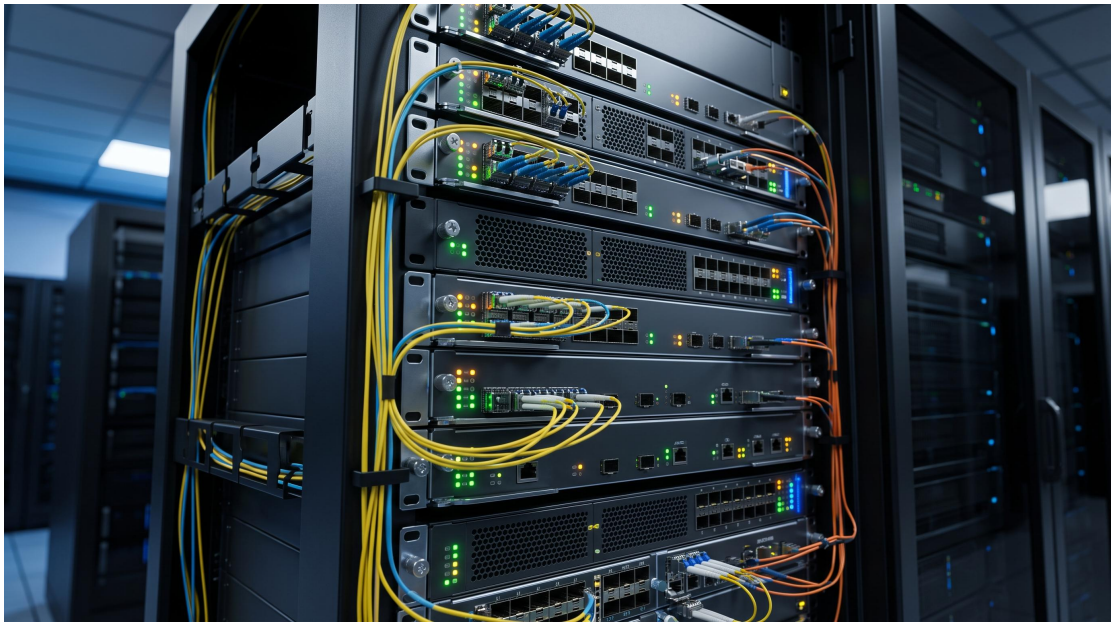
Nokia ISAM 7360 NG-PON2 Universal Line Card Wavelength Tuning Protocols - Official Technical Overview & Hardware Datasheet

EXECUTIVE SUMMARY

The Nokia ISAM 7360 NG-PON2 Universal Line Card, commercially designated as FWLT-B, represents a cornerstone innovation in carrier-grade fiber access infrastructure. This 8-port line termination card delivers a truly universal next-generation PON solution, consolidating XGS-PON dual-rate capabilities and TWDM-PON (NG-PON2) functionality onto a single hardware asset . The defining architectural advantage of this platform lies in its wavelength tuning protocol implementation, which enables dynamic, hitless migration of subscribers across wavelength channels without service disruption or manual intervention. By leveraging the ITU-T G.989 series protocol framework, the FWLT-B empowers operators to optimize wavelength resource allocation, perform maintenance activities with zero downtime, and execute pay-as-you-grow capacity expansions with unprecedented operational efficiency. This document provides a comprehensive technical exposition of the wavelength tuning protocols, hardware architecture, and compliance framework governing this critical access network element.



HARDWARE ARCHITECTURE & SILICON

The FWLT-B line card is purpose-engineered for deployment within the Nokia 7360 ISAM FX chassis family, available in FX-4, FX-8, and FX-16 variants . Each of the eight universal NG-PON ports supports pluggable XFP optical transceivers, accommodating N1, N2, E1, and E2 optic classes with corresponding optical loss budgets of 29dB, 31dB, 33dB, and 35dB respectively . The card architecture provides two wavelengths per port (one upstream, one downstream), with the flexibility to configure either identical wavelength assignments across all ports or unique wavelength constellations on a per-port basis . This design granularity is essential for supporting diverse deployment scenarios, from dense residential FTTH to specialized business and mobile backhaul applications. The backplane interface delivers 2 x 100 Gb/s connectivity to each line termination slot, ensuring non-blocking throughput to the switching

fabric . Wavelength tuning operations are orchestrated through the card's embedded control plane, which coordinates with the 5520 Access Management System (AMS) for policy-driven wavelength allocation and subscriber migration workflows.

KEY FEATURES & WAVELENGTH TUNING LOGIC

- UNIVERSAL NG-PON COMPATIBILITY: The FWLT-B simultaneously supports XGS-PON (10G/10G and 10G/2.5G dual-rate) and TWDM-PON (10G/10G or 10G/2.5G) operation, providing operators with unmatched flexibility to mix service tiers and technology generations on a single platform .
- FLEXIBLE WAVELENGTH MOVEMENT: Subscribers can be dynamically reassigned between available wavelength channels without service interruption, enabling load balancing, maintenance scheduling, and capacity optimization in response to real-time network conditions .
- STANDARDS-COMPLIANT TUNING PROTOCOL: The wavelength tuning mechanism adheres strictly to ITU-T G.989.3 Transmission Convergence layer specifications, implementing the Tuning_Control and Tuning_Response PLOAM message sequences for deterministic, error-checked channel migration .
- ROLLBACK CAPABILITY: In the event that an ONU cannot successfully tune to a target wavelength, the protocol supports a ROLLBACK sequence that returns the subscriber to the original source OLT channel, ensuring service continuity

even during failed migration attempts .

- PER-SUBSCRIBER BANDWIDTH CONTROL: Traffic management functions provide granular scheduling and rate limiting on a per-ONT, per-UNI, and per-service-class basis, maintaining policy enforcement across wavelength transitions .

- SYNCHRONIZATION SUPPORT: IEEE 1588v2 and SyncE capabilities ensure timing continuity during wavelength tuning operations, critical for mobile backhaul and latency-sensitive enterprise services .

COMPLIANCE & STANDARDS

The FWLT-B line card is designed and validated against the complete suite of international standards governing next-generation passive optical networking. The wavelength tuning protocol implementation specifically conforms to ITU-T G.989.3, which defines the Transmission Convergence layer requirements for NG-PON2 systems, including the precise state machine transitions for normal tuning, ROLLBACK, and NACK sequences . Physical media dependent specifications follow ITU-T G.989.2, while service requirements align with G.989.1. XGS-PON operation is governed by ITU-T G.9807.1. ONT management and control interface functionality adheres to ITU-T G.988 . Environmental compliance includes ETS EN 300 019 classes for storage, transport, and stationary use, alongside GR-63-CORE and GR-3108-CORE requirements for

central office and outside plant deployments .

TECHNICAL SPECIFICATIONS

The FWLT-B operates within an inlet ambient temperature range of -5°C to 45° C when installed in a fully populated ISAM FX rack, with humidity tolerance of 10% to 95% non-condensing . The card measures 405mm in height and 225mm in depth, weighing approximately 2kg . Optical interface encapsulation utilizes the XFP form factor, with support for the full range of NG-PON2 optic classes. The card derives timing references from the NT slot and distributes synchronization signals via onboard oscillators to all ports .

Parameter	**Specification**
Form Factor	Line Termination Card for 7360 ISAM FX Chassis (FX-4/FX-8/FX-16)
Port Count	8 x Universal NG-PON Ports (XFP Encapsulation)
Supported Technologies	XGS-PON (10G/10G, 10G/2.5G) / TWDM-PON (NG-PON2)
Wavelength Tuning Protocol	ITU-T G.989.3 PLOAM (Tuning_Control / Tuning_Response / ROLLBACK)
Optical Loss Budget	29dB (N1) / 31dB (N2) / 33dB (E1) /

	35dB (E2)
Backplane Capacity	2 x 100 Gb/s per LT Slot
Operating Temperature	-5°C to 45°C (Fully Populated Rack)
Humidity	10% to 95% (Non-Condensing)
Dimensions (H x D)	405 mm x 225 mm
Weight	Approximately 2 kg
Management Interface	Nokia 5520 AMS / 5529 APC
Synchronization	IEEE 1588v2, SyncE

ORDERING SKU INFORMATION

| SKU | Description |

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| 3FE72955AA | Nokia ISAM FWLT-B 8-port Universal NG-PON Line Termination Card |

