

SDM-300A



INTRODUCTION

Comtech EFData's SDM-300A is the future generation of satellite modems designed to serve into the 21st century.

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

FEATURES

- 2.4 kbit/s to 5 Mbit/s
- 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
- Reed-Solomon
- Fast Acquisition
- Built-In Self Test
- 8PSK Modulation
- Flex Mux

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

- | | |
|------------|------------|
| • SDM-100 | • SDM-309B |
| • SDM-300 | • SDM-650B |
| • SDM-308B | • SDM-6000 |

All Comtech EFData redundancy switches (1:1 or M:N) can be used with the SDM-300A, making field replacement or upgrades of existing systems easy and cost effective.

COST EFFECTIVE

Comtech EFData'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 and industry-first feature that eliminates the need to purchase options before they are needed. This makes modem selection easy and eliminates guesswork.

How does FAST work? Purchase of an SDM-300A base modem includes the following features:

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

When additional features are required, they can be implemented quickly *on site*. Using the FAST access code provided by Comtech EFData, these feature enhancements can be added from the front panel or remote M&C port.

FEATURE ENHANCEMENTS

Enhancing the SDM-300A's performance is easily accomplished: simply purchase a unique access code from Comtech EFData and enter the code into the unit.

Base unit enhancements include:

- Changing from single rate to variable rate
- Extending the data rate from 512 kbit/s to 5 Mbit/s
- Reed-Solomon concatenated Codec
- Viterbi or sequential decoding
- 8PSK
- IDR/IBS/D&I/AUPC/ASYN

BUILT-IN SELF TEST

Comtech EFData'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.



SDM-300A SPECIFICATIONS

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 kbit/s to 5 Mbit/s, in 1 bit/s steps 64 kbit/s to 5 Mbit/s (8PSK)
Symbol Rate	4.8 kbit/s to 2.5 Mbit/s
Modulation/Demodulation	BPSK 1/2 rate QPSK 1/2, 3/4, and 7/8 rates 8PSK 2/3 rate
Plesiochronous Buffer	2 to 99 ms, in 2 ms steps
Forward Error Correction	Viterbi, K=7, 1/2, 3/4, and 7/8 rates Sequential 1/2, 3/4, and 7/8 rates Reed-Solomon per Intelsat
Data Scrambling	IESS-308 (V.35), IESS-309, or None
External Reference Input	1, 5, 10, 20 MHz
Agency Approvals	CE Mark
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 Spectrum	Meets IESS-308/309 power spectral mask
Output Return Loss	> 20 dB
Output Impedance	75Ω
Data Clock Source	Internal or External
Internal Stability	$\pm 1 \times 10^{-5}$

DEMODULATION SPECIFICATIONS

Input Power:	
Desired Carrier	-30 to -55 dBm
Maximum Composite	-5 dBm or +40 dBc
Input Impedance	75Ω
Input Return Loss	> 20 dB
Carrier Acquisition Range	± 35 kHz from 100 Hz to 35 kHz
Acquisition Time	64k, < 1 second, 1/2 rate
Sweep Reacquisition	0 to 999 seconds, in 1 second steps
Buffer Clock	Internal, External, Transmit, Recovered Rx
Plesiochronous Buffer	16 to 256 Kbits

ENVIRONMENTAL AND PHYSICAL SPECIFICATIONS

Prime Power	90 to 264 VAC, 47 to 63 Hz, 30W
Size	24 or 48V DC, 30W 1.75" H x 19.0" W x 15.7" D (1 RU) (4.4 cm H x 48 cm W x 40 cm D) < 11 lbs. (4.9 kg)
Weight	
Operating Temperature	0 to 50°C
Humidity	Up to 95%, non-condensing

ESC SPECIFICATIONS

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

REMOTE CONTROL SPECIFICATIONS

Serial Interface	EIA-232-C or EIA-485
Signals Controlled/Monitored	Transmit Frequency Receive Frequency Transmit Power Transmitter ON/OFF Data Rate Select RF Loopback IF Loopback Data Loopback Scrambler ON/OFF Raw Error Rate Receive Carrier Detect Receive Signal Level Power Supply Voltages Fault Status Error Threshold Alarm Four Backward Alarms Field Upgradeability Modem Self Test Modes
Configuration Retention	Will maintain current configuration for at least one year without power

AVAILABLE OPTIONS

G.703 Interface
IBS/IDR/D&I
Asynchronous Overhead (Async/AUPC)
Concatenated Reed-Solomon Codec
 2×10^{-7} Internal Stability for IF and Data Clock
50Ω IF
High Output Power to +5 dBm
2 to 8 Channel Multiplexer
Flex Mux
8PSK

BER PERFORMANCE

E_b/N_0 Performance, Sequential Decoder

E_b/N_0 :				
Data Rate	BER	1/2	3/4	7/8
100 kbit/s	10^{-5}	4.8	5.8	6.7
	10^{-7}	5.8	6.6	8.0
1.544 Mbit/s	10^{-5}	5.8	6.3	6.9
	10^{-7}	6.6	7.1	8.0

TYPICAL E_b/N_0 PERFORMANCE, VITERBI DECODER

BER	1/2	3/4	7/8	2/3 8PSK
10^{-5}	4.6	6.0	7.2	7.4
10^{-6}	5.3	6.8	7.9	8.2
10^{-7}	5.9	7.5	8.6	8.8
10^{-8}	6.4	8.0	9.4	9.6

TYPICAL E_b/N_0 PERFORMANCE, CONCATENATED REED-SOLOMON CODES

BER	IBS	IDR	8PSK
	1/2	3/4	2/3
10^{-5}	3.2 dB	4.0 dB	5.8 dB
10^{-6}	3.5 dB	4.2 dB	6.1 dB
10^{-7}	3.6 dB	4.4 dB	6.4 dB
10^{-8}	3.8 dB	4.6 dB	6.6 dB



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

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