



DMD2401LS

Low Speed Satellite Modem



DMD2401LS Low Speed Satellite Modem

HIGHLIGHTS

- ▶ BPSK and QPSK Operation (OQPSK Optional)
- ▶ 9.6 to 1024 Kbps
- ▶ 1/2, 3/4, and 7/8 Rate Viterbi
- ▶ 1/2, 3/4, and 7/8 Rate Sequential (Optional)
- ▶ Low Profile Chassis - 1 U High (1.75")

OVERVIEW

The Radyne ComStream DMD2401LS low-speed satellite modem offers the best features of a sophisticated programmable modem, at an affordable price.

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. These features ensure that the modem will perform over years of service without degradation or failure.

The DMD2401LS 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 DMD2401LS 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 DMD2401LS 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 range:

- 9.6 Kbps to 512 Kbps, 1/2 Rate BPSK
- 19.2 Kbps to 1,024 Kbps, 1/2 Rate QPSK
- 28.8 Kbps to 1,024 Kbps, 3/4 Rate QPSK
- 33.6 Kbps to 1,024 Kbps, 7/8 Rate QPSK

The DMD2401LS 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 DMD2401LS can track and acquire a carrier over a programmable range of ± 1 KHz to ± 42 KHz. Acquisition times of less than 10 seconds are typical at data rates greater than 64 Kbps over a range of ± 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 DMD2401LS 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

| | |
|-----------|------------------------------------|
| DMD2401LS | BPSK - 9.6 to 512 kbps, Rate 1/2 |
| | QPSK - 19.2 to 1024 kbps, Rate 1/2 |
| | QPSK - 28.8 to 1024 kbps, Rate 3/4 |
| | QPSK - 33.6 to 1024 kbps, Rate 7/8 |

Data Rate Setting: Selectable in 1 bps steps

Modulator Specifications

| | |
|-----------------------|---|
| Frequency Range | 50-90 or 100-180 MHz (optional) in 1 Hz steps |
| Frequency Stability | ±2.5 ppm (220 Hz at 88 MHz) |
| Level Control | -5 to -30.0 dBm, 0.1 dB steps |
| Level Stability | ±0.5 dB from 0 to 50°C |
| Impedance | 50 ohm, 75 ohm (optional) |
| Return Loss | 20 dB (minimum) |
| Output Off Isolation | >60 dB |
| Spurious Output | <-55 dBc from 2 to 200 MHz |
| FEC | 1/2, 3/4, and 7/8 Viterbi, K=7 1/2, 3/4, and 7/8 Sequential (optional) |
| Differential Encoding | Selectable On or Off |
| Scrambler | Intelsat V.35, mode selectable |
| Connector | Type-SMA |

Demodulator Specifications

| Frequency Range | 50-90 or 100-180 MHz (optional) in 1 Hz steps | | | | | | | | | | | |
|-------------------------------|--|----------|----------|----------|------------------------|-----|-----|-----|------------------------|-----|-----|-----|
| Input Carrier Range | -65 to -40 dBm (Symbol Rate < 64 kHz) -50 to -30 dBm (Symbol Rate > 640 kHz) | | | | | | | | | | | |
| Acquisition/Tracking | ±1 kHz to ±42 kHz, 1 kHz steps | | | | | | | | | | | |
| Reacquisition Range | ±1 kHz to ±42 kHz, 1 kHz steps | | | | | | | | | | | |
| IF Input Impedance | 50 ohm, 75 ohm (optional) | | | | | | | | | | | |
| Return Loss | 20 dB (minimum) | | | | | | | | | | | |
| FEC | 1/2, 3/4, and 7/8 Viterbi, K=7 1/2, 3/4, and 7/8 Sequential (optional) | | | | | | | | | | | |
| Connector | Type-SMA | | | | | | | | | | | |
| Typical E_b/N_o (Viterbi) | <table border="1"> <thead> <tr> <th>Rate 1/2</th> <th>Rate 3/4</th> <th>Rate 7/8</th> </tr> </thead> <tbody> <tr> <td>@ BER=10⁻⁵</td> <td>5.1</td> <td>6.2</td> <td>7.5</td> </tr> <tr> <td>@ BER=10⁻⁷</td> <td>6.2</td> <td>7.7</td> <td>8.6</td> </tr> </tbody> </table> | Rate 1/2 | Rate 3/4 | Rate 7/8 | @ BER=10 ⁻⁵ | 5.1 | 6.2 | 7.5 | @ BER=10 ⁻⁷ | 6.2 | 7.7 | 8.6 |
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| @ BER=10 ⁻⁵ | 5.1 | 6.2 | 7.5 | | | | | | | | | |
| @ BER=10 ⁻⁷ | 6.2 | 7.7 | 8.6 | | | | | | | | | |
| Typical E_b/N_o , @ 64 Kbps | <table border="1"> <thead> <tr> <th>Rate 1/2</th> <th>Rate 3/4</th> <th>Rate 7/8</th> </tr> </thead> <tbody> <tr> <td>@ BER=10⁻⁵</td> <td>4.0</td> <td>5.0</td> <td>6.1</td> </tr> <tr> <td>@ BER=10⁻⁷</td> <td>4.9</td> <td>5.9</td> <td>7.4</td> </tr> </tbody> </table> | Rate 1/2 | Rate 3/4 | Rate 7/8 | @ BER=10 ⁻⁵ | 4.0 | 5.0 | 6.1 | @ BER=10 ⁻⁷ | 4.9 | 5.9 | 7.4 |
| Rate 1/2 | Rate 3/4 | Rate 7/8 | | | | | | | | | | |
| @ BER=10 ⁻⁵ | 4.0 | 5.0 | 6.1 | | | | | | | | | |
| @ BER=10 ⁻⁷ | 4.9 | 5.9 | 7.4 | | | | | | | | | |

Note: E_b/N_o 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 |

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 Signal Lock Major Alarm Minor Alarm Test Mode |
| 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_o |
| Demodulator Low E_b/N_o |
| Demodulator Measure BER and Estimated BER |
| Modulator/Demodulator Alarms |

Terrestrial Interfaces

| | |
|----------------------------------|--|
| Universal Interface Module (UIM) | User selectable RS-422/449, V.35, T1 (DSX1), T2 (DSX2), E1 (G.703) |
| ITU V.35 | Differential, Clock and Data only |
| RS-422/449 | All Rates, Differential, Clock/Data, DCE |

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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