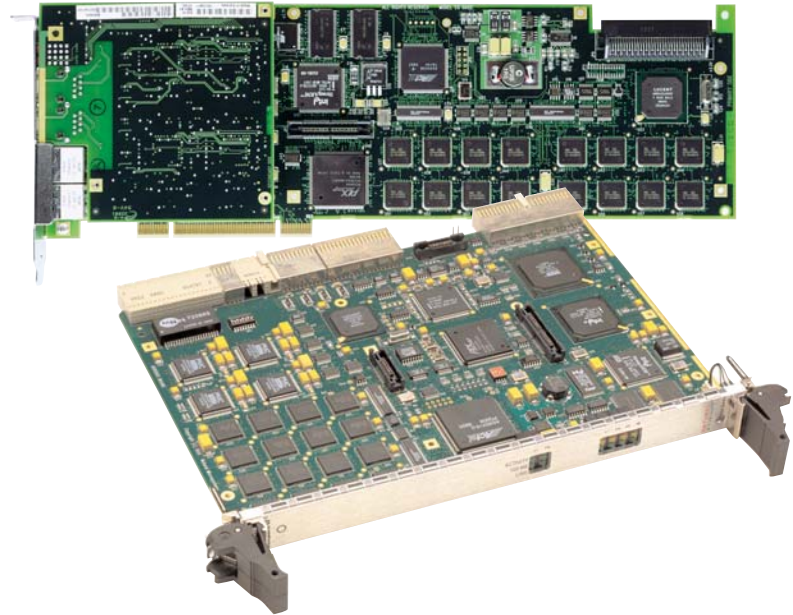


# CG 6000 Series

## Platform for the new era of communications

As IP telephony gains increasing market acceptance, the requirement emerges for a new class of platform that can combine voice over IP (VoIP) connectivity with traditional PSTN connectivity and voice processing functionality. The NMS Communications' CG 6000 Series, part of the Open Access framework, is a scalable, high-performance development platform for converged PSTN and IP telephony solutions, designed to meet the connectivity, flexibility, and performance requirements of new applications such as VoIP gateways and IP media servers. The CG 6000 Series has been developed from the ground up to address packet-intensive convergence applications. Unlike competitive IP telephony products, the CG 6000 Series is purpose-built to be a low-latency, IP media-streaming platform. And since it is supported by the rich and flexible Natural Access™ software development environment, solutions based on the CG 6000 Series are easily developed and rapidly brought to market. The CG 6000C is the first choice for cost-effective CompactPCI solutions, while the CG 6000 is the ideal platform for highest-density requirements in PCI form-factor.

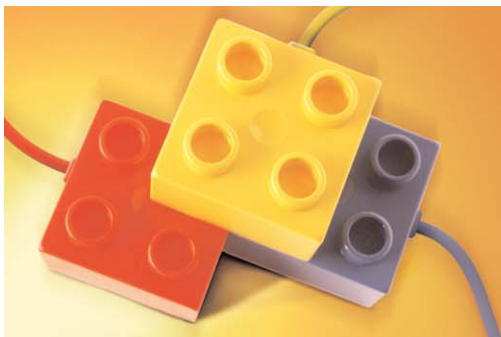


### FEATURES

- Up to 120 universal IVR/VoIP/fax ports
- Low-latency media streaming
- On-board RTP/RTCP
- Dual 10/100Base-T interface
- Both single-slot 6U CompactPCI and PCI solutions
- T1/E1 digital trunk PSTN interfaces
- Natural Access software environment
- Full-speed H.100/H.110 bus with 4,096 timeslots to support interoperability with other boards in open-architecture, high-capacity systems

### APPLICATIONS

- IP media servers
- VoIP gateways
- Enhanced service platforms
- Wireless/IP gateways



**Open Access**  
The Foundation of Innovation

# CG 6000 Series

## TECHNICAL DESCRIPTION

The architecture of the CG 6000 Series integrates PSTN interfaces, telephony protocols, comprehensive IVR functionality, full-duplex echo cancellation, speech encoding, fax processing, a Fast Ethernet interface, and packet protocols into a single-slot package. This integration results in a cost-effective and scalable platform for OEMs building next-generation convergence solutions.

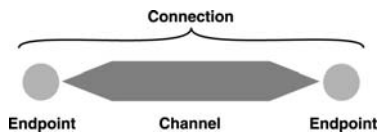
The CG 6000C is a carrier-grade platform targeted at in-the-network deployments where scalability and reliability are absolute requirements. NMS' leadership position in the CompactPCI industry is visible in the platform with first-to-market hot swap driver support, rear-panel I/O connections, and low power consumption.

The CG 6000 is a scalable, mid- to high-density platform targeted at enterprise deployments where low-cost, PC-based solutions are required.

### Media Streaming Architecture

The CG 6000 Series features a powerful media streaming facility. This capability is presented as a standard Natural Access service that provides functions for creating media channels that transfer data between endpoints. Supported endpoints include T1/E1, RTP/IP, UDP/IP-T.38 fax, and host-based functions such as play/record. The media streaming service can be used in combination with other Natural Access services, such as Natural Call Control,™ to provide an interface for PSTN call control and IVR.

The CG 6000 Series' media streaming architecture is based on a downloadable filter graph model, shedding the assumption that every customer solution will be a hard-wired VoIP gateway. The flexibility provided by this media streaming capability, and the programmability of the architecture via Natural Access APIs, enables the creation of unique and differentiated solutions based on CG 6000 platforms.



### Endpoints, Channels, and Connections

When using the media streaming service, the application creates a connection to describe the flow of data through the CG 6000 Series platform. Applications establish connections by creating media streaming endpoints and channels, and then connecting sets of endpoints with channels. The service provides programmers with a standard set of endpoint and channel types with which to build connections.

### Natural Access Support

The CG 6000 Series is supported by NMS' Natural Access development and runtime environment. Natural Access provides a consistent set of APIs that are operating system independent, thereby delivering true application portability. With Natural Access' Natural Call Control Service, programmers can easily and quickly develop applications that run on multiple types of telecommunications interfaces by using a single protocol-independent API. Natural Call Control minimizes the processing overhead on the host CPU by executing protocols on the board's control processor. Natural Access unifies application development across NMS Alliance Generation® and CG Series products.

### Dual Redundant Ethernet

The CG 6000 Series features dual 10/100 Base-T Ethernet interfaces. These can be used either as two independent subnets or in an automatic failover mode that switches traffic to the alternate interface without interruption of in-progress calls. This feature protects against wire cut or hub failure.

## NMS SERVICES

NMS provides a complete range of services designed to complement your needs at every stage — design, evaluation, development, and deployment. NMS offerings include product support, technical training, logistics, and the best developer support program in the industry. With NMS Services you are able to reduce time-to-market, ensure quality, and focus on your unique competitive advantage.

## TECHNICAL SPECIFICATIONS

### General

- Processor: 233 MHz SA110 StrongArm with 32 MB SDRAM
- PCI bus: 33 MHz, 32-bit master or slave
- PCI universal expansion board: Compatible with both 5.0 V and 3.3 V signaling environments
- Input/output: Via CompactPCI rear-panel transition card; via backplate on PCI

### Software Environment

- Development environment:
  - Natural Access
  - Fusion 4.x
- Hot Swap: Per PICMG 2.1 (CG 6000C)
- Operating Systems:
  - Windows 2000
  - Intel® Solaris™ 8
  - SPARC® Solaris 8 (32-bit, 64-bit, and mixed-mode)
  - Red Hat® Linux® 7.2

### Media Stream DSP Processing

- Universal port capability:
  - Comprehensive IVR support
  - Echo cancellation
  - Vocoding: G.711, G.723.1, G.729a/b, G.726
  - Fax: T.38 real-time; T.37 store-and-forward
- Processors: TI TMS320C5420 each with dual 100 MHz core plus 200 kB SRAM
- Capacity: from 24 to 120 universal ports

### IP Network Connectivity

- Physical: Dual 10/100Base-T Ethernet interface via RJ-45 connectors
- Protocols: RTP/RTCP, H.323, DHCP, SNMP (Ethernet interfaces can not be used by the host processor as a network interface card)

### PSTN Network Connectivity

- Physical: T1/E1 interfaces via RJ-48 connectors (CG 6000-2L/4TE has 2 trunks per connector)
- Capacity: Up to 120 ports
- Configuration: Software switchable between T1/E1
- T1 Interface: Complete interface for up to four T1 trunks (ANSI T1.102, T1.403)
- T1 Connector: RJ-48C
- E1 Interface: G.703 2048 kbps trunk interface
- E1 Connector: 75 ohm RJ-48C with BNC adapter cables or 120 ohm RJ-48
- Mix of ISDN and CAS trunks on single board

### Audio Signal Processing

- Sampling rates: 8 ksamples/sec (telephone industry standard)
- Speech compression (IVR):
  - 11 kHz, 8- or 16-bit linear (.WAV); 16-bit may reduce the number of ports per board
  - 8 kHz 16-bit linear (.WAV)
  - 64 kbps  $\mu$ -law or A-law per ITU-T G.711
  - 16, 24, and 32 kbps ADPCM using NMS algorithm with NMS framing and bit packing with up to 2x speedup on play back
  - OKI-compatible ADPCM 24 kbps @ 6 kHz or 32 kbps @ 8 kHz with up to 2x speedup on playback
  - IMA-compatible ADPCM 32 kbps
  - G.726-compatible ADPCM 32 kbps
  - MS-GSM

## CONFIGURATIONS

Part Number	Name	Form Factor	T1/E1 Trunks	Typical Application
80956	Fusion CG 6000-2L/4TE	PCI	4	120-port VoIP gateway
80481	Fusion CG 6000C-2L/4TE	cPCI	4	120-port VoIP gateway
80954	Fusion CG 6000-2L	PCI	0	120-port IP media server
82014	Fusion CG 6000/1600-2L/4TE	PCI	4	60-port VoIP gateway
82015	Fusion CG 6000/800-2L/2TE	PCI	2	30-port VoIP gateway
82061	Fusion CG 6000C/800-2L/2TE	cPCI	2	30-port VoIP gateway
80915	CG 6000-2L/4TE	PCI	4	120-port PSTN IVR + fax server
82092	CG 6000C-2L/4TE	cPCI	4	120-port PSTN IVR + fax server
82016	CG 6000/1600-2L/4TE	PCI	4	120-port PSTN IVR server
82096	CG 6000c/1600-2L/4TE	cPCI	4	120-port PSTN IVR server
82017	CG 6000/800-2L/2TE	PCI	2	60-port PSTN IVR server
82018	CG 6000/400-2L/2TE	PCI	2	30-port PSTN IVR server

### H.110/H.100 Support

- 256 full-duplex connections to bus
- 1,024 local connections
- Switchable access to any of 4,096 bi-directional timeslots
- H.100/H.110 bus clock master or clock slave (software selectable)
- H.100/H.110 bus termination capability (switch-enabled)
- Uses Lucent Microelectronics Ambassador™ T8105

### Power Requirements

	5.0 V	3.3 V
CG 6000C	1.4 A	3 A
CG 6000	1 A	3 A

### Environment

- Operating temperature: 0 °C to +50 °C
- Storage temperature: -20 °C to +70 °C
- Humidity: 5% to 80%, non-condensing

### Compliance and

#### Regulatory Certification

This product meets EMC, Safety and Telecom requirements for the US, Canada and the EU. Please refer to the Global Approvals section of our web site for a complete list of countries in which we currently hold Telecom approvals. If you need specific details on EMC, Safety, or Telecom approvals, please contact Technical Services at [tech\\_support@nmss.com](mailto:tech_support@nmss.com) or +1 508 271 1333.

#### Standards

- PCI SIG: PCI Specification Revision 2.2
- CompactPCI: PICMG 2.0, Rev. 2.1
- Hot Swap: PICMG 2.1, Rev. 1.0

**Refer to the PSTN Digital Trunk Support data sheet for specifications, standards, and compliance information on protocols, T1 and E1 interfaces, and tone generation and detection.**

For the latest information on supported features and operating systems, refer to our web site at [www.nmscommunications.com](http://www.nmscommunications.com).

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NMS also has offices throughout North America, Europe, and Asia. Visit the NMS web site for a complete listing.

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### OPEN ACCESS PRODUCT FAMILIES

Open Access is a comprehensive product framework for next-generation voice, data, and video applications and services. Open Access provides accessibility at any point — from enabling technology, to modular application platforms, to system-level products, satisfying business and technology requirements in one cohesive model.

Enabling Technology		Modular Application Platforms	Systems
<b>SOFTWARE</b> <ul style="list-style-type: none"> <li>• Universal Speech Access</li> <li>• PacketMedia HMP</li> <li>• Natural Access</li> <li>• Fusion</li> <li>• SS7</li> </ul>	<b>HARDWARE</b> <ul style="list-style-type: none"> <li>• CG Series</li> <li>• AG Series</li> <li>• CX Series</li> <li>• TX Series</li> </ul>	<ul style="list-style-type: none"> <li>• Video Messaging</li> <li>• IP/TDM Media Server</li> <li>• Speech Server</li> </ul>	<b>NMS HearSay Mobile Services Delivery System</b> <ul style="list-style-type: none"> <li>• Data Center</li> <li>• Central Office</li> </ul>