FEATURES

- 2.4 kbps to 5 Mbps
- Fully Accessible System Topology (FAST)
- Intermediate Data Rate (IDR)
- INTELSAT Business Services (IBS)
- Drop and Insert (D&I)
- Automatic Uplink Power Control (AUPC)
- Asynchronous Channel Unit Overhead
- Turbo Product Codec (Option)
- Reed-Solomon
- Built-In Self Test
- Burst Mode Operation

APPLICATIONS

Fully configured, the SDM-300A will meet or exceed all of the applicable requirements in IESS-308, 309, and 310 and is available with a full range of industry standard digital interfaces.

COMPATIBILITY

Maintaining Comtech EF Data's excellent history of modem compatibility, the SDM-300A is a direct replacement for many Comtech EF Data modems. When configured properly, the SDM-300A can be installed to communicate with or replace the following Comtech EF Data modems:

- SDM-100
- SDM-650B
- SDM-6000
- SDM-300
- SDM-308B
- CDM-600 (Open Network w/Turbo)
- SDM-309B

COST EFFECTIVE

Comtech EF Data's SDM-300A employs Fully Accessible System Topology (FAST). This technology provides a cost-effective approach to upgrading satellite modem configurations. FAST is an exclusive, industry-first feature that eliminates the need to purchase options before they are needed. Modem selection is easy with no guesswork.

An SDM-300A base modem includes the following features:

- BPSK and QPSK
- Viterbi or Sequential decoding
- Variable data rate to 512 kbps
- IF range from 50 to 180 MHz (1 Hz steps)

FEATURE ENHANCEMENTS

Enhancing the SDM-300A's performance is easy. Some features are added quickly on site, using the FAST access code purchased from Comtech EF Data, other features may require an overhead card. To enable FAST features, simply enter the code at the front panel. Unit enhancements include:

- Variable Data Rate to 5 Mbps
- Viterbi and Sequential Decoding
- 8-PSK
- Turbo Product Codec
- Reed-Solomon (R-S) Codec
- Duplex R-S Codec (for R-S and Turbo in the same unit)
- IDR / IBS / D&I / AUPC / ASYNC
- I/O Connector (25-, 50-, 34-, 37-, 100-pin)
- Asymmetrical Loop Timing
- G.703 Interface with DB-9 and BUC
- 2 x ADPCM Voice in 64 kbps IBS Frame
- 4 or 8 Channel Mux
- Flex Mux

BUILT-IN SELF-TEST

Comtech EF Data's unique built-in self-test feature allows the SDM-300A to complete a bit error rate (BER) measurement without the use of expensive noise generators and BER test equipment. The built-in self test:

- Provides fully functional modem testing with noise
- Displays pass or fail results
- Establishes modem confidence
- Eliminates BER test equipment

When commanded to the self test mode through the front panel or remote port, the SDM-300A disables the Tx and Rx IF ports and internally tests modulator, demodulator, and interface functions by means of a BER measurement. The BER measurement is achieved via an internal IF noise generator and BER test equipment built into the SDM-300A.

REDUNDANCY

The SDM-300A redundancy is supported by the SMS-301 (1:1) and SMS-7000 (2:8) switches.
**SDM-300A Satellite Modem**

### System Specifications (Fully Enhanced)

- **Operating Frequency Range**: 50 to 180 MHz, in 1 Hz steps
- **Digital Interface (Standard)**: EIA-232, EIA-422, and V.35 (25-pin D)
- **Digital Data Rate**: 2.4 kbps to 5 Mbps, in 1 bit/s steps
- **Symbol Rate**: 4.8 kbps to 2.5 Mbps
- **Modulation and Coding**
  - Viterbi (K=7)
  - QPSK / OQPSK 1/2, 3/4, 7/8
  - 8-PSK 2/3 TCM
- **Carrier Acquisition Range**: ±5 dBm to +40 dBc
- **Input Power**: -5 dBm to +40 dBc
- **Output Power**: -5 to -30 dBm, adjustable in 0.1 dB steps
- **Output Impedance**: 75 Ω
- **Output Return Loss**: > 20 dB
- **Data Clock Source**: Internal or External
- **Data Descrambling**: Selectable or none, 2^11-1, Synchronous
- **Forward Error Correction**: Convolutional encoding with soft-decision, K=7 Viterbi decoding
- **Data Scrambling**: IESS-308 (V.35), IESS-309, IESS-310, or None

### Environmental and Physical

- **Prime Power, AC**: 90 to 264 VAC, 47 to 63 Hz, 30W
- **Size**: 1.75H x 19.0W x 15.7D inch (1 RU)
- **Weight**: < 11 lbs. (4.9 kg)
- **Temperature**: 32°C to 122°F (0°C to 50°C)
- **Humidity**: < 95%, non-condensing

### Burst Mode Specifications

- **Operating IF Range**: 50 to 180 MHz, in 1 Hz steps
- **Type of demodulation**: QPSK
- **Operating Channel Spacing**: < 0.5 dB degradation operating with 2 adjacent-like channels, each 10 dB higher at 1.3 times the symbol rate, or a minimum of 1.2 times the specified acquisition range.
- **Carrier Acquisition Range**: ±4kHz at E_b/N0 = 8 dB, 99% prob.
- **Digital Data Rate, QPSK, R=1/2**: 19.2 kbps
- **Forward Error Correction**: Convolutional encoding with soft-decision, K=7 Viterbi decoding
- **Data Descrambling**: Selectable or none, 2^11-1, Synchronous

### Modulation Specifications

- **Output Power**: -5 to -30 dBm, adjustable in 0.1 dB steps
- **Output Spurious**: < -55 dBc, 0 to 500 MHz (4 kHz band)
- **Output Frequency Stability**: ±10 ppm
- **Input Return Loss**: > 20 dB
- **Data Clock Source**: Internal or External
- **Data Scrambling**: IESS-308 (V.35), IESS-309, IESS-310, or None
- **External Reference Input**: 1, 5, 10, or 20 MHz
- **Prime Power, AC**: 90 to 264 VAC, 47 to 63 Hz, 30W
- **Prime Power, DC**: 38 to 64 VDC, 40W

### Demodulation Specifications

- **Input Power**: Desired Carrier
- **Maximum Composite**: -30 to -55 dBm
- **Input Impedance**: 75Ω (Optional: 50Ω)
- **Input Return Loss**: > 20 dB
- **Carrier Acquisition Range**: ±35 kHz from 100 Hz to 35 kHz
- **Acquisition Time**: < 2 seconds for 64 kbps 1/2 rate
- **Clock Acquisition Range**: ±100 PPM
- **AGC Output**: 0 to 10 V at 10 mA maximum

### Available Options

<table>
<thead>
<tr>
<th>Option</th>
<th>How Enabled</th>
<th>FAST</th>
<th>Variable data rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add Viterbi or Sequential decoder</td>
<td>Option</td>
<td>FAST</td>
<td>8-PSK</td>
</tr>
<tr>
<td>Asymmetrical loop timing</td>
<td>FAST</td>
<td>8-PSK</td>
<td></td>
</tr>
<tr>
<td>IBS / IDR / DB</td>
<td>FAST + Card</td>
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</tr>
<tr>
<td>2KADPCM Voice</td>
<td>FAST + Card</td>
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<td></td>
</tr>
<tr>
<td>50Ω IF</td>
<td>Hardware</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asynchronous overhead</td>
<td>Hardware</td>
<td></td>
<td></td>
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<tr>
<td>6-V channel multiplexer</td>
<td>Hardware</td>
<td></td>
<td></td>
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<tr>
<td>EIA-232, EIA-422, &amp; V.35</td>
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<tr>
<td>50Ω IF</td>
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<tr>
<td>8-PSK with/without RS</td>
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<tr>
<td>8-PSK with/without RS</td>
<td>Hardware</td>
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</table>

### BER Performance (E_b/N0, dB)

<table>
<thead>
<tr>
<th>BER</th>
<th>Viterbi</th>
<th>Viterbi &amp; Reed-Solomon</th>
<th>56 kbps, Sequential</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2</td>
<td>3/4</td>
<td>7/8</td>
<td>1/2</td>
</tr>
<tr>
<td>10^10</td>
<td>10^-10</td>
<td>10^-9</td>
<td>10^-7</td>
</tr>
<tr>
<td>3.8</td>
<td>4.1</td>
<td>4.6</td>
<td>5.0</td>
</tr>
<tr>
<td>4.9</td>
<td>5.3</td>
<td>6.6</td>
<td>7.2</td>
</tr>
<tr>
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<td>6.9</td>
<td>7.9</td>
<td>8.5</td>
</tr>
<tr>
<td>4.1</td>
<td>4.2</td>
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<td>4.5</td>
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<td>7.9</td>
<td>8.9</td>
<td>9.6</td>
<td>9.6</td>
</tr>
</tbody>
</table>

### Environmental Specifications

- **Temperature**: -40°C to +70°C
- **Humidity**: < 80%, non-condensing