INTRODUCTION

The SDM-300L expands the closed network capabilities of SDM-300 series modems into L-Band frequencies. The SDM-300L is available in two versions:
- L1 Version: 70 / 140 MHz Transmit and L-Band Receive
- L2 Version: L-Band Transmit and L-Band Receive

The SDM-300L utilizes advanced technology and proprietary digital signal processing techniques. This design eliminates analog circuitry to perform modem signal processing, resulting in higher reliability and reduced packaging size.

MAIN FEATURES

- 19.2 kbit/s to 4.375 Mbit/s
- Fully Accessible System Topology (FAST)
- Closed Network Capability
- Automatic Uplink Power Control (AUPC)
- Asynchronous (Async) Channel Unit Overhead
- Reed-Solomon
- Fast Acquisition
- Built-In Self Test (with L-Band TX and RX only)
- OQPSK

APPLICATIONS

Fully configured, the SDM-300L meets or exceeds all closed network requirements and is available with a full range of industry standard digital interfaces.

COMPATIBILITY

Maintaining ComTech EFDa's excellent history of modem compatibility, the SDM-300L is functionally compatible with many ComTech EFDa modems. When configured properly, the SDM-300L will inter-operate with the following ComTech EFDa modems:
- SDM-100
- SDM-100A
- SDM-300
- SDM-300A
- SDM-650B
- SDM-6000
- SDM-8000

COST EFFECTIVE

ComTech EFDa's SDM-300L employs Fully Accessible System Topology (FAST). This technology provides a cost-effective approach to upgrading satellite modem configurations on site instead of returning the equipment to the factory. FAST is an exclusive and industry-first feature that eliminates the need to purchase options before they are needed. This makes feature selection easy and eliminates guesswork.

Purchase of an SDM-300L base modem includes the following features:
- BPSK and QPSK
- Either Viterbi or Sequential decoding (Customer-Selection)
- Single data rate
- TX IF range of 50 to 180 MHz or L-Band 950 to 1750 MHz
- RX IF range of 950 to 1750 MHz

Enhancing the SDM-300L's performance is easy and uncomplicated. When additional features are required, they are added quickly on site, using the FAST access code purchased from ComTech EFDa. These features are enabled by entering this code at the front panel.

FEATURE ENHANCEMENTS

Base unit enhancements include:
- Changing from single rate to variable rate
- Extending the data rate from 512 kbit/s to 4.375 Mbit/s
- Both Viterbi and Sequential decoding
- OQPSK

Option card enhancements include:
- AUPC/ASYNC (automatic up link power control/asynchronous EIA-232 / 485 channel)
- Reed-Solomon concatenated codec

TEST AND MONITOR FEATURES

The SDM-300L has extensive test capability to aid installation, troubleshooting, and maintenance.

Features include:
- Interface Loopback – at the modulator and demodulator data interface (bi-directional)
- Baseband Loopback – at the data interface (bi-directional)
- BER, E_b/N_0, Buffer Fill %
- IF Loopback (not available with 70/140 MHz Tx IF)
**SDM-300L SPECIFICATIONS**

**SPECIFICATIONS (FULLY ENHANCED)**

- **Digital Interface (Standard)**: EIA-232, EIA-422, and V.35 (25-pin D)
- **Digital Data Rate**: 19.2 kbits to 4.375 Mbps, in 1 bit/s steps
- **Symbol Rate**: 10.9 ksymms to 2.5 Msym/s
- **Modulation/Demodulation**: QPSK 1/2, 3/4, and 7/8 rates
  - QOQSK 1/2, 3/4, and 7/8 rates
  - 2 to 99 ms, in 2 ms steps
  - 32 to 262,122 bits/s, in 16 bit steps
  - Viterbi, 4/7, 1/2, 3/4, and 7/8 rates
- **Plesioschronous Buffer**: Sequential 1/2, 3/4, and 7/8 rates
- **Forward Error Correction**: Reed-Solomon
- **Data Scrambling**: IESS-308/309, Internal or External
- **External Reference Input**: 1, 5, 10, 20 MHz
- **Agency Approvals**: CE Mark

**MODULATION SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Bandwidth</th>
<th>L-Band (L1 option)</th>
<th>L-Band (L2 option)</th>
</tr>
</thead>
<tbody>
<tr>
<td>70/140 MHz</td>
<td>50 to 100 kHz in 1 Hz steps</td>
<td>350 to 1750 kHz in 100 Hz steps</td>
</tr>
<tr>
<td>20 kHz</td>
<td>0 to -90 dBi, in 0.1 dB steps</td>
<td>0 to -30 dBm, in 0.1 dB steps</td>
</tr>
<tr>
<td>2 kHz</td>
<td>±0.5 dB</td>
<td>±0.5 dB</td>
</tr>
<tr>
<td>500 Hz</td>
<td>±0.5 dB</td>
<td>±0.5 dB</td>
</tr>
<tr>
<td>100 Hz</td>
<td>±0.5 dB</td>
<td>±0.5 dB</td>
</tr>
<tr>
<td>50 Hz</td>
<td>±0.5 dB</td>
<td>±0.5 dB</td>
</tr>
<tr>
<td>10 Hz</td>
<td>±0.5 dB</td>
<td>±0.5 dB</td>
</tr>
<tr>
<td>5 Hz</td>
<td>±0.5 dB</td>
<td>±0.5 dB</td>
</tr>
<tr>
<td>1 Hz</td>
<td>±0.5 dB</td>
<td>±0.5 dB</td>
</tr>
</tbody>
</table>

**DEMODULATION SPECIFICATIONS**

- **Input Frequency**: 950 to 1750 MHz in 100 Hz steps
- **Minimum Input Power**: +10 log (symbol rate) dBm
- **AGC Range**: 50 dB above minimum input level
- **Composite to Desired Carrier**: +40 dBc, composite is AWGN over ±10 MHz
- **Maximum Composite Level**: -5 dBm
- **Input Impedance, Return Loss**: 75Ω ± 10 dB
- **Carrier Acquisition Range**: Type N Female (50Ω mechanical)
  - 0 to 75 kHz in 100 Hz steps
- **Acquisition Time**: <1 second at 64kbits/s 1/2 rate
- **Sweep Reacquisition**: 0 to 999 seconds, in 1 second steps
  - Internal, External, Transmit, Recovered RX
  - On or Off
- **LNB Voltage**: ≥13 and 18 VDC per DiSEqC 4.2 and 2.4 VDC at 500 ma max.
- **LNB Frequency Reference**: Same as Modulator Outdoor Frequency Reference.

**ENVIRONMENTAL AND PHYSICAL SPECIFICATIONS**

- **Prime Power**: 90 to 264 VAC, 47 to 63 Hz
  - 1.75H x 19W x 19.18D inch (1 RU)
  - (4.4H x 48.26W x 48.72D cm)
- **Size**: 12 lb. Maximum (5 kg)
- **Weight**: 0 to 50°C (32 to 122°F)
- **Operating Temperature**: Up to 95%, non-condensing
- **Humidity**: Up to 95%, non-condensing

**REMOTE CONTROL SPECIFICATIONS**

- **Serial Interface**: EIA-322 or EIA-485 (2 or 4 wire)
- **Signals Controlled/Monitored**: TX Frequency, RX Frequency, TX Power, RX Power, Data Rate Select, Data Loopback

**AVAILABLE OPTIONS**

- **How**
  - Option
  - Variable Data Rate
  - Add Viterbi or Sequential Decoder
  - Asymmetrical Loop Timing
  - Concatenated Reed-Solomon Codec
  - Asynchronous Overhead (Async/AUPC), with 50-pin D Connector
  - BUC communications (future)
  - ODU Power Supply ≤3 amps at TBD VDC (L-Band TX IF option only)
  - Internal Stability (70/140 MHz TX IF option)
  - LNB Reference (70/140 MHz TX IF option)
  - ±0.02 ppm internal stability
  - ±0.02 ppm LNB Reference (70/140 MHz TX IF option)
  - ±0.02 ppm internal LNB Power Supply

**BER PERFORMANCE**

**TYPICAL Eb/N0 PERFORMANCE, SEQUENTIAL DECODER**

<table>
<thead>
<tr>
<th>Data Rate</th>
<th>BER 1/2</th>
<th>3/4</th>
<th>7/8</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 kbits</td>
<td>10^-5</td>
<td>4.2 dB</td>
<td>5.2 dB</td>
</tr>
<tr>
<td></td>
<td>10^-7</td>
<td>5.1 dB</td>
<td>6.1 dB</td>
</tr>
<tr>
<td>1.544 Mbit/s</td>
<td>10^-5</td>
<td>5.3 dB</td>
<td>5.8 dB</td>
</tr>
<tr>
<td></td>
<td>10^-7</td>
<td>6.0 dB</td>
<td>6.7 dB</td>
</tr>
</tbody>
</table>

**TYPICAL Eb/N0 PERFORMANCE, VITERBI DECODER**

<table>
<thead>
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<th>BER 1/2</th>
<th>3/4</th>
<th>7/8</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 kbits</td>
<td>10^-5</td>
<td>4.8 dB</td>
<td>5.9 dB</td>
</tr>
<tr>
<td></td>
<td>10^-7</td>
<td>5.4 dB</td>
<td>6.6 dB</td>
</tr>
<tr>
<td>1.544 Mbit/s</td>
<td>10^-5</td>
<td>6.0 dB</td>
<td>7.2 dB</td>
</tr>
<tr>
<td></td>
<td>10^-7</td>
<td>6.5 dB</td>
<td>8.0 dB</td>
</tr>
</tbody>
</table>

**TYPICAL Eb/N0 PERFORMANCE, CONCATENATED REED-SOLOMON CODES**

<table>
<thead>
<tr>
<th>Data Rate</th>
<th>BER 1/2</th>
<th>3/4</th>
<th>7/8</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 kbits</td>
<td>10^-5</td>
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</tr>
<tr>
<td></td>
<td>10^-7</td>
<td>4.8 dB</td>
<td>6.2 dB</td>
</tr>
<tr>
<td>1.544 Mbit/s</td>
<td>10^-5</td>
<td>5.0 dB</td>
<td>6.4 dB</td>
</tr>
</tbody>
</table>

**ComTech EFData**

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ComTech EFData products are manufactured under a quality system certified to ISO 9001.

ComTech EFData reserves the right to make changes to specifications of products described in this data sheet at any time without notice and without obligation to notify any person of such changes.