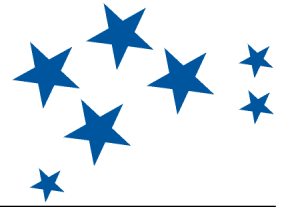


P32mxi System



Broadband Networking is the lifeblood of corporate communications, with many options available now and even more coming. As networks become more versatile, equipment deployed today must be flexible enough to grow into these new configurations.



The **P32mxi** is a modular 32-channel voice/data Broadband Access Device which can be deployed in today's existing networks, while offering inexpensive upgrades for future networks. Small (7.7" L x 13" W x 1.75" H) and lightweight (5.4 lbs), the system was specifically designed for customer premise operation.

The system supports dual T1/E1 ports, 32 analog FXS/FXO/DPT/DPO ports, SNMP management, Windows™-based Graphical User Interface, a full-featured TCP/IP router with an embedded stateful firewall, 10/100 Base-T Ethernet port, MGCP Voice over IP support, with simultaneous operation of TDM, ATM and IP. The system also includes an integrated V.35 interface, true sine-wave ringing generator, and built-in battery charger with programmable maintenance cycles. A wall or rack-mountable battery backup system providing up to 8 hours of backup power is also available.

Helping to push functionality to the Edge of the Network, the **Versapath** software feature of the **P32mxi** can intelligently route calls over the lowest-cost link in the network. For Carriers, this helps offload non revenue generating calls (911, 800 numbers) to a local Central Office while providing either standard Voice or integrated Voice and Data services. For the Enterprise, routing local calls at the branch office saves bandwidth that can be used for critical data applications. And as packet voice networks grow, the P32mxi will be ready for them with Voice over ATM and Voice over IP capabilities.

With the **Advanced Channel Bank** software feature installed, the **P32mxi** can perform Voice Activity Detection (VAD) type Answer and Disconnect Supervision. This is extremely useful for a network operator wanting to terminate Tier-1 traffic on their network. With dual T1 or E1 modules installed, Answer Supervision can be performed at the network hub, allowing the operator to use inexpensive channel banks at each termination.

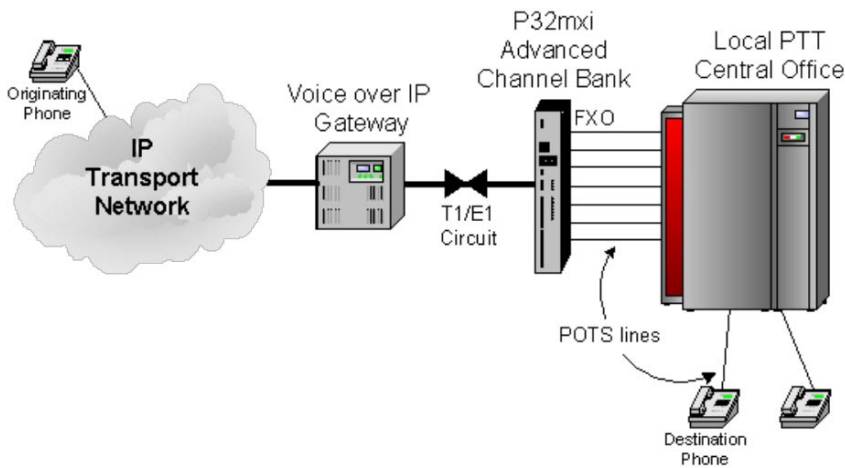
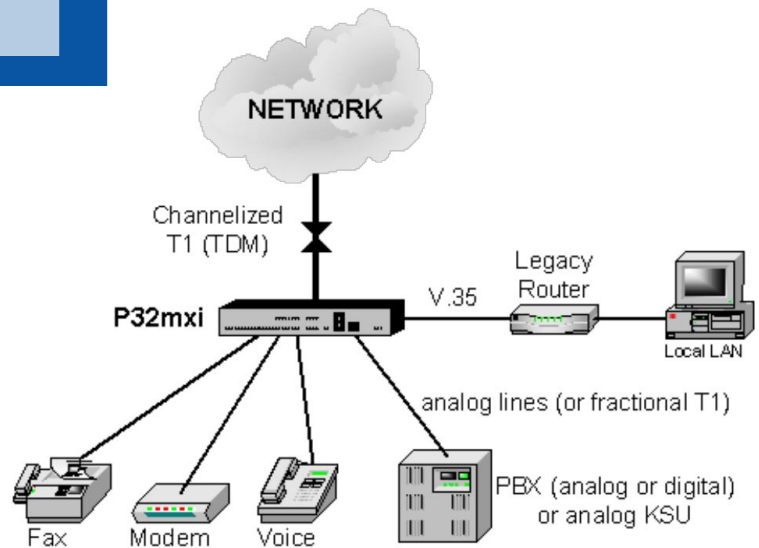
With one system that can be a simple T1/E1 Channel Bank to integrated Voice and Data Multiplexer to total Broadband Access Device, the **P32mxi** is the ultimate device for any Network Edge deployment, allowing ILECs, IXCs, CLECs, ISPs and VARs to offer their small-to-medium sized customers one device that protects their technology investment as network needs change.

P32mxi Applications

Voice & Legacy Data

This is a standard "Channel Bank" application. Up to 24 DS0 timeslots can be used. "In this example, a V.35 port is used to connect with a legacy router.

The PBX can be either analog (with FXS modules installed in the P32mxi) or digital via the drop (fractional) T1 port.



VoIP to Legacy PSTN Network Interface

Here the P32mxi acts as a digital-to-analog converter for a digital-only Voice over IP gateway.

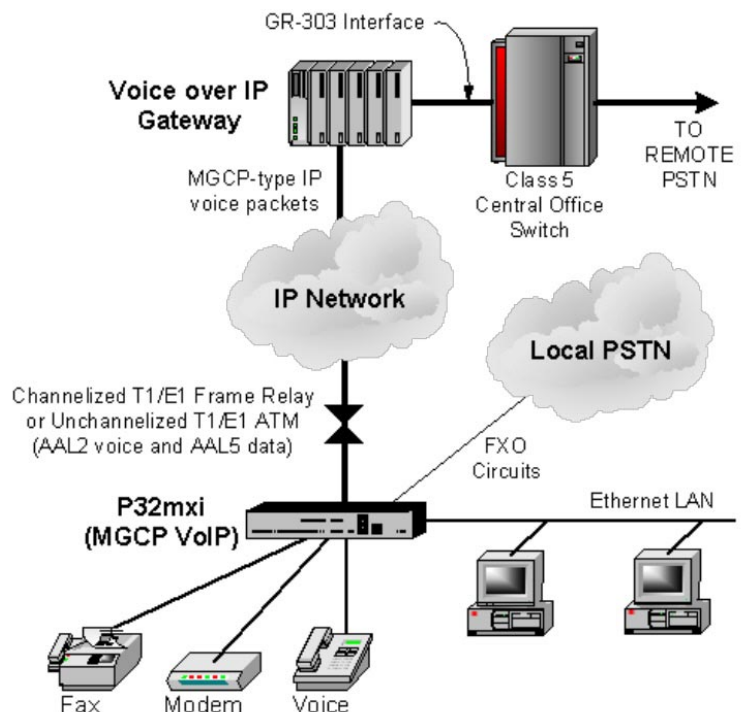
Accurate Voice Activity Detection-based Answer Supervision can be provided on the FXO trunks coming from the legacy PSTN switch. This feature can help support Tier-1 traffic for Toll Bypass or VoIP Network operators.

Packet Voice & Data

This is a modified version of the standard "Channel Bank" application where an ATM network is used to transport the packetized voice and data to a centralized hub.

Using Dynamic Bandwidth Allocation (and depending on the type of voice compression used), The P32mxi can connect up to 62 voice ports to the hub. This includes all 32 analog VF devices and all of the timeslots on the drop T1/E1 port. Data throughput will suffer depending on the number of voice ports actively in use.

In future the P32mxi will support both H.323 and SIP Voice over IP protocols.

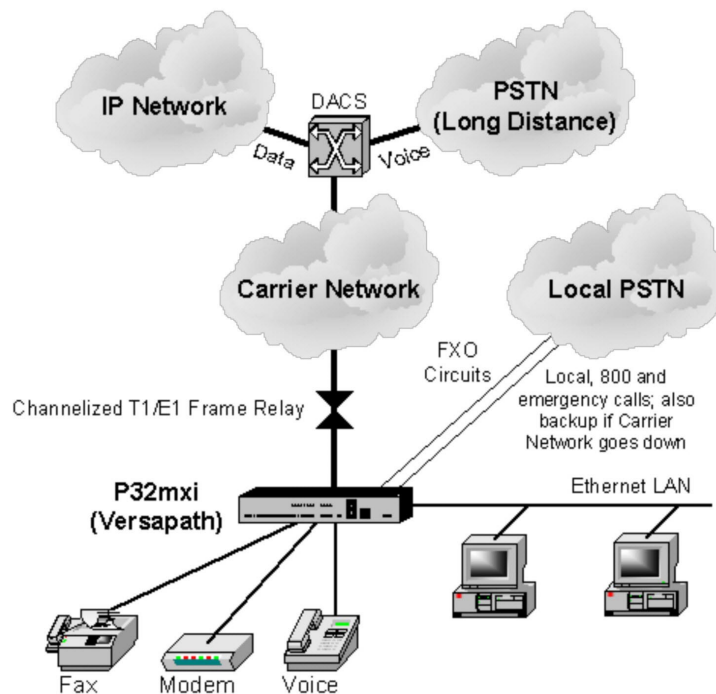


More P32mxi Applications

Versapath Application

In a typical Versapath application, when a device goes off hook, the P32mxi provides dial tone and collects the dialed digits. The system includes dialing rules for routing all local calls, 1-800 numbers, 911, 0+ calls to the local PSTN (Central Office) via FXO circuits, while Long Distance (1+) calls are routed to the carrier's long distance network via the T1.

Depending on the number of analog channels used for connecting to the local CO, up to 62 voice ports can be connected. Prior to the Versapath, these voice ports would have been connected directly to the CO at great expense to the customer. Just reducing the FXO line count makes the Versapath an economical solution for many customers.



General P32mxi System Capabilities

- Dual T1/E1 Network Interfaces
- Up to 32 total Analog (VF) Interfaces
- Long Loop (18,000 ft./1900 ohm) FXS Interfaces
- T1/E1 Conversion (with A to Mu-law Conversion)
- DID (DPT/DPO) Support
- Integrated CSU (T1)
- Autosensing 10/100 Base-T Ethernet
- Integrated Battery Charger
- Integrated TCP/IP Router
- Voice over Broadband/Voice over ATM (AAL5/AAL2)
- Integrated Stateful Firewall
- Virtual Private Network Support (via Tunneling)
- Full Digital Crossconnect (92 DS0 maximum)
- Signaling Conversion: FX to E&M, FX to FX, E&M to R2 Digital

- Graphical User Interface (Local and Remote)
- SNMPv2 Management
- Supports Caller ID / CLASS Features
- True Sine Wave Ringing Generator
- Integrated V.35 Interface (Nx56K/64K)
- Remote Battery Testing
- Remote Software Upgrades
- Eight-hour Battery Backup
- Frame Relay/PPP/HDLC Support
- Voice over IP (MGCP)
- Packet Voice Compression and Echo Cancellation
- Dynamic Bandwidth Allocation (VoATM/VoIP)
- QoS Support

Intelligent Call Routing (Versapath) Features

- Inbound/Outbound Call Routing
- Station-to-Station Calling
- Call Forwarding
- Remote Table Programming
- Digit Deletion/Digit Insertion
- Call Blocking
- "Ringdown" Circuit Using Switched Networks

- DNIS and DID Routing
- Digit Translation
- Call Transfer
- Local Number Portability Support
- Route Diversity/Redundancy
- 911 Override
- Inbound/Outbound Call Statistics

Advanced Channel Bank Features

- Timer-based Answer/Disconnect Supervision
- Voice Activity Detection Answer/Disconnect Supervision
- Selectable Tones and Cadence (150 countries)

- TR-08 Remote Terminal Emulation

P32mxi Technical Specifications

NETWORK INTERFACE MODULES (2 per chassis)

- T1 (D4, ESF and TR-08) interface supports FX and E&M Wink/Immediate signaling
- E1 interface (75 and 120 ohm) supports E&M Wink/Immediate and R2 Digital Signaling
- Future SDSL/HDSL2/G.SHDSL interface

ANALOG INTERFACE MODULES (8 per chassis)

- Quad FXS/DPO Long Loop interface (18,000 ft. CSA); FCC approved for outside plant or interoffice use
- Quad FXS/DPO Short Loop interface (3,000 ft.)
- Quad FXO/DPT interfaces

ROUTER/ATM/VoIP/ETHERNET (RAVE) MODULE

- 10/100 Base-T Ethernet Port
- TCP/IP Router and Bridge
- RIPv1/v2 and Static Routing Protocols
- Frame Relay/PPP/HDLC
- DHCP Client/Server
- NAT/PAT and NAPT (IP Masquerading)
- PAP/CHAP support
- IGMP Proxy support
- VPN Services: PPTP and L2TP
- Port Filtering and Access Policy Definition
- Stateful Firewall with Denial-of-Service (DOS) Attack Detection, real-time logging and blacklisting
- Future Radius support

ATM/VOICE OVER ATM

- ATM AAL2/AAL 5 voice and data with QoS prioritization
- Jetstream/BLES/VMOA compliant

VOICE OVER IP

- MGCP 1.0 support
- Future H.323 and SIP

VOICE COMPRESSION (with DSP Modules)

- G.711 PCM, G.726 ADPCM, G.729A CS-ACELP
- G.165 and G.168 Echo Cancellation (up to 32ms)

SUPPORTED NETWORK STANDARDS

ATM: ILMI 4.0; I.363.2 CPCS, I.366.1 & .2 SSCS; UNI 3.0, 3.1 & 4.0; I.610 OAM; LANE; RFC 1483/ 1577/ 1755 IP over ATM (IPoA); RFC 2684 MPoA; RFC 2364 PPPoA; PPPoE Relay; af-vmoa-0145

IP: RFC 791/1058/1191/1723/1812; RFC 2663 (NAT/NAPT); RFC 1661/1570/2364 (PPP); RFC 1334 (PAP); RFC 1994 (CHAP); RFC 2637 (PPTP); RFC 1058/1723/2453 (RIP); RFC 854 (Telnet); RFC 1350 (TFTP)

Frame Relay: FRF 1.1/12; Q.933 Annex A; RFC 2427

T1: ANSI T1.403/AT&T 54016, 62411 & 43801

E1: G.703, G.704, G.731, G.732, G.775, G.962, O.162, Q.421, Q.422, TBR 012 and TBR 013

MANAGEMENT

- Configured by the StarCAD 9000 GUI (Windows only)
- SNMPv2 Management via SLIP (craft port), Network Interface (via Frame Relay or ATM), or Ethernet

SUPPORTED MIBs

RFC 1155/11571213/1901 (SNMP core); RFC 1493 (Bridge); RFC 1471/ 1472/1473/1474 (PPP); ILMI; RFC 2515 (ATM); LANE; RFC 2665; RFC 2863 (IF); RFC 1406 (T1/E1); Custom System MIB

CLOCKING

Internal or Loop timing from either network module

POWER

- AC or DC with integrated battery charger and battery testing
- AC 95-135 VAC, 50/60 Hz
- DC input -42 to -60 VDC
- Maximum Power 90W
- Remote battery test function
- Automatic "Float" & "Equalize" for longer battery life
- Remote monitoring of internal temperature and power supply voltages
- True sine wave ringing generator

REGULATORY

- NRTL Safety Listed: Certified to UL 1950, Certified to CAN/CSA C22.2 Std
- FCC Part 15 class A Radiated Emissions Control
- FCC Part 68, CS-03 Listed for connection to PSTN

PHYSICAL & ENVIRONMENTAL

- Operating Temperature 0o to 50° C (32° to 122° F)
- Relative Humidity 0 to 95%
- 7.7" L x 13" W x 1.75" H
- 5.4 pounds fully configured

INDIVIDUAL MODULE PART NUMBERS

MX120 Quad FXO/DPT Module

MX220 Quad FXS/DPO (Long Loop) Module

MX240 Quad FXS/DPO (Short Loop) Module

MX800 T1 Network Interface Module

MX820 E1 Network Interface Module

MX310 VX Board (required with RAVE Module)

MX540 RAVE Module (Router/ATM/VoIP/ethernet)

MX001 DSP Modules (for VoATM/VoIP)

BC48 Battery Cabinet

MX400 Versapath Software

MX410 Voice over ATM/Voice over IP Software

MX420 Voice Activity Detection Answer Supervision Software

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