

## Intraplex VF-40

### 4-Wire Voice Transport Module for Land Mobile Radio

The VF-40 module is designed to meet the specialized voice transport requirements of land mobile radio (LMR) infrastructure installations. This module works with the MA-311 module adapter in Intraplex® Access Server multiplexers for T1 or E1 network applications and in Intraplex NetXpress™ multiplexers for IP networks.

#### Enhanced Low-Frequency Response

Continuous Tone Coded Squelch System (CTCSS) tones – or Private Line™ (PL) tones – ranging in frequency from 67 Hz to 254 Hz enable unobtrusive sharing of radio channels among multiple user groups. The digital version of this capability, Digital Coded Squelch (DCS) or Digital Private Line™ (DPL), requires voice frequency transport as low as 5 Hz. Low-speed signaling on legacy trunking systems also requires transmitting tones at frequencies below 300 Hz.

Traditional voice channels roll off quickly below 300 Hz, making them unusable for transporting these important LMR control signals. The VF-40 features enhanced low-frequency response to 5 Hz and below, providing seamless support for the entire range of low-frequency signaling applications.

#### Contact Closure Transport

The VF-40 provides two independent contact-closure signaling lines in both transmission directions for each of the four voice channels to support PTT, facility alarms, receiver un-squelch status or other signals. This transport of up to eight signaling leads in each direction per module increases efficiency in LMR infrastructure bandwidth use and simplifies system design.



#### Simulcast System Upgrades

When used with the Intraplex SynchroCast® or SynchroCast3™ system, the VF-40 module supports distribution of PL tones from a common point in simulcast LMR systems and provides an upgrade path for transitioning legacy simulcast systems onto modern high-speed digital backbones.

#### Product Features

- Frequency response  $\pm 0.5$  dB from 3000 Hz down to 5 Hz, with gentle roll-off below 5 Hz (typically 1 dB down at 2 Hz), provides support for PL, DPL and trunking signals
- Consistent channel gain, factory-calibrated to within  $\pm 0.2$  dB, ensures reliable simulcast operation
- Sharp roll-off above 3000 Hz eliminates transmission of unwanted high-frequency signals
- Four voice channels per module, with two contact-closure signaling lines in both directions for each voice channel, support efficient multichannel LMR installations

## Specifications

Specifications and designs are subject to change without notice

General	
Operating Modes	Four independent 4-wire voice channels Two independent signaling paths in both directions per voice channel
System Compatibility	Compatible with Intraplex T1, E1, and IP access products Compatible with Intraplex SynchroCast3 and SynchroCast simulcast systems

Voice Frequency	
Frequency Response	5 Hz to 3000 Hz, $\pm 0.5$ dB
Channel Gain Accuracy	$\pm 0.2$ dB of nominal at 1004 Hz
Input/Output Level (Nominal)	0 dBm, +7 dBm, or -16 dBm Independently jumper-selectable for input and output of each voice channel
Maximum Input/Output Level	3 dB greater than the selected nominal input or output level
Fine Input/Output Level Adjustment	Adjustment steps $<.5$ dB Adjustment range -6 dB to +6 dB Available via remote control only
Input/Output Impedance	Balanced 600 ohms
Idle Channel Noise	Less than 26 dBmC0
Signal to Distortion	1004 Hz input, 0 to -30 dBm: greater than 33 dB with C message weighting

Signaling	
Contact Closure (E&M) Signaling	Two independent signaling lines in both directions for each of the four voice channels. Ground on input (M lead) causes far-end relay output (E lead) to change state. Both normally open and normally closed outputs available for each signaling line. Normally open contact use creates equivalent of E&M Type V signaling.
Signaling Format	In T1 systems: Robbed Bit A,B In E1 systems: CAS

Input/Output Module	
Connector	50-pin telco-type female connector on MA-311

Network Interface	
Coding and Data Rate	$\mu$ -law PCM, 64 Kb/s per channel
Time Slot (DS0) Assignments	One to four sequential time slots (one per active channel) Selectable starting time slot

Status and Diagnostics	
LED Indicators	Green LED for Service On Yellow LED for loopback state
Loopbacks	Local loopback – simultaneous loopback of all four voice channels for installation verification Remote loopback – individual loopback of each voice channel for full circuit test

Physical and Environmental	
Nominal Power Consumption	Less than 4.0 W
Temperature	0° C to 50° C (32° F to 122° F) operating
Humidity	0% to 90% non-condensing

Regulatory Compliance	
FCC Part 15	