

# FXM32 Series

Decades of accumulated DSP technology for echo cancellation and voice processing, empowers the most competitive open source architectures with matchless price and robustness.

- Up to 32 ports FXO/FXS configurable analog telephony cards(per PCI/PCIe slot)
- DSP-enabled echo cancellation of carrier-grade(32ms or 128ms optional)
- Six-years warranty, refundable two-month return, lifetime maintenance

The FXM is the state-of-art open source architecture which supports configurable FXO and FXS lines for any high-scalability open source applications. Widely used for small/medium/large sized systems such as IP-PBX, voice mail, IVR, call center and unified messaging, the FXM series provides software developers with robust enabling hardware to create open source solutions with high flexibility and matchless price/performance advantages.

Modular architecture enables clients to design countless solution portfolios by convenient configuration and high expandability. A single card supports 2 channels and up to 32 channels by installing mixed FXO/FXS modules on the baseboard. With rich DSP resources and advanced data processing DMA technology, the FXM minimizes the utilizations of host CPU and empowers developers to design and create versatile, high scalability open source platforms in any highly demanding networking environments.

Both of Synway's open source families, including digital

telephony TEJ series and analog telephony FXM series, with the complementary voice processing CDC series, are designed with shared configuration and setup automation, which ensures high user-friendliness for developers worldwide. All universal standards are supported, including automatic compliance with 3.3 Volt and 5 Volt power supply from PCI(X) PCI-express form factor..

The FXM3200 series leverages SuPerForm™(32 and 128ms echo tail for each channel) to reassure superior voice quality and echo cancellation in complex networking environments. High-adjustability, original and complimentary SuPerForm™ is built on Synway-owned, certified DSP algorithm and carrier-grade applications, and can be "automatic adaptability" optimized by site environments for the unmatched voice enhancements, accurate DTMF/tone detection, and conferencing efficiency. The echo processing capability has been field-proven by the leading carrier labs and made Synway's product offerings the most cost affective and accountable worldwide.

## FXM32 Architecture



To configure any density (2~32 channels), the FXM32 baseboard can be mounted on a backplane, which has up to eight bus connectors to mount additional daughterboard for higher density. For that, a FXM32 baseboard and up to seven daughterboards (with no PCI/PCIe form factor) can be combined together by this backplane, and share the synchronous clocking of the FXM32 baseboard's PCI interface. This add-ons architecture(FXM32 series) is powered internally.

Each FXM32 baseboard or daughterboard has two sockets to mount two FXO/FXS/FXC modules. Each FXO and FXS module supports two FXO lines and FXS lines respectively. The FXC module supports one FXO line and one FXS line, and works properly in power-off conditions for its power-off protection design. Up to 16 FXO/FXS modules can be installed in FXM32's baseboard/ daughterboards(connected by a backplane) for 32 FXO/FXS lines

## Key features and benefits

### SuPerForm™ superior voice quality and echo cancellation

High-adjustability, original and complimentary SuPerForm™, built on Synway-owned, certified DSP algorithm and carrier-grade applications, can be "automatic adaptability" optimized by site environments for the unmatched voice enhancements(up to 128ms echo tail), accurate DTMF/tone detection.

### Largest-scalability powered by most flexible architecture

Four interdependent components, baseboard, daughterboard, FXO/FXS modules and backplane Bus connector, reassure the most cost effective and flexible IP PBX system. Please refer to [video demo](#) for FXM configuration.

### Perfect interoperability and physical ruggedness

FXO/FXS/FXC available; FXO and FXS modules can be installed on baseboard and daughterboard via bolt, and backplane Bus connector can be locked over baseboard and daughterboard through locking ring, which prevents loosening or breakaway in movement; Locked-in interface with all standard FXO lines or FXS lines via standard RJ11 port.

### Compact size for saving power consumption and space

The most compact-sized when compared with all comparable products, and allow highest-density (up to 64 FXO/FXS channels) installation in any 2U server; Apart from space efficiency, the FXM series adopt lowest-power-consumption design to relieve the ever-expandable systems off high power consumption.

### Maximum compatibility with PCI(X)/PCIe architecture

Compatible with all standard motherboard, PCI 2.2 BUS(data transmission rate 132MB/s); support PNP with no wire jumper; compatible with PCIe 1.0a, and support PCIe X1, X2, X4, X8, X16, with one-way data transmission rate up to 2.5Gb.

### Carrier-grade reliability and performance in any situation

32-bit bus master DMA data exchange at 132 MB/s across PCI(e) interface for data reading and writing helps minimize intervention over host CPUs, optimizing per channel DMA streams and maximizing system's reliability in the most difficulty situation.

### Power-off protection and internal power supply

FXC module works properly in power-off conditions; FXM baseboard is automatically adjusted and powered through PCI or PCI-express slot itself.

### Self-diagnostics and alerting for efficient maintenance

Self-diagnostic indicator light positioned behind RJ11 port; technician can detect internal installation (FXO or FXS modules) and diagnose malfunction outside of server.

### Fax capability optimized by Synway hardware

**Resource saving:** With Synway T1/E1/J1 card, Fax synchronization cable and FXM32 analog card mounting a FXS module, you can connect the FXS module (FXS line) to your fax machine, and so leave a separate analog line out;

**Error Correction Mode (ECM):** The FXM32 series analog cards can synchronize with Synway T1/E1/J1 cards and PSTN clocking for error-free fax and modem pass through; using T1/E1/J1 pass through with Synway FXM32 analog cards, you can optimize your Fax capability and avoid clock slips, buffer overrun or transmit under run that cause missed lines, blank sheets or page missing;

### Field-upgradeable firmware

On-board DSP algorithm can be loaded through driver, and other firmware is conveniently upgradeable through server.

### OS and open sources IP-PBX supported

support Unix, Linux and Solaris; compatible with Zaptel, and support a broad range of open source PBX systems, including Asterisk, Trixbox, Yate, Freeswitch, CallWeaver, Elastix and more .

# FXM series Technical Specifications

## Product models

FXM3200P, PCI, half length, 2 to 32ports configurable, SuPerForm™ 32ms echo cancellation

FXM3201P, PCI, half length, 2 to 32ports configurable, SuPerForm™ 128ms echo cancellation

FXM3200E, PCIe, half length, 2 to 32ports configurable, SuPerForm™ 32ms echo cancellation

FXM3201E, PCIe, half length, 2 to 32ports configurable, SuPerForm™ 128ms echo cancellation

## FXO/FXS configurable

Each baseboard or daughterboard can mount two FXO/FXS modules (each module supports two lines) for density up to 32 FXO/FXS lines per slot (baseboard can connect with up to seven daughterboards via a backplane Bus connector, with the baseboard's synchronous PCI or PCIe form factor);

## A complete range of open sources supported

Support for Asterisk, Trixbox and FreeSwitch, as well as other open source IP-PBX, Switch, IVR, or VoIP gateway applications.

## Basics

Automatically compatible with 5 V and 3.3 V PCI(X) or PCI-express interface, and fully PCI 2.2 compliant

## SuPerForm™ echo cancellation

The self-adaptive echo cancellation technology taps 128 ms tails (1024 taps/128 ms tail per channel) and can effectively eliminate echo effect in any situation.

## DMA data exchange

The use of PCI-based DMA technique for data reading and writing helps minimize the cost of the host CPU. 32-bit bus master DMA data exchanges across PCI interface at 132 MB/s for minimum host processor intervention, and optimizes per channel DMA streams and hardware-level.

## Input/output Interface

Ringing current & battery feed power supply jack: One 4-pin MPC-4

Telephone line jack: Four 4-pin RJ11/RJ21

## Audio Specifications

CODEC: CCITT A/ $\mu$ -Law 64kbps

Distortion:  $\leq 3\%$

Frequency response: 300-3400Hz ( $\pm 3$ dB)

Signal-to-noise ratio:  $\geq 38$ dB

Echo suppression:  $\geq 40$ dB

## Power Consumption

FXM32 series baseboard with 2 FXO/FXS modules

+3.3V DC: 1500mA (4.95W)

+12V DC: 500mA (6W)

FXM32 series daughterboard with 2 FXO/FXS module

+5V DC: 600mA (3W)

+ 12V DC : 500mA (6W)

## Environment

Operating temperature: 0°C—55°C

Storage temperature: -20°C—85°C

Humidity: 8%—90% non-condensing

Storage humidity: 8%—90% non-condensing

## Operating Systems

Linux (all versions, releases and distributions from 1.0 up).

FreeBSD.

Solaris.

Unix

## Maximum System Capacity

Depends on the system consumption of Asterisk and the processing capability of computer.

## Certification

CE, FCC Part 15 Class A and Class B , EN 55022, EN 55044, CISPR 22, CISPR 24

Safety: Lightning resistance: Level 4

## Warranty

6-years warranty, refundable 2-month return, lifetime maintenance, free support

## Production Quality

ISO 9001:2000

## Environment standard

RoHS

## About Synway

Synway specializes in providing superior media processing & signaling technologies as well as high-performance CTI components in use for convergence (voice/data/video) communications for CTI software developers and system integrators worldwide. With decades of expertise in voice communications, Synway's offerings, including its robust, versatile CTI hardware and platforms, are applied to design a broad range of TDM or VoIP-based applications and services, such as unified communications, call center, Telco value-added services(SMS/CRBT/DIALING), media gateway, signaling, fax, conferencing, passive call recording, open source applications and more.

For two decades, Synway has consolidated its position as a leading hardware and platform vendor in international market. Having been working with thousands of partners over time across the world, Synway has achieved the robust portfolios for passive call recording applications in call center and financial institutes: the most diverse product ranges, greatest scalability, greatest compliance with multi-protocols and multi-networks, and the most installations worldwide. For Asterisk open-source applications, Synway leverages its patent-owned DSP expertise for data processing, echo cancellation and transcoding, helping solution providers create high-scalability, cost effective, flexible, user-friendly systems. For more information, please visit us at <http://www.synway.net> or [contact us](#).

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