cPCI© cFXO3120
FXO/FXS VoIP Gateway

PRODUCT DESCRIPTION

The MediaPro® cFXO3120 is a combination FXO and FXS Controller and VoIP Gateway in a 6U cPCI Board.

The cFXO3120 includes 12 FXO subscriber side loop start/ground start trunks, 4 FXS central office side loop start/ground start trunks, cPCI 2.16 PSB and cPCI 2.5 H.110 backplanes. PRI ISDN T1/E1, IVR and SIP VoIP gateway features are available options. .

The cFXO3120 operates in conventional cPCI host bus or 2.16 PSB modes. In 2.16 mode, a chassis host CPU is not required and any host residing on the IP network may remotely control and configure the cFXO3120.

The cFXO3120 H.110 TDM switched backplane supports flexible scaling of port densities via the addition of cFXO3120 expansion cards.

The cPCI 2.16 packet switched backplane eliminates all single points of failure in the cPCI chassis, achieving in excess of “5 Nines” high availability.

The cFXO3120 provides cost effective interoperability between analog communications systems and VoIP network environments.

Typical applications for the cFXO3120 include scalable density T1/E1 PRI ISDN channel banks, remote analog to VoIP SIP Gateway, call center IVR and audio record/play systems.

The 4 port FXS option includes loop battery and ring voltage generation on card.

Voiceboard also offers the MediaPro cFXS3240, a 24 port FXS controller card for applications requiring greater FXS port density.

The cFXO3120 portable API’s and drivers support most software operating systems, including Linux, Windows, VxWorks and Solaris.

cFXO3120

FUNCTIONAL DESCRIPTION

cFXO3120 boards provide the following functions:

- Software programmable 2:4 wire hybrid
- Loop start and ground start tip-ring operation
- FXO ring detection
- FXS loop battery and ring generation
- Off hook, flash, DTMF, MF and dial pulse signaling
- Integral TSI provides line-line switching and access to the backplane H.110 bus
- IVR includes AGC, VAD, echo cancellation, DTMF and call progress signaling, play/record and multi-party conferencing.
- SIP or H.323 VoIP Gateway
- Dual 10/100 Ethernet connections
- T1/E1 ISDN channel bank operation

473 Post Street ✦ Camarillo, CA 93010 ✦ Telephone 805-389-3100 ✦ FAX 805-389-1611
E-mail: marketing@voiceboard.com ✦ URL: http://www.voiceboard.com

PRODUCT FEATURES

- High density packaging provides 12 FXO, 4 FXS, T1/E1 span and VoIP Gateway in a single cPCI slot.
- Software is downloadable to flash memory for simplified upgrades and field support.
- PICMG 2.5 H.110 back plane provides low latency switching of TDM data.
- Optional DSP supports telephony signaling, IVR and VoIP.
- On board microprocessor with Real Time OS handles low-level board control, simplifying host software tasks and improving call event response time.
- Software programmable codec gain, µ/a-law encoding selection and adjustable network characteristics provides flexibility in meeting a wide variety of installed system environments.
- PICMG 2.16 PSB implements ”5-nines+” high availability systems
- Dual10/100baseT Ethernet ports provide remote host command and control, VoIP interface, flash download capability and access to built-in test facilities.
- Hot swap allows mission critical systems to continue operation during maintenance and upgrade procedures.
- Port and board status displays clearly show current board status.
- Built-in test, watchdog and heartbeat functions allow host to verify correct board operation upon power-up or on a demand basis.
- Host-based API and driver for Windows NT, LINUX, VxWorks and Solaris simplifies system integration.
- Optional PRI T1/E1 port implements an ISDN channel bank.
- FXS ports include loop battery and ring generation power supplies on board.
- On board PTMC expansion slot supports processor PMC modules and DSP processor arrays, freeing up chassis slots.
- A full VoIP SIP and H.323 Gateway can run on the embedded processor, eliminating the necessity for additional equipment for interoperating with VoIP networks.

DIGITAL SIGNAL PROCESSORS

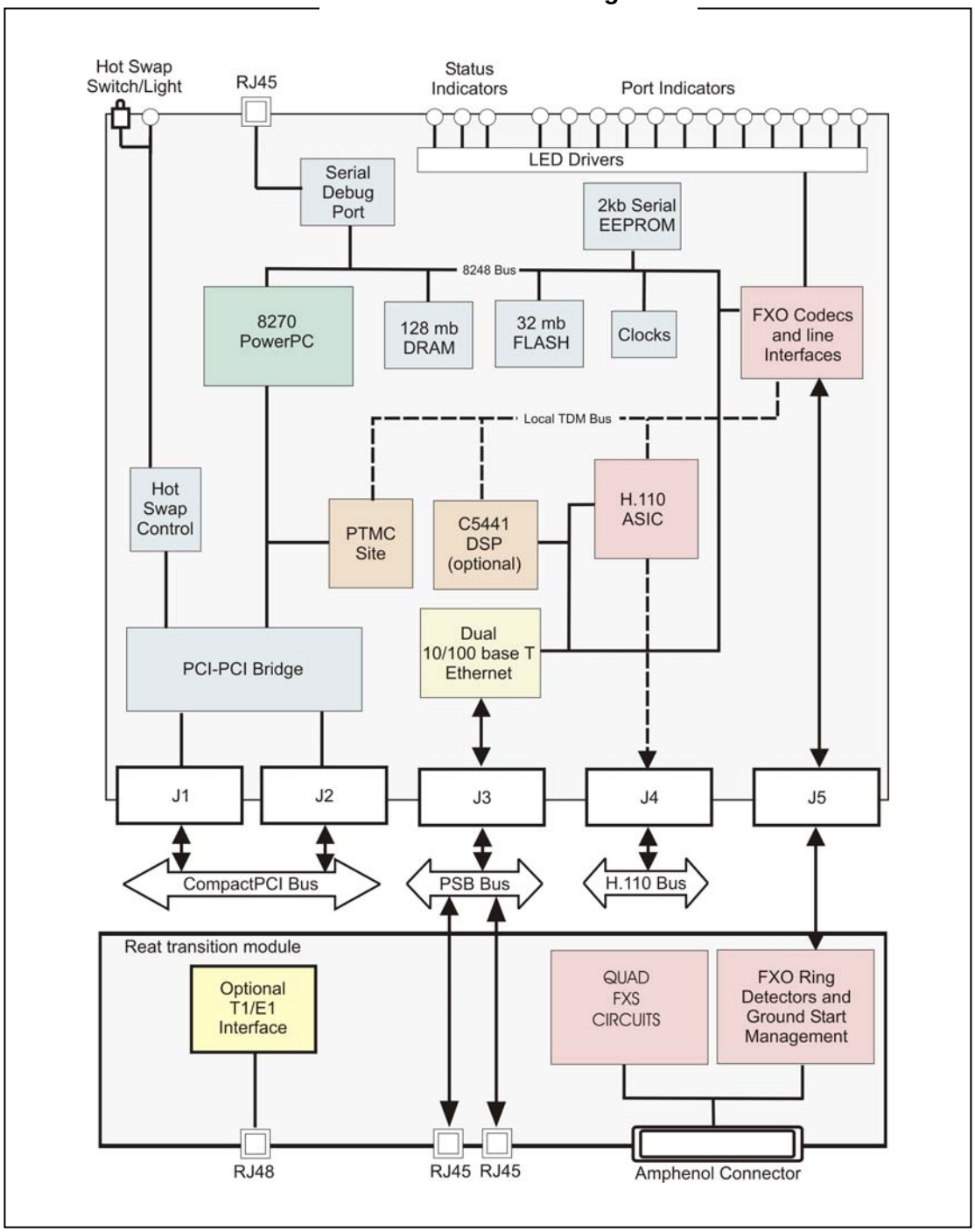
DSP options are available as a single DSP or a multi-DSP PTMC mezzanine module. The DSP expansion options add access to an extensive library of off the shelf telecommunications processing functions.

DSP software may be dynamically loaded into the DSP cores, allowing simultaneous execution of different function libraries.

AVAILABLE DSP LIBRARIES

- Telephony Functions (TF) includes G.711 DTMF and call progress tone detection and generation, caller ID, AGC, G.168-2000 echo cancellation, Voice Activity Detection (VAD), multi-party conferencing and play/record of audio files.
- Voice over IP (VoIP) includes all Telephony Functions plus G.723.1, G.729 G.729 A/B/D CS-ACELP vocoders, jitter buffering, comfort noise generation and G.168-2000 echo cancellation, 128 Msec tail.
- Conference (CONF) includes multi-party conferencing up to 32 participants per conference, VAD (Voice Activity Detection) and DTMF digit detection/removal.
- V.34, V.32 and V.22 modems v42. Requires optional PTMC41 mezzanine card.
- Terminating G3 FAX (FAX) includes V.27ter-4,800 bps, V.29-9,600 bps, V.17-14,400 bps and FAX session management layer. Requires optional PTMC41 mezzanine card.

CFXO3120 Block Diagram



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SIZE, WEIGHT, ENVIRONMENT AND POWER

Dimensions:

6U cPCI, 233.35 mm x 160 mm

Weight:

.75 lb, .35 Kg.

Environment:

Operating: 0 to +70°C (Standard) and -40 to + 70^0 C (E suffix)

Storage: -50 to +125°C

Relative Humidity: 0 to 95%, non-condensing

Power:

3.3VDC: 3.0A

5.0VDC: 1.0A

LINE INTERFACES

Tip/Ring Interfaces Per Card:

12 FXO ground and loop start, emulates subscriber side PBX trunk line card.

4 FXS ground and loop start, emulates central office side trunk line.

Signaling:

DTMF, MF and dial pulse

Frequency Response:

+/- 1dB 300 Hz-3.4 KHz

Audio Digitizing:

64 Kbps µ/a-law PCM or standard CCITT vocoders with DSP option installed

Timing Reference:

Software selectable and auto fallback between backplane H.110 reference clock or internal XTAL oscillator.

I/O Connectors:

I/O connections for all 16 lines wired to RJ21 connector on rear transition board.

FXO SPECIFICATIONS

Interface:

Loop length: >12kft

Impedance: Selectable

REN: 0.2

Operating DC loop current: 10-60Ma

Ring Detect:

17-68 Hz sine wave, Selectable minimum of 17, 24, 50Vrms

Transhybrid:

Balance: 20dB min (300-3.4KHz)

Two-wire return loss: 25dB min (300-3.4KHz)

FXS SPECIFICATIONS

Ring Generation:

Balanced ringing to 150Vpk. Ring amplitude, frequency and, cadence programmable.

Loop Current Feed:

16-55Ma.

Interface:

Loop length: up to 20kft

Impedance: Selectable

Transhybrid:

Balance: 34dB min (300-3.4KHz)

Two-wire return loss: 26dB min (200-3.4KHz)

Features:

Pulse metering, caller ID generation, polarity reversal, on hook transmission.

PRI ISDN T1/E1:

DSX-1 Electrical interface: with line build-outs 0-133 ft., 134-266 ft., 267- 399 ft., 400-533 ft., 534-655 ft.

CSU, with Line Build-outs: 0dB, -7.5 dB, -15dB and –22.5dB. Drive 0-6000 ft.

T1/J1 Input Impedance: Software selectable 100 ohms.

E1 Input Impedance:

Software selectable 120 ohms balanced, 75 ohms unbalanced.

T1/J1 Receive Frequency: 1.544 MHz ± 50 ppm.

E1 Receive Frequency: 2.048 MHz ± 50 ppm.

E1 Output Stream Drive Capability:

Per CCITT G.703

Framing Acquisition Time: Single frame period

Line Coding:

AMI, B8ZS, B7ZS, HDB3

Frame Formats:

D4, ESF, SLC-96, ZBTS1 (T1/J1), CAS, CCS, CRC4 (E1)

Signaling:

DTMF, MFR1, MFR2, ISDN signaling (T1/J1/E1); access to raw signaling data, Robbed bit (T1/J1 only); CAS and R2 (E1 only)

ANSI T1.403-1989, AT&T TR 62411 (12-90), CCITT G.703, G.704, G.706, G.823 and I.431; ISDN Q.921 and Q.931.

Connector:

RJ21 connector on rear transition module.

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Panel LED Displays:

Individual channel on/off hook, ringing, error, bus fail and board fail, LAN1/2, T1/E1

On Board Software:

On-board BIT diagnostics test microprocessor memory, DP memory, H.110 bus, codecs loopback and DSP resource.

DSP Option:

Optional DSP may be added to baseboard to provide IVR and VoIP GateWay functionality.

Record/Play Resource:

Provides data transfers into cPCI dual port memory. Memory buffers are programmable by audio channel.

cPCIbus:

PICMG 2.1 Rev 3

2.16 IP PSB:

Compliant to PICMG 2.16 packet switched backplane.

H.110 bus:

PICMG 2.5 standard H.110 non-blocking bus supports 4,096 timeslots.

10/100 Base-T Ethernet Ports

Dual Ethernet ports support remote IP communications and software downloads.

Microprocessor:

8270 Power QUICC II CPU with 128 Mb DRAM and 32 Mb downloadable flash memory.

RS232 Debug Port:

Front panel RJ45 serial debug port at 9600 bps, Tx, Rx, Signal ground.

PTMC Access:

Single PICMG 2.15 Type II PTMC site.

Hot Swap:

PICMG 2.1 Rev 3 High Availability hot swap allows for remote diagnostics, board shut off and replacement activation.

Manual board insertion and removal is also supported.

ORDERING INFORMATION	
PART NUMBER	**DESCRIPTION**
FXO3120	12 Port FXO Controller
FXO3124	12 Port FXO + 4 Port FXS Controller
PTMC41/3	DSP Mezzanine Daughter Board Capacity Expansion
OPTION NUMBER	**DESCRIPTION**
- D Suffix	Single Motherboard DSP
- E Suffix	Extended Temperature Operation

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