P300i & P310i Internet Modems

Satellite Modems with Mentat SkyX Accelerated TCP/IP Router

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General Description

The P300i and P310i are the *Internet* versions of the popular P300 (70/140MHz IF) and P310 (L-Band) satellite modems. Designed for point to point and point to multi-point operation they provide satellite IP connectivity to avoid terrestrial network congestion and supply guaranteed bandwidth for critical applications.

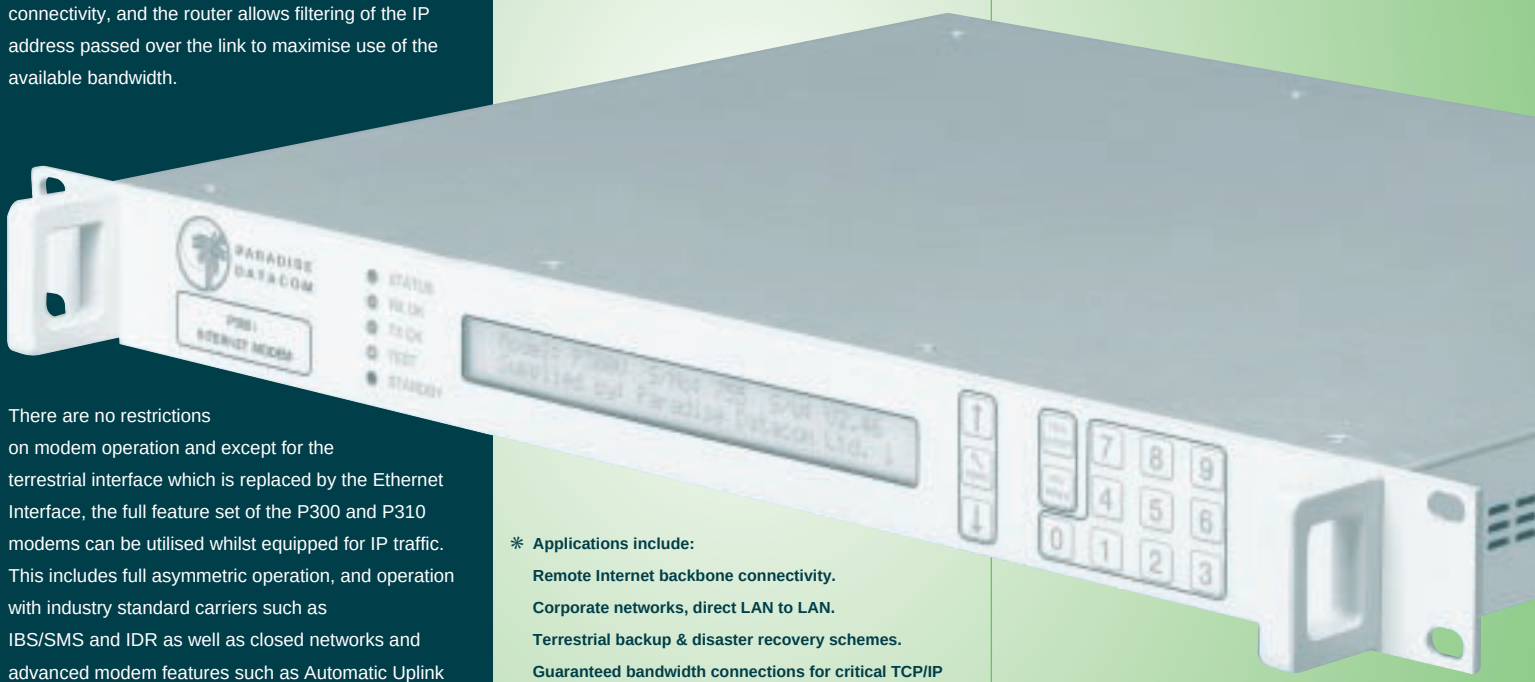
Both modems integrate a direct auto-switching 10/100 Base-T ethernet port, IP Router, and TCP/IP protocol accelerator all into the standard modem 1U housing.

The SkyX protocol accelerator provides a mechanism to avoid the well documented problems of passing TCP/IP over satellite. The ethernet port provides direct network connectivity, and the router allows filtering of the IP address passed over the link to maximise use of the available bandwidth.

There are no restrictions on modem operation and except for the terrestrial interface which is replaced by the Ethernet Interface, the full feature set of the P300 and P310 modems can be utilised whilst equipped for IP traffic. This includes full asymmetric operation, and operation with industry standard carriers such as IBS/SMS and IDR as well as closed networks and advanced modem features such as Automatic Uplink Power Control (AUPC).

The Internet Modem is transparent to TCP/IP and UDP/IP protocols, and will seamlessly handle all the higher level applications which utilise these such as HTTP, FTP, Telnet etc.

- **TCP 128kbps limitation per connection removed with SkyX protocol acceleration.**
- **Satellite Modem, Ethernet port, IP Router, and TCP/IP Protocol Accelerator allow seamless integration with LAN/WAN without server or workstation reconfiguration.**
- **Protocol Accelerator overcomes TCP/IP limitation over satellite, full satellite bandwidth available to any connection.**
- **Full feature set of modems available, IBS/SMS, IDR, Closed Net, Turbo coding, Reed-Solomon, etc. All housed in just 1U.**
- **L-Band version includes DC supply for LNB achieves complete earth station with just one indoor unit plus outdoor L-Band 'Radio'**
- **Ethernet Port Management by SNMP agent.**



- **Applications include:**
  - **Remote Internet backbone connectivity.**
  - **Corporate networks, direct LAN to LAN.**
  - **Terrestrial backup & disaster recovery schemes.**
  - **Guaranteed bandwidth connections for critical TCP/IP applications.**
  - **300% HTTP/WWW performance improvement with SkyX.**
  - ***The* most cost effective solution!**

EN 60950 (Safety)
EN 55022 Class B (Emissions)
EN 55082 Part 1 (Immunity)

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Front Panel

Rear Panel

Optional features are shown in [square brackets], consult the P300 or P310 data sheets for full modem feature/options list.

Router & Ethernet Interface

IP Capacity	TCP/IP Protocol conversion to overcome satellite latency for rates up to 5Mbps over satellite
Interface	Auto switching 10/100BaseT Ethernet port on UTP (RJ45) connector. 802.2, 802.3 and Ethernet II support
Router type	Static IP router configured by PC utility over Ethernet Port
Protocols Supported	HTTP, FTP, Telnet, POP3, PING, SNMP, SMTP, ICMP, TFTP, BootP, LPR, and others running over TCP/IP
Other Features	Full asymmetric operation up to 100:3 as 3% return bandwidth required for ACK traffic over the satellite
Monitor & Control	Remote FTP and Telnet configuration

Modem

Modulation	BPSK, QPSK, OQPSK, [8PSK]
IF Frequency	P300i: 70MHz to 90MHz, [option 70MHz to 180MHz] P310i: 950MHz to 1750MHz, [Option 950MHz to 2150MHz]
Data Rates	4.8kbps to 512kbps [option 4.8kbps to 5.0Mbps]
Services	Closed Network, [Closed Net Plus ESC], [IBS/SMS], [IDR]
Inner FEC	Uncoded, [Viterbi], [Sequential], [Trellis, TCM], [Turbo Product Code, TPC], [INTELSAT Turbo Convolutional Code, TCC]
Outer FEC	[Intelsat Reed-Solomon codec], [variable code rate RS option]
Filtering	Intelsat IESS compliant, equivalent to 6th order Butterworth with group and amplitude equalisation
Scrambling	Auto selection of correct scrambler to match config with manual override, from self sync V.35 (four variants), synchronous IBS, synchronous Reed-Solomon, synchronous Turbo (2^{12}-1)
Clock Tracking	±100PPM min

Modulator

Tx Spectrum & Phase noise	IESS 308/309/310
TX On/Off ratio	55 dB minimum
Carrier Suppression	-30dBc minimum
TX Power Range	P300i: 0 dBm to -25 dBm, 0.1 dB steps P310i: -5 to -30dBm, 0.1 dB steps
Output Level Stability	P300i: ±0.5dB at 25deg ±10 deg C P310i: as P300i ±0.5dB 950MHz to 1750MHz
Output Frequency Stability	Std 1PPM, P310i options for $7x10^{-7}$, $1x10^{-7}$, $7.5x10^{-8}$
Harmonics & Spurious	P300i: Better than -55dBc/4kHz
IF Input Range	P300i: -30 to -60dBm P310i: -20 to -70dBm

Demodulator

Max Composite Power	P300i: 30dB above desired carrier, <0dBm P310i: -10dBm
Frequency Acquisition	±1 to ± 32kHz
Acquisition Threshold	<5dB Eb/No
BER Performance	In all cases IESS compliant, met in the presence ot two adjacent carriers both 10dB higher than wanted carrier. See P300 & P310 data sheets for full spec

Modem (Common)

Asymmetry / Clocking	Tx/Rx fully service, FEC, and data rate independent, including Rx=Tx and Tx=Rx (`asymmetric clock loop`) modes
Station Clock	1MHz to 10MHz in 1kHz steps, RS422 or sine/square on transformer coupled 75 Ω BNC. 10MHz station reference may also be used as ref for Tx/Rx IF synthesisers
M&C	RS232 (direct to PC), RS485 (Multidrop/packet) and Terminal Modes
ESC & Aux Channels	As per IESS, plus high rate async ESC in min overhead (to <0.5%) for distant end M&C / AUPC, including centralised log retrieval and quality of service logging
Size	P300i 1U high chassis, 355 mm deep P310i: 1U high chassis, 440 mm deep
Weight	P300i: 7 lbs (3 kg) P310i: 8.4 lbs (3.8 kg) without reference or SSPA PSU options
Operating Temp	0C to 50C
Safety	EN 60950
EMC	EN 55022 Class B (emissions) EN 55082 Part 1 (immunity)
Power Supply	85-264 VAC, 47-63 Hz fused IEC connector P300i: 35 Watts maximum. P310i: 75 Watts without optional higher stability reference or LNB/SSPA DC outputs active

Option Summary

Please refer to the individual P300 & P310 modem data sheets for full option details, including standard configurations for VSAT, IBS, IDR, and TCM applications.

Modem:

Modulation	8PSK
Inner FEC	Viterbi, Sequential, Trellis (TCM), Turbo Product Code (TPC) and INTELSAT Turbo Convolutional Code (TCC)
Outer FEC	INTELSAT Reed-Solomon, full variable code rate option
IF	P300i, 70MHz to 180MHz (instead of 70MHz to 90MHz) P310i: 950MHz to 2150MHz (instead of 1750MHz)
Framing	IBS/SMS, IDR, Closed Net plus ESC (ESC o/h to <0.5%)
Async ESC	High rate ESC , for use in Closed Net Plus ESC, IBS/SMS and IDR applications
PRBS Tester	Full PRBS tester can run in main channel or in parallel through ESC/Aux channels with log of results for continuous quality of service monitoring
AUPC	Automatic Uplink Power Control (requires async ESC option also)
Monitor/AGC	Carrier level monitor, software configured AGC output, constellation monitor port.
References	Std 1PPM, P310i options for $7x10^{-7}$, $1x10^{-7}$, $7.5x10^{-8}$
SSPA Supply	P310: 15V/24V@500mA for LNB is standard, option for 4A 24V for SSPA

Future Options

Built in:	Proxy Server provides DHCP and NAT for up to 250 devices
	Web Server
	Full SNMP management
Router:	
Additional protocols	IPX/SPX, & Ethertalk
Dynamic routing	RIP-2 and OSPF