacity to 2.56 Tb/s and delivering 80 Gb/s to each line card slot.



## Features

- 1.28 Tb/s switching matrix (bidirectional)
- Active-active redundancy
- Supports 40 Gb/s connection to each line card slot (all ISAM FX shelves)
- Supports additional 8 x 10 Gb/s or 1 x 100 Gb/s connections via NT input/output card
- 4 x 1 Gb/10 Gigabit Ethernet (GigE) + 1 x 100 GigE network links with 1+1 link redundancy
- Supports subtending and aggregation
- Clock synchronization: BITS/SyncE/ToD with high stability clock, BITS, SyncE and ToD clock recovery
- MPLS forwarding with enhanced routing support: Routing Information Protocol (RIP), Open Shortest Path First (OSPF), Border Gateway Protocol (BGP) and Intermediate System to Intermediate System (IS-IS)
- Industrial hardened

## Benefits

- Market leading switching and backplane capacity
- Delivers 99.999% availability
- Supports Carrier Ethernet services
- Provides fast recovery of critical services with MPLS
- Reduces the number of aggregation network ports required through self-aggregation feature
- Supports clock critical applications: voice, leased lines and mobile backhauling
- Deploys in indoor and outdoor environments

## Technical specifications

### Product specifications

#### External interfaces

- 4 configurable small form-factor pluggable (SFP)+ cages supporting 1 Gb/10 Gb interface
- CFP4 cage supporting 100 Gb/s link
- Optical and electrical connection through SFP and SFP+ standards
- 1 port electrical 10/100/1000BASE-T port (RJ-45 connector)
- 2 ports BITS interface: 1 port in, 1 port out, using ITU-T G.703 (ANSI interfaces available on separate GFC unit)
- ToD interfaces
- 1 port local craft management (LCM) interface using RS-232 (RJ-45 connector)
- 1 alarm cutoff (ACO) button for alarm cutoff and lamp test interfaces; for example, signaling and communication (ANSI ACO available on separate GFC unit)

#### Forwarding

- Ethernet bridging
- Virtual local area network (VLAN) stacking for residential and business access
- 802.3ad trunking: Link Aggregation Control Protocol (LACP)
- Multiple Spanning Tree Protocol (MSTP), Rapid Spanning Tree Protocol (RSTP) and Spanning Tree Protocol (STP) support
- 4,095 VLAN IDs, VLAN stacking (Q in Q), 128,000 move, add and change (MAC) addresses
- MPLS
- Layer (L3) forwarding (IPv4)
- RIP v2, OSPF v2, BGP v4, IS-IS routing protocols



- Multicast forwarding, high performance Internet Group Management Protocol (IGMP) processing, IGMP proxy
- IP quality of service (QoS)
- Dynamic Host Configuration Protocol (DHCP) relay, multiple instances
- Access control lists (ACLs), denial of service (DoS) protection
- Malicious MAC move protection
- Lawful intercept (LI)
- Billing and accounting support
- Hubbing support
- Ethernet ring connectivity
- Supports central broadband remote access server (BRAS) and distributed service-edge models
- Point-to-Point Protocol (PPP) connectivity to single or multiple systems
- Up to 16,000 subscribers per system
- Syslog: CLI screen, external server, local file
- Loopback interface
- CLI and TL1 operator authentication: local or Remote Access Dial-In User Server (RADIUS) based
- Alarm management
  - Severity handling
  - Lists: current, snapshot, delta
  - Logs
  - Filtering
- Troubleshooting counters
- IP ping and trace route
- Central processing unit (CPU) and memory load
- SFP digital diagnostics
- Performance monitoring
- Protocol tracing
  - DHCP
  - Address Resolution Protocol (ARP)
  - IGMP
  - Output to CLI, syslog or local file
- Offline migration system configuration

## Deployment

- Simple Network Management Protocol (SNMP)
  - SNMPv1 (RFC 1157)
  - SNMPv2 (RFC 1909-1910)
  - SNMPv3 (RFC 3410-3418)
- Command-line interface (CLI): telnet (RFC 854), secure shell (SSH)
- Transaction Language 1 (TL1): with or without SSH
- File Transfer Protocol (FTP):
  - FTP (RFC 959)
  - Trivial File Transfer Protocol (TFTP)
  - Secure Shell File Transfer Protocol (SFTP) for backup and restore and software download
- Simple Network Time Protocol (SNTP)

## Eco-sustainability

- Switch ports can be selectively powered down
- Equipped with thermal sensors for temperature-controlled cooling, resulting in maximum efficiency and low acoustic noise

## 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 (packed, public transportation)

- ETS 300 019-1-3 stationary use – Class 3.1E (temperature-controlled locations), when used in fully populated Nokia 7360 ISAM racks with more than one shelf
- ETS 300 019-1-3 stationary use – Class 3.3 (non-condensing, not temperature-controlled locations), when used in standalone Nokia 7360 ISAM shelves
- NEBS Level 3 compliant (SR-3580)
- GR-63-CORE
- Protection: ITU-T K.20/K.45
- Safety: IEC 60950-1/EN60950-1
- EMC and ESD
  - ETS 300 386 V1.3.3 (2005-04) for telecommunication network equipment
  - GR-1089-CORE
- European directive 2011/65/EU on the restriction of the use of certain hazardous substances (RoHS)

## Operating environment

- -5°C to 45°C (23°F to 113°F) inlet/ambient temperature range, when used in fully populated Nokia 7360 ISAM racks with more than one shelf
- -40°C to 65°C (-40°F to 149°F) inlet/ambient temperature range, when used in standalone Nokia 7360 ISAM FX shelves
- Over-temperature sensors and shutdown
- GR-3108-CORE for operating temperature and humidity for Class 2 equipment
- Compliant with environmental requirements as described in ATT-TP-76200

## Dimensions

- Height: 405 mm (15.9 in)
- Width
  - Top: 225 mm (8.9 in)
  - Bottom: 205 mm (8.1 in)
- Board-to-board pitch: 30 mm (1.2 in)