

# Xedge AVM LIMs

## *Critical Analog Voice Applications at High Aggregate Rates*

### INTRODUCTION

As mission critical enterprise networks evolve, there is a continuing need for analog voice/VG connections. Private network operators for defense, aviation, railways, utilities as well as other governmental agencies/industries are looking for a technology refresh that not only supports new and emerging Ethernet/IP/MPLS services with higher bandwidth applications, but also the transport of the legacy services now in place. Any viable migration of these critical legacy networks must include a flexible analog voice solution to be cost effective.

The Xedge Analog Voice module (AVM) meets the need for applications, such as Analog Voice Trunking in interconnecting office PBXs, Foreign Exchange, Private Line Ring-down (pickup-and-ring), and Push-to-Talk (ground to air communications) and VG services among others.

### Intended Use

The Xedge AVM LIM installs behind the Xedge PCX slot controller at the midplane connector of any Xedge switch to provide all physical interfaces. Each controller can accept an additional AVM or other type of Xedge LIM to create a variety of multiservice combinations. The Xedge AVM LIM supports up to 12 voice channels:

- FXS and FXO applications are supported in 4-port increments.
- 2/4 W E&M applications are supported with an 8-port plug-in interface module.

The AVM LIM also has a built-in digital codec that enables voice packetization (AAL-2 or VoIP) with or without standards-based compression schemes.

Future development of the Xedge AVM LIM will support additional applications: 4-port incremental async/sync data for mixed services on the same card, and a standalone solution for voice and data service provisioning which can be used for CESoPSN encapsulation or VoIP.

### LIM FEATURES

- Single-slot LIM supports FXS, FXO and/or E&M voice port combinations (*Figure 3*)
- Supported by the PCX2 slot controller in any Xedge chassis
- Manageable via RS232 console port, remote in-band Telnet, SNMP, Ethernet and the ProSphere NMS
- Supports AAL1 and CESoPSN in any Xedge shelf system
- Intended for in-building cabling
- Configurable audio level adjustment in each direction
- U-law and A-law encoding
- Busying out or administrative turndown
- Fax Bypass support
- Echo Cancellation per ITU-T G.165
- Supports silence suppression, white noise generation, voice compression
- Meets MOS scores greater than or equal to 3.5
- Provides a "test tone" on the circuit for troubleshooting, and a status of each port.
- Able to nail up two way voice paths with no signaling required.
- ITU-T G.729 CS-ACELP or ITU-T G.726 ADPCM compression schemes.
- Conforms to RFC 1884 IPV6 addressing schemes

### Status & Diagnostics

The Xedge Analog Voice LIM provides several useful status and diagnostic tools, such as loopbacks on 4-wire circuits and Call and Signaling status (onhook/offhook, etc.). The AVM LIM also can inject a test tone for troubleshooting purposes.

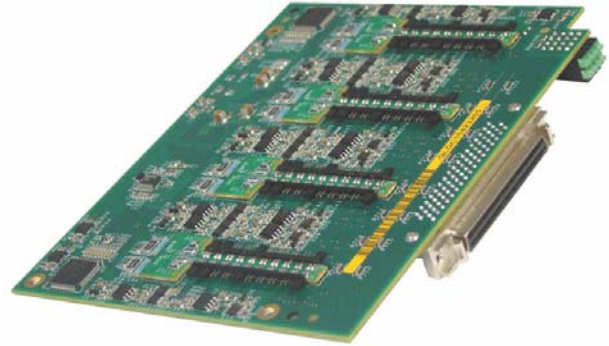
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## Interface Card Options

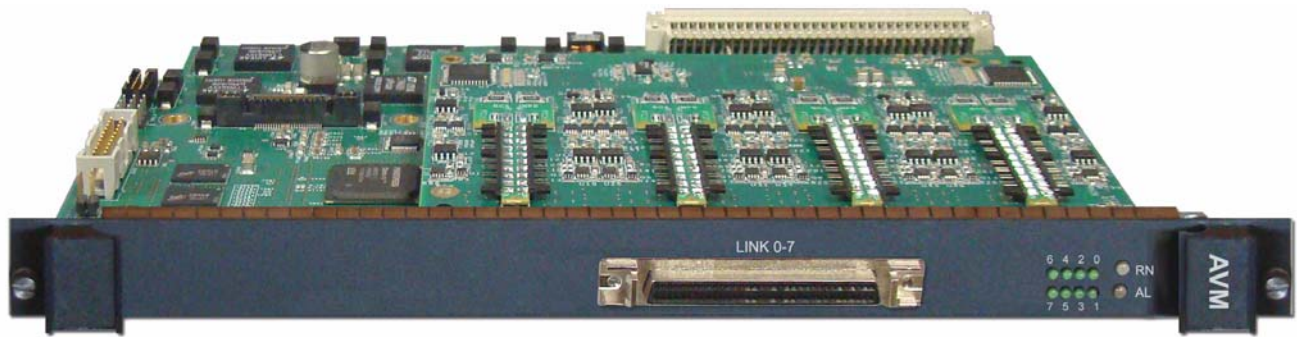
The Xedge AVM LIM is ordered from the factory with one or more interface plug-in card combinations as listed in the table below. *Figure 1* shows the AVM LIM with the 8-port E&M interface plug-in card.

The E&M interface card has eight banks of jumpers that allow the user to individually configure an E&M signaling type for each of the eight ports: Type I, Type II, Type III, Type IV, Type V, or SSDC5A.

*Figure 2* shows the E&M signaling jumpers on the 8-port E&M interface plugin card.



*Figure 2: Onboard E&M Signaling Jumpers*



*Figure 1: Xedge AVM LIM with 8-port E&M interface plug-in card*

Individual Components	Ports	GDC P/N
Analog Voice LIM basecard	--	032P209-001
E&M 2/4 wire interface plug-in	8 ports	032P205-001
FXO interface plug-in	4 ports	032P207-001
FXS interface plug-in	4 ports	032P208-001

GDC Model	Plugin 1	Plugin 2	Plugin 3	Port Max.	GDC P/N
AVM Basecard with	4-port FXS	--	--	4	032M209-011
AVM Basecard with	4-port FXS	4-port FXS	--	8	032M209-012
AVM Basecard with	4-port FXS	4-port FXS	4-port FXS	12	032M209-013
AVM Basecard with	4-port FXS	4-port FXS	4-port FXO	12	032M209-014
AVM Basecard with	4-port FXS	4-port FXO	--	8	032M209-015
AVM Basecard with	4-port FXO	--	--	4	032M209-016
AVM Basecard with	4-port FXO	4-port FXO	--	8	032M209-017
AVM Basecard with	4-port FXO	4-port FXO	4-port FXO	12	032M209-018
AVM Basecard with	8-port E&M		--	8	032M209-019
AVM Basecard with	8-port E&M		4-port FXS	12	032M209-020
AVM Basecard with	8-port E&M		4-port FXO	12	032M209-021
AVM Basecard with	4-port FXO	4-port FXO	4-port FXS	12	032M209-023

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## Physical Specifications

### LIM Models/Supported interfaces

Three AVM models with their associated front panel connectors are shown at right:

AVM-FXS/FXO: Up to three FXS and/or FXO interface cards in 4-port increments, in any combination.

AVM-FXO/FXS and E&M: One FXS or FXO interface card with 4 ports, and one 2/4 W E&M interface card with an additional 8 ports.

AVM-E&M: One 2/4 W E&M interface card with 8 ports.

### Operational Specifications (all models)

Compatible Controllers: PCX2

Compatible Chassis: Xedge 6002, 6160, 6280, 6640 and 6645

Port Capacity: up to 12 voice ports, depending on the LIM model

### Physical Specifications

Dimensions: 10.5" x 8" x 1"

Weight: Approximately 1 lb

### Environmental Specifications

Non-operating Temp: -40 to 70 degrees C (-40 to 158 degrees F)

Non-operating Relative Humidity: Up to 95%

Non-operating Altitude: up to 12,191 m (40,000 ft)

Operating Temp: 0 to 50 degrees C (32 to 122 degrees F)

Operating Relative Humidity: Up to 95% non-condensing

Operating Altitude: -60 to 4,000 m (-197 to 13,123 ft)

### E&M Audio Parameters

Maximum Output Level	+5 dBm
Maximum Input Level	+1.0 dBm
Nominal Input Impedance	600 ohm
Nominal Output Impedance	600 ohm
Gain Adjust Transmit/Receive	±6 dB
Gain Adjust Steps	N/A (±0.5 dB)
Idle Channel Noise, Psophometric Weighted	< -74 dBm
Frequency Response, 300 Hz to 3,000 Hz	±0.2 dB
Isolation	1,000 VAC

### E&M Signaling Parameters

E&M Signaling Type	I, II, III, IV, or V
Configurable Signaling	Signaling Unit
Maximum Output Signaling Current	35 mA
Output Signaling Voltage	-24 to -60 VDC
E&M Circuit Isolation	1,000 VAC

### Management Interfaces

Standard SNMP and GDC MIB management;  
GDC's ProSphere Network Management System

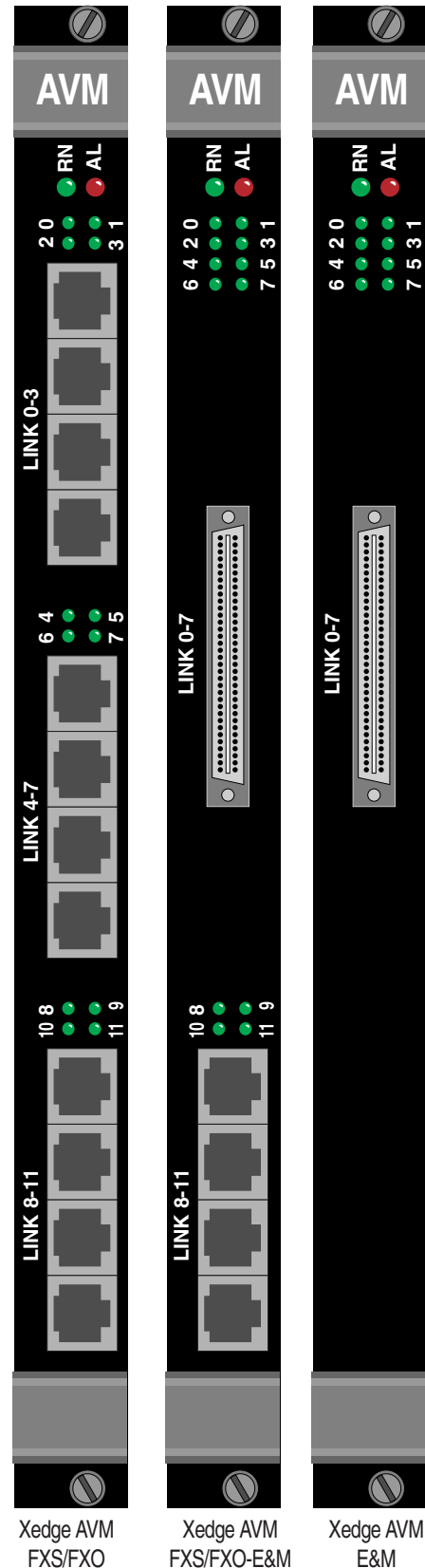


Figure 3: Front Panels of Xedge AVM LIMs