

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
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IGP Protocols

- RIP v2
 - OSPFv2
 - OSPFv3
 - IS-IS (Level-1 / Level-2)
 - IS-IS Wide Metrics
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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
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MPLS and Advanced MPLS Capabilities

- IP MPLS
 - MPLS LDP
 - MPLS L2VPN
 - MPLS L3VPN
 - VRF-based MPLS services
 - Segment Routing (SR-MPLS)
 - MPLS label operations (push / pop / swap)
 - MPLS PHP (Penultimate Hop Popping)
 - MPLS TTL propagation control
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MPLS Traffic Engineering

- MPLS Traffic Engineering (MPLS-TE)
 - RSVP-TE
 - Constraint-based path selection
 - Explicit and dynamic LSP definition
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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
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IP Address Management and Services

- DHCP Server
 - DHCP Relay
 - VRF-aware services
 - IPv4 / IPv6 Dual-Stack Routing
 - ARP / IPv6 Neighbor Discovery
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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
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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)
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Overlay and Virtualized Network Support

- VXLAN support
 - Compatibility with overlay and virtualized network architectures
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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	-10 °C ~ +55 °C
Storage temperature	-40 °C ~ +70 °C
Relative humidity	10% ~ 95% (non-condensing)

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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