



## FEATURES

- 2.4 kbps to 4.375 Mbps
- Fully Accessible System Topology (FAST)
- Closed Network Capability
- Tx 70/140 MHz
- Rx L-Band

## APPLICATIONS

Fully configured, the SDM-300L1 will meet or exceed all of the applicable requirements in IESS-308/-309 and is available with a full range of industry standard digital interfaces.

The SDM-300L1 expands the open network capabilities of SDM-300 series modems into L-Band frequencies. Utilizing advanced technology and proprietary digital signal processing techniques, the design eliminates analog circuitry to perform modem signal processing, resulting in higher reliability and reduced packaging size.

## COMPATIBILITY

Maintaining our excellent history of modem compatibility, the SDM-300L1 is fully compatible with many Comtech EF Data modems. When configured properly, the SDM-300L1 interoperates with the following Comtech EF Data modems:

- SDM-100
- SDM-100A
- SDM-300
- SDM-300A
- CDM-600 (Open Network)
- SDM-650B
- SDM-6000
- SDM-8000
- CDM-550

## COST EFFECTIVE

Comtech EF Data's SDM-300L1 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-300L1 base modem includes the following features:

- BPSK and QPSK
- Viterbi or Sequential
- Single data rate
- Tx IF range: 50 to 90 and 100 to 180 MHz
- Rx IF range of 950 to 1750 MHz

## FEATURE ENHANCEMENTS

Enhancing the SDM-300L1'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 these features, simply enter the code at the front panel.

Unit enhancements include:

- Variable data rate, 512 kbps to 5 Mbps
- Viterbi and Sequential decoding
- OQPSK
- Reed-Solomon concatenated Codec
- IDR/IBS/D&I/AUPC/ASYN
- I/O Connector (25-, 34-, 37-, 50-, 100-pin)
- G.703 Interface with DB-9 and BUC
- 2 x ADPCM Voice in 64 kbps IBS Frame

## TEST AND MONITOR FEATURES

The SDM-300L1 has extensive test capability to aid installation, troubleshooting, and maintenance:

- Interface Loopback - at the modulator and demodulator data interface (bi-directional)
- Baseband loopback - at the data interface (bi-directional)
- BER Eb/No, and Buffer Fill %



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## SYSTEM SPECIFICATIONS (FULLY ENHANCED)

Operating Frequency Range	50 to 90 and 100 to 180 MHz Tx 950 to 1750 MHz Rx
Digital Interfaces: Standard	EIA-232, EIA-422, and V.35 (25-pin D)
Optional	G.703 (Closed Network)
Digital Data Rate	2.4 kbps to 4.375 Mbps
Symbol Rate	4.8K symbols/s to 2.5 Msys/s
Modulation and Coding	BPSK R = 1/2 QPSK R = 1/2, 3/4, and 7/8 OQPSK R = 1/2, 3/4, and 7/8
Baseband Filtering	IESS, Comtech EF Data Closed, Comstream Closed, EFD Closed
Forward Error Correction	Viterbi, K = 7, R = 1/2, 3/4, and 7/8 Sequential, R = 1/2, 3/4, and 7/8 Reed-Solomon Concatenated per Intelsat or Closed Network
Reed-Solomon Interleaver	Depth 8, Closed Network: Depth 4 or 8 per IECS-308, and 309
Plesiochronous /Doppler Buffer	1 to 99 ms, in 1 ms steps
Data Scrambling	32 to 262,144 bps, in 16 bit steps IESS-308 (V.35 Intelsat), IECS-309, FDC, V.35 (EFD/CSC), Modified V.35, or None
External Reference Input	1, 5, 10, 20 MHz
Agency Approvals	CE Mark
Internal Stability	± 10 PPM

## MODULATION SPECIFICATIONS

Output Frequency	50 to 90 and 100 to 180 MHz
Output Power	+5 to -20 dBm
Output Stability	± 0.5 dB
Output Spurious in 4 kHz Band (measured with modulated carrier)	< -50 dBc, 20 to 500 MHz > 64 kbps < -45 dBc, 20 to 500 MHz ≤ 64 kbps
Output Phase Noise	< -66 dBc/Hz at 100Hz < -76 dBc/Hz at 1 kHz < -86 dBc/Hz at 10 kHz < -96 dBc/Hz at 100 kHz < -96 dBc/Hz at 1 MHz

Output Impedance, Return Loss	75 Ω ≥ 20 dB
Output Connector	BNC Female
Output Spectrum	IESS-308/-309, EFD Closed
Spectrum Sense	Normal or Inverted
Data Clock Source	Internal or External

## DEMODULATION SPECIFICATIONS

Input Frequency	950 to 1750 MHz in 100 Hz steps
Minimum Input Power (Desired Carrier)	+10 log (symbol rate) -135 dBm
AGC Range	50 dB above minimum input level
Composite to Desired Carrier	+40 dBc, ≥ 64 ksym/s
Maximum Composite Level	-5 dBm
Input Impedance, Return Loss	75Ω, > 10 dB
Input Connector	Type N, Female (50Ω mechanical)
Carrier Acquisition Range	± 75 kHz in 1Hz steps
Acquisition Time	< 1 second at 64 kbps 1/2 rate
Sweep Reacquisition	0 to 999 seconds, in 1 second steps
Buffer Clock	Internal, External, Transmit, Recovered Rx
LNB Voltage	On or Off +13 and +18 VDC per DiSEqC 4.2 and 24 VDC at 500 mA, max.
LNB Reference (center Conductor of IF Input Connector)	On or Off 10 MHz at -6 to 0 dBm

## ENVIRONMENTAL AND PHYSICAL

Prime Power, AC	90 to 264 VAC, 47 to 63 Hz
Size	1.75H x 19.0W x 19.18D inch (1 RU) (4.4H x 48 W x 48 D cm)
Weight	< 12 lbs. (5 kg)
Operating Temperature	0 to 50°C (32 to 122°F)
Storage Temperature	-40° to +70°C (-40° to +158°F)
Humidity	< 95%, non-condensing

## AVAILABLE OPTIONS

How Enabled	Option
FAST	Variable data rate
FAST	OQPSK
FAST	Asymmetrical loop timing
FAST	Add Viterbi or Sequential decoder
FAST	2 x ADPCM Audio in 64 Kbps IBS
FAST + Card	Concatenated Reed-Solomon Codec
FAST + Card	IBS / IDR / D&I (requires OH Card)
FAST + Card	ASYNCR + AUPC with 50-pin D connector (requires OH Card)
FAST + Card	AUPC with no ASYNCR (requires Reed-Solomon, no OH Card)
FAST + Card	G.703 interface (50-pin-D connector, requires UB530 or switch)
FAST + Card	G.703 interface with BNC & DB9 (requires OH Card), closed network
Hardware	± 0.02 ppm internal stability
Hardware	50Ω IF (70/140 MHz TX IF option)
Hardware	-48 VDC power supply
Hardware	25-pin (F) D connector with EIA-530 (EIA-422), EIA-232, and V.35
Hardware	37-pin (F) D connector with EIA-530 (EIA-422), and MIL-188-141
Hardware	34-pin (F) V.35 "Winchester" connector with V.35
Hardware	50-pin (F) D connector for use with overhead card.
Hardware	50-pin (F) D connector for use without overhead card (EIA-422, EIA-232, and V.35).

## REMOTE CONTROL SPECIFICATIONS

Serial Interface	EIA-232 or EIA-485 (2- or 4-wire)	
Signals Controlled/Monitored:		
Tx Frequency	Power Supply Voltages	IF Loopback (L-Band)
Tx Power	Plesiochronous Buffer	Raw Error Rate
Data Rate Select	Rx Frequency	Rx Signal Level
Scrambler On/Off	Tx On/Off	Fault Status
Rx Carrier Detect	Data Loopback	Error Threshold Alarm
Configuration Retention	Will maintain current configuration for at least one year without power	

## BER PERFORMANCE E<sub>b</sub>/N<sub>0</sub> (dB)

BER	Viterbi			Sequential				
	BPSK, QPSK & OQPSK	1/2	3/4	7/8	BPSK (1/2 Only), QPSK & OQPSK			
				Data Rate	BER	1/2	3/4	7/8
10 <sup>-5</sup>	5.3	6.4	7.6	100 kbps	10 <sup>-4</sup>	4.5	5.5	6.6
10 <sup>-6</sup>	6.0	7.2	8.3		10 <sup>-5</sup>	5.4	6.4	7.8
10 <sup>-7</sup>	6.6	7.9	8.9	1.544 Mbps	10 <sup>-4</sup>	5.6	6.1	6.9
10 <sup>-8</sup>	7.2	8.5	9.6		10 <sup>-5</sup>	6.3	7.0	7.9

## Concatenated Reed-Solomon

BER	BPSK, QPSK & OQPSK		
	1/2	3/4	7/8
10 <sup>-6</sup>	4.1	5.6	6.7
10 <sup>-7</sup>	4.2	5.8	6.9
10 <sup>-8</sup>	4.4	6.0	7.1

## ESC SPECIFICATIONS

IBS:	ASYNCR Data Orderwire	1/2000 x data rate
	Backward Alarm	Form C contacts
	Total Overhead	1/15 x data rate
IDR:	Voice Orderwire	2 ADPCM (input: 4-wire/VF), or 64 kbps data
	Data Orderwire Backward Alarm	8 kbps (EIA-422 interface)
	Alarm	Form C contacts (4)
	Total Overhead	96 kbps
D&I:	Interface	G.703
	Data Rate	T1 or E1
	N x 64 bits	N=1, 2, 3, 4, 5, 6, 8, 10, 12, 15, 16, 20, 24, 30
		2.048 Mbps (E1_IBS)
		1.544 Mbps (T1_IBS)



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