DATUM SYSTEMS

PSM-4900L   L-Band Transmit & Receive Programmable SCPC/VSAT Modem

DESCRIPTION

Datum Systems' new PSM-4900L 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 PSM-4900L uses Datum Systems' 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 PSM-4900L is the latest design based on the extremely successful and reliable PSM-4900 line of modems.

The BER vs. Eb/No performance is unmatched by any other modem in its class.

The PSM-4900L is capable of performing as both ends of a satellite Single Channel Per Carrier (SCPC) link, or as the VSAT remote site modem in a star system. The transmit and receive can independently be operated using BPSK or QPSK modulation at any data rate or configuration settings.

The PSM-4900L has the fastest and most sophisticated receive acquisition and tracking system on the market, improving on even the PSM-2100. It offers extremely fast DSP acquisition over a programmable range of +/- 100 Hz to +/- 1.25 MHz.

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

FEATURES

♦ BPSK or QPSK operation.

♦ L-Band Transmit allows use with Low Cost Block Up-Converters (BUC).

♦ BUC power/Reference from modem.

♦ Low cost receive by connecting an LNB directly to the L-Band IF input.

♦ LNB power/Reference from modem.

♦ Programmable receive acquisition/tracking range.

♦ Typical DSP acquisition time of 315 mseconds at 9.6 kbps QPSK, 71 mseconds at 64 kbps QPSK.

♦ BER vs. Eb/No performance within 0.3 dB of theoretical. 10-7 BER at 6.0 dB Eb/No (2.8 dB with TPC, 3.5 dB with Reed-Solomon codec).

♦ DDS transmit and receive frequency setting in 1 Hz increments.

♦ Programmable Interface type.

♦ Low power, light weight 1 U case.

♦ Built-in BER Test Set.

♦ DDS setting of transmit and receive data rates from 1.2 kbps to 4.92 Mbps in 1 bps increments.

♦ Optional IBS multiplexer and Reed-Solomon codec available. Provides fully integrated AUPC.

♦ Optional Turbo Product Codes or Reed-Solomon FEC available.

♦ 55 dB AGC range with -5 dBm composite input power.

♦ Fully programmable from either front panel or remote command without jumpers.

♦ Built-in 1:1 Redundancy.

♦ Designed to use external G.703 and Ethernet bridge interfaces.

♦ 8 User stored and recallable configurations. Automatic Recovery of stored configurations.

SPECIFICATIONS

Parameter	PSM-4900L
Operating Modes, all programmable:	Receive and Transmit Continuous (SCPC), Optional Tx Burst.
Transmit IF Frequency Range: Receive IF Frequency Range:	950 to 1750 MHz in 1 Hz Steps. 950 to 1900 MHz in 1 Hz Steps.
Transmit Output Power: (50 Ω Type N) Return Loss	+5 to -35 dBm, programmable in 0.1 dB steps 14 dB typical, 10 dB minimum.
Transmit Output Phase Noise:	Better than IESS-308/309 by 6 dB typical, 4 dB minimum.
Transmit Output Level Stability/Accuracy:	±0.5 dB, 0 ~ 50°C, accurate ±0.5 dB, 950 ~ 1750 MHz at 25°C
Transmit Output Spurious/Harmonics:	<-50 dBc / <-50 dBc up to -10 dBm, <-40 dBc @ + 5 dBm out
Receive Carrier Level In (75 Ω Type F): Return Loss	-20 to -70 dBm, scales to –101 at lower data rates. Formula is: minimum = 10log(symbol rate)-135dBm 10 dB minimum.
Maximum Composite Receive Input Power	-5 dBm or +40 dBc whichever is lower power
Receive Demodulator Phase Noise:	Better than IESS-308/309 by 4 dB minimum., 6 dB typical.
Receive Acquisition Range:	Programmable from ± 100 Hz to ± 1.25 MHz
Transmit BUC Power: (via DIN plug on rear). Voltage and Current monitor at Front Panel. Transmit BUC Reference:(can be disabled).	Nominal 24VDC, 95 Watts (Or 12/36/48 VDC). Maximum 60 Vdc / 6 A, up to 250 W. Max/Min V and current alarms limits settable. 10 MHz at nominal +3 dBm from internal or external reference.
Receive LNB Power: (can be disabled). Current monitor at Front Panel. Receive LNB Reference: (can be disabled).	Selectable +13/+18 VDC at <500mA. Max/Min current alarms limits settable. 10 MHz at nominal -3 dBm internal or external reference.
Frequency Reference (Internal) Stability/Aging Reference Phase Noise External:	1 x 10 -7 OCXO. 2 x 10 -7/year aging. -110 dBc at 10 Hz -130 dBc at 100 Hz -140 dBc at 1 kHz -150 dBc at 10 kHz -155 dBc at 100 kHz External reference input on rear panel for 1, 5, 9, or 10 MHz. Internal OCXO phase locks to external input.
Modulation and Demodulation:	Programmable for BPSK or QPSK independently
Forward Error Correction: Optional Turbo Product Codes: Optional Concatenated Reed-Solomon:	Viterbi. k=7 Rates 1/2, 3/4 or 7/8. Standard and Short Block. n=126, k=112, t=7 or n=219, k=201,t=9 or programmable with depth of 4 or 8
FEC (Viterbi or TPC) Rates Selectable:	1/2, 3/4 or 7/8
Data Rates Programmable at FEC rate 1/2: (without IBS mux or R-S option)	1.2 kbps to 1,230 kbps BPSK, 2.4 kbps to 2,460 kbps QPSK
Data Rates Programmable at FEC rate 3/4 or 7/8 (without IBS mux or R-S option)	2.4 kbps to 2,460 kbps BPSK, 4.8 kbps to 4,920 kbps QPSK
IBS Multiplex Option:	IBS framing supporting enhanced 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).
Receive Data FIFO Buffer: Plesiochronous or Doppler Elastic Store	4 bits to 131,070 bits, programmable in 1 bit increments, or in delay time.
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: with Viterbi FEC ½ rate:
  ½ rate Viterbi +R-S Concatenated FEC:
  ¾ rate Viterbi +R-S Concatenated FEC:
  ½ rate Turbo Product Codes FEC:
  ¾ rate Turbo Product Codes FEC:
	10-7 at 6.0 dB Eb/No, 10-5 at 4.8 dB
	10-7 at 3.7 dB, 3.5 dB typical (n=126, k=112)
	10-7 at 4.7 dB, 4.5 dB typical
	10-7 at 3.0 dB, 2.8 dB typical
	10-7 at 3.7 dB, 3.5 dB typical

Fast Receive Lock Performance at FEC rate ½, 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
Front Panel Control:	LCD display and keypad provide full status and programmability.
Remote Control: Terminal Mode: Packet Mode:	Full screen live display and interactive control of all operating parameters and status. Command packet driven RS-232/485/IrDA control and reporting of all parameters and status.
Case Dimensions:	Rack mount @ 1 RU (19"W X 14"D X 1.75"H.)
Input Power Requirements (without BUC):	90 to 264 VAC, 50/60 HZ, Approx. 40 Watts, 60 Watts maximum, fully loaded including LNB power.
Operating Conditions:	0 to 50° C, to 95% humidity, non-condensing.