



FEATURES

- IDR/IBS
- Closed Network
- 9.6 Kbps to 9.312 Mbps
- Concatenated Reed-Solomon Coding (Optional)
- 8PSK and 16QAM Modulation (Optional)

APPLICATIONS

The single-chassis SDM-8000 satellite modem meets all requirements of the IESS-308 and 309 specifications for the Intermediate Data Rate (IDR), INTELSAT Business Specifications (IBS), and EUTELSAT SMS requirements.

Switching from one open network application to another is very simple with the SDM-8000. In most cases, switching can be done from the front panel.

The SDM-8000 can also be used for any closed network application.

An optional sequential decoder is available to complement the SDM-8000. Multiple filter masks, selected at the front panel, ensure end-to-end compatibility with other manufacturer's modems in closed network environments.

MAXIMUM FLEXIBILITY

The SDM-8000 can be configured to any data rate ranging from 9.6 Kbps to 9.312 Mbps, in 1 bit/s steps. Each rate meets standard FEC code rates. Selection of data rates can be done from the front panel. The modem contains an internal channel unit that includes both IDR and IBS overhead framing units.

The framing unit, with D&I option installed, is fully functional at all specified rates for IDR (64 to 8448 Kbps) and IBS (64 to 2048 Kbps) data rates.

INTERFACES

A full range of industry standard digital interfaces (G.703, V.35, or MIL-188/EIA-422) is built into the modem. Interface selection is a simple matter of moving jumpers.

Optional breakout panels provide convenient access to all components of the IDR and IBS Engineering Service Channels (ESC) via built-in standard connectors and terminal blocks. Access to the Drop and Insert (D&I) signals also is available.

MONITOR AND CONTROL

The SDM-8000 has been equipped with an improved, more extensive M&C system than its predecessors. Each modem subsystem has its own M&C microprocessor controlled by the host processor located on the M&C board. The microprocessor/host processor greatly enhances the flexibility of the SDM-8000. The M&C is compatible with the software versions of other Comtech EFData modems currently in the field.

All M&C functions controlled and monitored at the front panel keyboard are also programmable through the remote EIA-232 or EIA-485 serial interface. Modems can be individually addressed from 1 to 255. Address 0 is reserved for global addressing. Modem configuration is stored in non-volatile memory that is maintained for at least one year without external power.

ENERGY AND BANDWIDTH EFFICIENT

Forward error correction, utilizing convolutional encoding and soft decision Viterbi K=7 decoding, yields high performance at low E_b/N_0 levels while occupying minimal bandwidth.

Options available for the SDM-8000 include 8PSK and 16QAM modulation methods. These modulation techniques provide maximum bandwidth efficiency, particularly when used in conjunction with the concatenated Reed-Solomon Codec.

BACKUP SWITCHING

Different types of protection switches are available to satisfy all installation configurations. Fully automatic 1:1 redundancy and M:N protection (M = 1 or 2, N = 1 to 8) are available. These systems are capable of backing up to eight modems operating on different transponders.

Switches and modems are also available in completely assembled and tested racks. The SDM-8000 also will interoperate in a redundant system with other models of Comtech EFData modems.



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SYSTEM SPECIFICATIONS

Operating Frequency Range 50 to 180 MHz, in 2.5 kHz steps
 Digital Interface G.703, MIL-188/EIA-422, and V.35 selectable
 Digital Data Rate 4.8 Kbps to 9.312 Mbps, in 1 bps steps
 Symbol Rate 6.0 ks/s to 6.3 Ms/s
 Modulation Type BPSK, QPSK, 8PSK, and 16QAM

Stability 5, 10, or 20 MHz at +5 dBm external reference,
 $\pm 1 \times 10^{-5}$ internal reference
 Energy Dispersal CCITT, V.35, and others

MODULATION SPECIFICATIONS

Output Power -5 to -30 dBm, adjustable in 0.1 dB steps
 (+5 to -20 dBm optional)
 Output Return Loss 20 dB
 Output Impedance 75 Ohms (50 Ohms optional)
 Spurious -55 dBc, measured in a 3 KHz bandwidth
 Output Connector BNC

DEMODULATION SPECIFICATIONS

Input Power:
 Desired Carrier -30 to -55 dBm (≤ 2 Mbps)
 Maximum Composite -30 to -45 dBm (> 2 Mbps)
 Input Impedance 75 Ohms (50 Ohms optional)
 Input Connector BNC
 Carrier Acquisition Range ± 30 kHz, selectable
 Input Return Loss 20 dB
 Elastic Buffer 32 to 262,144 bits, selectable

ENVIRONMENTAL AND PHYSICAL

Prime Power 90 to 264 VAC, 47 to 63 Hz, 130W
 38 to 64 VDC, 80W typical, 130W maximum
 Mounting 19 inch rack
 Size 19W x 20D x 3.5H inches (2RU)
 (48W x 51D x 9H cm)
 Weight < 19 lbs. (8.6kg)
 Temperature Operating 0 to 50°C (32 to 122°F)
 Storage -40 to 70°C (-40 to 158°F)
 Humidity Up to 95%, non-condensing

ESC SPECIFICATIONS

IDR:
 Voice/Orderwire Data 2 ADPCM (4-wire) or 64 kbps data channel
 Data Orderwire 8 kbps (EIA-422 Interface)
 Backward Alarms Form C contacts (4)
 Total Overhead 96 kbps

IBS:
 ASYNC Data Orderwire 1/2000 x customer data rate
 Backward Alarm Form C contact (1)
 Total Orderwire 1/15 x customer data rate

AVAILABLE OPTIONS

- Sequential Soft Decision Decoder
- Concatenated Reed-Solomon Codec
- DVB compatibility
- High Output Power (+5 to -20 dBm)
- $\pm 2 \times 10^{-7}$ internal clock
- Closed Network Overhead:
 - Automatic Uplink Power Control (AUPC) Interface
 - Asynchronous Channel Unit
- 8PSK / 16QAM
- Drop and Insert (D&I)
 - Interface: G.703
 - T1 (1.544 Mbps) or E1 (2.048 Mbps)
 - nx64 Kbps, n=1-6, 8, 10, 12, 15, 16, 20, 24, 30

BER PERFORMANCE

Viterbi Decoder, QPSK

BER	1/2	3/4	7/8
10^{-3}	4.2 dB	5.2 dB	6.4 dB
10^{-4}	4.8 dB	6.0 dB	7.2 dB
10^{-5}	5.5 dB	6.7 dB	7.9 dB
10^{-6}	6.1 dB	7.5 dB	8.8 dB
10^{-7}	6.7 dB	8.2 dB	9.2 dB
10^{-8}	7.2 dB	8.8 dB	9.9 dB

Viterbi + Reed-Solomon, QPSK

BER	1/2	3/4
10^{-5}	4.1 dB	5.6 dB
10^{-7}	4.2 dB	5.8 dB
10^{-8}	4.4 dB	6.0 dB
10^{-10}	5.0 dB	6.3 dB

High Order Modulation

8PSK w/ RS		16QAM w/ RS		
BER	2/3	BER	3/4	7/8
10^{-4}	5.5 dB	10^{-4}	7.9	9.3
10^{-5}	5.8 dB	10^{-5}	8.1	9.6
10^{-6}	6.2 dB	10^{-6}	8.4	9.8
10^{-7}	6.5 dB	10^{-7}	8.6	10.0
10^{-8}	6.7 dB	10^{-8}	8.8	10.3
10^{-9}	6.9 dB	10^{-9}	9.0	10.5



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