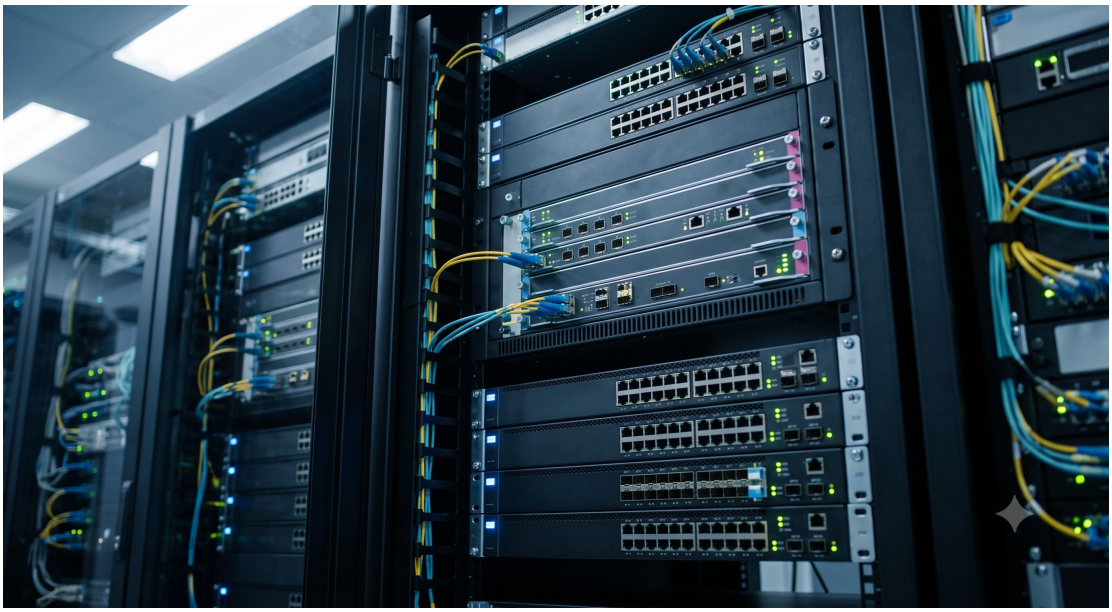
OEM Auto-Adaptive XPON ONU OMCI Register Mapping for Nokia OLT Platforms - Official Technical Overview & Hardware Datasheet

EXECUTIVE SUMMARY

This document provides a comprehensive technical overview and hardware datasheet for the OEM Auto-Adaptive XPON Optical Network Unit (ONU) solution, specifically engineered for seamless integration and register-level interoperability with Nokia OLT platforms. This next-generation ONU family is purpose-built to address the critical challenge of OMCI (ONT Management and Control Interface) register mapping discrepancies, enabling auto-adaptive interoperability that eliminates manual configuration overhead and accelerates service deployment. Designed for carriers and ISPs operating in heterogeneous access networks, the device delivers robust GPON and XGS-PON support, advanced quality-of-service (QoS) traffic management, and carrier-grade reliability, all within a compact, energy-efficient form factor.



HARDWARE ARCHITECTURE & SILICON

The hardware architecture of the OEM Auto-Adaptive XPON ONU is centered around a high-performance, energy-efficient SoC (System-on-Chip) that integrates a powerful network processor with a dedicated OMCI engine. This engine is the cornerstone of the product's auto-adaptive capability, featuring a dynamic register mapping logic that can interpret and respond to a wide range of Nokia OLT management messages without requiring firmware recompilation. The board is designed with a modular approach, separating the PON MAC (Media Access Control) layer from the user-facing interface controllers, which allows for flexible configuration of LAN, voice, and RF video ports. The silicon is fabricated on a advanced low-power process, ensuring minimal thermal dissipation and enabling a fanless chassis design for silent operation in customer premises. A key architectural feature is the dual-bank flash memory,

which supports hitless firmware upgrades, a vital requirement for maintaining service continuity in a live network environment.

KEY FEATURES & ROUTING LOGIC

- Auto-Adaptive OMCI Register Mapping: The core feature of the ONU is its dynamic OMCI engine. It stores a comprehensive database of register definitions for a broad range of Nokia OLT families, allowing it to automatically map its internal managed entities to the OLT's expected data models. This eliminates the need for per-ONU or per-deployment custom firmware, drastically simplifying inventory management and field upgrades.
- XPON Interoperability: The ONU natively supports both GPON (ITU-T G.984) and XGS-PON (ITU-T G.987) standards. It automatically detects the upstream OLT's line rate and protocol, reconfiguring its PHY layer to ensure a stable link, making it a universal CPE for network operators transitioning to 10G PON.
- Advanced QoS and Queue Management: The device features a robust hierarchical QoS engine that supports 8 hardware queues per PON port. It can perform advanced traffic classification, policing, and shaping based on 802.1p, DSCP, and TOS fields, ensuring that latency-sensitive services such as VoIP and IPTV receive priority treatment.
- Integrated Carrier-Grade Routing: The ONU acts as a full Layer 3 gateway, supporting IPv4/IPv6 dual-stack, static routing, and DHCP server/relay

functionalities. It incorporates robust NAT and firewall features, ensuring secure and reliable connectivity for the subscriber's network.

COMPLIANCE & STANDARDS

The product is designed and validated to meet the most stringent telecom standards to ensure interoperability in global carrier networks. It is fully compliant with the ITU-T G.984.4 and G.988 OMCI specifications, which is the foundation of its self-adaptive mapping engine. The device also complies with IEEE 802.3ah Ethernet in the First Mile (EFM) and relevant ETSI environmental standards for network equipment. On the interface side, the Gigabit Ethernet ports comply with IEEE 802.3, 802.3u, and 802.3ab. The ONU has successfully passed comprehensive conformance and interoperability testing in a multi-vendor ecosystem, with specific validation against the Nokia 7360 Intelligent Services Access Manager (ISAM) and the Nokia 7368 ISAM ONT product family. Furthermore, the system's software aligns with TR-069 and TR-181 for remote management, enabling efficient service provisioning through an ACS (Auto-Configuration Server).

TECHNICAL SPECIFICATIONS

Parameter	Specification

Form Factor	Compact Customer Premises Equipment (CPE)
PON Interface	1x XPON (GPON/XGS-PON auto-adaptive, SC/APC connector)
User-Side Interfaces	4x 10/100/1000Base-T RJ45, 1x RJ11 (VoIP), 1x RF (optional)
Switching Capacity	2.5 Gbps (GPON) / 10 Gbps (XGS-PON)
Forwarding Rate	N/A (Layer 2/Layer 3 integrated gateway)
Packet Buffer	256 MB DDR3 SDRAM
Flash Memory	128 MB NAND Flash (Dual-Bank)
Power Supply	External 12V DC / 1.5A (AC/DC adapter)
Power Consumption	< 8W (Typical)
Operating Temperature	0°C to 45°C
MTBF	> 150,000 hours at 25°C

