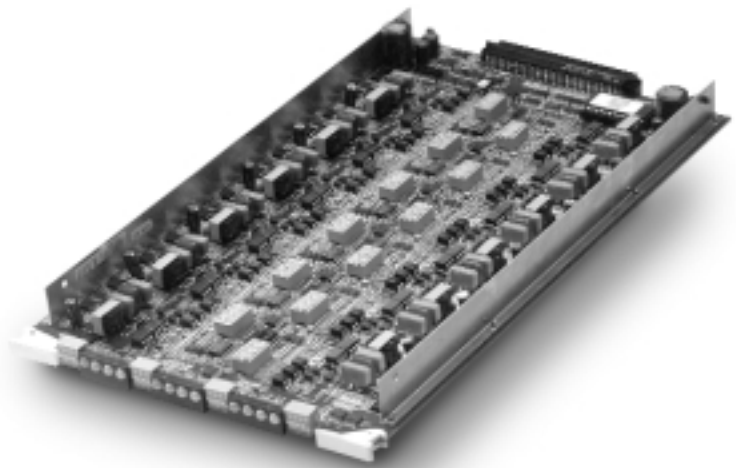


# FXS 12-Channel Voice Card



## Carrier Access

## Corporation's FXS

## 12-channel voice

## card provides standard

## battery and ringing

## voltage interface

## to PBX or key

## system trunks.

## For use in the

## Access Bank I,

## Access Bank II and

## Access Exchange

## family of T1 Voice

## and Data Multiplexers.

## Operational Description

The Foreign Exchange Station (FXS) 12-channel voice card delivers high quality loop-start or ground-start dial tone telephone line connections to key systems, off-premises extensions, facsimile machines, modems, PBXs and other conventional analog telephone devices. The FXS card supports Calling Party Disconnect (CPD) and most CLASS® features including caller ID and Distinctive Ringing.

The FXS card receives T1 signaling, tip and ring pairs, control logic and power through a 64-pin connector inside the Access Bank® or Access Exchange™ unit. The back plate of the FXS card provides 12 multi-color LEDs for monitoring call progress and channel status. The back plate also contains 3 DIP switches for selecting E&M signaling options, a busy/idle card switch, and 12 test switches that can also be used to "busy out" individual channels. On the FXS card itself, each channel has 6 DIP switches for setting transmit and receive line attenuations.

When equipped with the FXS voice card, the Access Bank and Access Exchange can support a number of popular signaling types used by dedicated T1-accessed voice service providers, including:

- AT&T Megacom®
- NYNEX Flexpath®
- US West DSS®
- Long-distance Automatic Number Identification (ANI) and Dialed Number Identification Service (DNIS) from long distance carriers.

The FXS circuits automatically perform impedance matching to adapt to various PBXs, key systems, telephones, modems and line lengths.

## Physical Description

The FXS card measures 7.8" x 13.6" and slides into the back of the Access Bank I, Access Bank II, or Access Exchange family of T1 Voice and Data Multiplexers.

## FXS Card Features and Advantages

- E&M support is configured per card, using DIP switches, for the following common signaling conversions:
  - E&M immediate start to loop-start or ground-start
  - E&M wink start to loop-start or ground-start
  - E&M wink delay (ANI/DNIS) to loop-start or ground-start
- FXS support for:
  - Automatic loop-start or ground-start selection on every channel
  - Most CLASS® features including caller ID and distinctive ringing
- Fuseless overvoltage and overcurrent safety protection
- Separate transmit and receive gain settings per channel
- Full compatibility with V.34 modems
- CAC patented automatic impedance balancing adapts to line conditions

## Technical Specifications

### FXS Transmission Performance

Return Loss	ERL > 28dB, SRL > 20dB with respect to 900Ω +2.16μF
Transhybrid Loss	ERL > 28dB, SRL > 20dB with respect to 900Ω +2.16μF
Idle Noise	A/D < 15 dBBrnC0, D/A, 10dBBrnC0
Crosstalk Coupling	< 80dB at 0dBm0
Signal/Distortion	> 45dB with 1004Hz, 0dBm0 input
Overload	+3.0dBm/900Ω
Frequency Response	+0.25dB, -1.0dB from 300 to 3400Hz
Encoding	μ-Law 255 for US and Canada as defined in CCITT G.712
Terminating Impedance	900Ω + 2.16μF
Transmit Gain/Loss	0 to -9 dB, switch selectable per channel
Receive Gain/Loss	0 to -9 dB, switch selectable per channel
Modem Support	Full compatibility with V.34/V.90 modems Patented automatic analog impedance adjustment adapts to various modems and line lengths
Transmit TLP Maximum	+12dBm with FXS gain set to -9dB
Receive TLP Maximum	+3dBm with FXS gain set to 0dB
Idle Noise	A/D < 15 dBBrnC0, D/A, 10dBBrnC0
Longitudinal Balance	> 63dB in FXS off-hook state measured per IEEE 455 and FCC Part 68
Impulse Noise	0 Counts above 47dBBrnC0

### FXS Signaling Performance

DC Loop Range	1200Ω (3 miles on 24 AWG + 300Ω telephone), Exceeds EIA/TIA-464A and Bellcore® TR-57
Loop Feed	Nominal -48VDC with 30mA current limit
Ringing Voltage	All-channel simultaneous ringing power, 85Vrms, 20Hz, thermal current limited, provided by LUI
Maximum Ringers	5 REN, FCC Class B ringers
Ring Trip Time	>50ms, <150ms with 1500Ω termination
Control Technique	Solid-state with no mechanical relays
Overvoltage	600Vrms without fire hazard per UL 1459, 2nd ed., FCC Part 68 lightning protection, solid-state (fuseless) overvoltage and over current protection

### Off-Hook Detection

### Tip Ground

### Ring Ground

### Internal Ringing Cadence

### CLASS® Support

### Calling Party Disconnect

### FXS Signaling

### FXSDN Signaling

### PLARD

### Ringer Equivalency Number (REN)

### Trunk Processing Option

### Compliance

### Environmental

Operational Temperature 0° to 50°C (32° to 122°F)

Relative Humidity 0 to 95%

Detects tip or ring currents > 8mA, rejects for <4mA

<200Ω with 30mA current limit

Detects ring ground currents >8mA

Ringing cadence is 2 seconds on, 4 seconds off for E&M wink start conversion modes

Supports CLASS® features such as calling party ID, three-way calling, and Distinctive Ringing

Calling party (forward) disconnect provides 2 second current interruption to disconnect answering devices and modems – requires E&M signaling service such as Megacom on the T1

FXS loop-start or FXS ground-start with automatic LS/GS selection per channel

E&M immediate or wink start to either loop-start or ground-start conversion with ringback tone for carrier services such as Megacom®, Flexpath®, DSS®, VPN®, VNET®, etc. Wink delay for advanced ANI/DNIS 800 number services and Direct Inward-Dial (DID) conversion

Private Line Automatic Ringdown (PLARD) – E&M immediate start signaling with ringback tone to network

0.0 by definition

One switch per FXS card selects busy (tip lead grounded) or idle (tip lead open)

FCC Part 68, CS-03 listed for connection to PSTN

FCC Part 15, Class A Radiated Emissions Control

NRTL safety listed: UL 1459, CSA

National Electrical Code 1996 safety requirements



5395 Pearl Parkway, Boulder, CO 80301

303-442-5455 fax 303-546-9724

800-495-5455

<http://www.carrieraccess.com>