




DMD15

Universal IBS/IDR Satellite Modem



DMD15 Universal Satellite Modem

HIGHLIGHTS

- ▶ BPSK/QPSK/8PSK/16 QAM Operation
- ▶ 9.6 kbps to 5 Mbps, 1 bps Steps (DMD15A)
- ▶ 9.6 kbps to 10 Mbps, 1 bps Steps (DMD15B)
- ▶ FEC - Viterbi, Reed-Solomon, Sequential, Trellis, Turbo Product Code 
- ▶ Configuration, Monitor and Control Features Fully User-Programmable
- ▶ Excellent Spurious Performance
- ▶ Fully Compliant with IESS 308/309/310
- ▶ Industry-standard Universal Interface Module
- ▶ 50 to 180 MHz IF in 1 Hz Steps
- ▶ Optional L-Band IF

OVERVIEW

The Radyne ComStream DMD15 satellite modem offers the best features of a sophisticated programmable IBS/IDR and closed network modem, at an affordable price.

This versatile equipment package combines unsurpassed performance with numerous user-friendly front panel programmable functions. The DMD15 provides selectable functions for different services: Intelsat IDR and IBS, as well as closed networks. All of the configuration, monitor and control functions are available at the front panel. Operating parameters, such as variable data rates, FEC code rate, modulation type, IF frequencies, IBS/IDR framing and interface type can be readily set and changed at the front panel by earth station operations personnel.


Additionally, all functions can be accessed with a terminal or personal computer via a serial link for complete remote monitoring and control capability.

The DMD15 operates at all standard IBS and IDR data rates up to 8.448 Mbps. Selection of any data rate is provided over the range of 9.6 kbps to 10 Mbps in 1 bps steps.

For applications requiring system redundancy, the DMD15 modem may be used with the Radyne ComStream RCS11 1:1 Redundancy Switch or the RCS20 M:N (N≤9) Redundancy Switch. An optional Internal Engineering Service Channel Unit is available to provide voice, data, and alarms for Intelsat IDR applications.

A full range of industry standard interfaces are available for the DMD15. Interface types are selectable from V.35, RS-232, RS-422/449 and ITU G.703.

Available options include:

- OQPSK
- OM73 Compatible
- 8PSK
- 16QAM
- Drop and Insert
- Internal Engineering Service Channel
- Async Overhead Channel
- Sequential Decoding
- Reed-Solomon FEC
- Turbo Product Code FEC 
- Trellis FEC
- L-Band IF
- Analog AGC Voltage
- Internal Stability 1x10⁻⁷
- DC Input Power 48 Vdc



DMD15 Universal IBS/IDR Satellite Modem

SPECIFICATIONS

DMD15 System Data Rates

Rate 1/2 BPSK	9.6 kbps to 3.25 Mbps
Rate 1/2 QPSK/OQPSK	19.2 kbps to 6.5 Mbps
Rate 3/4 QPSK/OQPSK	28.8 kbps to 9.75 Mbps
Rate 7/8 QPSK/OQPSK	33.6 kbps to 10 Mbps
Rate 2/3 8PSK	256 kbps to 10 Mbps
Rate 3/4 16QAM	38.4 kbps to 10 Mbps
Rate 7/8 16QAM	44.8 kbps to 10 Mbps
BPSK Uncoded	19.2 kbps to 6.5 Mbps
QPSK Uncoded	38.4 kbps to 10 Mbps

0.495 Turbo Codec

BPSK	9.6 kbps to 2 Mbps
QPSK/OQPSK	19.2 kbps to 4 Mbps
8PSK	256 kbps to 4 Mbps
16QAM	256 kbps to 4 Mbps

0.793 Turbo Codec

BPSK	15.2 kbps to 3.2 Mbps
QPSK/OQPSK	30.4 kbps to 6.312 Mbps
8PSK	256 kbps to 6.312 Mbps
16 QAM	512 kbps to 4 Mbps

Modulator

Modulation	BPSK and QPSK (OQPSK, 8PSK, 16QAM optional)
IF Tuning Range	50 to 180 MHz in 1 Hz steps
Optional L-Band IF	950-1750 MHz
IF Impedance	75 Ohms, 50 Ohms (Opt.) L-Band, 50 Ohms
IF Connector	BNC, (L-Band, SMA)
IF Return Loss	20 dB minimum
Output Power	-20 to +5.0 dB in 0.1 dB steps (L-Band -5 to -30 dB)
Output Stability	±0.5 dB over time and temp.
Output Spectrum	Meets IESS 308/309/310 Power Spectral Mask
Spurious	< -55 dBc in any 4 kHz band
On/Off Power Ratio	>60 dB
Scrambler	CCITT V.35 or IBS (Others Optional)
FEC	Viterbi, K=7 at 1/2, 3/4 and 7/8 Rate Sequential 1/2, 3/4, 7/8 (Optional) Trellis 2/3, 5/6 (Optional) Turbo Product Code (Optional) 0.495 - (32,26) x (32,26) x (4,3) 0.793 - (64,57) x (64,57) (Turbo supported at all modulation types)
Outer Encoder Options	Reed-Solomon INTELSAT Rates
Data Clock Source	Internal, External, Rx Recovered
Internal Stability	1 x 10 ⁻⁶ Typical (Optional to 1 x 10 ⁻⁷)

Demodulator

Demodulation	BPSK and QPSK (OQPSK, 8PSK, 16QAM optional)
IF Tuning Range	50 to 180 MHz in 1 Hz steps
Optional L-Band IF	950 to 1750 MHz
IF Impedance	75 Ohms, 50 Ohms (Opt.) L-Band, 50 Ohms
IF Connector	BNC, SMA (L-Band)
IF Return Loss	20 dB minimum
Spectrum	INTELSAT IESS 308/309/310 compliant
Input Level	-55 to -25 dBm
Adjacent Channel Rejection Ratio	>+14 dBc
Total Input Power	+10 dBm or +40 dBc (the lesser)
FEC	Viterbi, K=7 at 1/2, 3/4 and 7/8 Rate,

Rate Sequential 1/2, 3/4, 7/8 (Optional)

Trellis 2/3, 5/6 (Optional)

Turbo Product Code (Optional)

0.495 - (32,26) x (32,26) x (4,3)

0.793 - (64,57) x (64,57)

(Turbo supported at all modulation types)

Decoder Options

Reed-Solomon

Descrambler

CCITT V.35 or IBS (others optional)

Acquisition Range

Programmable ±1 kHz to ± 32 kHz

Sweep Delay Value

100 msec to 299.9 sec. in 100 msec. steps

Plesiochronous Buffer

Size 2 ms to 32 ms

Centering

Automatic on underflow/overflow

Centering Modes

IBS: Integral number of frames

IDR: Integral number of multiple frames

Clock

Transmit, External, Rx Recovered or SCT (Internal)

DMD15 Modem BER Performance

Typical E _b /N ₀	Vit. 3/4	Vit. 1/2	Vit. W/RS 3/4	Turbo 0.793	Turbo 0.495
3 dB	--	--	--	3x10 ⁻³	1x10 ⁻⁷
4 dB	--	6x10 ⁻⁵	2x10 ⁻⁴	1x1 ⁻⁸	<1x10 ⁻¹⁰
5 dB	1x10 ⁻⁴	2x10 ⁻⁶	1x10 ⁻⁸	<1x10 ⁻¹⁰	<1x10 ⁻¹⁰
6 dB	2x10 ⁻⁶	5x10 ⁻⁸	<1x10 ⁻¹⁰	<1x10 ⁻¹⁰	<1x10 ⁻¹⁰

Monitor and Control

Remote RS485 / Terminal RS232

DMD15 Drop and Insert (Optional)

Terrestrial Data	1.544 Mbps or 2.048 Mbps, G.732/733
Line Coding	AMI or B8ZS for T1 and HDB3 for E1
Framing	D4, ESF, or SLC-96 for T1 and PCM30 (30 channels) or PCM31 (31 channels) for E1
Time Slot Selection	n x 64 contiguous or arbitrary blocks for Drop or Insert.
Time Slots	TS1, 2, 3, 4, 5, 6, 8, 10, 12, 15, 16, 20, 24, 30
Data Rates	64, 128, 192, 256, 320, 384, 512, 640, 768, 960, 1024, 1280, 1536, 1920 kbps

Terrestrial Interfaces

A variety of standard interfaces are available for the DMD15 modem in stand-alone applications.

Universal Interface

Module (UIM)	User Selectable RS-422/449, V.35, T1(DSX1), T2 (DSX2), E1 (G.703), and E2 (G.703)
G.703 T1 (DSX1)	1.544 Mbps, 100 Ohm balanced, AMI and B8ZS
G.703 E1	2.048 Mbps, 75 Ohm unbalanced & 120 Ohm balanced, HDB3
G.703 T2 (DSX2)	6.312 Mbps, 75 Ohm unbalanced & 110 Ohm balanced, B8ZS and B6ZS
G.703 E2	8.448 Mbps, 75 Ohm BNC, unbalanced, HDB3
ITU V.35	Differential, Clock and Data only
RS-422/449	All Rates, Differential, Clock/Data, DCE (50 Ohm options are also available)
RS-232	(DCE up to 200 kbps)

Environmental

Prime Power	100-240 Vac, 50-60 Hz, 1.0 A Max. 48 VDC (optional)
Operating Temp.	0 to 50° C, 95% humidity, non-condensing
Storage Temp.	-20 to 70° C, 99% humidity, non-condensing

Physical

Weight	9.6 pounds (4.3 Kg.)
Size	19 W x 22 D x 1.75 H (inches) (48.26 x 43.18 x 4.45 cm)

U.S.A./Canada: 6340 Sequence Drive, San Diego, California 92121 USA Tel:+(1) 858.458.1800 Fax:+(1) 858.657.5404

3138 East Elwood Street, Phoenix, Arizona 85034 USA Tel:+(1) 602.437.9620 Fax:+(1) 602.437.4811

Latin America: 6413 Congress Avenue, Suite 220, Boca Raton, Florida, 33487 USA Tel:+(1) 561.988.1210 Fax:+(1) 561.988.8290

European Office: 8, Oriol Court, Alton, GU34 2YT, United Kingdom Tel: +(44)(0)1420.544.200 Fax: +(44)(0) 1420.88.999

China: Room 1501 Canway Building, 66 Lanlishi Road, Xicheng District, Beijing, 100045 Tel: (86) 10 6 804.2542 Fax: (86) 10 6 804.2524

Asia-Pacific: 101 Cecil Street, #23-09, Tong Eng Building, Singapore, 069533 Tel:+(1) 65.325.1952 Fax:+(1) 65.325.1950;

7th Floor Wisma Budi, J.L.H.R. Rasuna Said, Kav C-6 Jakarta, Indonesia 12940 Tel:+(62) 21.521.3295 Fax:+(62) 21.521.3343

Internet: www.radynecomstream.com

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