Simgenet SMG818V5 Industrial IP MPLS Router Datasheet

In-house Developed SMGOS Software, Advanced Routing & MPLS Capabilities, PTP Support, and Modular Hardware Architecture

SMG818V5 is a high-performance, modular **Industrial IP MPLS Router** platform designed for critical infrastructure and service provider networks, operating on **SMGOS**, an **in-house developed IP/MPLS routing software** developed by Simgenet.

It is engineered for power transmission and distribution systems, substations, railway communication infrastructures, SCADA and industrial automation networks, as well as **telecom and service provider edge and aggregation layers**, with a focus on **high availability, fast convergence, time awareness, and long-term operational stability**.

SMGOS – In-house Developed IP/MPLS Routing Software

SMGOS, running on the SMG818V5 platform, is a fully **in-house developed IP/MPLS routing operating system** created by Simgenet.

- No dependency on third-party routing software
- Provides full control, customization, and long-term sustainability
- Optimized architecture for critical infrastructure and service provider networks

SMGOS is designed to respond to network topology changes at **millisecond-level convergence times**.

SMGOS CLI Design Approach

While preserving a **Cisco IOS–like command syntax and operational logic**, SMGOS is intentionally designed to reduce operational complexity, particularly in advanced configurations such as **traffic engineering and MPLS-TE**. Instead of relying on multiple configuration contexts with interdependent references, required parameters can be defined through a **single, clear, and direct CLI command**. This streamlined approach minimizes configuration errors, simplifies field operations, and eliminates the need for additional training, enabling fast and secure deployment.

The SMGOS CLI is **English-based**, and its Cisco IOS–like hierarchical structure ensures rapid learning and operational familiarity for network engineers.

Routing, MPLS, and Service Protocol Support

Core Routing Capabilities

- Static Routing
- Default Routing
- Policy-Based Routing (PBR)
- Route redistribution between routing protocols

IGP Protocols

- RIP v2
- OSPFv2
- OSPFv3
- IS-IS (Level-1 / Level-2)
- IS-IS Wide Metrics

Advanced BGP Capabilities

- iBGP / eBGP
- BGP Multipath
- ECMP
- BGP Communities and Extended Communities
- Local Preference, MED, AS-Path manipulation
- Prefix-list, route-map, and community-based routing policies
- Graceful Restart
- Graceful Shutdown
- Session Recovery
- Route Aggregation / Summarization
- BGP Add-Path
- BGP Flowspec

MPLS and Advanced MPLS Capabilities

- IP MPLS
- MPLS LDP
- MPLS L2VPN
- MPLS L2VPN VPWS (Virtual Private Wire Service)
- MPLS L2VPN VPLS (Virtual Private LAN Service)
- MPLS L3VPN

- VRF-based MPLS services
- Segment Routing (SR-MPLS)
- Segment Routing TI-LFA (Topology Independent Loop-Free Alternate)
- OSPFv2 Segment Routing Extensions
- IS-IS Segment Routing Extensions
- MPLS label operations (push / pop / swap)
- MPLS PHP (Penultimate Hop Popping)
- MPLS TTL propagation control
- MPLS OAM (Y.1731 Performance Monitoring, CFM)

MPLS Traffic Engineering

- MPLS Traffic Engineering (MPLS-TE)
- RSVP-TE
- Constraint-based path selection
- Explicit and dynamic LSP definition
- MPLS FRR (Fast Reroute) — Facility Backup, One-to-One Backup

Fast Convergence and Load Sharing

- **Fast Convergence:** Millisecond-level rerouting upon link or neighbor failure
- **ECMP (Equal-Cost Multi-Path):** Traffic distribution across equal-cost paths
- **BFD (Bidirectional Forwarding Detection):** Rapid link and path failure detection
- **Advanced timer tuning:** Hello / dead / keepalive / holdtime

IP Address Management and Services

- DHCP Server
- DHCP Relay
- VRF-aware services
- IPv4 / IPv6 Dual-Stack Routing
- ARP / IPv6 Neighbor Discovery
- Source NAT (SNAT)
- Destination NAT (DNAT)
- Port Address Translation (PAT)
- VRF-aware NAT support

Time Synchronization – PTP and NTP

SMG818V5 provides **IEEE 1588-2008 PTP v2** support for critical infrastructures requiring time awareness and event correlation.

PTP Support Scope

- IEEE 1588-2008 (PTP v2)
- Network transport: UDP/IPv4 and L2
- Delay mechanism: End-to-End (E2E)
- PTP role: Timing Consumer (Follower / Slave)

PTP Operational Behavior

- Hardware timestamp synchronization on the first node directly connected to an upstream Grandmaster Clock
- Software timestamp–based synchronization on downstream nodes in serial router chains
- Designed for time awareness, SOE, and system correlation in energy, SCADA, and edge networks

SMG818V5 is **not positioned as a telecom-core or 5G fronthaul/core hardware re-clock (Hard Boundary Clock) platform**.

Additionally:

- NTP / SNTP support

Network Management, Monitoring, and Security

- Centralized network monitoring and management via SNMP
- Performance, status, and alarm monitoring
- Syslog support
- Centralized authentication and authorization via RADIUS (AAA)
- ACL (Access Control Lists) — IPv4 / IPv6 extended access lists
- QoS / DiffServ — DSCP marking, traffic policing, traffic shaping, priority queuing
- LLDP (Link Layer Discovery Protocol)
- LACP / Link Aggregation (IEEE 802.3ad)

Overlay and Virtualized Network Support

- VXLAN support
- Compatibility with overlay and virtualized network architectures

Modular Ethernet Interface Architecture

SMG818V5 features a modular Ethernet card architecture, allowing application-specific configurations:

- 1G / 10G / 40G / 100G Ethernet modules
- SFP / SFP+ / QSFP+ / QSFP28 interface options
- Flexible port and speed combinations on a single platform

Example supported Ethernet modules:

- SMG3500PF-4SFP-M
- SMG7100PF-4SFP+-M
- SMG8100PF-2QSFP28-M

Hardware Platform

- 2U rackmount industrial chassis (440 × 592 × 88 mm)
- Support for Intel® Xeon® Scalable processors (4th / 5th Generation)
- DDR5 ECC memory architecture
- PCIe Gen5 expansion infrastructure
- Redundant power supply
- Hot-swappable intelligent fan modules (replaceable during operation)

Mechanical and Environmental Conditions

Parameter	Value
Operating temperature	-20°C ~ +60°C
Storage temperature	-40 °C ~ +70 °C
Relative humidity	10% ~ 95% (non-condensing)
EMC Emission	EN 55032:2015+A11:2020 (Class A)
EMC Immunity	EN 55035:2017+A11:2020
ESD (IEC 61000-4-2)	Level 3
Radiated RF (IEC 61000-4-3)	Level 3
EFT/Burst (IEC 61000-4-4)	Level 3
Surge (IEC 61000-4-5)	Level 3
Conducted RF (IEC 61000-4-6)	Level 3
Magnetic Field (IEC 61000-4-8)	Level 3
Voltage Dips (IEC 61000-4-11)	Level 3
Harmonics	EN IEC 61000-3-2:2019+A1:2021
Flicker	EN 61000-3-3:2013+A2:2021
LVD	EN 62368-1:2020+A11:2020
RoHS	EN IEC 63000:2018
EU Directives	2014/30/EU (EMC), 2014/35/EU (LVD), 2011/65/EU+2015/863/EU (RoHS)

Built-in SIP Server (VoIP)

With its built-in Asterisk-based SIP Server running on the SMGOS operating system, SIP lines from the ISP are terminated directly on the router, eliminating the need for additional termination hardware. Calls can be forwarded to the customer's existing PBX system via the router, or the router can operate as an independent IP PBX at locations without a dedicated PBX. This provides a more practical and seamless deployment.

- **Unlimited SIP Extensions:** Define as many internal lines as needed
- **ISP SIP Trunk Integration:** Directly integrates with SIP numbers from the service provider
- **Basic PBX Functions:** Internal calling, call forwarding, dial plan support
- **ISP SIP Termination:** SIP lines terminate directly on the router, no additional hardware required
- **PBX Integration:** Forward calls to existing customer PBX systems via the router
- **Standalone PBX Mode:** Basic IP PBX function at locations without a dedicated PBX
- **Management:** Configuration via CLI (Web interface under development)

Application Areas

- Telecom and service provider edge and aggregation networks
- ISP and Metro Ethernet backbones
- Power transmission systems and substations

- SCADA and industrial automation networks
- Railway communication infrastructures **(IP/MPLS transport infrastructure supporting GSM-R / FRMCS / ETCS-based systems)**
- Public and critical infrastructure communication systems

Short Summary

SMG818V5 is a professional **Industrial IP MPLS Router** solution developed for critical infrastructure and service provider networks, combining an **in-house developed SMGOS software platform**, field-proven advanced routing and MPLS capabilities, support for **MPLS-TE and RSVP-TE**, PTP-based time awareness, a modular Ethernet interface architecture, and robust industrial-grade design.

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