APPENDIX A

IPX System Specifications

Introduction

This appendix provides details on the Release 8.1 IPX system specifications.

General

The following are general conditions applicable to the IPX 8, 16, and 32.

Operating Environment: Operating Conditons are listed in Table A-1.

Shock: Withstands 10G, 10 ms. at 1/2 sine wave.

Vibration: Withstands 1/4 G, 20 to 500 Hz.

Heat Transfer to Room: IPX 16: 3600 BTUs max
IPX 32: 6800 BTUs max
IPX 8:

Table A-1 Ambient Temperataure and Humidity Limits

	Limits	
Conditions	**Fahrenheit**	**Centigrade**
Operating Temperature	+40 to +100 degrees	+4.5 to 38 degrees
Recommended:	+68 to 86 degrees	+20 to +30 degrees
Short-Term Temperature[1]	+35 to +120 degrees	+1.7 to + 49 degrees
Operating Relative Humidity	20% to 55% non-condensing	
Short-Term Relative Humidity	10% to 80% non-condensing.	

1. Room temperature refers to conditions at a location 5 feet above the floor and 15 inches in front of the equipment.

General (IPX 16/32)

System Capacity:
1 or 2 shelves, each with 16 card slots.
Requires 1 or 2 dedicated slot(s) for PCC/SCC.
Up to 16 T1 or 14 E1 circuit ports.
Up to 16 T1 or 14 E1 packet trunks.
Up to 100 synchronous data ports.
Up to 25 Voice, Data, and/or Frame Relay PAD groups.

Cabinet Size:
65.6 inches (166.7 cm) high.
22.0 inches (55.9 cm) wide.
36.5 inches (92.0 cm) deep.

Shipping Weight:
700 pounds (318 kilos) for IPX 32 fully loaded.
350-400 pounds for IPX 16.

Clearance Requirement:
At least 30 inches front and rear clearance; nominal 12 inch side clearance.

Power Input:
AC system: 180 to 264 VAC, 47 to 63 Hz.
DC system: –42 to –56 VDC.
Each AC or DC supply can provide up to 600 watts to the card shelves. Shelf space for 4 power supplies.

Power Requirements:
Configuration dependent - use Network Design Tool for exact requirements. For planning purposes, use:

- AC Power

	Max . Current at 180 VAC	Max. VA	Max. Power
IPX 16:	9.2 A	1.7 KVA	1.1 KW
IPX 32:	17 A	3.1 KVA	2 KW

- DC Power

	Max . Current at 42 VDC	Max. Power
IPX 16:	28 A	1.2 KW
IPX 32:	50 A	2.1 KW

Input AC Power Connector:	AC Power Distribution unit is the same for all cabinets shipped: IEC 16 Amp input connector. Six different power cords are available dependent upon country of destination: • For North America and Japan: NEMA L6-20 Twist Clock • For Continental Europe: CEE 7/7 (Schuko) • *For Italy: CEI 23-16/VII (16-amp plug) • For United Kingdom and Ireland: BS 1263 • For Australia and New Zealand: AS 3112 • For those countries not appearing in the preceding list, use a power cord with an IEC 320 C-19 coupler for the system end, and an appropriate ground-type attachment plug at the other end in accordance with local standards.
DC Input Connections:	DC power is the same for all IPX 16/32 cabinets shipped. DC: 3 ring lug screw terminal connectors. 6 feet (2 m.) power cord supplied

General (IPX 8)

System Capacity:	1 shelf with 8 card slots. Requires 1 or 2 dedicated slot(s) for PCC/SCC, All others can be used for port cards. Two of the eight slots are double-wide and have no significance.
System Controller:	NPC, single or redundant configuration.
System Software:	Release 8.1
System Throughput:	32 Mbps
External Clock Sources:	IPX synchronizes to the nearest, highest-stratum clock available. Any E1 or T1 circuit line, trunk, or external clock input can be used as a clock source.
Internal to Node Source:	T1: 1.544 MHz, ± 50 Hz (Stratum 4). E1: 2.048 MHz, ± 10 ppm (Stratum 4) Same as IPX 16/32.
Cabinet Size:	24.5 inches (62.2 cm) high. 16.25 inches (41.3 cm) wide. 22.25 inches (57.2 cm) deep.
Shipping Weight:	122 pounds (55.5 kgs) fully loaded 90 pounds (40.9 kgs) minimum configuration
Clearance Requirement:	At least 30 inches front and rear clearance; nominal 12 inch side clearance.

Voice Circuit Support

Voice Channel Interface:	24-channel T1 (D4 format). 24-channel T1-ESF (using CDP). 30-channel framed CEPT E1. 31-channel framed CEPT E1.
Voice Compression Available:	32/24/16 Kbps ADPCM (Rel. 6 systems). 32 Kbps ADPCM (Rel. 5 systems). Voice Activity Detection compression.
Compression Algorithm:	CCITT G.721, G.723, G.726 (Rel. 6 systems). StrataCom 32 Kbps ADPCM (Rel. 5 systems).
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 (QDU)s with Digital Loss PAD (μ-law or A-Law).

Data Channel Support

Sync. Data Interfaces:	RS-232C/D, RS-449/422, V.24, X.21, and V.35 with IPX as DCE or DTE.
Sync. Data Rates (SDP):	2.4 Kbps to 1.344 Mbps.
Low-Speed Data Rates:	2.4 to 19.2 Kbps per LDP 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.
Base-to-Peak Height:	6V, ± 0.6V.
Minimum Pulse Density:	Zero code suppression, either LSB or MSB.
Frame Format:	D3/D4 superframe or ESF.
VF Signalling:	Robbed bit D4 with A and B bits, ESF with A, B, C, and D bits.
Max. Line Lengths:	Up to 655 feet with equalizers using ABAM cable.
Jitter Transfer:	Meets Bell PUB 62411 specifications.
Jitter Tolerance:	Meets ANSI standards and Bell PUB 62411 specifications.
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 CCITT G.704.
VF Signalling:	CAS or CCS.
Max. Line Lengths:	Up to 50 meters with equalizers using shielded cable.
Jitter:	Meets G.823.
Electrical Interface:	Complies with G.703 Specification.
Connector:	DB 15 female or BNC.

T3 Interface

Line Code:	B3ZS.
Frequency:	44.736 Mbps ± 20 ppm.
Clock Source Mode:	Internal (Asynchronous).
Signal Level:	DSX-3.
Framing Formats:	M13 mode.
Alarms Sent:	AIS. Yellow.
Alarms Received:	AIS. LOS. Yellow. 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:	40 ft. to DSX-3 using ABAM cable.
Indicators:	RED Alarm. YELLOW Alarm. LOS. AIS.

E3 Interface

Frame Relay Interface

Type of Service:	Permanent Virtual Circuit (PVC).
Data Interface:	Per CCITT 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:	CCITT V.35. IPX 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. IPX 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, IPX will provide GMT from any node accurate to within 1 second.

Network Synchronization

External Clock Sources:	IPX synchronizes to the nearest, highest-stratum clock available. Any E1 or T1 l circuit line, trunk, or optional external clock input can be used as a clock source.
Internal to Node Source:	T1: 1.544 MHz, ± 50 Hz (Stratum 4). E1: 2.048 MHz, ± 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, automatic downloading of software, and network management including Frame Relay connection management.
Control Terminal:	SV+ telnent session, or DEC VT100, WYSE 85, Televideo 970 or equivalent terminal for basic system configuring.
Remote Alarm Reporting:	Autodial modem connects to one of two control ports on each IPX nodes for automatic reporting of network alarms.
Remote Diagnostics:	Auto-answer modem connects to one of two control ports on each IPX node for remote diagnostic access by StrataCom ISC or other authorized personnel.
Network Control Ports:	Two ports per node, RS 232C interface.
Alarm Notification:	Status of all trunks and nodes in network distributed to and stored by each individual node. Reported to StrataView Plus terminal 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.