

Simgenet 104 IP/MPLS Router

Hardware User Manual

(Hardware-Focused User and Reference Document)



1. Purpose and Scope

This document has been prepared to describe the hardware architecture of the SMG104 IP/MPLS Router product, its ETSI-compliant physical layout, port and slot structure, power and cooling components, and the supported Ethernet modules; and to provide a hardware reference for installation and field operation by defining the locations and functions of the hardware components.

This document does not include CLI commands or software configuration. Information related to the CLI is provided in the SMGOS CLI User Manual / Command Reference document.

2. General Hardware Description of the Product

SMG104 is an IP/MPLS router platform designed for 19-inch rack environments, with a 1U rackmount form factor; all I/O components are located on the front side, and only the power and cooling components are located on the rear side.

All console, USB, and Ethernet interfaces are positioned on the front panel. The rear panel includes a 1x220 VAC server-class industrial-type power supply and hot-swap fan modules. This layout improves cabling and maintenance convenience in accordance with ETSI standards.

3. Front Panel Layout and Components



The front panel includes the console, USB, management Ethernet ports, Ethernet module slots, and status LEDs to ensure easy access and maintenance in the field.

Component	Description
1: Console	Used for initial access and maintenance
2: USB (2 x USB3.0)	Service and maintenance operations
3: Management Ports (ETH0 / ETH1)	Management or service ports
4: Copper / Fiber Ethernet Slots	Copper and fiber Ethernet card slots



4. Rear Panel Layout



The rear panel includes only the power and cooling components:

Component	Description
1: Fans	Hot-swap fan modules
2: Power Switch	Start, Reboot, Shutdown
3: PSU / 250 W	1 × 220 VAC server-class industrial-type power supply

5. Platform and Processor Hardware Specifications

Component	Description
Platform	Server-class router platform based on Intel® C236
CPU	Intel® Xeon® E3-1200 v5 series processor
Chipset	Intel® C236

6. Memory Subsystem Technical Specifications

Component	Description
Memory Type	4 × DDR4 2133 MHz DIMMs
Memory Capacity	Memory support up to a total of 64 GB
Memory Slots	4 × DDR4 DIMM slots

7. Hardware Capacity and Backplane Approach

SMG104 provides a PCIe Gen3-based modular expansion architecture. This structure enables scalable configurations with different Ethernet speeds from 1G up to 40/100G.

SMG104 uses a PCIe Gen3-based modular Ethernet card architecture instead of classic ASIC-based chassis architectures. In this architecture, backplane capacity is evaluated based on the total theoretical PCIe I/O capacity of the Ethernet expansion slots.

Metric	Value
Ethernet expansion slots	4 × PCIe Gen3 ×8
Theoretical capacity per slot (FD)	≈ 126 Gbps
Total theoretical backplane capacity (FD)	≈ 504 Gbps

In packet-switching scenarios (IP, MPLS, etc.), actual forwarding performance depends on packet size, protocol type, and service load. Therefore, theoretical values should be treated as a hardware design ceiling rather than a performance commitment.

8. Physical Specifications

Form factor: 1U rackmount (430 mm (W) × 550 mm (D) × 89 mm (H)) / 20 kg

9. Environmental Specifications

Parameter	Value
Operating Temperature	-5 °C to +50 °C
Storage Temperature	-20 °C to +75 °C
Humidity	10% to 95% (non-condensing)
Certification	Components compliant with FCC and other regional regulations have been used.

10. Certification and Hardware Robustness

- The power infrastructure has been designed with reference to the EN 61000-4 series immunity criteria.
- Server-class power supply architecture.
- Designed for reliable deployment in energy, railway, telecom, and ISP infrastructures.
- Engineered for continuous 24/7 operation.



11. Supported Copper and Fiber Ethernet Modules

No	Model	Port Configuration	Speed	Interface Type	Special Feature	Description
1	SMG3500PF-8SFP-M	8 × SFP	1G	Mezzanine	None	PCIe x8 Mezzanine Ethernet Network Adapter (Intel I350)
2	SMG3500PF-4SFP-M	4 × SFP				PCIe x8 Mezzanine Ethernet Network Adapter (Intel I350)
3	SMG3500PT-8T-M	8 × RJ45				PCIe x8 Mezzanine Ethernet Adapter (Intel I350)
4	SMG3500BP-8T-M	8 × RJ45			Bypass	PCIe x8 Mezzanine Bypass Ethernet Adapter (Intel I350)
5	SMG3501PT-4T-M	4 × RJ45			None	PCIe x8 Mezzanine Ethernet Adapter (Intel I350)
6	SMG3501BP-4T-M	4 × RJ45			Bypass	PCIe x8 Mezzanine Bypass Ethernet Adapter (Intel I350)
7	SMG5991PF-2SFP-M	2 × SFP+	10G		None	PCIe x8 Mezzanine Ethernet Network Adapter (Intel 82599)
8	SMG7100PF-2QSFP-M	2 × QSFP+	40G			PCIe x8 Mezzanine Ethernet Network Adapter (Intel XL710)
9	SMG8100PF-2QSFP-M	2 × QSFP+	100G			PCIe x8 Mezzanine Ethernet Network Adapter (Intel E810)

12. Supported Mezzanine Ethernet Cards (Summary Table)

No	Model	Port Configuration	Speed	Image
1	SMG3500PF-8SFP-M	8 × SFP	1 Gbps	
2	SMG3500PF-4SFP-M	4 × SFP	1 Gbps	
3	SMG3500PT-8T-M	8 × RJ45	1 Gbps	
4	SMG3500BP-8T-M	8 × RJ45	1 Gbps	
5	SMG3501PT-4T-M	4 × RJ45	1 Gbps	



6	SMG3501BP-4T-M	4 × RJ45	1 Gbps	
7	SMG5991PF-2SFP-M	2 × SFP+	10 Gbps	
8	SMG7100PF-2QSFP-M	2 × QSFP+	40 Gbps	
9	SMG8100PF-2QSFP-M *	2 × QSFP+	100 Gbps	

NOTE: * The platform supports 100G Ethernet interface cards. The maximum simultaneous total throughput is limited by the platform backplane capacity in line with the PCIe Gen3 architecture.
Per PCIe Gen3 x8, the theoretical bandwidth is ≈ 63 Gbps (one-way) / ≈ 126 Gbps (Full-Duplex).

Contact Information:

SİMGENET MÜHENDİSLİK ENERJİ SAN. VE TİC.LTD.ŞTİ.

Orhantepe Mah. Tomurcuk Sok. B Blok NO:4B Kartal / İstanbul

www.simgenet.net

info@simgenet.net