System Specifications

This appendix contains system specifications.

General

This section provides general system information on the IGX 8. More detailed information on peripherals and cabling is available in the installation manual.

System Capacity:	1 shelf with 8 card slots.
	Requires 2 dedicated front slot(s) for NPMs.
	Requires 2 dedicated back slots for SCMs (1 slot with blank plate).
	Up to 6 T1/E1 circuit ports.
	Up to 6 T1/E1 packet trunks.
	Up to 48 synchronous data ports.
	Up to 25 Voice, Data, and/or Frame Relay Module groups.
Enclosure Size:	IGX 8 Standalone/Rackmount:
	Height: 25 ins. (63.5 cm) standalone; 24.5 ins. (62.3 cm), rack
	Width: 19.9 ins. (50.5 cm), standalone; 19 ins. (48.3 cm.), rack
	Depth: 26.5 ins. (67.3 cm), standalone and rack-mount
Shipping Weight:	270 pounds (122.7 kilograms)
Clearance Requirement:	At least 30 inches front; nominal 30 inches rear clearance; 12 inch side clearance.
Power Input Voltage:	AC system: 100 to 240 VAC (90–264 under-voltage and over-voltage tolerance), 47 to 63 Hz.
	DC system: –42 to –56 VDC.
	Each AC supply can provide up to 400 watts to the card shelves.
	Space for 4 power supplies.
Current Requirements:	Configuration dependent—use Network Design Tool for exact requirements. For planning purposes, use:
• AC System	10 A. Max. for 110 VAC, 5 A for 220 VAC.
• DC System	20 Amps max. at -48 VDC; 25 Amps at -42 VDC (worst case)

Input AC Power Connector:	IEC 16 Amp input connector. Six different power cords are available to comply with the standards of different countries. Power cords are six feet (approximately two meters) long.
DC Input Connections	3-wire pluggable terminal block with screw terminal connectors.
Operating Environment:	0° to 50° C (32° to 104° F). Maximum 85% relative humidity
Shock:	Withstands 10 G, 10 ms. at 1/2 sine wave.
Vibration:	Withstands 1/4 G, 20–500 Hz.
Heat Transfer to Room:	IGX 8: 2720 BTUs max.

Voice Circuit Support

Voice Channel Interface:	24-channel T1 (D4 format). 24-channel T1-ESF (using CVM8). 30-channel framed CEPT E1. 31-channel framed CEPT E1.
Voice Compression Available:	32/24/16 Kbps ADPCM. 32 Kbps ADPCM. Voice Activity Detection compression.
Compression Algorithm:	ITU-T G.721, G.723, G.726. StrataCom 32 Kbps ADPCM.
PCM Encoding Types:	Accommodates µ-Law or A-Law encoding, End-to-end conversion available.
Channel Gain Control:	–8 dB to +6 dB.
Signalling Modes:	T1: Robbed bit or CCS (ISDN). E1: Channel Associative Signalling (CAS) or Common Channel Signalling (CCS).
Signalling Conditioning:	Various make-busy and forced idle routines during circuit alarm can be specified on a per-channel basis.
Quantizing Distortion Added:	2.5 Quantizing Distortion Units (QDU)s with 32 Kbps ADPCM over 1 hop plus 0.7 QDUs with Digital Loss PAD (µ-law or A-Law).

D.1   Data Channel Support

Sync. Data Interfaces:	RS-232C/D, RS-449/422, V.24, X.21, and V.35 with IGX 8 as DCE or DTE.
High-Speed Data Rates (HDM):	2.4 Kbps to 1.344 Mbps.
Low-Speed Data Rates:	2.4 to 19.2 Kbps per LDM port.
Ports per card:	LDI: 4 or 8. SDI: 4.
Control Leads Supported:	SDI: Per interface standards. SDI: Up to 7 in each direction for fast EIA. LDI: 3 in each direction for DCE and DTE for each port.
Control Lead Sync w/Data:	Control leads are sampled every 50 ms. and changes will normally follow data within 100 to 1000 msec. Fast EIA lead will be within 1 byte.
DS0A Interface:	Superrate, 56 Kbps to 512 Kbps (8 DS0s) per port. Subrate: One 2.4/4.8/9.6/19.2/ or 56 Kbps per DS0 Per Bell TR-TSY-000458, TR-TSY-000280, TR-TSY-000083, and TR-TSY-000077.
Data Clocking:	Synchronous and isochronous clocking. Normal, looped, and split clock configurations.
Pleisochronous Clock Range:	± 2 percent of nominal data rate.

Digital Data Service Interface

Ports per card:	Four.
Electrical Interface:	Digital Data System (DDS)—AT&T Pub. 62310, November 1987.
Interface Type:	DSU or OCU (software selectable).
Data Rates:	2.4, 4.8, 9.6, 19.2, and 56 Kbps (software selectable).
DDS Data Encoding:	Standard DDS Bipolar Return to Zero. Alternate Mark Inversion coding with bipolar violation sequences for zero suppression and control.
Data Compression:	Repetitive Pattern Suppression (RPS): 7, 8, or 16 bit pattern matching.
Synchronization Modes:	External (DSU only) Looped (OCU only).

Control Codes Recognized: Idle.
Zero Suppression.
Out-of Service.
Loopback Sequences.

Control Code Translation: Translation of RTS to IDLE.

Alarm Code Translation: Translation of the logical NOR of Out-of-Service
Sync Fail.
Excessive Bipolar Violations.
No Signal to DSR (DSU only).
No Signal to DTR (OCU only).

Connector: ISO 4903, female DB-15 type connector.

T1 Interface

Line Rate:	1.544 Mbps, ± 50 bps (± 200 bps VCO lock range).
Line Code:	Bipolar AMI or B8ZS.
Framing Formats:	Fractional T1, adjacent or alternating channels. Minimum of four DS0 channels required.
Signal Level:	DSX-1 compatible.
Line Impedance:	Terminated = 100 Ohms nominal. Bridged = 1 KOhm.
Pulse Amplitude	Individual pulse amplitude 2.4 V–3.6 V (making a total base-to-peak amplitude of 6 V ± .6V)
Minimum Pulse Density:	Zero code suppression, either LSB or MSB.
Frame Format:	D4 and Extended Superframe (ESF).
VF Signalling:	Robbed bit D4 with A and B bits.
Max. Line Lengths:	Up to 533 feet with equalizers using ABAM cable.
Jitter Transfer:	Meets AT&T PUB 62411 specifications.
Jitter Tolerance:	Meets ANSI standards and AT&T PUB 62411 specs.
Connector:	DB 15 female.

E1 Interface

Line Rate:	2.048 Mbps, ± 50 bps (± 200 bps VCO lock range).
Line Code:	Bipolar AMI or HDB3.
Line Impedance:	120 Ohms (balanced) or 75 Ohms (balanced or unbalanced)
Minimum Pulse Density:	Zero code suppression via HDB3 coding.
Frame Format:	Unframed, 32-channel (G.703). Framed: 30 or 31-channel CEPT multiframe per ITU-T G.704.
VF Signalling:	CAS or CCS.
Max. Line Lengths:	E1 output complies with G.703, so cabling must not exceed –6dB/1000 feet at 1024 kHz (applies to 75 Ohm coax or 120 Ohm twisted pair up to 350 meters or 1000 feet). StrataCom supplies cable with a maximum attenuation of 7 dB /1000 ft., so the maximum length of this cable is 850 feet (260 meters).
Jitter:	Meets G.823.
Electrical Interface:	Complies with G.703 Specification.
Connector:	DB 15 female or BNC.

T3 Interface

Line Rate:	44.736 Mbps ± 20 ppm, asynchronous.
Line Code:	B3ZS.
Clock Source Mode:	Internal (Asynchronous).
Signal Level:	DSX-3.
Framing Formats:	M13 mode, C-bit parity.
Alarms Processed:	AIS. LOS. Remote Alarm Indication. Loss Of Framing.
Line Errors Counted:	BPV. Parity Bit Errors.
Receiver Input Impedance:	Terminated = 75 ohms.
Transmission Modes:	Point-to-Point or Drop and Insert.
Jitter:	Meets ACCUNET T45 specification (Pub 54014).
Connector:	75 ohm BNC.
Max. Line Lengths:	450 ft. (137 m.) to DSX-3 using 75 Ohm coaxial cable.
Indicators:	RED Alarm. YELLOW Alarm. LOS. AIS.

E3 Interface

Line Rate:	34.368 Mbps ± 20 ppm, asynchronous.
Line Code:	HDB3.
Clock Source Mode:	Internal (Asynchronous).
Signal Level:	ITU-T G.703
Framing Formats:	ITU-T G.804, G.832,
Alarms Processed:	AIS. LOS. Remote Alarm Indication. Loss Of Framing.
Line Errors Counted:	BPV. Parity Bit Errors.
Receiver Input Impedance:	75 ohms unbalanced.
Transmission Modes:	Point-to-Point or Drop and Insert.
Jitter:	per ITU-T G.823.
Connector:	75 ohm BNC.
Max. Line Lengths:	137 meters (450 ft.) using specified cable.
Indicators:	RED Alarm. YELLOW Alarm. LOS. AIS.

Frame Relay Interface

Type of Service:	Permanent Virtual Circuit (PVC).
Data Interface:	Per ITU-T I.122 and ANSI T1/S1 Standards.
Data Transfer Protocol:	LAP-D frame level core functions.
Input Data Format:	High Level Data Link (HDLC) protocol.
Input Data Frame Length:	Up to 4096 bytes max.
Frame Integrity Check:	Frame Check Sequence and CRC check of data frame. If CRC fails, data frame is discarded at receiving node.
Input Data Rate:	56 Kbps to 2.048 Mbps. (Max. rate available only with one of four ports/card active).
No. of Ports per Card:	4
No. of PVCs per Port:	252 per FR card, distributed in any combination.
Port Electrical Interface:	ITU-T V.35. IGX 8 can act as a DCE or DTE for direction of control leads and timing.
Data Clocking:	Normal or looped.
Virtual Circuit Identifier:	Data Link Connection Identifier (DLCI).
Control Protocol:	Local Management Interface with XON/XOFF type flow control. IGX sets FECN and BECN bits in frame relay frame.
Bundled Connections:	252 virtual circuits per card 1024 virtual circuits per node.
Billing Time Accuracy:	Upon request from user device, IGX will provide GMT from any node accurate to within 1 second.

ATM Interface

Type of Service:	Permanent Virtual Circuit (PVC)
Interface Types:	User-to-Network (UNI) and Network-to-Network (NNI) per ITU I.361 and I.363
Data Rates:	T3 or E3
ATM Layer:	Physical Layer Convergence Protocol per AT&T publication TA-TSY-00772 and 000773 for T3; ITU I-361 with HEC for E3
Cell Rate:	96,000 cells/sec. for T3, 80,000 cells/sec. for E3
Adaptation Layer:	AAL5
No. of Ports per card:	4
No. of PVCs per card:	255
VPI Addressing Range:	0-255
VCI Addressing Range:	0-65535
Traffic Queues:	CBR, VBR, and ABR
Management Protocol:	Interim Layer Management Interface (ILMI)

Network Synchronization

External Clock Sources:	IGX 8 synchronizes to the nearest, highest-stratum clock available. Any E1 or T1 circuit line, trunk, or optional external clock input can be used as a clock source.
Internal to Node Source:	T1: 1.544 MHz, $\pm$ 10 ppm. (Stratum 4). E1: 2.048 MHz, $\pm$ 10 ppm (Stratum 4).
Clocking Hierarchy:	Dynamic primary, secondary, and tertiary clocking.

Network Management Control

Network Control Terminal: StrataView Plus workstation and StrataCom software required for graphical display of network status, statistics gathering and display, and automatic downloading of software.

Control Terminal: DEC VT100, WYSE 85, Televideo 970 or equivalent terminal for basic system configuring and alarm monitoring.

Remote Alarm Reporting: Auto-dial modem connects to one of two control ports on each IGX 8 node for automatic reporting of network alarms.

Remote Diagnostics: Auto-answer modem connects to one of two control ports on each IGX node for remote diagnostic access by StrataCom ISC or other authorized personnel.

Network Control Ports: Two ports per node, (one RS 232C interface and one Ethernet LAN port).

Alarm Notification: Status of all trunks and nodes in network distributed to and stored by each individual node. Reported to StrataView Plus workstation at connecting node.

External Alarms: Meets Bellcore Compatibility Bulletin #143 and AT&T Technical Reference PUB 43801 DS1 (T1) facility alarm requirements when equipped with DTI group.

Indicators and Controls: Active and Fail lights on all cards and power supplies.