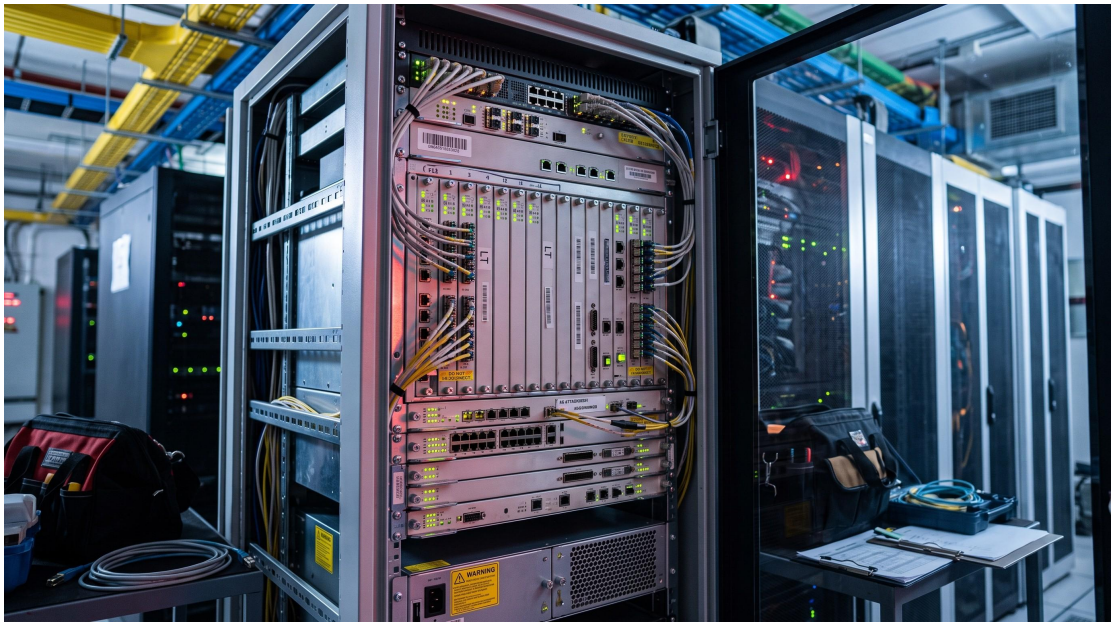
Enterprise Core Systems Engineering Reference Manual: Nokia 7360 ISAM FX-8 Intelligent Services Access Manager Field Installation Manual

PRODUCT IDENTIFICATION

The Nokia 7360 Intelligent Services Access Manager (ISAM) FX-8 is a carrier-grade, high-capacity access node designed for central office and large enterprise Optical LAN deployments requiring flexible multi-service aggregation and field-installable modular architecture. As the mid-range variant within the ISAM FX shelf family, the FX-8 occupies the strategic intersection between compact remote-hub form factors and high-density core office platforms, accommodating eight line termination slots alongside redundant network termination and power subsystems within a standard 8-RU chassis .

The 7360 ISAM FX-8 hardware installation manual serves as the authoritative field engineering reference for physical deployment, covering shelf mounting procedures, fiber management protocols, power provisioning, thermal considerations, and equipment safety compliance. This document is intended for qualified service personnel performing installation and commissioning activities in restricted access locations such as telecommunications central offices, enterprise data centers, and optical LAN distribution hubs .



CORE INTERNAL TOPOLOGY

The FX-8 shelf architecture is engineered around a non-blocking, high-capacity backplane that delivers 2 x 100 Gb/s of dedicated bandwidth to each line termination slot . The chassis accommodates two Network Termination (NT) cards in active/standby or active/active configurations, providing switching capacities of 480 Gb/s (FANT-F) or 1.28 Tb/s (FANT-G) bidirectional throughput . This redundant control and data plane architecture ensures that a single NT card failure triggers a stateful switchover in less than 50 milliseconds, preserving all active subscriber sessions without packet loss .

The eight line termination slots accept a diverse portfolio of access technology cards, enabling simultaneous support for GPON, XGS-PON, TWDM-PON, point-to-point Ethernet, and VDSL2 vectoring within a single unified platform .

This multi-technology convergence allows network operators to migrate subscribers from legacy copper access to next-generation fiber services incrementally, without requiring parallel infrastructure or shelf replacement.

A dedicated uplink extension slot accommodates Network Termination Input Output (NTIO) modules, adding up to eight additional 10 Gb/s or 1 Gb/s network interfaces for increased uplink capacity and traffic distribution flexibility . The total system uplink capacity reaches 160 Gb/s with FANT-F controllers or 360 Gb/s with FANT-G controllers, sufficient for high-density subscriber aggregation and bandwidth-intensive enterprise applications .

SWITCHING SUBSYSTEM CAPABILITIES

The switching fabric of the 7360 ISAM FX-8 is designed around a non-blocking architecture that eliminates internal congestion points, ensuring that every line termination slot has simultaneous access to the full backplane bandwidth without contention. This design philosophy is particularly critical for downstream multicast video distribution, where multiple PON ports must replicate high-definition IPTV streams concurrently without introducing jitter or packet loss.

The NT card provides both switching and uplink functionality, featuring four

configurable SFP+ cages that accept 10 Gb/s or 1 Gb/s transceivers. In FANT-G configurations, CFP4 cages enable 100 Gb/s uplink connectivity for next-generation transport integration . The network termination cards support active/active data plane redundancy with load sharing, while the control and management plane operates in active/standby mode to ensure deterministic failover behavior .

Traffic management within the FX-8 employs sophisticated Quality of Service mechanisms including hierarchical traffic shaping, Dynamic Bandwidth Allocation (DBA) for GPON upstream scheduling, and IGMP snooping with Multicast VLAN Registration (MVR) for efficient IPTV delivery . The DBA implementation utilizes Status Reporting DBA (SR-DBA), wherein Optical Network Terminals report buffer occupancy via DBRu messages, allowing the line card ASIC to allocate upstream time slots within microseconds based on configured T-CONT profiles .

OPERATIONAL ADVANTAGES

The 7360 ISAM FX-8 field installation architecture emphasizes operational simplicity and lifecycle cost reduction through modular, hot-swappable components. Fan trays and power supply modules are accessible from the front panel without requiring shelf removal, enabling field maintenance with minimal

service disruption . The -48/-60 V DC power input accepts fully redundant branch A and B feeds, and the chassis complies with Network Equipment Building System (NEBS) Level 3 requirements for seismic, thermal, and electromagnetic robustness .

Thermal management employs a push-pull airflow design with variable-speed fan control governed by thermal sensors on line cards. This approach optimizes cooling efficiency during high-load periods while reducing acoustic noise and power consumption under nominal conditions . The operating temperature range of -40°C to +65°C enables deployment in temperature-controlled central offices as well as harsher outside-plant cabinet environments .

From an operational management perspective, the FX-8 supports both traditional SNMP/MIB-based management via the Nokia 5520 Access Management System (AMS) and modern SDN-oriented programmability through NETCONF/YANG interfaces and the Nokia Altiplano Access Controller . This dual-mode management capability allows operators to preserve existing OSS integration while transitioning toward intent-based networking and automated service provisioning.

SPECIFICATION MATRIX

The following specification matrix summarizes the principal technical parameters of the Nokia 7360 ISAM FX-8 as documented in the hardware installation manual and associated product datasheets. Field engineers should verify all values against the specific equipment revision and software release deployed at the target site.

Parameter	Specification
Form Factor	8-RU modular shelf; supports 19-inch and 23-inch rack mounting
Dimensions (H x W x D)	355 mm x 446.5 mm x 278.3 mm
Line Termination Slots	8 slots for GPON, XGS-PON, TWDM-PON, P2P, or VDSL2 line cards
Network Termination Slots	2 slots (FANT-F or FANT-G) with active/active or active/standby redundancy
Switching Capacity	480 Gb/s (FANT-F) or 1.28 Tb/s (FANT-G) bidirectional per NT card
Backplane Bandwidth	2 x 100 Gb/s per LT slot; non-blocking architecture
Uplink Capacity	160 Gb/s (FANT-F) or 360 Gb/s (FANT-G) network interfaces
Uplink Interfaces	4 x SFP+ per NT card (10G/1G);

	optional NTIO adds 8 x SFP+; FANT-G supports CFP4
Max GPON Ports	128 ports (8 slots x 16-port cards)
Max Subscribers	8,192 subscribers at 1:64 split ratio
Power Input	-48/-60 V DC nominal; redundant branch A and B feeds
Power Protection	50 A branch circuit overcurrent protection; 8 AWG copper conductors
Operating Temperature	-40°C to +65°C (-40°F to +149°F)
Operating Humidity	5% to 93% non-condensing
Cooling	Push-pull airflow; hot-swappable fan trays with variable speed control
NEBS Compliance	Level 3 (GR-63-CORE, GR-1089-CORE)
Environmental Standards	ETS EN 300 019-1-1 Class 1.1; ETS EN 300 019-1-2 Class 2.3; ETS EN 300 019-1-3 Class 3.1E/3.3
Management Interfaces	SNMP/MIB via Nokia 5520 AMS; NETCONF/YANG via Altiplano Access Controller
Redundancy Switchover	< 50 milliseconds (NT card stateful failover)

REGULATORY COMPLIANCE

The Nokia 7360 ISAM FX-8 is designed and tested to meet the regulatory and safety standards applicable to telecommunications infrastructure deployed in North American and international markets. These certifications ensure that the equipment can be installed and operated in regulated environments without additional site modifications beyond those specified in the installation manual.

Environmental compliance includes adherence to ETS EN 300 019-1-1 (storage, Class 1.1), ETS EN 300 019-1-2 (transport, Class 2.3), and ETS EN 300 019-1-3 (stationary use, Class 3.1E and Class 3.3) for temperature, humidity, and vibration characteristics . The chassis also conforms to GR-63-CORE for NEBS Level 3 physical protection requirements .

Safety and electromagnetic compatibility certifications include compliance with applicable sections of IEC 60950-1 (product safety), EN 55022 (emissions), and EN 55024 (immunity) for the ETSI variant, as well as UL 60950-1 and FCC Part 15 for the ANSI variant. The installation manual specifies that the FX-8 must be connected to a reliably grounded -48 V DC SELV source with branch circuit overcurrent protection rated at 50 A using 8 AWG copper conductors .

Restriction of Hazardous Substances (RoHS) compliance is declared under European Directive 2002/95/EC, and the equipment is designed for end-of-life collection and treatment in accordance with WEEE (Waste Electrical and Electronic Equipment) regulations under Nokia ' s producer responsibility programs .

