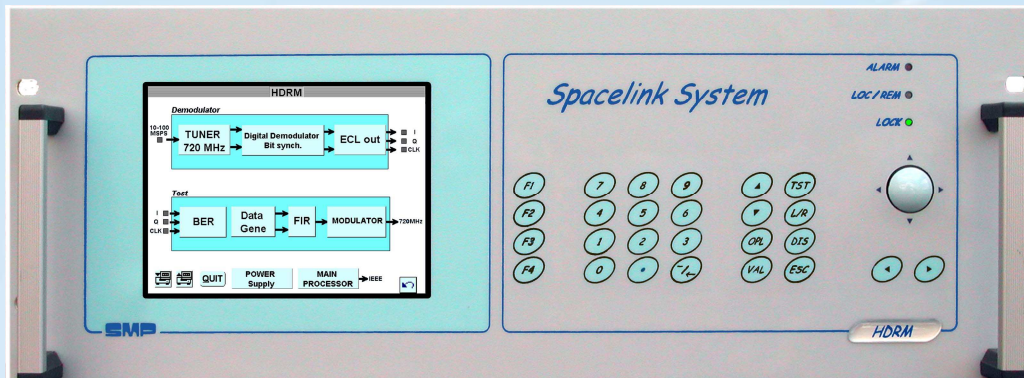


# SPACELINK SYSTEM

## MODEL : H.D.R.M



The SPACELINK SYSTEM is directly derived from our multi-modes experience. With new technologies and new digital boards, SMP shows its own capability to develop a complete solution for tracking, demodulation, synchronization & decoding in a single equipment as well as test facility (BER, Modulator).

With the on-head Down-Converter and Ingest options, the HDRM offers to the Customer a complete solution in a single box, more reliable and at low cost.

The SMP SPACELINK system is **fully configurable** and **fully upgradable** via Ethernet link.

The characteristics of the **High Data Rate Modem** are defined for receiving, through earth stations or test benches, high data bit streams available in the field of sensing and sciences.

### FEATURES

- On-head Down-Converter (option)
- Data Ingest and Front End Processing functions (option)
- Fully digital design (demodulator, bit synchronizer. & decoding)
- BPSK, QPSK, AQPSK, SQPSK demodulations
- 8PSK capability fully compliant with PLEIADE generation
- Programmable bit rate (up to 500 Mbps)
- Up to 2 TMI channels per main frame
- BER measurements and PRBS generator + Test Modulator
- Compatible with SPOT – SARLUPE – EROS – IRS – MODIS – ERS/RADARSAT – ENVISAT – COSMO SKYMED.
- Large and bright color screen for easy to use human/machine interface
- Compact design rack 19", 3 U

CHARACTERISTICS OF DEMODULATOR		CHARACTERISTICS OF MODULATOR	
<b>General</b>		<b>General</b>	
<ul style="list-style-type: none"> <li>● Frequency : 720 MHz / 375 MHz / 1200 MHz</li> <li>● Connector : Type N female</li> <li>● Impedance : 50 Ohms – VSWR &lt; 1.3</li> <li>● Signal level : -10 dBm to -50 dBm</li> <li>● AGC time constant : 1 ms</li> <li>● IF bandwidth : 260 MHz</li> </ul>	<ul style="list-style-type: none"> <li>● Frequency : 720 MHz / 375 MHz / 1200 MHz</li> <li>● Stability : <math>2.10^{-6}</math> / 24 hours</li> <li>● Level : -81 dBm to -10 dBm (step 1 dB)</li> <li>● Impedance : 50 <math>\Omega</math> - VSWR &lt; 1.3</li> <li>● Connector : Type N female</li> <li>● Phase noise : -51 -10 log F/10 Hz <math>\leq</math> f <math>\leq</math> 1 MHz</li> <li>● Spurious : Harmonic -40 dBc</li> <li>● Modulation : BPSK/QPSK/SQPSK/AQPSK</li> <li>● Phase error bet. State : 2 degrees (1° typ.)</li> <li>● Level unbalance : 1 dB (0.5 dB typ.)</li> </ul>		
<b>Demodulator</b>		<b>BER Measurement</b>	
<ul style="list-style-type: none"> <li>● Type : Fully digital – continuous Demodulations BPSK, QPSK SQPSK, AQPSK</li> <li>● Digital rhythm : 5 to 350 Mbps fully programmable Step of 1 kHz</li> <li>● Search range : <math>\pm 1.5</math> MHz, <math>\pm 800</math> kHz <math>\pm 400</math> kHz, <math>\pm 200</math> kHz</li> <li>● Acquisition time : &lt; 300 ms</li> <li>● Lock in : 99 % with E/No <math>\geq 7</math> dB Symmetrical noise</li> <li>● Loop bandwidth (2BL) : 30 kHz</li> </ul>	<b>Generation</b> <ul style="list-style-type: none"> <li>● Frequency : 2 channels - 10 - 175 MHz (prog. step 1 kHz)</li> <li>● Differential coder, transcoder</li> </ul> <b>Data</b> <ul style="list-style-type: none"> <li>● Number of channel : 2</li> <li>● Data binary format : NRZ</li> <li>● Word data length (bits) : standard = <math>2^{11} - 1</math>, <math>2^{15} - 1</math>, <math>2^{23} - 1</math></li> </ul>		
<b>Bits synchronizer</b>		<b>Measurement</b>	
<ul style="list-style-type: none"> <li>● Acquisition range : <math>\pm 0.5</math> % Rb</li> <li>● Holding range : <math>\pm 1</math> % Rb</li> <li>● Eb/No threshold : <math>\geq 4</math> dB (probability 99 %)</li> <li>● BER degradation : 2 dB max.(1 dB typ.) (between <math>10^{-3}</math> &amp; <math>10^{-7}</math>)</li> <li>● Data/Clock Jitter : &lt; 2 ns</li> <li>● Symmetrical clock : <math>\pm 5</math> % of half period</li> </ul>	<ul style="list-style-type: none"> <li>● Rate : 10 to 160 Mbps (320 Mbps in MUX)</li> <li>● Format : NRZ</li> <li>● Code : Standard = <math>2^{11} - 1</math>, <math>2^{15} - 1</math>, <math>2^{23} - 1</math></li> <li>● BER resolution : <math>10^{-3}</math> and <math>10^{-9}</math></li> <li>● Polarity : Data / <math>\overline{\text{Data}}</math> Clock / <math>\overline{\text{Clock}}</math></li> <li>● Selection : Channel I / Channel Q</li> <li>● Ambiguity level : Automatic</li> <li>● Interface : Single ECL</li> <li>● Impedance : 50 ohms</li> <li>● Connector : BNC female</li> <li>● Input : Data + Clock</li> </ul>		
<b>Data outputs</b>			
<ul style="list-style-type: none"> <li>● Differential decoder, merging, transcoder</li> <li>● ECL output (BNC female) data + clock</li> </ul>			
<b>MONITORING &amp; CONTROL</b>			
<ul style="list-style-type: none"> <li>● Interfaces : IEEE-488.1 – RS-232/RS-422/ RS-485/Ethernet (std)</li> </ul>			
<b>OPTIONS</b>			
01. Delete internal PRBS code generator & BER measurements, noise generator. Modulator compliant with the demodulator.	09. Bit rate up to 500 Mbps		
02. LVDS interface	10. Tracking receiver (Monoscan)		
03. Doppler and fading simulation (rate & range program)	11. Data Ingest and Front End Processing functions		
04. Beacon generation	12. Graphic User Interface (GUI)		
05. Programmable filters (FIR) : SRRRC/RRC -0.2 to 0.5 by step of 0.05	13. Antenna Control Unit (ACU)		
06. a-Viterbi (max input 100Mbps) / b-RS (max input 320 Mbps)	14. Optional interface : RS-232/RS-422/ RS-485 – IEEE-488.1		
07. 8PSK demodulator + Treillis code	15. On-head Down-Converter		
08. 2 TMI demodulators + TM/BER in the same unit	16. Noise generator		
<b>POWER SUPPLY</b>		<b>DIMENSIONS</b>	
<ul style="list-style-type: none"> <li>● Voltage : 120 V / 240 V <math>\pm 10</math> %</li> <li>● Frequency : 45 to 65 Hz</li> <li>● Power consumption : 150 VA max.</li> </ul>	<ul style="list-style-type: none"> <li>● Drawer : 19<sup>th</sup> standard x 4 U x 500 mm (depth)</li> </ul>		
<b>ENVIRONMENTAL CONDITIONS</b>		<b>RELIABILITY</b>	
<ul style="list-style-type: none"> <li>● Temperature : Operating : +15°C to +40°C Non-operating : -20°C to +60°C</li> <li>● Humidity : – Operating : 70 % without condensing – Non-operating : any in the original packing</li> </ul>	<ul style="list-style-type: none"> <li>● Modulator design to ease maintenance</li> <li>● MTBF : 40 000 hours</li> <li>● MTTR : 4 hours With a full lot of spare parts</li> </ul>		