ISDN Gateway Exchange

IGX

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ISDN Capable
Modular, Scalable
Private Switching
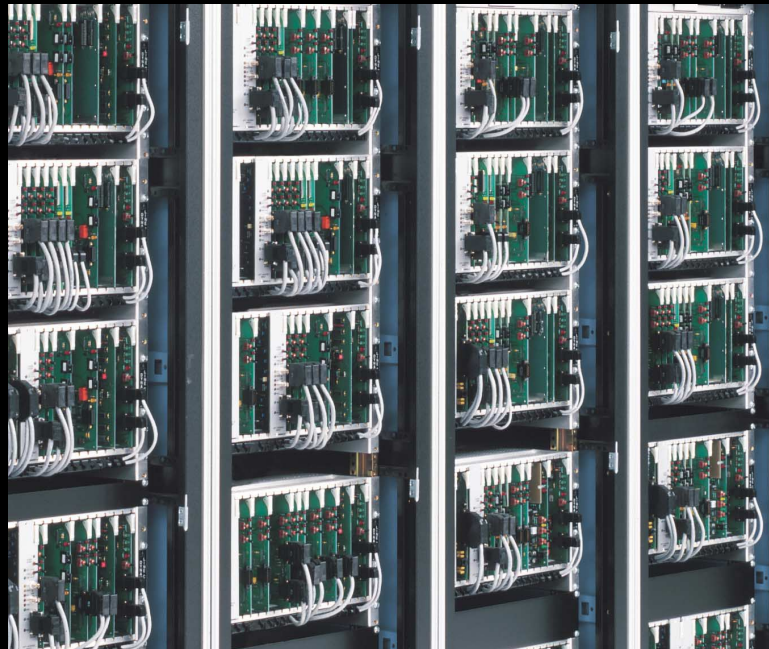
REDCOM
LABORATORIES, INC.

ISDN Capable
Modular, Scalable
Private Switching

Reality Based Telecom Switching©

REDCOM

REDCOM is a design, consulting, and manufacturing company that specializes in digital telecommunications systems. For over 20 years, we have introduced new products that provide our customers with state-of-the-art, high quality equipment at an excellent cost-to-performance ratio.

REDCOM is customer-driven. We understand and anticipate the needs of our customers. We develop solutions quickly, effectively, and economically. This gives our customers competitive advantages, higher revenues, and growth opportunities.

REDCOM does not compromise where quality is concerned. Our systems are designed and manufactured to perform their intended functions flawlessly and consistently. They are rugged, reliable, and field-proven in the harshest environments.

REDCOM markets products and services globally. We personally develop relationships in other countries and adapt our products to each market's unique needs. International sales account for a significant portion of our business. We have satisfied customers in the South Pacific, Africa, Asia, Europe, and North and South America.

REDCOM products include ISDN systems, public and private network systems, tactical systems, programmable switches, and test equipment. Our broad-based experience directly translates into comprehensive solutions.

Focus on the customer, insistence on quality, a willingness to adapt, and a broad range of products make REDCOM a leader in the telecommunications industry. The IGX is the answer to your public and private network requirements. Contact us today.

Powerful

The IGX is a field proven platform for private network switching. The IGX can be configured for a range of applications including portable tactical packages and large permanently installed systems. The IGX's patented distributed architecture makes the IGX powerful, flexible, adaptable, scalable, reliable, and compatible.

Flexible

The IGX provides a proven platform for managing a wide range of private network applications:

Expanded Digital Announcer (XDA)—Provides both CLASS^{SM} and Intercept announcements. The XDA requires an IGX at version 6 or higher.

Public Exchange Adjunct Systems—Provides ISDN services with minimal impact to existing hardware.

Straightforward User Interface—On-line help assists the user in handling routine system administration.

Multi-Tenant Systems Packaging—A turnkey solution combining switching platform, voice mail, battery backup, and an advanced set of calling features in one convenient package.

Computer Telephony Integration (CTI)—The IGX allows access for a host computer to assert call control commands in response to IGX port/state messages. This allows the IGX owner to develop custom applications, including line and trunk protocols to suit their particular application. For self-hosted applications, an optional BASIC language interpreter is available with many language extensions and debugging capabilities.

Flexible Call Translator—A full-featured call translator and protocol construction capabilities allow the IGX to manage varied dialing plans and network connection requirements.

Administrative Flexibility—Open database access for complete on-site or remote reconfiguration of system features and layouts, including configuring other site databases on a system that is currently handling traffic.

The IGX is powerful, flexible, adaptable, scalable, reliable, and compatible.
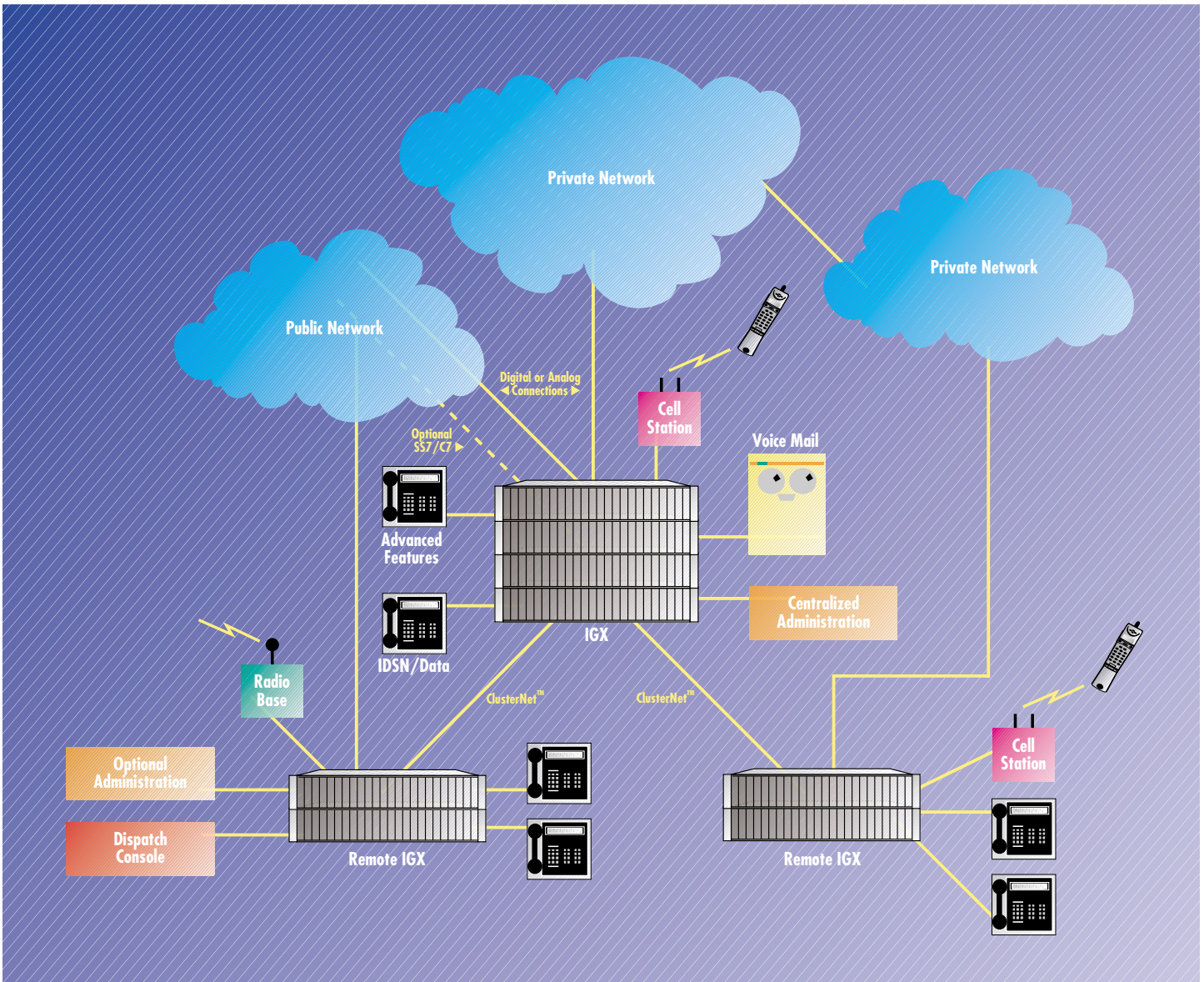
With REDCOM's ClusterNet,™ multiple IGX sites work together as if all are administered from one location.

Adaptable

A variety of network interfaces and protocols enable the IGX to be deployed worldwide:

ISDN Primary Rate Interface—Supporting #4ESS, #5ESS, DMS-100, and NI1 interface protocols at both the network and user ends.

ISDN Basic Rate Interface (2B+D)—Supporting #5ESS and NI1 network end interface protocols for 2-wire U interfaces and 4-wire S interfaces.

T1 (1.544 Mbit/s) Direct Digital Interface—With AMI or B8ZS line coding and D4 or ESF framing format.

E1 (2.048 Mbit/s) Direct Digital Interface*—With AMI or HDB3 line coding and CRC4 error checking.

Standard Analog Trunks and Lines—Trunks: Ground Start Ringdown, Loop Start Ringdown, E&M, Two-Way Loop (DID/DOD), Lines: Standard 1200 Ω (1900 Ω optional) loop length.

Switched 56 Digital Line Circuits—For Switched 56 DSU/ CSU high speed data.

R2 Interregister Signalling*—Table-driven architecture for compelled R2 signalling adapts to unique country variations.

Signalling System No. 5 (SS5)—Over both analog and digital trunk circuits.

Signalling System No. 7 (SS7/C7)—Tandem Trunking and fully redundant signalling links (SS7 requires an IGX at version 6 or higher).

Support for External Equipment—Including paging systems, voice mail equipment, Call Detail Record storage and recording devices.

PCM Companding Law Options*—A-law or μ-255 law, with optional companding law conversion (International Gateway Access Transit Exchange—IGATE®).

*International Options

Scalable

The IGX is cost-effective from 10,000 plus ports down to 32 ports.

It's Scalable—Unlike switching systems based on a central processor, you only pay for the capacity you need when you need it.

Easily Expandable—To add capacity at a single site; you simply add MSUs and connect them with ribbon cables. When connected together, MSUs function as an integrated system.

Minimal Installation Effort—Networking with other equipment is via standard connectors and industry standard circuit interfaces.

ClusterNet™—ClusterNet™ Technology allows true unification of multiple IGX sites, or a single IGX site to have multiple, strategic equipment locales. ClusterNet provides enhanced Host/Remote operation. Users enjoy the unparalleled survivability of a fully distributed system, with the convenience of centralized administration.

Reliable

The IGX is made with high quality components and rugged construction, field-proven in harsh environments.

No Central Control Function to Fail—Each of the IGX's modular elements has its own processor. This unique design gives you field proven performance.

No Fans or Filters are Required—There are no fans or filters to clog. Yet the IGX is rated for operation in 0°-50°Celsius.

No Tapes or Disks are Required—Solid state "flash" memory stores the system's operating programs. The database can be modified and copied to memory or PCMCIA cards. No moving parts ensures exceptional reliability.

Low Maintenance Requirements—Diagnostics are remote or on-site and repair is simplified by board-level replacement.

Compatible

REDCOM products and application packages can be custom engineered to meet your requirements.

International Gateway Access Transit Exchange (IGATE®)—An international exchange overlay reconciles the differences in companding laws, transmission, signalling, and numbering plans found in various networks.

Modular Digital Exchange with ISDN (MDX•I)—The MDX•I provides a sophisticated yet flexible platform for managing a wide range of public network requirements. It works with existing MDX or other central office equipment, and it can function as an adjunct for CLECs as well.
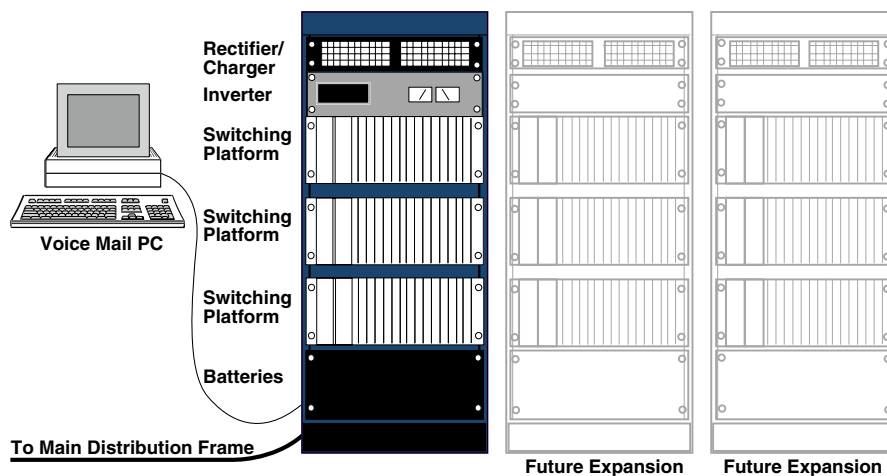
The MDX•I can be configured for a variety of applications including End Office, Wireless/Wireline Network Integration, and Emergency/Rapid Response capabilities.

Modular Switching Peripheral (MSP)—The MSP is a state-of-the-art digital switching system that is specifically designed to be controlled by a user's host computer. The MSP provides the host computer with an interface to voice and data switching systems. This separation of control and switching increases flexibility in application development and system design.

The patented MSP features stored program control and a distributed architecture. Because of its unique design, the MSP delivers unmatched reliability and adaptability in meeting a wide range of requirements.

TOLL•GATE®—An advanced operator services and billing system serves as an adjunct to a toll tandem or international gateway system. It provides all the necessary services and billing for operator-assisted calls and has an integrated Debit Card option.

TeleTraffic Generator® (TTG®)—Call generating device, which simulates traffic on a telecommunications switching system, offers many features and network interfaces for compatibility with all your testing requirements.

Rectifier/Charger
Inverter
Switching Platform
Switching Platform
Switching Platform
Batteries
Voice Mail PC
To Main Distribution Frame
Future Expansion   Future Expansion

In this example, the REDCOM IGX cabinet contains five major assemblies:

IGX Switching Platform—Provides the switching matrix for subscriber lines, and supports a wide variety of trunk interfaces. Batteries—Provide back-up power for the IGX switching platform and voice mail PC. The batteries are continuously charged by the rectifier. Inverter—Converts 48VDC to 110VAC, providing back-up power to the voice mail PC. Voice Mail PC—Provides voice mail support through standard analog line circuits on the IGX System. Rectifier/Charger—Provides operating power (48 VDC) to the IGX system and charging power to the batteries.

Portable

The forward thinking REDCOM Tactical Communications Package (TCP) combines an IGX•C with a unique cross-connect design in a shock-absorbent container. The TCP can be easily transported to field locations. It is specifically designed to support field communications demands common in military operations, government agency disaster responses, and other tactical/emergency response situations. The flexibility of the IGX•C and the TCP's unique cross-connect design ensure rapid setup and field adaptation to your changing deployment requirements.

The TCP's numerous wired, wireless, and satellite interfaces, plus advanced multinational signalling support, make it the proven choice for interoperable communications. The TCP can connect directly to a wide variety of crypto equipment with direct plug-in interfaces making it suitable for secure communications applications, including secure enclaves. Its tandem MLPP capability (including ANSI 619a support) makes it especially useful in U.S. DoD interoperability deployments. The TCP, using the IGX•C's stackable modularity, serves deployments small and large.

The REDCOM TCP is a commercial, off-the-shelf (COTS) product. However, the TCP is adaptable for unique requirements.

Field Command Post Capabilities

- No fans or filters, 0° to 50° Celsius
  - Use in tents, vans and buildings
- Secure reachback to home base networks
  - Unload traffic from home base to site radio
  - Satellite
  - Spread spectrum radio
- Trunk links to local PSTN
- ISDN BRI Video Teleconference (VTC)
- Secure Calling
- Radio net dial access by authorized home base users
- Patch radio nets together
- Provide interoperable connections to other switches
- Provide large on-site conferencing
- Multiple dial plans for inter-agency interoperability
- Conserve reachback bandwidth
- Command village concept improves coordination
- Grows easily as the deployment expands
- Unique cabling system allows rapid setup
- Configure circuit needs "on the fly"
- Control access to circuits as needed

Tactical Communications Package (TCP)

Conferences
- Secure
- Preset
- Meet-me
- Flexible

TRI-TAC Networks
- Secure Dial
- Secure Access
- KY-68 2nd Dial
- MLPP

International Networks
- E-1
- E-1 Priority
- R2 Signalling
- 2M (Japan)
- SS5 (SATCOM)

Domestic Networks
- DSN (ANSI 619a)
- PSTN
- GETS
- ISDN/SS7

Wireless
- Federal Radios
- Civil Radios
- GSM

Secure Interoperability
- FNBDT
- Iridium Type 1
- GSM Type 1
- STE
- NBS (Narrowband STE)
- STE-R
- STU-III
- KY-68
- LTU-TED
- Secure Tactical Radios

IGX•C

The IGX•C includes all IGX capabilities and adds enhancements especially useful in Command/Control and Emergency Response settings. Examples of applications benefiting from the IGX•C include police, fire, air traffic control, emergency/terrorist response, and natural disaster response.

A wide range of configurable dispatch consoles allow direct access to stations, trunks, radios, and conferences. Sizes range from 8 to 240 assignable keys per console. Consoles are available in desktop, portable, free-standing floor configurations, and video versions. With the IGX•C's command conferencing, you control who talks and who listens.

The IGX•C provides a variety of special features specifically related to Command Control Exchange applications such as DSN, Multi-Level Priority Override, and Fourth-Column DTMF Digits.

Command Features

- 5-level MLPP
  - Analog and digital trunks
  - Level conversion to/from R2 priority
  - 619a PRI and BRI MLPP service
  - Current MLPP is based on DCAC 370-175-6
- Executive Right-of-way and Conferenced Priority
- Command Conferencing
  - 32 party DSP Conferencing
  - Conference Chaining for Larger Conferences
  - Preset, Progressive and Meet-me Combinations
  - Loudest Talker and Additive Talker Capabilities
  - Priority Talker
  - ANI Matching to Attributes
  - MLPP Support
  - Radios
- Direct COMSEC Interfaces
- Special Digit Translation Capability
  - Multiple Dial Plans
  - 3-4, 4-3 and Other Station Numbering
  - 3 and 4 Digit Area Codes
  - "Chained" Dial Code Tables for Access Codes, Passwords, Intercepts, and Special Tone Sequences
  - Digit Substitution
  - Wild Card Digits
  - Can Route Based on ANI
- Computer Telephony Function
  - External Computer Control of Ports
  - Intercept Calls
  - Create Special Features
  - Provide Special Call Security Functions
  - Create Look-up and Match Tables for Alternate Action
- International Operability (IGATE®)
- Radio Line Interface
  - Authorized Radio Network Dial-Up
  - DTMF Equipped Radios Receive/Initiate Calls
  - HF Radio Dial Up
  - VOX Radio PTT

Interoperable

- Full or fractional ISDN Primary Rate Interface—Supporting DSN-PRI with MLPP, #4ESS, #5ESS, DMS-100, and NI1 protocols at network and user ends
- ISDN Basic Rate Interface (2B+D)—Supporting #5ESS and NI1 network end interface protocols for 2-wire U interfaces and 4-wire S interfaces
- T1 (1.544 Mbit/s)
- E1 (CEPT 2.048 Mbit/s)
- DSN/TRI-TAC T1 (1.544 Mbit/s) (with Precedence)
- Single Frequency (SF) Trunks—DSP in-band signalling (Type 36, KY-68 -TRI-TAC Long Local to TRI-TAC COMSEC parent switch or Secure Point-to-Point in Dial Mode)
- Radio
- Secure Military Standard Interfaces
- Non-secure Military Standard Interfaces

This powerful and flexible platform supports numerous Commercial and Tactical Interfaces such as:

- Secure
- Wireless
- Satellite
- Domestic
- International
- TRI-TAC (T1 or SF)
- KY-68
- BRI
- PRI
- DSN-PRI
- T1 (MF/DTMF)
- DSN-T1 CAS
- E1 (R2)
- 2M (Japan)
- Type 36
- STU-III
- STE
- Digital Wireless
- Commercial, Government, and Tactical Radio

Configuration Options

The IGX is currently available in several configurations.

- Small Voice Package
- Large Voice Package
- Secure Voice Access and Conference Package (Supports third party secure interface circuits)
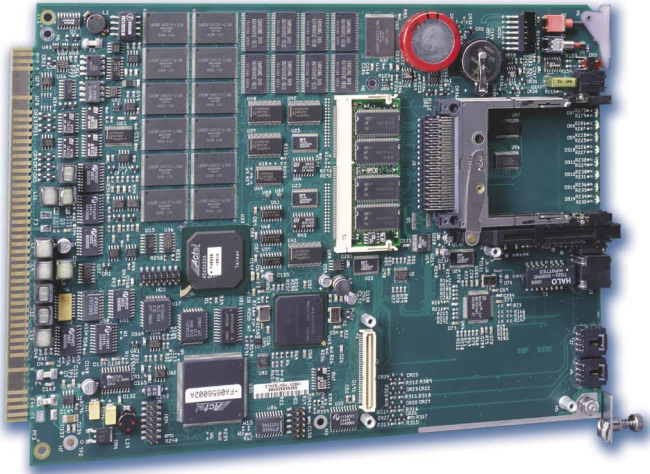
REDCOM's MSU Controller Board controls the IGX shelf with a micro-processor. Controller memory consists of SRAM, ROM, and an optional plug-in memory card.
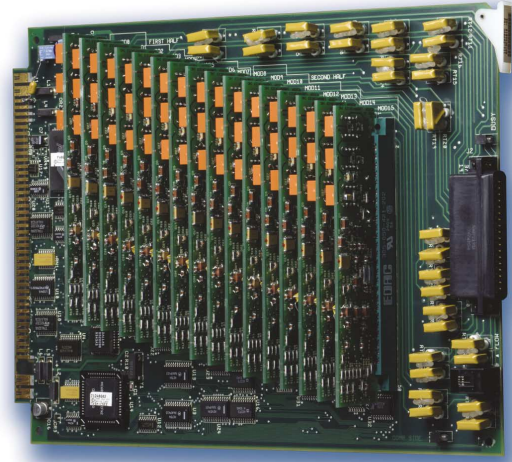
REDCOM's high density line board has 16 circuits. Each circuit has its own separate field-changeable interface module for easy and economical repairs.

Specifications

Control
- Multiprocessor distributed processing
- Stored program controlled

System Capacity
- 96 to 1536 ports (non-blocking). Larger systems, 10,000+ ports are traffic engineered

Station Loop
- Lines: 1200 Ω including station set, (1900 Ω optional)

Interregister Dialing
- DP, DTMF, ISDN, R2, and MF
- Senderized dialing available for ISDN, MF, SS5, and R2

Tones
- Standard precise tones (EIA/TIA-464)
- Special tones available as an option

Traffic
- 36 ccs (1Erlang) per port up to 1536 ports (non-blocking network)

Power
- –48 VDC (typically 2.5 amps/shelf)
- 24 VDC
- 100/120/240 VAC, 50-60 Hz

Transmission
- Digital 8-bit PCM format
- μ-255 Law (A-Law companding optional)
- Crosstalk Attenuation: >75 dB
- Idle Circuit Noise: < 20 dBrnc
- Line-to-Line Insertion Loss: 5 dB nominal (adjustable)
- Line-to-Trunk Insertion Loss: 0.3dB nominal (adjustable)
- Longitudinal Balance: 60 dB (Trunks); 40 dB (Lines Standard); 60 dB (Lines Optional)
- Nominal Impedance: 600 Ω, (900 Ω optional)

Environment
- 0 to 50 degrees C (32 to 122 degrees F)
- 5% to 95% relative humidity (non-condensing)

Shelf Dimensions
- 8.75 inches high, 19 inches wide, 17 inches deep
- 22 cm high, 48.3 cm wide, 43.6 cm deep
- Cable tray adds 1.75 inches (4.5 cm) to height

IGX Feature List

- Account Codes
- ANI (MF and PRI Based)
- Attendant Console
- Attendant Groups
- Automated Call Processing (ACP)
- Business Features
  - Call Hold
  - Call Park
  - Call Pickup
  - Call Waiting
  - Camp-on
  - Direct Dialing (DID/DOD)
  - Ground Start Ringdown Trunk
  - Large Conference Capabilities
  - Loop Start Ringdown Trunks
  - Multiple Console Groups
  - Music-On-Hold Access
  - Paging Access
  - Phone Book Program
  - Speed Dialing (System/Individual)
  - Transfer with Consultation Hold
- Busy Verify Trunk
- Call Center Features
- Call Detail Records
- Call Following (Remote Call Forwarding)
- Call Forwarding
- Call Monitoring
- Call Trap
- Called Party Control
- Caller ID (Name and Number)
- Caller ID Call Waiting
- Changed Number Intercept
- CLASS℠ Feature Service Groups
- CLASS℠ Features
- Clock Synchronization
- ClusterNet™ Technology
- Companding Law Conversion
- Computer Telephony Integration (CTI)
- Data Protection (Digital, Analog Lines)
- Direct Inward System Access (DISA)
- Direct Trunk Group Selection
- Dynamic Timeslot Allocation
- Enhanced Call Restriction
- Enhanced Maintenance Features
- Enhanced Traffic Reporting
- Ethernet/RS232 Link
- Expanded Digital Announcer (Version 6+)
- Facility Groups (ISDN Primary Rate)
- Flexible Numbering Plans
- Flexible R2 Backward Digit Tables
- Flexible System Timers
- Flexible Tone Tables
- FXO/FXS Support
- Host/Remote Capability
- Hunting (Station, Trunk, Circular, Homing)
- Individual Speed Dialing
- Individual Trunk Selection
- Intercept Trunks
- Integrated Network Operation
- ISDN Basic Rate Interface (BRI) S&U
- ISDN Primary Rate Interface (PRI)
- Last Number Redial
- Line Lockout
- Loop/Ground Start Line
- Loop/Ground Start Ringdown Trunk
- Loop Trunks
- Maintenance Phone
- Message Waiting Services
- Mixed DP/DTMF Station Dialing
- Nodal and Tandem Network Operation
- Non-volatile Database
- Note Logging
- Off-Hook Service
- Pad Level Support
- PIN Number Authorization
- Powerful Translator
- Priority Override
- Radio Line Interface (VOX)
- Radio Trunk Interface (PTT)
- Remote Access to Alarms
- Recorded Announcements
- Remote Administration and Diagnostics
- Remote Recording of Announcements
- Remote Station Login
- Route Treatments with Alternates
- Screen Classes
- Secure Disable
- Selective Station Disable
- Shuttle
- Smart SPIDS (ISDN Basic Rate)
- PCMCIA Card (Database Save/Restore)
- SS7 (C7 for international) (Version 6+)
- Switched 56 Data Service
- Tandem Operation
- Test Access
- Toll Restriction
- Traffic Usage Report
- Trunk-to-Trunk Answer Return
- Universal Sensor Driver
- Visual Alarm Indications
- Voice Mail System Interface
- Wake Up Services
- Warm Line Service
- Wireless Support (Selected Technologies)
- 800 Services
- 911 Service

Custom Features

The IGX also supports a variety of other features available through custom design. For more information contact REDCOM or visit our web site.

Some features and specifications listed are optional and/or available in Version 6 or higher Control Packages.

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