DATUM SYSTEMS
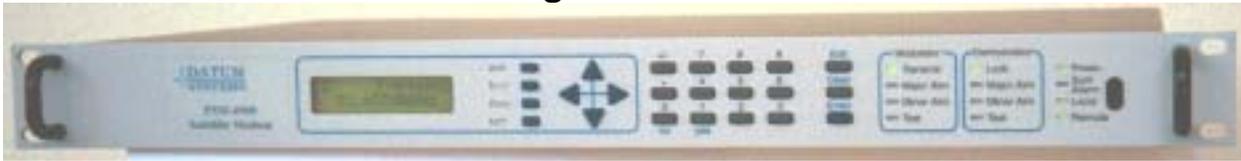
PSM-4900H   70 MHz Transmit, L-Band Receive Programmable SCPC/VSAT Modem

DESCRIPTION

Datum Systems' new PSM-4900H 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-4900H 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-4900 is the latest design based on the extremely successful and reliable PSM-2100 line of modems.

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

The PSM-4900H 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-4900H has the 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

- ♦ Low cost receive by connecting an LNB directly to the L-Band IF input.
- ♦ BPSK or QPSK operation.
- ♦ SCPC or VSAT remote mode (Burst modulation).
- ♦ 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 (3.5 dB Eb/No 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.
- ♦ 40 dB AGC range with -5 dBm composite input power.
- ♦ Fully programmable from either front panel or remote command without jumpers.
- ♦ Accurate Eb/No and Symbol Error Rate display.
- ♦ 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.
- ♦ LNB power/Reference from modem.

SPECIFICATIONS

Parameter	PSM-4900H
Operating Modes, all programmable:	- Receive and Transmit Continuous (SCPC) – Optional Transmit Burst (VSAT)
Transmit IF Frequency Range: Receive IF Frequency Range:	50 to 90 MHz (optional 100 to 180 MHz) 950 to 1900 MHz
Transmit Output Power: (Programmable 50 or 75 Ω)	+5 to -35 dBm, programmable in 0.1 dB steps (max. +3 dBm @ 50Ω)
Receive Carrier Power In (75 Ω):	-20 to -70 dBm, scales to –101 at lower rates. minimum = 10log(symbol rate)-135dBm
Maximum Composite Receive Input Power	-5 dBm or +40 dBc whichever is lower power
Transmit/Receive Frequency Setting:	1 Hz steps
Receive Acquisition Range:	Programmable from $\pm$ 100 Hz to $\pm$ 1.25 MHz
Receive LNB Power: (can be disabled). Receive LNB Reference: (can be disabled).	Selectable +13/+18 VDC at <500mA. 10 MHz from internal or external reference.
Frequency Reference:	Internal 2.0 ppm oscillator. 1ppm optional. External reference input on rear panel for 1, 5, 9, or 10 MHz.
Modulation and Demodulation:	Programmable for BPSK or QPSK independently
Forward Error Correction: Optional Concatenated Reed-Solomon:	Viterbi. k=7 n=126, k=112, t=7 or n=219, k=201,t=9 or programmable with depth of 4 or 8
FEC 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 fully buffered RS-232/485 overhead channel.
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.

BER Performance: with Viterbi FEC ½ rate:
  ½ rate Viterbi +R-S Concatenated FEC:
  ¾ rate Viterbi +R-S Concatenated FEC:
	10-5 at 4.8 dB Eb/No, 10-7 at 6.0 dB
	10-7 at 3.4 dB (n=126, k=112)
	10-7 at 4.5 dB

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:	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 Dimensions:	Rack mount @ 1 RU (19"W X 13"D X 1.75"H.)
Input Power Requirements:	90 to 264 VAC, 50/60 HZ, Approx. 30 Watts.
Operating Conditions:	0 to 50° C, to 95% humidity, non-condensing.