SDM-150A
Satellite Modem

CALIFORNIA MICROWAVE | **EF DATA**

EFData's SDM-150A satellite modem is a low cost, fully digital, burst and continuous modem designed for use in Demand Assigned Multiple Access (DAMA) satellite networking applications. The SDM-150A design incorporates the latest digital signal processing technology resulting in one of the smallest and most cost effective burst modems available on the market.

FEATURES

- Low Cost
- Burst mode operation at 19.2 kbit/s
- Fast burst acquisition (< 30 ms)
- Continuous mode operation from 9.6 kbit/s to 224 kbit/s
- Continuous mode options
    - Automatic Uplink Power Control (AUPC)
    - Asynchronous Overhead Channel
    - Reed-Solomon

APPLICATIONS

The SDM-150A operates in dual mode ideally suited for use in DAMA networks. In the burst mode, the SDM-150A can be used as a control channel modem with an aloha or aloha/slotted access scheme, or in a star network configuration for TDM/TDMA networks. The control channel is used for call setup and tear down.

In the continuous mode, the modem operates as a fast acquisition traffic modem with the capability to carry data, voice, or ISDN traffic.

All the modem control functions are available through a serial M&C port. This allows easy integration when used with a Network Management System.

FLEXIBILITY

The SDM-150A provides complete flexibility in the selection of data rate, code rate, frequency, and output level of the modulator. Since the SDM-150A configuration is software controlled, the modem can be easily configured in the burst mode or in the continuous mode. All parameters are fully selectable from the front panel or remotely via the serial M&C interface.

INTERFACES

The SDM-150A IF ports are frequency-agile from 50 to 180 MHz, in 100 Hz steps. This feature accommodates both wide and narrow band, up and down converters. The SDM-150A supports EIA-422/449, V.35, and EIA-232 data interfaces. The serial M&C interface is selectable between EIA-232 and EIA-485/449.

TECHNOLOGY

EFData has integrated a unique set of technologies to reduce the SDM-150A size and cost while increasing the modem capabilities and flexibility.

Recent advances in Digital Signal Processing (DSP) have been incorporated in the design of the SDM-150A. Examples of high density components employed in the modem are an embedded microprocessor, Viterbi LSI processors, Direct Digital Synthesizer, and field-programmable gate arrays for logic processing. These state-of-the-art components provide maximum modem processing power in a minimum amount of space.

ADVANCED FEATURES

The SDM-150A is a dual functionality modem. The modem can operate in burst and continuous mode. This feature allows the utilization of the SDM-150A in a wide variety of network applications using TDM/TDMA and SCPC/DAMA.

The SDM-150A modem is designed to operate as the master control channel modem in the Phoenix Bandwidth Management System. This application requires efficient burst acquisition schemes that are not available in most satellite modems. With the SDM-150A, burst acquisition times of less than 30 ms are easily achieved.

The SDM-150A command set allows the user to retrieve the frequency offset of the last acquisition. This is useful in networks employing Automatic Frequency Control.

REDUNDANCY

The standard EFData product line of modem protection switches is available to provide 2:8 backup switching for hubs and 1:1 backup switching for remote stations. Please contact your EFData Sales Representative to determine product compatibility specific to your application.

SDM-150A SPECIFICATIONS

System Specifications

IF Frequency	50 to 180 MHz, in 100 Hz steps
Digital Data	
Continuous Mode	QPSK, 1/2 rate, 19.2 to 128 kbit/s
	QPSK, 3/4 rate, 28.8 to 192 kbit/s
	QPSK, 7/8 rate, 33.6 to 224 kbit/s
	BPSK, 1/2 rate, 9.6 to 64 kbit/s
Forward Error Corr.	Viterbi or sequential, soft decision
Doppler Buffer	64 to 65536 bits, selectable from front panel in bits or ms
Data Scrambling	IESS-308 (modified V.35) or none, selectable
Burst Mode	QPSK, ½ rate, 19.2 kbit/s
Forward Error Corr.	Viterbi soft decision
Doppler Buffer	None
Data Scrambling	$2^{15}-1$ synchronous or none, selectable
Data Interfaces	EIA-422/449, V.35, or EIA-232
Phase Noise	Per IESS-308
Prime Power	90 to 264 VAC, 47 to 63 Hz, 48 VDC optional
Power Dissipation	50W
Operating Temperature	0 to 50°C
Humidity	Up to 95%, non-condensing
Size	19" W x 20" D x 1.75" H (1 RU) (48.3 cm W x 50.8 cm D x 4.45 cm H)
Weight	< 10 lbs. (4.54 kg.)

Modulation Specifications

Output Power	-5 to -30 dBm, adjustable in 0.1 dB steps (+5 dBm optional)
Spurious	-55 dBc (4 kHz)
Data Clock Source	Internal or External
Internal Clock Stability	$\pm 1 \times 10^{-5}$
Output Impedance	75Ω (50Ω optional)
Output Return Loss	≥ 20 dB

Demodulation Specifications

Input Level (Desired Carrier)	-30 to -55 dBm
Maximum Composite Carrier	-5 dBm or +30 dBc, within 2 MHz of desired carrier
Continuous Mode	
Carrier Acquisition Range	± 30 kHz, selectable
Acquisition Time	< 1 second at 64 kbit/s
Burst Mode	
Carrier Acquisition Range	± 4 kHz at E_b/N_0 = 8 dB, > 99% prob.
Acquisition Time	< 30 ms
Input Impedance	75Ω (50Ω optional)
Input Return Loss	≥ 20 dB
Local M&C	LCD and keypad
Remote M&C	Serial Interface: EIA-485 or EIA-232

E_b/N_0 at BER 1×10^{-7}	Viterbi	Sequential
1/2 Rate	6.7 dB	5.4 dB
3/4 Rate	8.3 dB	6.9 dB
7/8 Rate	9.4 dB	7.9 dB

Monitor and Control Specifications

Serial Interface Type	EIA-232 or EIA-485/449
Data Rate	300 to 9600 bit/s
Signals Controlled/ Monitored	Transmit Frequency
	Receive Frequency
	Transmit Power
	Transmitter ON/OFF
	Data Rate Select
	IF Loopback
	RF Loopback
	Baseband Loopback
	Scrambler ON/OFF
	Descrambler ON/OFF
	Sweep Re-acquisition
	Directed Sweep ON/OFF
	Sweep Range
	Sweep Center
	Sweep Direction
	Raw Error Rate
	Corrected Bit Error Rate
	Receive E_b/N_0
	TX Clock Internal/External
	RX Clock Internal/External
	Receive Signal Level
	Receive Carrier Detect
	Power Supply Voltage
	Fault Status
	Stored Fault Status
Configuration Retention	Will maintain the current configuration for at least one year without power
Addressing	Programmable from 1 to 255; address 0 is reserved for global addressing
Commands	ASCII

Options

Continuous Mode	Voice Interface (ADPCM)
	Asynchronous Overhead Channel
	Automatic Uplink Power Control (AUPC)
	Concatenated Reed-Solomon Codec

"Your Error Free Choice"

EFData products are designed and manufactured under a quality system certified to ISO 9001

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