Dialogic®

Datasheet

Dialogic® I-Gate® 4000 Media Gateways

Modern IP Media Gateways

This datasheet discusses the following products:

- Dialogic® I-Gate® 4000 EDGE Media Gateway — low-to-medium port density
- Dialogic® I-Gate® 4000 PRO Media Gateway — medium-to-high port density

Dialogic® I Gate® 4000 Media Gateways (MGWs) are designed for Communications Service Providers (CSPs) seeking a competitive advantage by moving to an operationally efficient and service-centric Next Generation Network (NGN) or IMS architectures. I-Gate 4000 MGWs deliver fixed-line, toll-quality voice in a compact footprint for satisfying IP and TDM telephony requirements in both low- and medium-scale port densities.

I-Gate 4000 MGWs leverage state-of-the-art Digital Signal Processing (DSP) technology, and have set a benchmark for telephony voice quality while preserving end-to-end service transparency for voice, fax, modem, and video calls. And finally, they combine high-quality bandwidth optimization, reliability, and scalability with open standards-based interfaces, to provide OPEX and CAPEX savings opportunities in the most demanding mobile, IPX and fixed network applications.

Features	Benefits
Unparalleled bandwidth optimization	Proven voice processing technology and advanced codec implementations enable 16:1 optimization and bandwidth savings of up 92%
Carrier class reliability: 99.99995% ("six 9s") availability for I-Gate 4000 EDGE and 99.999% ("five 9s") for I-Gate 4000 PRO	Increase up-time and customer satisfaction with carrier class performance
Highly efficient signal detection and processing techniques including VAD, CNG, unmatched-in-class echo cancelation, smart packet loss concealment and patented packet prioritization	Improve billable minutes by delivering voice, fax, modem, and video calls with unrivaled completion rates and exceptional quality even in packet-switched environments with impaired network conditions
Software upgradeable to support the latest CODECs, including OPUS and iLBC	Offer next generation differentiated services involving WebRTC and HD Voice.
Open platform with incomparable scalability	Deployment options for low density (one E1) to very high (STM-1) with support for a wide array of different vendors' switching technology.
Supports mobile, fixed and satellite operators with a variety of deployment modes for NGN and IMS/VoLTE networks	Unmatched deployment flexibility to support next generation IP and IMS/VoLTE, along with IPX, radio link and satellite installations

Unparalleled Optimization Delivers Cost Savings

Field-proven voice processing technology and advanced codec implementations, coupled with a rich set of bandwidth optimization and voice quality protection techniques, enable CSPs to realize bandwidth savings (up to 16:1) without compromising on voice quality.

Field-Proven in IMS and TDM Networks

Service providers around the globe have deployed I-Gate 4000 MGWs in networks spanning more than 100 countries for voice, fax, modem, video, and signaling traffic. I Gate 4000 MGWs enable carriers to bridge the gap between circuit-switched and next-generation Voice-over-IP (VoIP) and IMS/VoLTE networks by delivering exceptional voice quality over both TDM and IP networks.

Cost Effective, Bandwidth-Efficient and Reliable Signaling Transport

I-Gate 4000 MGWs are unmatched in their support for bandwidth-efficient and reliable transport of Common Channel Signaling (CCS) for SS7, PRI, and QSIG and Channel Associated Signaling (CAS), even under impaired network conditions. The highly efficient signal detection and processing techniques featured on I Gate 4000 MGWs provide unrivaled call completion rates with exceptional quality for voice, fax, modem, and video calls, allowing CSPs to reduce expenses while increasing the capture of billable minutes.

Open, Flexible Platform

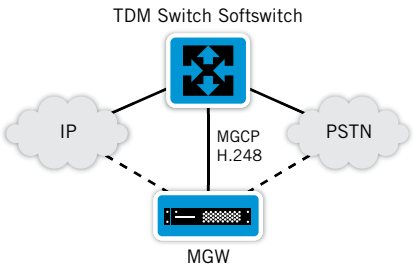
I Gate 4000 MGWs are built with “total openness” in mind. I-Gate 4000 MGWs are IMS- and NGN-ready and comply with industry standards/protocols such as MGCP, H.248, SIP and SS7/SIGTRAN. They offer field-proven interoperability with wide array of other vendors’ softswitches allowing CSPs the flexibility to deploy and support a variety of network topologies that enable them to optimize signaling gateway placement and consolidate infrastructure footprint.

Support for Multiple Deployment Modes

I-Gate 4000 MGWs provide multiple deployment modes to support a variety of network architectures including NGN, IMS/VoLTE and wholesale voice. CSPs have the flexibility to deploy I-Gate 4000 MGW platforms in following modes to accommodate their service delivery and operational requirements:

- Softswitch-controlled mode
- IMS Media Gateway mode
- Standalone static trunking mode
- Transcoding gateway mode (RFC 4117)

Softswitch-controlled mode

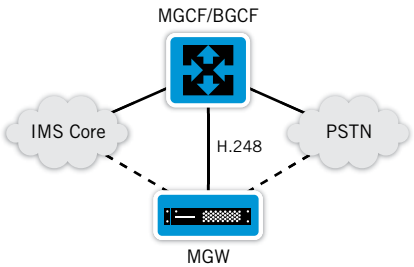


CSPs can deploy I Gate 4000 MGWs in multiple next-generation IP switching applications including:

- Domestic and international long-distance services
- Wireline or wireless network tandem switching
- Class 4 switch replacement, and
- PRI trunking

I-Gate 4000 MGWs support standard gateway control protocols like MGCP and H.248 to enable interoperability with a wide variety of different vendors' switching platforms.

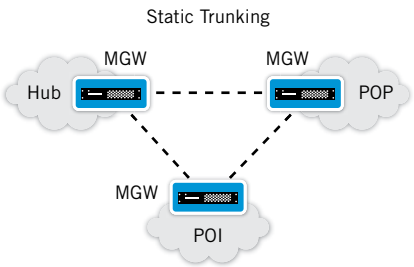
IMS Media Gateway Mode



Multimedia services are at the heart of IMS, with media interworking playing a key role in IMS deployments. I-Gate 4000 MGWs can help CSPs transition to an IMS network by acting as an IMS MGW. As the IMS MGW, an I-Gate 4000 MGW interconnects with an MGCF via H.248 for resource control and to provide services like:

- Managing circuit-switched bearer channels and packet-switched media streams
- Media transcoding and optimization
- Application of resources such as echo cancellation, CNG and VAD

Standalone Static Trunking Mode

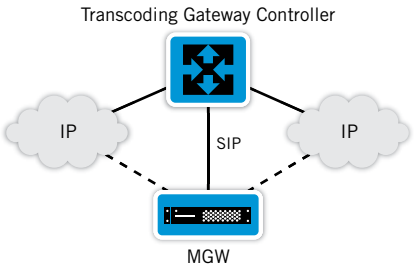


For CSPs carrying voice traffic over costly or bandwidth-limited transmission links, the static trunking feature of I-Gate MGWs is well suited to help them with:

- Substantial savings on bandwidth,
- Reduced equipment CAPEX and OPEX,
- More efficient utilization of deployed network resources, and
- New ways to improve competitiveness and increase profitability.

In static trunking, the traffic transmitted between PSTN and/or MSC switches is compressed by an I Gate 4000 EDGE or I-Gate 4000 PRO MGW connected to one of the switches and decompressed at a remote I Gate 4000 EDGE or PRO MGW connected to the second switch. The compressed traffic can be carried over IP or TDM networks. Static trunking can be used for minimizing costs and optimizing traffic on international and domestic voice routes, inter-MSC links, between call centers, on connections from mobile and fixed networks to PSTN POIs, and on backup protection networks.

Transcoding Gateway[1] Mode



CSPs can deploy the I-Gate 4000 PRO MGW as a high-density media transcoding platform (up to 62,400 call legs) for next generation IP networks. I-Gate 4000 PRO MGWs support scenarios requiring media interworking described in RFC 4117, "Transcoding Services Invocation in the Session Initiation Protocol (SIP) Using Third Party Call Control (3pcc)." Transcoding resources can be controlled via SIP for applications requiring an RFC 4117 compliant transcoding server to support third party call control (3pcc) when codec interworking is required between two SIP endpoints. The I-Gate 4000 PRO can work with the Dialogic® ControlSwitch™ System, BorderNet™ SBCs, and IMS Application Servers or other compliant platforms to interwork media streams between.

[1] *Supported in I-Gate 4000 PRO release 3.8.6.x or later*

Technical Specifications

Technical Specifications for Both Dialogic® I-Gate® 4000 EDGE Media Gateway and Dialogic® I-Gate® 4000 PRO Media Gateway

Traffic Processing

Signal Detection and Classification (Voice, Fax, VBD, Video, DTMF, signaling)

Silence Suppression (Voice Activity Detection and Comfort Noise Injection)

Router-agnostic and bandwidth-efficient RTP Multiplexing mechanism

Bandwidth-efficient signaling transmission mechanism (SS7, PRI, CAS)

SRTP[2] support to provide encryption, message authentication, integrity and replay protection to the RTP (and SRTCP for RTCP) sessions

[2] SRTP is supported in DSPK-R2 and later model of DSPK cards.
In media gateway mode, SRTP is supported only for MGCP MG (not MEGACO).
SRTP can be used only for switch connections (not for static channels), or in STGW mode.

Voice Codecs

G.711 PCM @64 kbps A-law/μ-law

G.729A (+B) CS-ACELP @8 kbps

G.723.1 ACELP /MPMLQ @5.3, 6.3 kbps

EFR @12.2 kbps

AMR-WB[3,4] all rates (6.6, 8.85, 12.65, 14.25, 15.85, 18.25, 19.85, 23.05, 23.85) kbps

iLBC[3,4] – iLBC20 and iLBC30

OPUS (6, 8, 12) Kbps)

[3] AMR-WB & iLBC codec are supported ONLY for switch channels, not for static channels. As of the publication date of this document listed below, the earliest version of the Dialogic® ControlSwitch™ System which supports AMR-WB & ILBS codecs is Release 5.9.2.

[4] AMR-WB & iLBC codec are supported by I-Gate® 4000 PRO and I-Gate® 4000 EDGE models with DSPK-R2 only.

Echo Cancellation

ITU G.168 and G.165 compliant

Up to 128 msec echo tail length

Dynamic EC enabling

Fax

Group 3 fax calls

V.27, V.29 and V.17 (up to 14.4 kbps)

ITU T.38 fax relay or Passthrough mode

V.34 fax (V.Fax) — Passthrough mode

Voice Band Data (Modem)

V.22, V.23, V.32, V.34, V.90 and V.92 modems

Passthrough mode

Video

Automatic detection and Clear channel mode transmission of H.324 video calls over bearer links

DTMF Handling

DTMF tones transfer according to RFC 2833

MGCP/H.248 — DTMF package support

Network Jitter Compensation

Adaptive jitter buffer up to 300 msec

Clear Channel

64 kbps (G.711), VAD OFF, EC OFF

RFC 4040 Clear Mode

Signaling

Compressed Common Channel Signaling, using SCTP to carry the signaling over IP

ISDN support: ISDN-PRI though IUA SIGTRAN Protocol (RFC 3057)

Embedded Cross-Connection

Any-DS0 to any-DS0

Operator-configurable

Security

Embedded firewall

Access list

IP Sec protocol (RFC 2401)

Quality of Service

End-to-end compression quality protection

QoS protection control mechanism — Operator-configurable threshold

DiffServ (TOS field)

ITU Q.50 Interface protocol

TDM Interfaces

E1 complying with ITU G.703 and G.704

T1 complying with ITU G.703 and G.704

IP Protocols

IPv4

RTP (RFC 3550)

SRTP (RFC 3711)

RTCP (RFC 3551)

SNMPv2 (RFC 1907)

FTP (RFC 959)

SNTP (RFC 2030 v4)

IP (RFC 791)

UDP (RFC 768)

Transcoding Services Invocation in the Session Initiation Protocol (RFC 4117)

Typical bandwidth optimization –Gain/compression ratio (voice traffic)

G.729A - 12:1

G.723.1 - 16:1

GSM-AMR (12.2 kbps) - 8:1

AMR-WB – depends on the rate

iLBC - depends on the rate

OPUS – depends on the rate

Redundancy

Softswitch redundancy support

Fan redundancy and turbo mode

Reliability

99.99995% (“six 9s”)

Hot module swapping

Hitless software upgrade

Runtime configuration

Power

DC power input	-48 VDC / -60 VDC (nominal)

Internal Clock Accuracy

4.7 ppm (Stratum 3)

Electro-Magnetic Compatibility

Europe	EN300 386 V1.3.2 (2003-05) Emission — EN55022 Immunity — EN61000-4-2,3,4,5,6,11
North America	FCC rules CFR 47 part 15
Canada	ICES-003
Japan	VCCI V-3/2001.04
Australia/New Zealand	CISPR 22:04

Product Safety

UL60950.1:2007 (US) (selected models)

CAN/CSA-C22.2 No.60950-1-07 for Canada (selected models)

CE EN60950-1:2006+All:2009

CB-Safety: IEC 60950-1:2005 (selected models)

Environmental Standards

ETSI — ETS 300 019

Telcordia — GR-63 (selected sections)

EU Directive 2002/95/EC (Restriction of Hazardous Substances — RoHS)

EU Directive 2002/96/EC (Waste Electrical and Electronic Equipment — WEEE)

Approvals, Compliance, and Warranty

Hazardous substances	RoHS compliance information at http://www.dialogic.com/rohs
Country-specific approvals	https://www.dialogic.com/en/products/others/declarations.aspx
Warranty	http://www.dialogic.com/warranties.aspx

Additional Technical Specifications for Dialogic® I-Gate® 4000 EDGE Media Gateway

Operation Mode

Softswitch-controlled mode (MGCP v1.0, H.248/Megaco)

IMS Media Gateway mode (H.248/Megaco) Standalone static trunking (without softswitch)

Total Capacity

Up to 496 simultaneous calls (any codec or combination of codecs)

Signaling

CAS-R1 (static trunking)

CAS-R2 (static trunking)

CAS-R2 (switched)

CAS-R1.5 (switched)

M3UA

QoS Management

Multiple queues

IP packet classification and marking

Multiple congestion avoidance mechanisms

Scheduling and shaping

Policing

Ethernet Interfaces

100BaseT (Fast Ethernet)

VLAN Tag — IEEE 802.1q

Redundancy

Main module	1:1 redundancy
Power input	1:1 redundancy
Power supply	1:1 redundancy
IP link	
TDM Bearer	

Power

AC power input	240 VAC / 100 VAC (nominal)
Max. DC power consumption	80 Watts
Max. AC power consumption	105 Watts

Additional Technical Specifications for Dialogic® I-Gate® 4000 PRO Media Gateway

Operation Mode

Softswitch-controlled mode (MGCP v1.0, H.248/Megaco)

IMS Media Gateway mode (H.248/Megaco)

Standalone static trunking (without softswitch)

Transcoding gateway (RFC 4117)

Total Capacity

Up to 13,392 simultaneous G.729A and/or G.723.1 and/or EFR calls

Up to 16,800 simultaneous G.711 calls

Up to 62,400 IP transcoding sessions.(call legs)

Signaling

CAS-R1 (DS3 or OC3, switched /MGCP package)

CAS-R2 (CAS tunneling, static trunking)

CAS-R1.5 (switched)

DSP Pooling Functionality

Ability to oversubscribe to maximize system utilization for low-Erlang deployments

Border Gateway

Support IETF MIDCON model

IMS architecture-compliant

Transcoding

Voice

Fax

DTMF

Ethernet Interfaces

Gigabit Ethernet — optical and electrical interfaces

100BaseT

VLAN Tag — IEEE 802.1q

TDM Interfaces

DS3 complying with ANSI T1.102 and T1.107

STM-1/OC3 (optical and electrical) complying with ITU G.703, G.707, G.813, G.825, G.783, G.957, and GR-253

Redundancy

E1/DS1 TDM Interface cards	1:N redundancy
DS-3 TDM Interface cards	1:N redundancy
OC-3 / STM-1, SONET/SDH Interface card	1:1 redundancy
DSP cards	1:N redundancy
CPU, TDM-switch fabric, and Layer 2/3-switch fabric card	1:1 redundancy
Power Feed	1:1 redundancy
Clock	1:1 redundancy
100BaseT and 1 Gigabit Ethernet ports	1:1 link redundancy
OC-3/STM-1 SONET/SDH	1:1 link redundancy

Power

Max. DC power consumption	795 Watts

Operating Temperature Range

-5°C to 50°C

Dimensions

Height	25 in. max (635 mm)
Width	17.44 in. (444 mm)
Depth	10.82 in. (274 mm)
Weight	30 kg (fully populated)

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For a list of Dialogic locations and offices, please visit: https://www.dialogic.com/contact.aspx

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