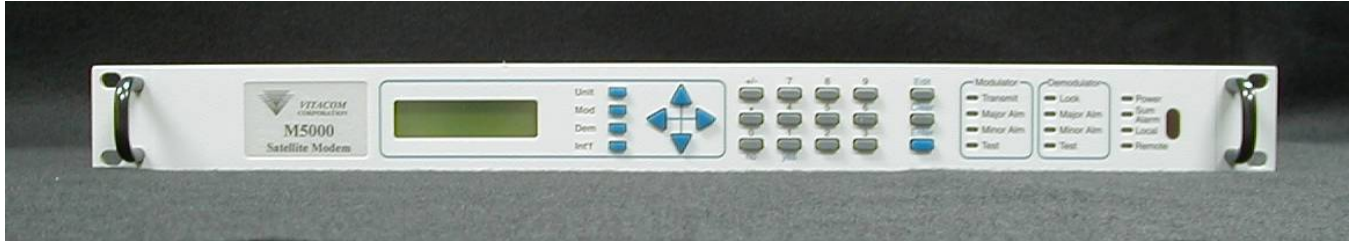


M523L SATELLITE MODEM



Description

The Datum Systems M523L satellite modem supplied by Vitacom offers state of the art performance and reliability with the best features of a sophisticated programmable modem, all at the industry's lowest price. The M523L forms the basis for a complete low-cost earth station when combined with a BUC, LNB, antenna, and cabling.

In addition to the signal, the transmit cable multiplexes on the BUC power and 10 MHz reference. On the receive side, the receive cable includes the received signal, LNB power, and LNB 10 MHz reference.

The M523L uses proprietary techniques of direct modulation and demodulation to completely eliminate transmit and receive IF sections and their associated filters. Sophisticated digital signal processing eliminates all on-board physical adjustments and provides performance within 0.3 dB of theoretical.

Direct Digital Synthesis (DDS) of the transmit, receive and data rate synthesizers allow settings to 1 Hz and 1 bps respectively.

The M523L comes standard with Viterbi and Reed-Solomon FEC. Optional turbo products code can also be purchased for improved BER vs Eb/No performance.

The M523L includes BPSK, QPSK, OQPSK, 8PSK, and 16QAM modulations.

The full front panel provides a backlit LCD display, full keypad and LED indicators for monitor and control of all modem parameters.

Features

- BPSK, QPSK, OQPSK, 8PSK, 16QAM operation.
- Signal, BUC Power, and 10 MHz reference muxed onto transmit cable. Power and 10 MHz reference can be turned on/off.
- Signal, LNB Power, and 10 MHz reference muxed onto receive cable. Power and 10 MHz ref can be turned on/off.
- 96 Watt BUC power supply supplied with modem.
- 1x10⁻⁸ 10 MHz reference standard.
- Typical DSP acquisition time of 315 mseconds at 9.6 kbps QPSK, 71 mseconds at 64 kbps QPSK.
- Viterbi and Reed-Solomon FEC standard, TPC optional. BER vs Eb/No performance within 0.3 dB of theoretical.
- DDS setting of transmit and receive frequencies in 1 Hz increments.
- Programmable Interface type.
- Low power, light weight 1 U case.
- Built-in IBS Multiplexer with overhead channel, AUPC and Remote Modem Control.
- DDS setting of transmit and receive data rates from 1.2 kbps to 10.0 Mbps in 1 bps increments.
- Viterbi FEC codec programmable to rate 1/2, 3/4, 5/6, 7/8, and disabled. R 2/3 in 8PSK mode.
- 55 dB AGC range with +5 dBm comp input power.
- Fully programmable from either front panel or remote command without jumpers.
- Built-in 1:1 Redundancy.

M523L MODEM SPECS



Operating Modes, all programmable

- Receive and Transmit Continuous (SCPC)
- Optional Transmit Burst (VSAT)

IF Frequency Range, Tx and Rx, Independent

Transmit: 950-1750 MHz in 1 Hz Steps
Receive: 950-1900 MHz in 1 Hz Steps

Transmit Output Power: (50 Ω Type N)

+5 to -35 dBm, programmable in 0.1 dB steps
Return Loss 14 dB typ, 10 dB min

Transmit Output Level Stability/Accuracy

+/- 0.5 dB stability, 0 to 50 deg C
+/- 0.5 dB accuracy, 950-1750 mHz, 25 deg C

Transmit Output Spurious/Harmonics

<-50 dBc up to -10 dBm out, <-40 dBc up to +5 dBm out

Transmit and Receive Phase Noise

Better than IESS308/309 by 4 dB min, 6 dB typ

Receive Carrier Level In, 75 Ω Type-f

-20 to -70 dBm, scales to -101 dBm at lower rates
Return Loss: 10 dB min

Maximum Composite Receive Input Power

-5 dBm or +40 dBc whichever is lower power

Receive Acquisition Range

Programmable from ± 100 Hz to ± 1.25 MHz

Transmit BUC Power (via DIN plug on rear)

24 VDC, 4 A External Supply provided standard
Optional higher voltage and current supplies
Max voltage: 60 volts, max current 6A, max pwr 250 W
Voltage and current monitored via front panel
Min/max voltage and current limits settable
BUC power can be disabled

Transmit and Receive 10 MHz Ref

Internal OCXO, 1x10⁻⁸ stability over temp
2x10⁻⁷ max aging per year
Transmit Output power +3 dBm nom
Receive Output power -3 dBm nom
Phase noise: -110 dBc at 10 Hz, -130 dBc at 100 Hz
-140 dBc at 1 kHz, -150 dBc/Hz at 10 kHz
-155 dBc/Hz at 100 kHz
10 MHz ref can be disabled

Receive LNB Power

Selectable +13/+18V at 500 mA max
Min/max current limit alarm settable
LNB power can be disabled

Frequency Reference

External reference input on rear panel for 1, 5, 9, or 10 MHz.

Modulation and Demodulation (independent)

Programmable for BPSK, QPSK, OQPSK, 8PSK, 16QAM

Forward Error Correction

Viterbi k=7 and concatenated Reed-Solomon, n=126,
K=112, t=7 or n=219, k=201, t=9 or programmable
With depth of 4 or 8. Optional 4k or 16k turbo.

FEC Rates Selectable

R 1/2, 3/4, 7/8, or disabled, R 5/6 in Viterbi only.
R 2/3 in 8PSK

Data Rates

20 Mbps maximum except 7.38 Mbps BPSK R 1/2
14.76 Mbps max QPSK R 1/2
19.68 Mbps max 8PSK R 2/3
1.2 kbps min R 1/2, 2.4 kbps min R 3/4 or R 7/8 BPSK
2.4 kbps min R 1/2, 4.8 kbps min R 3/4 or R 7/8 QPSK OQPSK
9.6 kbps min 8PSK, 19.2 kbps 16QAM

IBS Multiplex Built-in

IBS framing supporting enhanced fully buffered RS-232/485
overhead channel, AUPC, remote modem control and
Variable overhead.

Data Rate Selection, Transmit & Receive

Programmable in 1bps increments. Accurate to 2 x 10E-12
(relative to reference).

Data Interface (All synchronous)

RS-449/422 or V.35 or EIA-530 or RS-232 electronically
selectable at DB-37 connector. DB25 and V.35 (M34)
Adaptors available.

BER Performance:

1/2 rate Viterbi, 10⁻⁵ at 4.8 dB Eb/No, 10⁻⁷ at 6.0 dB
1/2 rate Viterbi +R-S FEC: 10⁻⁷ at 3.7 dB, 3.5 dB typ
3/4 rate Viterbi +R-S FEC: 10⁻⁷ at 4.7 dB, 4.5 dB typ
1/2 Rate Turbo FEC: 10⁻⁷ at 3.0 dB, 2.8 dB typ
3/4 Rate Turbo FEC: 10⁻⁷ at 3.7 dB, 3.5 dB typ



M523L MODEM SPECS

Fast Receive Lock Performance at FEC rate 1/2, 6.0 dB Eb/No, +/-30kHz acquisition range, (Average)

315 msecond at 9.6 kbps QPSK or
175 msecond at 9.6 kbps BPSK
71 msecond at 64 kbps.QPSK

Receive Data FIFO Buffer Plesiochronous or Doppler Elastic Store

4 bits to 524,280 bits, programmable in 1 bit increments,
or in delay time.

Front Panel Control

LCD display and keypad provide full status and
programmability.

Remote Control

Terminal Mode: Full screen live display and interactive control
of all operating parameters and status.

Packet Mode: Command driven RS-232/485/IrDA control and
reporting of all parameters and status.

Case Dimension and Weights

Rack mount @ 1 RU (19"W X 14"D X 1.75"H.), 6.5 lbs

Input Power Requirements

90 to 264 VAC, 50/60 HZ, Approx. 40 Watts.
60 Watts max fully loaded

Operating Conditions

0 to 50° C, to 95% humidity, non-condensing