

Systems Engineering Technical Reference Manual: Layer 2 Managed Switch RFQ

SYSTEMS ENGINEERING TECHNICAL REFERENCE MANUAL: LAYER 2 MANAGED SWITCH RFQ

1. PRODUCT IDENTIFICATION

Product Designation: L2-MGS-24T4X (Layer 2 Managed Gigabit Switch – 24x GigE + 4x 10G SFP+ Uplink). The unit is a high-density, carrier-grade Layer 2 switching platform designed for service aggregation, enterprise edge, and industrial access networks. It is fully compliant with IEEE 802.1 and IETF RFC bridging standards, delivering wire-speed forwarding, advanced VLAN segmentation, and comprehensive security enforcement without routing complexity.



2. SYSTEM HARDWARE TOPOLOGY

The L2-MGS-24T4X architecture implements a non-blocking shared-memory switch fabric with an integrated packet processor ASIC. Forwarding decisions are executed in hardware at line rate. The control plane is isolated via a dedicated ARM Cortex-A9 CPU subsystem, managing SNMP, CLI, RADIUS, and 802.1X authentication. Data plane features include 802.1Q VLAN tagging, QinQ (double tagging), IGMP snooping, link aggregation (LACP 802.3ad), and loop protection (STP/RSTP/MSTP).

3. DATA & CONTROL PLANE CAPABILITIES

- LAYER 2 FORWARDING: 128k MAC address table; 16k VLAN IDs (802.1Q); 4k active VLANs simultaneously.
- TAGGING: Port-based and protocol-based VLAN; QinQ (IEEE 802.1ad) with selective TPID configuration.
- REDUNDANCY & RESILIENCE: 802.1w Rapid Spanning Tree; 802.1s Multiple Spanning Tree; Ethernet Ring Protection Switching (ITU-T G.8032) with sub-50ms convergence.
- MULTICAST: IGMP v1/v2/v3 snooping; MVR (Multicast VLAN Registration).
- LINK AGGREGATION: 8 groups, up to 8 ports per group; LACP active/passive.
- TRAFFIC POLICING: 802.1p CoS; 8 egress queues per port; strict priority and weighted round robin (WRR).
- SECURITY: Port security with dynamic MAC lock; 802.1X port-based authentication; DHCP snooping; Dynamic ARP Inspection (DAI); IP Source

Guard.

4. COMPONENT BREAKDOWN

CHASSIS & POWER: Hardened steel chassis with passive convection cooling for fanless deployment (extended temperature SKU) or dual hot-swappable fans (standard SKU). Power supply options: AC (100-240V, 50/60Hz) or DC (-48V telecom). Factory option for 1+1 redundant power supplies.

INTERFACES: 24x 10/100/1000BASE-T RJ45 ports (auto-MDI/X, auto-negotiation); 4x 10G SFP+ uplink cages (support 1G/10G SFP/SFP+ optics and DAC cables). Front-panel console port (RJ45, RS-232), out-of-band management Ethernet (10/100), and USB for firmware recovery.

5. OPERATIONAL SPECS MATRIX

Parameter	Specification
Form Factor	1RU Rack-Mountable (19-inch) or Optional Din-Rail (industrial SKU)
Switching Capacity	128 Gbps (non-blocking, full duplex)
Forwarding Rate	95.2 Mpps (64-byte packets)
MAC Table	128,000 entries
VLAN Groups (Max)	4,096 (4k active)
Jumbo Frame	Up to 10,240 bytes
Power Supply	Dual internal: AC (100-240V, 0.5A) or

	DC (-36V to -72V, 1.5A)
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6. REGULATORY COMPLIANCE

EMC: FCC Part 15 Class A, CE (EN 55032, EN 55024), VCCI. Safety: UL 60950-1 / IEC 62368-1, CB Scheme. Environmental: RoHS3, WEEE, REACH. Telecom NEBS Level 3 compliant (optional extended SKU). MTBF calculation (MIL-HDBK-217F, Ground Fixed): 420,000 hours at 25°C.

