



FEATURES

- IDR
- Fiber Restoral
- 6 Mbit/s to 52 Mbit/s

The SDM-9000 satellite modem is a high-performance, full-duplex, digital vector modulator/demodulator designed for IDR applications from 6 to 52 Mbit/s. When equipped with a G.703 interface and ESC overhead framing unit, the SDM-9000 meets all requirements for IESS-308 specifications.

INTERFACES

Three interfaces are available as plug-in circuit cards:

- G.703
- Differential ECL
- MIL-STD-188-141

DATA RATE FLEXIBILITY

Data rate modules can support 1, 2, 3, or 4 different symbol rates. Field-installable data rate kits accommodate additional data rates.

BANDWIDTH EFFICIENT

Digital signal processing is used to provide advanced modulation techniques for reduction bandwidth. Supported signals include QPSK, 8PSK, and 16QAM

VITERBI AND REED-SOLOMON

The SDM-9000 utilizes the 3-wide punctured convolutional encoder and Viterbi decoder specified in IESS-308. Optional: Reed-Solomon coder/decoder is available for enhanced error correction capabilities

EXTENSIVE DIAGNOSTICS

The SDM-9000 contains extensive diagnostic tools, including:

- Digital loopback
- RF loopback
- BER monitoring
- Fault monitoring

Diagnostic tools simplify the initial installation and check-out of the modem. The tools also offer a high degree of maintainability over the service life of the modem. The modem is able to store complete status information on each fault, in order of occurrence. This diagnostic feature enables a technician to easily isolate and correct system problems without being present at the time of the fault. All circuit cards are removable and interchangeable between chassis without readjustment to further ease repair and troubleshooting.

BACKUP SWITCHING

The SDM-9000 has two companion protection switches: SMS-458B 1:N and SMS-451A 1:1.

OVERHEAD FRAME UNIT

The SDM-9000 G.703 interface can be supplied with an onboard ESC overhead channel unit. The overhead channel meets the requirements of IESS-308 and includes:

- One 8 kbit/s ESC data channel
- Two ESC audio channels or one 64 kbit/s data channel (optional)
- Four backward alarms
- One plesiochronous/Doppler buffer

The ECL and MIL-STD-188-114 interfaces can also be fitted with an onboard ESC overhead framing unit.



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SYSTEM SPECIFICATIONS

Operating Frequency Range	50 to 180 MHz, in 2.5 kHz steps
Digital Interface	G.703 or MIL-STD-188-141
Digital Data Rate	G.703 at 32.064, 34.368, 44.736, or 51.840 Mbit/s (8.448 Mbit/s optional) ECL at 6 to 52 Mbit/s MIL-STD-188-141 at 6 to 13 Mbit/s
Symbol Rate	37.5 Mbit/s maximum
Modulation/Demodulation	QPSK at 1/2, 3/4, and 7/8 8PSK trellis at 2/3 and 5/6 rate (optional) 16QAM at 3/4 and 7/8 rate (optional)
Forward Error Correction	Viterbi, K=7, Reed-Solomon (optional)
IDR ESC (Optional)	IESS-308, selectable
Data Scrambling	IESS-308 (V.35)
Plesiochronous Buffer	2 to 32 ms or bypass, selectable
Operation Mode	Duplex, Tx only, Rx only
Compatibility	NEC 5500

ENVIRONMENTAL AND PHYSICAL

Prime Power	90 to 264 VAC, 47 to 63 Hz, 200W
Size	19W x 20D x 3.5H inches (2RU) (48W x 51D x 9H cm)
Operating Temperature	0 to 50°C (32 to 122°F)
Humidity	Up to 95%, non-condensing
Weight	< 30 lbs. (13.6kg)

MODULATION SPECIFICATIONS

Output Power	-20.0 to +5.0 dBm, in 0.1 dB steps accuracy of ± 0.5 dB
Tx Frequency Stability	± 10 PPM standard (± 0.2 PPM with external high stability option)
Output Spurious/Harmonics	-55 dBc
Output Return Loss	> 18 dB
Output Impedance	75 Ω (50 Ω optional)
Data Rate	6 to 52 Mbit/s, 4 rate plug-on modules
Internal Data Clock Stability	± 10.0 PPM standard (± 0.2 PPM with external high stability option)

DEMODULATION SPECIFICATIONS

Input Power (Desired Carrier)	-45 to -25 dBm
Input Impedance	75 Ω (50 Ω optional)
Input Return Loss	> 18 dB
Carrier Acquisition Range	± 32 kHz
Output Spurious/Harmonics	-55 dBc
Data Rate	6 to 52 Mbit/s, 4 rate plug-on modules

COMPLEMENTARY SWITCHES

SMS-451A	1:1 Configuration (G.703)
SMS-451E	1:1 Configuration (ECL)
SMS-458B	1:4 Configuration (G.703)

CONFIGURATION RETENTION

Modem configurations are maintained in non-volatile memory that can be maintained for at least one year without external power.

INTERFACE SPECIFICATIONS

G.703 Interface:	
Data Rate	32.064, 34.368, 44.736, or 51.84 Mbit/s

Buffer Clock	Internal, External Reference, Tx Terrestrial, or Satellite (Bypass)
Line Coding	B3ZS, HDB3, or None (AMI)
ECL Interface:	
Data rate	6 to 52 Mbit/s
Buffer Clock Source	Internal, External Reference, Tx Terrestrial, or Satellite (Bypass)
Tx Clock Source	Internal (SCT) or Tx Terrestrial
MIL-STD-188-141 Interface:	
Data Rate	6 to 13 Mbit/s
Buffer Clock Source	Internal, External Reference, Tx Terrestrial, or Satellite (Bypass)
Tx Clock Source	Internal (SCT) or Tx Terrestrial

MONITOR AND CONTROL SPECIFICATIONS

Local user Keypad Interface	6-button
LCD Display	2 lines, 16 characters per line
Status LEDs	Power On Tx On Carrier detect Test mode Tx fault Rx fault Common equipment fault Stored fault Tx alarm Rx alarm
Remote User Interface:	
ASYNC Serial Interface	EIA-485 (2-/4-wire) or EIA-232
Baud Rate	300, 600, 1200, 2400, 4800, 9600, or 19200 bit/s
Serial Format	ASCII
Data Bits	7
Stop Bits	2
Parity	Odd or Even
Addressing	Configurable address from 1 to 255
Status Relays	TX fault RX fault Common equipment fault Tx alarm Rx alarm Deferred maintenance alarm

PERFORMANCE FOR BER EQUAL TO 1×10^{-8}

Modulation Type	FEC	Guaranteed E_b/N_0
QPSK	1/2 Viterbi	7.2 dB
QPSK	3/4 Viterbi	8.8 dB
QPSK	7/8 Viterbi	9.9 dB
8PSK	2/3 Viterbi with RS	6.6 dB
8PSK	5/6 Viterbi with RS	8.9 dB
16QAM	3/4 Viterbi with RS	8.7 dB
16QAM	7/8 Viterbi with RS	10.3 dB



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