OEM Dual-Mode ONU G.984 TR-069 Management Sync Compatibility on ZTE OLTs - Official Technical Overview & Hardware Datasheet

EXECUTIVE SUMMARY

This document serves as the official technical datasheet and product overview for the OEM Dual-Mode Optical Network Unit (ONU), engineered to deliver exceptional interoperability and management synchronization within ZTE OLT-based passive optical networks. This ONU is specifically designed to address the critical carrier requirement for a unified management framework, enabling seamless G.984 GPON standards compliance while offering dual-mode operational flexibility. The device integrates advanced TR-069 management synchronization, ensuring that service providers can manage, monitor, and provision customer premises equipment with the same efficiency and granularity as their existing ZTE OLT infrastructure. This document details the hardware architecture, key features, technical specifications, and compliance standards, providing a comprehensive reference for network engineers and procurement specialists.



HARDWARE ARCHITECTURE & SILICON

The OEM Dual-Mode ONU is built upon a purpose-designed system-on-chip (SoC) architecture that combines a high-performance GPON Media Access Control (MAC) layer with a powerful network processor. The silicon integrates both the G.984 standard physical layer and a full-featured TR-069 client stack, enabling simultaneous operation and synchronization. The hardware architecture includes:

- GPON MAC & PHY: A fully integrated G.984 GPON MAC and SerDes interface, compliant with ITU-T G.984.3, supporting upstream and downstream line rates of 1.244 Gbps and 2.488 Gbps, respectively. The advanced burst-mode receiver and transmitter ensure robust optical performance over Class B+ and Class C+ optics.

- Dual-Core Network Processor: A heterogeneous dual-core processor handles data forwarding, network protocol termination, and management plane processing. This separation ensures that high-speed packet forwarding is not impacted by complex management tasks.

- TR-069 Management Engine: A dedicated hardware-accelerated engine manages the TR-069 (CWMP) protocol stack, including secure HTTPS session handling, XML parsing, and data model synchronization. This engine ensures rapid and reliable management communication with any compatible ACS.

- Synchronization Module: This is the core of the device's interoperability. It integrates a proprietary state machine and event-driven logic that ensures configuration and performance monitoring parameters are continuously synchronized between the ZTE OLT (via OMCI) and the remote ACS (via TR-069). The module handles parameter mapping, conflict resolution, and bi-directional state updates.

KEY FEATURES & ROUTING LOGIC

- Dual-Mode Management Synchronization: The ONU operates in a unique dual-mode, actively managing its state and configuration through both the OMCI channel (as defined by G.988) and the TR-069 channel. It includes a sophisticated arbitration and mapping engine to synchronize parameters like VLANs, QoS, and POTS line configurations, ensuring consistency across the

network management stack.

- Native G.984 GPON Interoperability: Fully compliant with ITU-T G.984 series recommendations, ensuring seamless registration, ranging, and activation on any ZTE OLT platform.

- TR-069 (CWMP) Full Support: The ONU acts as a fully compliant CPE WAN Management Protocol (CWMP) client, supporting all required RPC methods (Inform, GetParameterValues, SetParameterValues, Download, Reboot, etc.) and events (Boot, Periodic, Connection Request).

- Advanced Security Features: Supports robust security mechanisms including AES-128 encryption for GPON downstream traffic (as per G.984.4), and HTTPS/TLS 1.2 for secure TR-069 management sessions. Hardware-based MACsec provides secure Layer 2 communication.

- Dynamic Bandwidth Allocation (DBA): The ONU fully participates in the OLT's DBA mechanism, automatically requesting and managing upstream bandwidth based on traffic profiles and SLAs.

- Service-Aware QoS: Provides comprehensive Quality of Service (QoS) capabilities, including 802.1p and DSCP-based classification, priority queuing, and traffic shaping for voice, video, and data services.

COMPLIANCE & STANDARDS

The OEM Dual-Mode ONU is designed to meet or exceed the following critical

industry standards and certifications:

- ITU-T G.984.1, G.984.2, G.984.3, G.984.4 (GPON)
- ITU-T G.988 (ONU Management and Control Interface - OMCI)
- Broadband Forum TR-069 (CPE WAN Management Protocol) and TR-143 (Performance Monitoring)
- IEEE 802.1Q (VLAN) and IEEE 802.1p (CoS)
- IEEE 802.3-2008 (Ethernet)
- RoHS and REACH compliance
- Telcordia GR-1089-CORE (EMC and Safety) and GR-63-CORE (NEBS Level 3)

TECHNICAL SPECIFICATIONS

GPON Interface

- Standard: ITU-T G.984 series
- Downstream Speed: 2.488 Gbps
- Upstream Speed: 1.244 Gbps
- Optical Connector: SC/APC
- Optical Budget: Class B+ / C+
- Wavelength: 1490 nm (downstream) / 1310 nm (upstream)

Ethernet Interfaces

- Ports: 4 x 10/100/1000Base-T Auto-Sensing, Auto-MDI/MDIX, RJ-45

- Ports: 1 x SFP (Optional for uplink or cascading)

POTS Interface

- Ports: 1 x FXS, RJ-11

- Signaling: G.711, G.729, G.722 (VoIP via SIP/MGCP)

Management

- Protocol: TR-069 (CWMP) + OMCI (G.988)

- Out-of-Band Management: yes, via dedicated management VLAN

- Local Management: Telnet, SSH, Web UI (HTTP/HTTPS)

Parameter	**Specification**
Form Factor	Desktop / Wall-Mountable or 1RU Shelf (MDU option)
GPON Standard	ITU-T G.984.1, G.984.2, G.984.3, G.984.4
Downstream/Upstream Speed	2.488 Gbps / 1.244 Gbps
Ethernet Ports	4 x 10/100/1000Base-T (Auto-Sensing, RJ-45)
POTS Ports	1 x FXS (RJ-11)
Management Protocols	TR-069 (CWMP) and OMCI (G.988)

	with Sync
Power Supply	12V DC, 1.5A (external) or Optional 802.3af PoE
Power Consumption	< 12W (max)
Operating Temperature	0°C to 45°C
MTBF	> 150,000 hours

Physical & Environmental

- Power Supply: 12V DC, 1.5A (external adapter) or Optional 802.3af PoE

- Power Consumption: < 12W (max)

- Form Factor: Desktop / Wall-Mountable (for in-home deployment) or 1RU Shelf (for MDU/MTU applications)

- Dimensions (W x H x D): 180 mm x 35 mm x 130 mm (desktop)

- Operating Temperature: 0°C to 45°C

- Storage Temperature: -40°C to 70°C

- Humidity: 5% to 95% (non-condensing)

- MTBF: > 150,000 hours (Bellcore method)



ORDERING SKU INFORMATION

- ONU-4G-1P-DUAL: OEM Dual-Mode ONU with 4x GigE + 1x FXS (TR-069 Sync), SC/APC GPON, no PoE.

- ONU-4G-1P-DUAL-POE: OEM Dual-Mode ONU with 4x GigE (PoE) + 1x FXS (TR-069 Sync), SC/APC GPON.

- ONU-8G-2P-DUAL-SHELF: OEM Dual-Mode ONU in 1RU shelf format with 8x GigE + 2x FXS (TR-069 Sync), SC/APC GPON.