SMG Integrated Media Gateway

Remove Unclearness, Disconnection and Complexity

About Synway

Synway specializes in providing superior Multimedia Gateway, Integrated Multimedia Switch,Media Processing & Signaling Technologies, Telephony Hardware and in use for Telecom communications. Since 1995, over 1000 Service providers, software developers and system integrators have integrated Synway's offerings to deliver a broad range of TDM and VoIP-based applications, including unified communications, SIP trunking, call center, mobile VAS, media gateway, fax, conferencing, call recording, Asterisk-based open source applications for operators and enterprises worldwide.

Having continued to optimize and expand its product portfolios to cater to various needs, Synway has consolidated its position as a leading vendor in international market for its widest range of portfolios: IP&TDM board & new-generation integrated multimedia switch platform and Gateway for SP developers, Asterisk-based hardware & appliances, and the most diverse hardware options for passive call recording (logging) applications in IP and TDM network.

With 500 teammates, Synway makes all efforts to deliver quality support and service and help clients offer a variety of customizable, high-performance and cost effective solutions.

Remove Unclearness, Disconnection and Complexity

- *High Capacity in Compact Size*
- *Telecom Voice Quality*
- *Customizable for any enviroments*

SMG Integrated Media Gateway

With over two decades of expertise in signaling and voice technology, Synway SMG gateway family helps customers access to IP networks from legacy telephony applications more reliably and efficiently. Our Field-proven PSTN/IP signaling technology possesses unparalleled and seamless interoperability with any complex network environments, which exponentially reduces your investment and time to markets under any uncertain situations.

In addition to inheriting Synway's voice processing capability, SMG gateway also adopts world-class voice optimization technologies, which ensure our products to communicate properly and clearly under a variety of extremely changeable networks. SMG presents subscribers with crystal voice quality, Anytime and Anywhere.

It is our priority to provide our customers with user-friendly,customizable and Plug-And-Play(PNP) SMG products. For general users, the basic configurations are available. And for sophisticated requirements, SMG offers a range of advanced configurations or personalized features. Customization for customers enable SMG to fulfill any unique and special requirements in any application.

SMG 2000/3000

- Compact 1U form factor for 16E1/T1-SIP
- Compliant with SS7/ISDN Globally
- Telecom Resilience and Voice Quality

With a better way to interconnect and deliver services through ease-of-use and unmatched low total cost of ownership,The Synway SMG2000/3000 is a member of Synway's gateway family that enables service providers and enterprises to maximize value of their networks and services.The SMG2000/3000 converts digital PSTN message into IP formats and connects and secures sessions across IP and mixed network boundaries to support the seamless delivery of services.

Besides providing low-to-high scalability in single compact footprint, the SMG2000/3000 processes signaling and media in a single chassis and can deliver SIP services into SS7, PRI,and SIP networks. It also provides basic IP session control and security features to help service providers deliver multimedia services with features that include SIP trunking support, and IP-to-IP transcoding of voice, mobile HD voice.

The SMG2000/3000 connects IP and hybrid networks via telephony and Ethernet links in a compact 1U form factor appliance. It also transforms media and signaling to support efficient and reliable voice, fax and multimedia sessions for mobile, fixed and cloud-based applications.The convergence of IP multimedia and TDM gateway functionality in a single chassis in the SMG offers significant reductions in investment and operational cost when compared to less integrated alternatives.

Key features

● Flexible and efficient Gateway Solution

With its scalable density and versatility, SMG can help enable wireless and wireline service providers to add new Value Added Services (VAS) quickly, and provide a clear migration path to an all-IP network.It can scale up to 480 simultaneous IP sessions and at the same time provide media transcoding and impressive sessions per second performance.

SMG supports voice densities ranging from 30 to 480 channels of SS7 signaling, call routing, call translation and IP transcoding in a single 1U chassis for gateway operations. The integrated gateway functionality not only provides interworking between IP and TDM domains, but also automated failover from IP to TDM for outbound routing. These features help service providers looking to improve network and routing resiliency and lower TCO. These capabilities make the SMG an excellent option for mobile VAS, SIP trunking, contact center and emergency service deployments, as well as for retail,wholesale, business, and enhanced Voice over IP (VoIP) services.

● Any-to-Any Signaling and Multimedia Connectivity

SMG2000/3000 provides any-to-any network connectivity through its ability to interwork multiple protocols used by telecommunications providers to deliver services to their retail, business and wholesale customers. it can provide interworking between ISDN, SS7, SIP formats.

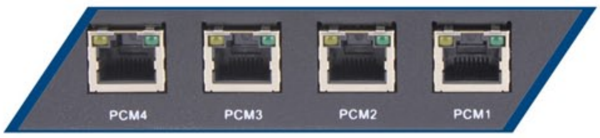
The SMG also supports any-to-any media transcoding for popular voice codecs. T.38 and G.711 fax interworking and support for RTP, INBAND and SIPINFO method based tones and event handling complement the media transcoding capabilities to provide a high degree of flexibility to help deliver value added services economically.

● User-friendly management and configuration toolkits

The Web graphical user interface (WebUI) is a real-time web toolkits to configure, monitor SMG. It allows operators to configure and perform real-time monitoring and maintenance.Flexible SIP and Protocols configuration enable services providers and enterprises to seamlessly connect in hybrid networks, Helping configure SIP, SIP trunking,SIP Mediation, PCM, SS7 and ISDN, Routing and more; And a broad range of gateway toolkits also help gateway's maintenance and software upgrading for Web UI,gateway services and firmware.

Telecom -grade Cooling System

Adopt two built-in ultra-silent fans coupled with minimum windage design



Modular Structure

Modular design with E1 interface for better and easier expandibility

Dual Power Supply

Embrace dual power module to guarantee 100% availability

EMC Design

Minimize heating and EMC via regular hexagon cooling hole

Make connections between networks, services and subscribers reliable and efficient

Key Features	Values
Flexible SIP and Protocols configuration enable services providers and enterprises to seamlessly connect in hybrid networks	Help configure SIP, SIP trunking,SIP Mediation, PCM, SS7 and ISDN, Routing and more; a broad range of gateway toolkits help gateway's maintainance and software upgrading for Web UI,gateway services and firmware
Scalable from 30 to 480 simultaneous SIP sessions with multimedia transcoding, and 30 to 480 channels of SS7 signaling	Scalable IP and TDM connectivity solution provides high performance in a small footprint to help lower ownership cost and operational cost
Combined IP and TDM gateway features on a single platform	Integrated multimedia gateway features facilitate TDM and IP interworking to provide service delivery flexibility and automated failover between domains
Any-to-any signaling and media support	Support for SS7, SIP signaling, and SIP interworking along with voice and transcoding provides a cost-effective platform to help service providers evolve from a TDM to an all-IP environment
SIP profiler and web based user configuration	Easy-to-use service configuration and management tools can help accelerate service deployment and simplify platform management
Integrated transcoding support for voice, tone and faxing	Eliminates the need to add separate hardware to support transcoding requirements helping to reduce CAPEX and number of platforms deployed
Carrier class solution	Carrier class design and features provide high availability, reliable throughput and enhanced service delivery

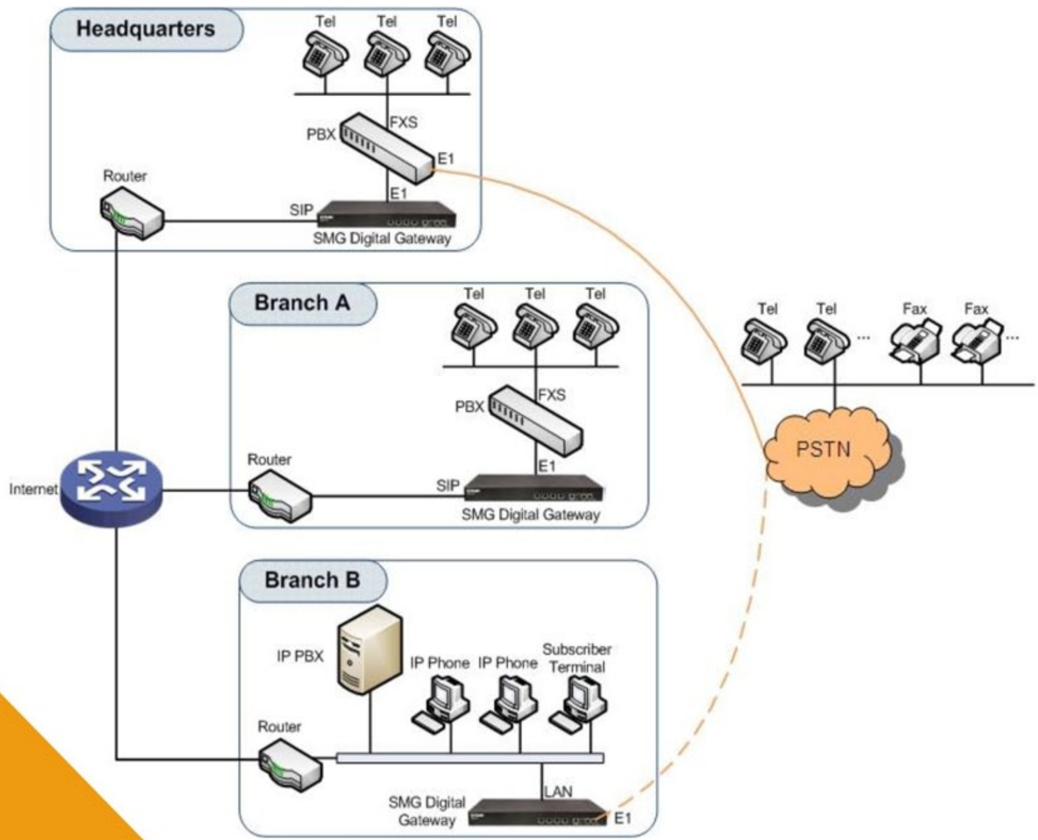


Figure 1 Typical Application

Typical Applications

- **Typical Applications**
- Centralized VoIP and FoIP application servers, including IP-based voice mail and UMC
- IVR and announcements
- IP PBX
- VoIP extension to branch offices
- Contact centers

Product models

SMG2030	1E1/T1 and 30 SIP channels
SMG2060	2E1/T1 and 60 SIP channels
SMG2120	4E1/T1 and 120 SIP channels
SMG3008	8E1/T1 and 240 SIP channels
SMG3016	16E1/T1 and 480 SIP channels

Routing Features
Call routing and translation(from PCM to IP or reversely)

IP Bearer Features
Coder support: G.711A,G.711U, G.729 A/B,GSM, iLBC, RFC 2833,RF 3261,SIPINFO,INBOUND
Compliant with TCP/UDP, HTTP, ARP/RARP,DNS,NTP,TFTP,TELNET,STUN and more IP protocols
Echo cancellation: G.168 128 ms tail length
Voice activity detection and packet loss concealment
Comfort noise generation
T.38 real-time fax, T.38 – G.711 interworking
Digit transmission via RFC 2833 (SIP)
Hosted NAT

OAM&P
Network Time Protocol (NTP)
Web User Interface (WebUI) supports configuration via browser
SNMP MIBs

Power Requirements
AC Power Supply Range 100 – 240 VAC
The power supply will operate at frequencies between 47 Hz and 63 Hz

Power Consumption

Typical	Minimum
1 E1/TI	70 Watts
2 E1/T1	80 Watts
4 E1/T1	100 Watts
8 E1/T1	120 Watts
16 E1/T1	150 Watts

Environment

Operating temperature range
0 to +55 °C, 8-90% relative humidity non-condensing
Storage temperature range
-20 to +85 °C, 8-90% relative humidity non-condensing

Physical Dimensions

High	Wide	Deep
1.72 in (44 mm)	17.32in (440 mm)	10.51in (267 mm)

Weight 6.8 lb (Approx.3.1 kg)

Maintenance
Power supplies field installation

Resiliency
SS7 signaling: 1+1 active/standby redundancy
Redundant power supply(Dual power system)
Smart IP probing
Automated failover (Ethernet links)
Failover via automatic protection switching

Capacity
30 - 480 TDM channels per 1U shelf
30 - 480 VoIP channels per 1U shelf

I/O Interfaces — Rear I/O — T1/E1

Telephony T1 and E1	16 T1/E1 for timing (BITS clock), signaling and bearer traffic (T1 - 100 ohms and E1 - 120 ohms)
Clock Sync	Stratum

IP Interfaces
IP Dual redundant 2 - 100/1000 Base-T Ethernet for VoIP payload and signaling

TDM Signaling Protocols
ISDN PRI
ISDN/SS7
SS7 ISUP
SS7 TCAP
16 SS7 links in standalone configuration

IP Protocols
Core SIP Specifications and Notable Extensions
RFC 3261 SIP Basic
RFC 3262 SIP PRACK
RFC 3265 SIP Subscribe/Notify

Notable SIP Extensions
RFC 3398 ISUP/SIP Mapping
RFC 3711 SRTP (for SIP)
Tel URI – RFC 3966
IP and ISUP interworking and more

QoS
Adaptive jitter buffer
Packet loss compensation
Configurable Type of Service (ToS) fields for packet prioritization and routing

Approvals and Compliance
For information about RoHS compliance and other approvals, please contact Synway directly.

EMC/EMI
Compliant with most international standards. For compliance documents, please contact Synway's sales representatives.

Safety
Compliant with most international standards, please ask Synway or its sales representatives worldwide. Synway would comply all new safety standardfor different regions around the world while needed.

Telecom Approvals
(Partially approved)Compliant with most international standards, please ask Synway or its sales representatives worldwide.

Reliability/Warranty
Estimated MTBF per Telcordia Method 1: With Dual Redundant AC or DC Power Supplies
Rear I/O Type 1 — T1/E1
NO PSTN Interface:150000 hours

1E1/T1	135000 hours
2E1/T1	120000 hours
4E1/T1	95000 hours
8E1/T1	950000 hours
161/T1	90000 hours

Technical Specifications

SMG 1000

- Compact 1U 32 ports (SIP)
- FXS/FXO Configurable
- FoIP Supported (T.30 to T.38)

With a simple and economical way to helps legacy telephone, fax machine and PBXs interconnect with IP network,Synway SMG1000 analog media gateway enables call center and multi-branch enterprises to process powerful, versatile and efficient VoIP solutions for unparalleled cost advantage.

SMG1000 Analog Gateways allows for a well-planned, phased migration to an IP network, making the gateways an easy solution for enterprises looking to enhance their legacy PBX equipment with new VoIP access and applications.Connected between a PBX or an Analog and a LAN,the SMG1000 Gateways convert analog PSTN messages into a format suitable for transmission over standard IP networks.

Key features

● Functional Description

Designed for voicemail and unified messaging applications,SMG analog Gateways have a 10/100 Base-T Ethernet connection for connecting legacy PBX to a LAN. The analog loop start functionality supports integration via in-band signaling (DTMF or FSK) or serial protocols. The SMG1000 Gateways provide a simple, cost-effective transition to voice and data convergence for enterprises with PBXs. Connected externally, they offer an IP solution that works with current legacy equipment. They support SIP-based applications as well as T.38 for fax transmissions over IP (FoIP).

Key Features	Values
Voice over Internet Protocol (VoIP)	Supports SIP per RFC 3261. Uses Real-time Transport Protocol/Real-Time Control Protocol (RTP/RTCP) for delivery of voice over the LAN or WAN
IP security	Supports HTTPS for web interface
Enhanced voice processing	Supports a variety of compression algorithms, including G.711 A-law and μ-law, G.729AB
T.38 Fax over Internet Protocol (FoIP)	*Transco*de fax from T.30 fax protocol(supporting V.17) to T.38 for transmission over a packet network
Hot swap	Allows gateway units to be added or removed without affecting other gateway units
Web server interface	Each gateway unit is delivered with a web server interface, allowing configuration and software upgrades via a web browser

● Configurations

The SMG1000 Gateways can be used to connect IP telephones to a legacy PBX, integrate network-hosted applications with the PBX, extend the PBX to branch offices, and integrate various voice and call processing capabilities in an enterprise LAN or WAN environment.

Using exclusive PBX network interfaces, the SMG1000 gateway appliances provide exceptional IP to PBX integration capabilities to protect an investment in legacy telecom equipment.

● Call Routing

The SMG1000 Gateways route calls from the switched network to a VoIP destination on the IP network.Conversely, it routes calls from the IP network through a switch port to a destination telephone number on the switched network. The SMG1000 Gateways support the following call routing options:

❖ • TDM to IP or IP to TDM

❖ • IP load balancing

❖ • IP fault tolerance

● Compatible with general FXO/FXS lines, and a variety of popular PBX manufacturers(Digital PSTN lines compliance would be available)

Protects investment in legacy telecommunications equipment and allows a controlled migration to IP technology

● Developed and tested in Synway PBX lab and optimized for use in an Enterprise environment

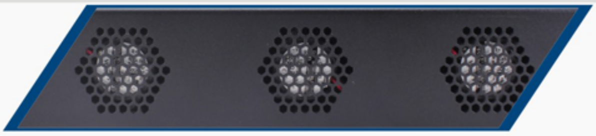
Ideally suited for Enterprise Unified Messaging applications

● Support for IP load balancing and IP fault tolerance

Allows the ability for inbound (TDM-to-IP) calls to round-robin between available media servers

● Supports configuration via serial, telnet, and a web browser including context-sensitive help

Easy to install, configure, debug, and maintain



Telecom -grade Cooling System

Adopt two built-in ultra-silent fans coupled with minimum windage design

Multiple Interface

Interconnect to various network interfaces (RJ11/RJ21/RJ45)

Modular Structure

In-house modular FXO/FXS interface for any configuration

EMC Design

Minimize heating and EMC via regular hexagon cooling hole

PBX Interface

Number of ports	2-32 FXO/FXS configurable
Connectors	2-32 shielded female RJ-11 jacks

*Use multiple gateway units for higher port counts

Network Interface

Network Interface	10/100 Base-T Ethernet LAN port
Connector	2 shielded female RJ-45 jack for LAN

VoIP Protocols

SIP per RFC 3261

RTP/RTCP for delivery of voice

FoIP Protocol

T.38 FoIP	transcode fax from T.30 fax protocol(supporting V.17) modulation schemes, to T.38 for transmission over a packet network

Voice Support

G.711 μ-Law and A-Law, G.723.1, G.729AB

Silence suppression with comfort noise

G.168 automatic echo cancellation

Call Progress Analysis (CPA), including Positive Voice Detection, Positive Answering Machine Detection (PAMD), DTMF detection, and fax tone detection

Quality of Service

Type of Service (ToS)

IP precedence

Configuration and Management

Web UI for instant management and status monitoring

Telnet

Call Routing

From IP to PSTN or from PSTN to IP

User configuration list of VoIP endpoints

IP load balancing

IP fault tolerance

IP Security

HTTPS for web interface

Power Requirements

Line voltage 100 VAC to 240 VAC

Frequency 47 Hz to 63 Hz

Physical Dimensions

High	Wide	Deep
1.72 in (44 mm)	17.32in (440 mm)	10.51in (267 mm)

Weight Approximately 8.8 lbs. (about 4kg)

Environment

Operating temperature range

0 to +55 °C, 8-90% relative humidity non-condensing

Storage temperature range

-20 to +85 °C, 8-90% relative humidity non-condensing

Approvals and Compliance

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EMC/EMI

Compliant with most international standards. For compliance documents, please contact Synway's sales representatives.

Safety

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Telecom Approvals

(Partially approved)Compliant with most international standards, please ask Synway or its sales representatives worldwide.

Reliability/Warranty

Estimated MTBF Five Years

Technical Specifications

Products Family

Multimedia Switch Platform

SPBX integrated multimedia switch platforms are open programmable, soft switching platforms with integrated multimedia processing and signaling capabilities. In addition to rich media resources, the switch platforms help bridge existing wired and wireless networks with IP networks, and integrate for IP (SIP) / TDM (SS7/ISDN/CAS) / mobility protocols with IVR, fax, conferencing, compression, echo cancellation and other media processing resources. 1U,2U available, the SPBX supports up to 64E1/T1/J1 or 128FXO/FXS channels per system.

IP & TDM Series

IP & TDM boards consist of three product lines: SHN series for IP network, SHD series for E1/T1/J1 digital network, and SHT series with analog interface. Besides a complete range of media resources, such as fax, conferencing, compression, echo cancellation for voice enhancement, they also combine various built-in signaling protocol software packets, which include SIP, H.323, SS7 (MAP/SCCP/ISUP/TCAP/TUP/MTP1~3), ISDN variants, CAS and more.

Call Recording Series

Synway offers the broadest range of call recording hardware platforms. For two decades Synway has consolidated its position as a leading international call recording hardware solution vendor. Having worked with our products over time, our clients have helped Synway achieve: the most diverse product ranges, greatest scalability, greatest compliance with multi-protocols and multi-networks, and the most installations in Asia and Europe. Our offerings can passively tap analog/digital/PBX/IP lines.

Open Source Series

Synway open source family includes four product lines: FXM series analog telephony boards, TEJ series digital telephony boards, CDC series boards for transcoding, chassis-based Asterisk appliance. The open-source family reassures high interoperability, voice quality and robustness. All these Asterisk hardware platforms adopt Synway's patent-pending echo cancellation technology SuPerForm(128ms echo tail).

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