DATUM SYSTEMS

PRECISION SATELLITE MODEMS

M7L/LT L-Band Sat-Modems
with M70 / D70
High Speed DVBS2X card sets

Datum Systems introduces advanced DVB-S2/S2X capability in the M7 series. This product combines state-of-the-art performance in a platform that is versatile, compact, highly efficient, and costs less to own and operate.

System Architectures Supported

- Point-to-Point, Point-to-Multipoint,
- Mesh, Unicast & Multicast

Key Highlights

- DVB-S2 and DVB-S2X Capability
- Widest Range of Modcod selections
- 950 to 2150 MHz (50 to 180 MHz optional)
- Data Rate from 256 kbps to 350 Mbps
- 256 kHz to 72 MHz Symbol Rate, 1 bps steps
- QPSK/8PSK/8QAM/16APSK/32APSK/64APSK (128APSK and 256APSK Optional)
- Full DVB-S2X Range /Carrier Roll-Off Factors
- Fully Supported Adaptive Coding and Modulation (ACM)
- Optional Smart Carrier Cancelling
- E7-GSE Express Ethernet Interface
  - Efficient GSE Encapsulation
  - Layer 2 Bridge, Switch Based
  - 4-Port with additional SFP Port
  - QoS and VLAN Support
  - VLAN Filtering
- Highly Configurable Remote Terminal
- Internal BUC and LNB Power Supply
- High Stability 10 MHz Reference
- Efficient Modem Control Channel, AUPC
- State-of-the-Art Web Browser GUI
- Local and Remote SNMP and Web Browser

Applications

- IP Trunking
- Enterprise
- IP Networks
- Cellular Backhaul
- Dynamic SCPC

DVB-S2 and DVB-S2X Capability – Datum now offers DVB-S2 and DVB-S2X capability. The M7LT with M70 / D70 Cards allows optimized operation with the most efficient satellite data transmission solution. Datum supports both DVB-S2 modulation and also the recently standardized DVB-S2X extensions. DVB-S2X significantly improves satellite capacity by using much finer steps between modulation coding combinations (modcods) and allowing Filter Roll-Off options down to 5%. DVB-S2X can improve spectral efficiency up to 50% over DVB-S2. Datum features Symbol Rates up to 72 MHz to allow full utilization of wide transponders with data rates up to 350 Mbit/s. This configuration supports Filter Roll-Offs of 5%, 10%, 15%, 20%, 25%, 30%, 35% compliant with the standards. See our Advanced Filter Shaping White Paper for more information on the advantages of Low Filter Roll-Off.

Adaptive Coding & Modulation (ACM) – Datum's M7LT fully supports ACM. This is the capability of a pair of modems to adjust their modcods to the best available case for the satellite link conditions. ACM works for the cases where the data rate can be variable. This is a perfect fit for Ethernet operation. Satellite links were historically backed off significantly to account for Rain Fade and Inclined Orbit operation. ACM gives back that lost capacity. The data rate in each direction is maximized by having the modems exchange small information packets that tell the distant end what modcod will maximize the capacity. This is done seamlessly when enabled. The unit can be set to utilize either DVB-S2 modcods or DVB-S2X (which includes DVB-S2) for better capacity

Smart Carrier Canceller – Smart Carrier is a patented advanced second generation carrier canceller which allows 2 similar carriers to occupy the same transponder spectrum, but is different from other cancellers in that it is a baseband canceller instead of an IF canceller. It allows excellent performance with easy setup and no additional cabling. Smart Carrier is compatible with all Datum modulation types and FECs, and is well suited to be used with DVB-S2 and DVB-S2X Sharp Roll-Off factors all the way down to 5%. Datum's technique provides improvement in the Shannon Capacity of ~ 2 dB, which is ~50 % increase in the fundamental channel capacity.

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Specifications

Data Services	DVB-S2 and DVB-S2X DVB-S2 per ETSI EN 302-307 DVB-S2X per ETSI EN A83-2
Data Rate Range	256 Kbps to 350 Mbps
Symbol Rate Range	256 KHz to 72 MHz (1 Hz Steps)
L-Band Tuning Range	950 to 2150 MHz, (50 to 180MHz Optional)(1 Hz steps)
Modulation Types	QPSK, 8PSK, 8QAM, 16APSK, 32APSK, 64APSK (Optional 128APSK, 256APSK)
Forward Error Correction	LDPC Inner Code BCH Outer Code
Filter Roll-Off	5%, 10%, 15%, 20%, 25%, 30%, 35%
Pilots	On/Off
Frame Length	64800 bits Long, 16200 bits Short
DVB-S2 Short & Normal Frames	Modcods
QPSK	1/2 to 9/10
8PSK	3/5 to 9/10
16APSK	2/3 to 9/10
32APSK	3/4 to 9/10
DVB-S2X Short & Normal Frames	Modcods
QPSK	13/45 to 9/10
8PSK/8QAM	5/9 to 9/10
16APSK	1/2 to 9/10
32APSK	2/3 to 9/10
64APSK	32/45 to 5/6
128APSK	3/4, 7/9
256APSK	32/45, 3/4, 29/45 to 11/15
ACM	Supported
Es/No Range (QEF)	-2 dB to 17 dB
Bits/Hz Range	0.6 to 4.95
Modcod Selection	Automatic (Preferred Table) DVB-S2 and DVB-S2X
Smart Carrier Cancelling	Optional, see detail section
AUPC	Supported
Data Interface	GB Ethernet Layer 2 Bridge
Encapsulation	DVB GSE per ETSI TS 102 606

Modulator

Output Level	L-Band +5 to -35.00 (dBm)
Output Level Accuracy	±0.5 dB Over Freq, Level and Temp
Output Impedance	50 Ohms N-Type or 75 Ohms F-Type (factory option)
Output Return Loss	> 16 dB
Output Off Isolation	> 60 dB
Output Spurious	< -60 dBc / 4 kHz BW
Phase Noise	
Offset = 10 Hz	< -78 dBc/Hz
Offset = 100 Hz	< -95 dBc/Hz
Offset = 1.0 kHz	< -110 dBc/Hz
Offset = 10 kHz	< -110 dBc/Hz
Offset = 100 kHz	< -115 dBc/Hz
Offset = 1.0 MHz	< -130 dBc/Hz
Mod Roll-Off Factor %	5, 10, 15, 20, 25, 30, 35 (%)
Ext Reference Frequency	1, 1.544, 2.048, 5, 10, 20 (in MHz)
External Ref Level	-10 dBm to +10 dBm

Demodulator

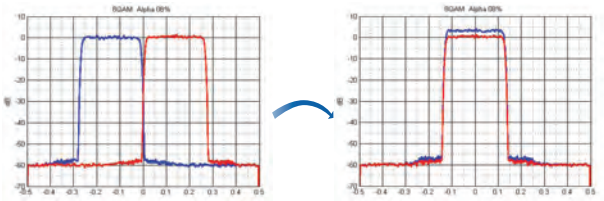
Input Acquisition Range	±100 Hz to ±3 MHz, 1 Hz Steps
Minimum Input Level	10 Log(Symbol Rate) - 125 = Lvl (dBm)
Maximum Input Level	10 Log(Symbol Rate) - 80 = Lvl (dBm)
Maximum IF Input Power Density	+20 dBc/Hz
Maximum Total Power	+10 dBm
Input Impedance	50 Ohms N-Type or 75 Ohms F-Type (factory option)
Input Return Loss	L-Band > 16dB
Input Phase Noise	> Intelsat by 6 dB typical, 4 dB min
Demod Roll-Off Factor %	5, 10, 15, 20, 25, 30, 35 (%)

Certification and Compliance

CE Certified for	ETSI EN 301 489-1 V1.9.2 (Emissions & Immunity) EN55022, EN55024, EN60950 (Safety)
RoHS	Meets RoHS lead-free standards

Smart Carrier Cancelling

Delay Range	0 to 320 msec
Acquisition Time	< 45 Sec for Full Delay Sweep < 2 Sec for 10 msec range
Power Spectral Density Ratio	+/- 10 dB
Symbol Rate Ratio	+/- 30% of Symbol Rate
Frequency Offset	+/- 12.5% of Symbol Rate
Eb/No Degradation	PSD Ratio 0 dB
QPSK	0.2 dB
8PSK/8QAM	0.3 dB
16QAPSK	0.5 dB
32APSK	0.7 dB
64APSK	0.8 dB



Express Ethernet Interface (E7 GSE)

Encapsulation	Generic Stream (GSE) per ETSI TS 102 606
Protocols	IPV4 IPV6 VLAN Filtering MPLS Compatible
QOS Priority	WRED, STRICT, NONE
Jumbo Frames	Supported to 10240 bytes
Copper Ports	4 ports RJ45 (switch based) Auto Switching 10/100/1000Base T
Optical Port	SFP GBE

Monitor and Control

IP control Port	Fast Ethernet RJ-45 Web Server GUI (Browser) SNMP v2c
Serial Control Port	RS-232 RS-485
Alarms Port	Qty 2 Form C Relay

Environment and Physical M7L

AC to DC Adapter (Std)	Input 100-240 VAC, Output 24 V 65 W max
DC Input (Rear of Unit)	8 to 36 VDC, -48 VDC Optional
Operating Temperature Range	0°C to 50°C, 99% humidity, non-cond
Storage Temperature	-20°C to +70°C, 99% humidity, non-con
Size	8.5" (W) x 11" (D) x 1.75" (H), (2 Units in 1 RU)
Weight	< 5 lbs, fully configured

Environment and Physical M7LT

AC or DC Input (factory option)	90-264 VAC, Optional 48 VDC (20-60 VDC)
High Stability Ref Option	Internal 10 MHz at Nominal, -3 dBm
Reference Stability	1 x 10-8 OCXO, 2 x 10-7/year aging
BUC Power Options	**AC Input Models:** (Max Current Rating Listed) (1) 24 VDC@110 watts, 4.2A (2) 24 VDC@120 watts, 5.0A **DC Input Models:** (1) 48 VDC@100 watts, 2.1A (2) 48 VDC@150 watts 3.1A (3) 48 VDC@200 watts 4.2A
LNB Output Power	Selectable: Off, 13 or 18 VDC
Operating Temp Range	0 to +50°C, 99% humidity, non-con
Storage Temperature	-20°C to +70°C, 99% humidity, non-con
Size	19" (W) x 11" (D) x 1.75" (H),
Weight	10 lbs, fully configured

- Specifications subject to chance without notice

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