



# DMD2401L

## L-Band VSAT/SCPC Satellite Modem



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### HIGHLIGHTS

- ▶ Operates in L-Band (950-1450 MHz)
- ▶ BPSK and QPSK Operation (OQPSK Optional)
- ▶ 9.6 to 2048 Kbps
- ▶ 1/2, 3/4, and 7/8 Rate Viterbi
- ▶ 1/2, 3/4, and 7/8 Rate Sequential (Optional)
- ▶ Low Profile Case-1 U High (1.75")

### OVERVIEW

The Radyne ComStream DMD2401L L-Band satellite modem offers the best features of a sophisticated programmable modem.

Digital microprocessor control eliminates virtually all on-board adjustments. Direct Digital Synthesis (DDS) of the IF and data rate synthesizers allow settings to one hertz and one bit-per-second, respectively.

The DMD2401L is designed to perform as both ends of a satellite Single Channel Per Carrier (SCPC) link or as the VSAT remote site modem in a TDMA hub system. The DMD2401L is perfect for mesh or star topology networks. The modulator and demodulator operate independently using BPSK, QPSK or OQPSK (Optional) modulation in either SCPC or VSAT modes.

The DMD2401L is also the ideal VSAT modem for use in a point-to-point frame relay hybrid network. Other applications include FDMA, telephony, video conferencing, long distance learning, paging and news gathering.

Selection of any data rate is provided over the following ranges:

- 9.6 Kbps to 1024 Kbps BPSK
- 19.2 Kbps to 2048 Kbps QPSK
- 19.2 Kbps to 2048 Kbps OQPSK (Optional)

The DMD2401L is programmable from the front panel. The program menu was specifically designed for ease of use to quickly put the modem online and for any network changes. The modem can also be monitored and controlled through the RS485 or RS232 serial control channel.

The DMD2401L can track and acquire a carrier over a programmable range of  $\pm 1$  KHz to  $\pm 42$  KHz. Acquisition times of less than 10 seconds are typical at data rates greater than 64 Kbps over a range of  $\pm 25$  KHz. For even faster carrier reacquisition, the modem can be programmed to search a limited range before reverting to the full search range.

Available options for the DMD2401L include a low data rate asynchronous serial overhead channel for remote monitor and control. Additionally, a Reed-Solomon codec is available for applications requiring Bit Error Rates of  $10^{-10}$ .

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## SPECIFICATIONS

### Transmit and Receive Data Rates

DMD2401L	BPSK - 9.6 to 1024 kbps, Rate 1/2
	QPSK - 19.2 to 2048 kbps, Rate 1/2
	QPSK - 28.8 to 2048 kbps, Rate 3/4
	QPSK - 33.6 to 2048 kbps, Rate 7/8
	OQPSK - 19.2 to 2048 kbps, Rate 1/2 (optional)
	OQPSK - 28.8 to 2048 kbps, Rate 3/4 (optional)
	OQPSK - 33.6 to 2048 kbps, Rate 7/8 (optional)

Data Rate Setting: Selectable in 1 bps steps

### Modulator Specifications

Frequency	950-1450MHz
Frequency Stability	±1 ppm
Frequency Resolution	100 Hz
Output Level	-5 to -30 dBm
Output Level Accuracy	±0.5
Output Level Temp Stability	±0.5
Output Level Resolution	0.1 dB
Tx On/Off Isolation	-55 dBc
Phase Noise	100 Hz -63 dBc
	1000 Hz -73 dBc
	10 KHz -83 dBc
	100KHz -93 dBc
Spectral Shaping	Per IESS-308
Spurious and Harmonics	-50 dBc
Impedance	50 ohm (75 ohm optional)
Return Loss	14 dB
Connector	Type-SMA

### Demodulator Specifications

Frequency	950-1450 MHz
Frequency Resolution	100 Hz
Carrier Acquisition	±30 KHz
Input Carrier Range	-65 to -40 dBm (Symbol Rate < 64 kHz)
	-50 to -30 dBm (Symbol Rate > 640 kHz)
Aggregate Power	Min. of -10 dBm or 35 dBc
Impedance	50 ohm (75 ohm optional)
Return Loss	8 dB (minimum)
Connector	Type-SMA
Typical $E_b/N_0$ (Viterbi)	<u>Rate 1/2</u> <u>Rate 3/4</u> <u>Rate 7/8</u>
@ BER=10 <sup>-5</sup>	5.1   6.2   7.5
@ BER=10 <sup>-7</sup>	6.2   7.7   8.6
Typical $E_b/N_0$ , @ 64 Kbps	
Sequential (optional)	<u>Rate 1/2</u> <u>Rate 3/4</u> <u>Rate 7/8</u>
@ BER=10 <sup>-5</sup>	4.0   5.0   6.1
@ BER=10 <sup>-7</sup>	4.9   5.9   7.4

Note:  $E_b/N_0$  typical values include effect of using differential encoding and V.35 scrambler.

Descrambler	Intelsat V.35, mode selectable
Data Buffering	8 bits to 262,144 bits, in 8-bit steps
Terrestrial Interfaces	RS-449/422, RS-232 or V.35

### Alarms

Summary Alarms Two separate form-C contacts available at the rear panel. Each provides a summary alarm of fault conditions.

### Front Panel LED Indicators

Unit	Power Alarm
	Event Remote
Demodulator	Signal Lock
	Major Alarm
	Minor Alarm
	Test Mode
Modulator	Transmit On
	Major Alarm
	Minor Alarm
	Test Mode

### Monitor and Control

All operating parameters can be monitored and controlled via the front panel display/keypad or the RS-485 or RS-232 serial control channel in either terminal or command modes. The following modem parameters may be controlled and/or monitored:

- Transmit and Receive Frequencies
- Transmit and Receive Offsets
- Modulator Power Level
- Modulator On/Off
- Modulator/Demodulator Modulation (BPSK, QPSK or Optional OQPSK)
- Modulator/Demodulator Data Rates (1 bps steps)
- Modulator/Demodulator Code Rates (1/2, 3/4, 7/8)
- Modulator/Demodulator Differential Decoders (On/Off)
- Modulator/Demodulator Scrambler (On/Off)
- Modulator/Demodulator Data (inverted or non-inverted)
- Modulator/Demodulator Clock Source and Phase
- Demodulator FIFO Size, Delay and Status
- Demodulator  $E_b/N_0$
- Demodulator Low  $E_b/N_0$
- Demodulator Measure BER and Estimated BER
- Modulator/Demodulator Alarms

### Options

Concatenated Codec A Reed-Solomon codec is available.  
Asynchronous Channel Asynchronous overhead channel for remote control and order-wire applications.

### Environmental

Prime Power 100-240 Vac, 50-60 Hz, 1.0 A  
(IEC 3-pin Power Connector with Switch)  
Operating Temp. 0 to 50° C, 95% humidity, noncondensing  
Storage Temp. -20 to 70° C, 99% humidity, noncondensing

### Physical

Chassis size 19 x 17 x 1.75 inches  
(48.26 x 43.2 x 4.45 cm)  
Weight 8 pounds (3.6 Kg)  
Shipping Weight 10 pounds (4.5 Kg)

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ML-0002 10/99



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