

# EVOLUTION Series PD25L L-Band Satellite Modem



### **OVERVIEW**

The Evolution Series PD25L has been designed for cost-critical modem applications and discerning users who demand quality and reliability at an affordable price. This **25Mbps** capable modem offers full compliance with IESS-308, 309, 310, 314 & 315, plus a range of data interfaces including Ethernet. The Evolution Series Satellite Modem design is based on highly programmable logic giving the flexibility of instant feature upgrades and built-in future-proofing.

### **Advanced Bandwidth-Efficient Features**

Evolution Series Modems contain a host of bandwidth-efficient features, which can all be used at the same time.

Paired Carrier<sup>™</sup> overlays transmit and receive carriers reducing satellite bandwidth by up to 50%. Paired Carrier<sup>™</sup> uses ViaSat's patented PCMA technology.

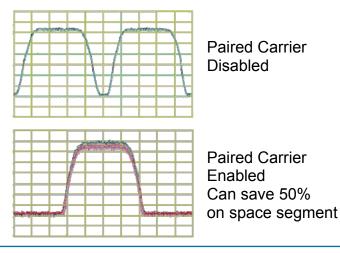
FastLink<sup>™</sup> low-latency LDPC has been designed specifically for latency-sensitive applications while giving coding gain that is close to the theoretical limits.

Advanced bandwidth-saving IP features include acceleration and header and payload compression. A sophisticated on-board IP traffic shaping feature allows end-to-end provisioning of quality of service.

## **FEATURES**

- Data rate options to 25Mbps, 12.5Msps.
- ▶ Paired Carrier<sup>™</sup> option.
- A wide range of terrestrial interfaces including Ethernet, serial and G.703.
- Advanced IP feature set including TCP acceleration, compression, routing, bridging, traffic shaping, ACM, VCM and throughput/ diagnostic graphs.
- FastLink Low-Latency LDPC, 2nd Generation Turbo (TPC) and other FEC options.
- Modulations up to 64QAM.
- New! Patent-pending LinkGuard<sup>™</sup> signalunder-carrier interference detection.

### Paired Carrier<sup>™</sup> Operation



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# **EVOLUTION Series**

# PD25L L-Band Satellite Modem

Main Specifications			
Frequency	950 to 2050MHz (resolution 100Hz) (N -type connector)		
Data Rate	4.8kbps to 25Mbps 1bps resolution Operation to 2,048kbps provided as standard; extension options to 5Mbps, 10Mbps, 25Mbps		
Symbol Rate	9.6ksps to 12.5Msps		
Operating Modes	Closed Network (+ESC) (IESS-315) IBS/IDR (IESS-308/309/310/314) options		
Scrambling	IBS: Synchronised to framing per IESS-309 IDR with RS coding: Synchronised to RS overhead IDR, no RS coding, non-TPC FEC: V.35 self-synchronising IDR, no RS coding, with TPC FEC: 2^12-1 up to 10 Mbps Closed+ESC: Synchronised to ESC overhead		
L-band Impedance	50Ω		
Return Loss	14dB typical		
Frequency Reference Stability	<4E-8/yr		
External Reference	Clocking only: 1 to 10MHz, 1kHz steps Clocking and RF frequency: 10MHz, 0dBm±1dB		
Redundancy	Can be operated in standalone, 1:1 or 1:N redundancy configuration		

# Traffic Interfaces Base modem (standard): Ethernet (10/100 BaseT) IP traffic on RJ45 Traffic options: IP Traffic card 10/100/1000 BaseT on RJ45 (increases performance compared to base modem IP traffic) RS422, X.21, V.35 and RS232 on EIA530 connector (25-pin D-type female) Serial LVDS (25-pin D-type female) G.703 (balanced on EIA530) G.703 (unbalanced on BNC 75Ω female) Quad E1 G.703 (balanced on RJ45) HSSI (50-pin HD SCSI-2 connector) MultiMux option: generates a single carrier from any mixture of G.703, IP and EIA530 traffic

Modulator			
Output Power	0 to -30dBm (0.1dB steps)		
Output Power Stability	±0.5dB, 0°C to 50°C		
Transmit Filter Roll-off	20%, 25%, 35%		
Phase Accuracy	±2° maximum		
Amplitude Accuracy	±0.2dB maximum		
Carrier Suppression	-30dBc minimum		
Output Phase Noise	As IESS-316, nominally 3dB better		
Harmonics	Better than -55dBc/ 4kHz in band		
Spurious	Better than -55dBc/ 4kHz in band		
Transmit On/Off Ratio	55dB minimum		
Adaptive Signal Predistorter Option	Use with 16QAM to relax HPA backoff by up to 1.6dB. Compensates for HPA non-linearities		

Demodulat	or
Input Range	Minimum: -130+10 log symbol rate
	Maximum: -80+10 log (symbol rate)
Maximum	+10dBm
Composite Signal	
Wanted-to-	-102+10 log (symbol rate)
composite	
Level	
Frequency	±1kHz to ±32kHz up to 10 Msps
Sweep Width	(1kHz steps)
	±10kHz to ±250kHz above 10 Msps
Acquisition	(10kHz steps) <5dB Es/No QPSK
Threshold	SUB ES/NU QF3K
Acquisition	Dependent on FEC, data rate and
Time	sweep width (at 9.6kbps, less than
	1s at 6dB Es/No QPSK; at 10Mbps,
	less than 100ms at 6dB Es/No QPSK)
Clock Tracking	±100ppm minimum
Range	
Receive Filter	20%, 25%, 35%
Roll-off	
Performance Monitoring	Eb/No (range 0-15dB, ±0.2dB)
wonitoring	Frequency offset (100Hz resolution) Receive signal level
	Buffer fill status
AGC Output	Buffered direct AGC output for
rice capar	antenna tracking, etc.
	·
Forward Er	ror Correction
Modulation	BPSK, QPSK, OQPSK plus options
	for: 8PSK, 16QAM, FastLink 8QAM,
	FastLink 16APSK, FastLink 32APSK,
	FastLink 64QAM
FEC	Note BPSK and (O)QPSK provided as
	standard; other modulations are op- tions
	FastLink Low-Latency LDPC option:
	BPSK 0.499
	(O)QPSK 0.532, 0.639, 0.710, 0.798
	8PSK/8QAM: 0.639, 0.710, 0.778
	16APSK/16QAM: 0.726, 0.778, 0.828,
	0.851
	32APSK: 0.778, 0.828, 0.886, 0.938
	64QAM: 0.828, 0.886, 0.938, 0.960 TPC option:
	BPSK 5/16, 21/44,
	0.493 (Paradise), 2/3, 3/4,
	0.789 (Paradise),
	7/8 (Paradise), Rate 7/8 de facto
	(O)QPSK: 5/16, 21/44,
	0.493 (Paradise), 2/3, 3/4,
	0.789 (Paradise), 7/8 (Paradise),
	0.789 (Paradise), 7/8 (Paradise), 7/8 de facto, 0.93 (Paradise)
	0.789 (Paradise), 7/8 (Paradise), 7/8 de facto, 0.93 (Paradise) 8PSK: 3/4 de facto, 7/8 de facto,
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	0.789 (Paradise), 7/8 (Paradise), 7/8 de facto, 0.93 (Paradise) 8PSK: 3/4 de facto, 7/8 de facto, 0.93 (Paradise)
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	0.789 (Paradise), 7/8 (Paradise), 7/8 de facto, 0.93 (Paradise) 8PSK: 3/4 de facto, 7/8 de facto, 0.93 (Paradise) 16QAM: 3/4 de facto, 7/8 de facto, 0.93 (Paradise) Viterbi: BPSK/(O)QPSK 1/2, 3/4, 7/8 TCM option: 8PSK 2/3 Sequential option: BPSK/(O)QPSK 1/2,
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Ethernet T	raffic
Throughput Performance	The maximum modem through- put depends on IP traffic format and the features enabled. Bridged IP/ UDP data can be processed up to the modem maximum data rate. Please seek assistance from Paradise Datacom in evaluating your particular requirements.
Routing and Bridging	Bridging (standard). Static routing (standard). Dynamic routing option: RIP V1, V2; OSPF V2, V3; BGP V4
TCP Acceleration Option	Typical throughput level of 90% of link capacity. IP Traffic card option: Supports 5,000 concurrent accelerated TCP connections (plus at least 35,000 unaccelerated TCP connections) up to the modem maximum data rate. Base modem TCP acceleration option is restricted to 1000 accelerat- ed TCP connections and 10Mbps. IP Traffic card includes HTTP Accel- eration (reduces web page download times)
Header Compression Option	IP Traffic card option. Robust Header Compression to RFC 3095. Reduces Ethernet/IP/UDP/RTP header sizes typically by 90%. 1-way packet pro- cessing limit: 29,000 pps; 2-way limit: 22,000 pps. Includes Ethernet head- er compression (compresses 14-byte Ethernet frame to typically one byte)
Traffic Shaping Option	Provides guaranteed throughput levels for IP streams, using Commit- ted Information Rate and Burst Infor- mation Rate settings. Stream differentiation is by IP address, IEEE 802.1p priority class, Diffserv DSCP class or MPLS EXP field
Encryption Option	Encrypts all IP traffic using AES with 256-bit keys
VLAN Support	IEEE 802.1q VLAN support (standard) IEEE 802.1p Quality of Service (packet prioritisation) using strict priority or fair weighting queuing
DHCP, SNMP	DHCP (standard) for automatic allocation of M&C IP address. SNMP (standard) v1, v2c and v3
Web Server	Embedded web server M&C inter- face (standard)
IP Diagnostic Graphs	Shows Tx, Rx throughput (bps, pps); dropped, errored packet counts (standard)

# **EVOLUTION Series** PD25L L-Band Satellite Modem



common BERtesters

Bit error rate tester operates over main traffic, ESC or Aux channels, allowing BER monitoring while on

Various test patterns compatible with

**EZ BERT Option** BER Channel

Test Patterns

traffic

Paired Carr	ier
Paired Carrier	Transmit and receive carriers are overlaid on top of each other in the same space segment. Echo cancella- tion techniques are used in the demod- ulator to cancel the transmit carrier and extract the wanted receive carrier signal
Paired Carrier data rate options	256kbps, 512kbps, 1024kbps, 2.5Mbps, 5Mbps, 10Mbps, 15Mbps, 20Mbps, 25Mbps (30kHz minimum occupied bandwidth; operates to maxi- mum symbol rate of modem)
Supported power asymmetry	-10dB to +10dB
Supported symbol rate asymmetry	Up to 12:1
Eb/No degradation	Typically < 0.5dB (0.7dB for 16QAM/16APSK with 10dB power asymmetry)
Mobile Operation	Uses GPS data to continually recalculate position relative to satellite, allowing uninterrupted operation in mobile environments (ships, etc.) anywhere in satellite footprint

		Rate 1/2	Rate 3/4	Rate 7/8	Rate 2/3	Rate 0.93
	1E-4	4.7 (4.4)	6.1 (5.8)	7.1 (6.8)		
Viterbi QPSK	1E-8	7.2 (6.9)	8.8 (8.5)	9.5 (9.2)		
Sequential	1E-4	4.3 (4.0)	5.4 (5.1)	6.4 (6.1)		
(64kbps)	1E-8	6.4 (6.1)	7.3 (7.0)	8.6 (8.3)		
Sequential	1E-4	5.6 (5.3)	6.1 (5.8)	6.9 (6.6)		
(2048kbps)	1E-8	7.5 (7.2)	8.1 (7.8)	8.4 (8.1)		
	1E-4	2.7 (2.4)	3.5 (3.2)	4.1 (3.8)		
Turbo (TPC) OPSK	1E-6					6.3 (6.0)
	1E-8	3.3 (3.0)	4.5 (4.2)	4.5 (4.2)		6.8 (6.5)
	1E-4		5.6 (5.3)	6.8 (6.5)		
Turbo (TPC) 8PSK	1E-6					9.2 (8.9)
	1E-8		6.8 (6.3)	7.2 (6.8)		9.9 (9.6)
	1E-3		6.5 (6.2)	7.7 (7.4)		
Turbo (TPC)	1E-6					10.0 (9.7)
16QAM	1E-7		7.8 (7.5)	8.2 (7.8)		
	1E-8					10.7 (10.4)
8PSK/TCM	1E-3				6.3 (6.0)	
OF SIVE OM	1E-8				10.4 (10.1)	
8PSK/TCM +	1E-4				6.1 (5.8)	
Reed-Solomon (all rates)	1E-10				7.3 (7.0)	

BUC from the modem via the Tx IFL

10MHz output level to BUC:

+3dBm (+/-1dBm) 10MHz output level to LNB:

0dBm (+/-1dBm)

E-4	4.3 (4.0)	5.4 (5.1)	0.4 (0.1)				
E-8	6.4 (6.1)	7.3 (7.0)	8.6 (8.3)			Other test	Transmit CW (pure carrier)
E-4	5.6 (5.3)	6.1 (5.8)	6.9 (6.6)			modes	Transmit alternate 1-0 pattern
E-8	7.5 (7.2)	8.1 (7.8)	8.4 (8.1)				Simulated satellite delay for TCP/IP
E-4	2.7 (2.4)	3.5 (3.2)	4.1 (3.8)				packets
E-6					6.3 (6.0)		
E-8	3.3 (3.0)	4.5 (4.2)	4.5 (4.2)		6.8 (6.5)	Mechanica	al/Environmental
E-4		5.6 (5.3)	6.8 (6.5)			Size	1U chassis, 410mm deep excluding
E-6					9.2 (8.9)		front panel handles and rear panel
E-8		6.8 (6.3)	7.2 (6.8)		9.9 (9.6)		connectors and fans
E-3		6.5 (6.2)	7.7 (7.4)			Weight	3.5kg
E-6					10.0 (9.7)	Power Sup-	100-240VAC, +6%, -10%, 1A
E-7		7.8 (7.5)	8.2 (7.8)			ply	@100V, 0.5A @ 240V, 47-63Hz
E-8					10.7 (10.4)	P.J	Fused IEC connector (live and neutral
E-3				6.3 (6.0)			fused); 48V DC option
E-8				10.4 (10.1)		Safety Stand-	EN60950-1
E-4				6.1 (5.8)		ards	
E-10				7.3 (7.0)		Emission and	EN55022 Class B (Emissions)
W-LA	TENCY L	DPC: SE	E SEPAR	ATE DATA	SHEET	Immunity	EN55024 (Immunity)
						Operating	0 to 50°C
3 Fa	cilitie	es				Temperature	
See Configuration Options at end of					of	Humidity	95% relative humidity, non-
datasheet							condensing
+15/24V 0.5A DC to LNB via Rx IFL				via Rx IF	L	Compliance	FCC, CE and RoHS compliant
Allows monitor and control of a compatible					npatible	Alarm Relays	4 Independent Form C relays for unit,

Tx, Rx and backward alarms

Drop & Inse	ert Option	<b>BUC/LNB Facilities</b>		
Bearer Types	T1-D4, T1-ESF, E1-G.732	BUC PSU Options	See Configurat datasheet	
Timeslot Selection	Independent selection of arbitrary timeslots for both drop and insert.	LNB Power	+15/24V 0.5A I	
Bearer Generation	Terrestrial bearer may be looped through modem, or terminated after	FSK Option	Allows monitor BUC from the r	
	Drop Mux and a new bearer generated by the insert Mux	10MHz Reference	10MHz output +3dBm (+/-1d	
Timeslot ID	Maintains the identity of individual Drop/Insert timeslots for	(via IFL to BUC/LNB)	10MHz output 0dBm (+/-1dE	
	N=1,2,3,4,5,6,8,10,12,15,16, 20, 24 and 30. (See extended option below)	· · · ·		

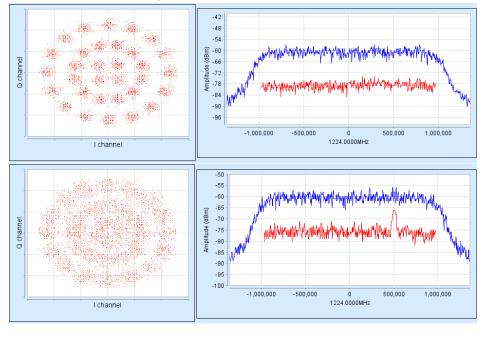
Drop & Insert Option		
Bearer Types	T1-D4, T1-ESF, E1-G.732	
Timeslot Selection	Independent selection of arbitrary timeslots for both drop and insert.	
Bearer Generation	Terrestrial bearer may be looped through modem, or terminated after Drop Mux and a new bearer generated by the insert Mux	
Timeslot ID	Maintains the identity of individual Drop/Insert timeslots for N=1,2,3,4,5,6,8,10,12,15,16, 20, 24 and 30. (See extended option below)	

Extended D	rop & Insert Option
Timeslot Re-Ordering	Selected timeslots may be independently re-ordered on both Tx and Rx paths
Multi- Destinational Working	All or only a subset of the received dat a may be inserted into the terrestrial bearer on the receive path for multi- destinational working
Timeslot ID Maintenance	The framed service is extended to maintain the identity of individual timeslots for all values of N from 1 to 31
Signalling	CAS and RBS are fully supported

### Advanced CC

Advanced ESC			
ESC/Aux Port	Provides high rate async ESC or Intelsat low rate async IBS ESC		
Electrical Interface	IP, RS23	32, RS422 or RS485	
Async ESC	Closed Net Plus ESC	Overhead scales to any ESC baud rate from 0.5% to 70% of the main channel rate	
	IBS Option	High rate async channel (1/32nd to 2/32nd of the IBS overhead) providing async baud rates from 0.2% to 5.1% of the terrestrial rate	
Advanced Aux	bit 1 of 7 channel allowing	ow-rate async ESC carried In S32 providing a synchronous at 1/480th of the data rate, up to one quarter of this over-sampled async data	

Built-in Spectrum Analyser showing LinkGuard™ Signal-Under-Carrier interference detection without/with interferer present.



# **EVOLUTION Series**

# PD25L L-Band Satellite Modem



### Fully configurable - pay only for what you need!

Base Modem         4 48bps to 2.048Mbps closed network modem with two Ethernet 10100 BaseT R.456 for M&C and traffic respectively. Ethernet bridge, static routing Verification 550 to 2950Mbr; high-stating V0MP; 10MP; 20Percence Land operation 550 to 2950Mbr; high-stating V0MP; 10MP; 20Percence Verification 250, because in the Konst of Note Mode Mergins ESO constants AUPC: Automatic Uplink Power Control Were browser molitoring biols. Spectrum Display, Constellation Montor, TCP/IP throughput EEE 802, 1p.005; EEE 802, 1p.104, integrating and the plate ESO constants AUPC: Automatic Uplink Power Control Were browser molitoring biols. Spectrum Display, Constellation Montor, TCP/IP throughput EEE 802, 1p.005; EEE 802, 1p.104, integrating and the plate ESO constants (Mode and the constants) and the spectrum Display, Constellation Montor, TCP/IP throughput EEE 802, 1p.005; EEE 802, 1p.104, integrating and the spectrum Display, Constellation Montor, TCP/IP throughput EEE 802, 1p.005; EEE 802, 1p.104, integrating and the spectrum Display, Constellation Montor, TCP/IP throughput EEE 802, 1p.005; EEE 802, 1p.104, integrating and the spectrum Display, Constellation Montor, and the Display and the State and the Display and th		Option	Description
Desite Tele Options         10Mbps data rate: extends 5Mbps operation to 10Mbps           10Mbps data rate: extends 5Mbps operation to 25Mbps         12Mbps data rate: extends 5Mbps operation to 25Mbps           10Mbps data rate: extends 5Mbps operation to 25Mbps         12Mbps data rate: extends 5Mbps operation to 25Mbps           10Mbps data rate: extends 5Mbps operation to 25Mbps         12Mbps data rate: extends 5Mbps operation to 25Mbps           10Mbps of CP acceleration         Payload Compression: TP/UDP ProxPt Packet payload encryption using AtE Swtb 256-bit keys           10Mbps data rate: extends 5Mbps operation of HTTP requests through pre-fetching of web page contents (requires TCP Acceleration)           10Mbps data rate: extends 5Mbps operation of MTTP requests through pre-fetching of web page contents (requires TCP Acceleration)           10Mbps data rate: extends 5Mbps operation of SMbps, subject to prevailing modern data rate limits           Position 1         ICP Acceleration: extends 10Mbps, subject to prevailing modern data rate limits           Position 2         IPP Traffic card (2x101/00/100 Baset TRA6)           IDE (AS 300 (D25 DCE providing RS422X 21/V 35/RS322, also balanced G.703 if G.703 option fitted)           IDE acceleration: LOS 0.0000         EIA-530 (D25 DCE providing RS422X 21/V 35/RS322, also balanced G.703 if G.703 option fitted)           IDE acceleration: Devolding RS422X 21/V 35/RS322, also balanced G.703 if G.703 option fitted)           IDE acceleration: Devolding RS422X 21/V 35/RS322, also balanced G.703 if G.703 option fitted) <td>Base Modem</td> <td>~</td> <td>L-band operation 950 to 2050MHz; high-stability 10MHz reference BPSK/QPSK/QQPSK; Viterbi FEC rates 1/2, 3/4 &amp; 7/8; Intelsat Reed-Solomon outer codec Advanced ESC: Variable rate Async channel for Closed Net plus ESC operation AUPC: Automatic Uplink Power Control Web browser monitoring tools: Spectrum Display, Constellation Monitor, TCP/IP throughput</td>	Base Modem	~	L-band operation 950 to 2050MHz; high-stability 10MHz reference BPSK/QPSK/QQPSK; Viterbi FEC rates 1/2, 3/4 & 7/8; Intelsat Reed-Solomon outer codec Advanced ESC: Variable rate Async channel for Closed Net plus ESC operation AUPC: Automatic Uplink Power Control Web browser monitoring tools: Spectrum Display, Constellation Monitor, TCP/IP throughput
Second	Data Rate Options		5Mbps data rate: extends base operation to 5Mbps
IP Options (all features require IP) Traffic Shaping: supports CIR/BIR/priority settings for IP streams classified by IP address, Diffserv class, IEEE 802.1p priority lag or MPLS EXP field           Interse require IP) Traffic and other in the interference determine interference detection of IPSK, OGPSK, Rate 778 in OPSK, OGPSK, Rate 778 in OPSK, OGPSK; Rate 778 in OPSK; O			10Mbps data rate: extends 5Mbps operation to 10Mbps
(a) Instances require IP Traffic card of brits         Header Compression: IP/UDP/TCPIRTP packet header compression (RFC 3095) plus Ethernet header compression 10Mpps TCP acceleration:           (b) Mops TCP acceleration:         Payload Compression: TCP/UDP packet payload compression using the Defalte algorithm (RFC 1951)           (c) Mops TCP acceleration:         Dynamic Routing; RPC OSPF, BGP plus static routes           Web Page Acceleration: acceleration of HTTP requests through pre-fetching of web page contents (requires TCP Acceleration)           TCP Acceleration: acceleration of HTTP requests through pre-fetching of web page contents (requires TCP Acceleration)           TCP Acceleration: acceleration of BMDps subject to prevailing modern data rate limits           Position 1 must choose 1 option) hardware option         EL4-S30 (D25 DCE providing selectate RS422X.21V/ 35/RS232, also balanced G.703 if G.703 option fitted)           IDR (ESS 308)         Blank panel           Position 2 must choose 1 option) hardware option         IP Traffic card (2x10/100/1000 BaseT RJ45)           EL4-S30 (D25 DCE providing RS422X 21V/ 35/RS232, also balanced G.703 if G.703 option fitted)           Quad E1 Multiplexer (balanced G.703 ot ARJ45 of which one is enabled by default; includes Drop & Insert and IBS satellite framing)           Serial LVSD (D2 DCE providing RS422X 21V/ 35/RS232, also balanced G.703 if G.703 option fitted)           Quad E1 Multiplexer (balanced G.703 of IS MCD option fitted)           Quad E1 Multiplexer (balanced G.703 of IS MCD option fitted)           Qu			25Mbps data rate: extends 10Mbps operation to 25Mbps
Traditic card office rham         Indexed Compression. 12PC/UDP packet payload compression using the Deflate algorithm (RFC 1951)           Payload Compression. 12PC/UDP packet payload compression using the Deflate algorithm (RFC 1951)         Encryption: TCP/IIP packet payload compression using the Deflate algorithm (RFC 1951)           Position 1         Web Page Acceleration: to 10Mbps zo builder to prevailing modern data rate limits           TCP Acceleration: to tothops, subject to prevailing modern data rate limits           TCP Acceleration: to tothops, subject to prevailing modern data rate limits           TCP Acceleration: to tothops, subject to prevailing modern data rate limits           TCP Acceleration: tothops, subject to prevailing modern data rate limits           TCP Acceleration: tothops, subject to prevailing modern data rate limits           TCP Acceleration: tothops, subject to prevailing modern data rate limits           TCP Acceleration: tothops, subject to prevailing modern data rate limits           TCP Acceleration: tothops, subject to prevailing modern data rate limits           TOP Acceleration: tothops, subject to prevailing modern data rate limits           TOP Acceleration: tothops, subject to prevailing modern data rate limits           TOP Acceleration: tothops, subject to prevailing modern data rate limits           TOP Acceleration: tothops, subject to prevailing modern data rate limits           TOP Acceleration: tothops, subject to prevailing modern data rate prior tothops, subject to prevaling data           Positio	IP Options		Traffic Shaping: supports CIR/BIR/priority settings for IP streams classified by IP address, Diffserv class, IEEE 802.1p priority tag or MPLS EXP field
10Mbps TCP acceleration:         Payload Compression: TCP/UDP packet payload compression using the Deflate algorithm (RFC 1951)           icon)         Encryption: TCP/UDP packet payload encryption using the Deflate algorithm (RFC 1951)           icon)         Encryption: TCP/UDP packet payload encryption using the Deflate algorithm (RFC 1951)           icon)         Web Page Acceleration: acceleration of HTTP requests through pre-fetching of web page contents (requires TCP Acceleration)           TCP Acceleration: extends 10Mbps operation to 25Mbps, subject to prevailing modem data rate limits         TCP Acceleration: extends 10Mbps operation to 25Mbps, subject to prevailing modem data rate limits           Position 1         IDR (IESS 308)         IDR (IESS 308)           Blank panel         IDR Taffic card (2x10/100/1000 BaseT RJ45)           Position 2         IDP Taffic card (2x10/100/1000 BaseT RJ45)           must choose 1 option)         EIA-530 (I2S DCE providing R42ZX.21/V.35/RS232, also balanced G.703 if G.703 option fitted)           Position 2         IDP Taffic card (2x10/100/1000 BaseT RJ45)           must choose 1 option)         EIA-530 (I2S DCE providing R42ZX.21/V.35/RS232, also balanced G.703 if G.703 option fitted)           Serial LVDS (on D2S)         IBank panel           Position 2         IP Taffic card (2x10/100/100 BaseT RJ45)           must choose 1 option)         Adds Port 2 with Drop & Insert (requires Quad E1 Mux Wher Dat I arate options to 10Mbps)           Quad E1			Header Compression: IP/UDP/TCP/RTP packet header compression (RFC 3095) plus Ethernet header compression
Position 2         Adds Port 2 with Drop & Insert (requires Quad E1 Mux pilos data rate option to 5Mbps)           Position 2         Ouad E1 Mux option           Position 3         MultiNux: multiplexes nay mixture of E1, IP and EIA-530 traffic types on a single carrier; see separate Quad E1 funct with Port 2 single carrier in PSK (requires BPSK (requires BPSK option);           Position 3         No BNC traffic interface           must choose 1 option)         Adds Port 2 with Drop & Insert (requires Quad E1 Mux pilos data rate option to 5Mbps)           Position 2         IP Traffic card (2x10/1000 BaseT RX42X.21/V.35/RS232, also balanced G.703 if G.703 option fitted)           Position 2         IP Traffic card (2x10/1000 BaseT RX45)           Must choose 1 option)         EIA-530 (CS DCE providing R5422X.21/V.35/RS232, also balanced G.703 if G.703 option fitted)           Position 2         IP Traffic card (2x10/100/1000 BaseT RX45)           Must choose 1 option)         EIA-530 (CS DCE providing R5422X.21/V.35/RS232, also balanced G.703 if G.703 option fitted)           Position 2         IP Traffic card (2x10/100/1000 BaseT RX450 f which one is enabled by default; includes Drop & Insert and IBS satellite framing)           Serial LVDS (on D25)         EIA-530 (CS ICC Providing R5422X.21/V.35/RS232           Quad E1 Mux gues with Core 3 Laser (requires Quad E1 Mux with Port 2 option pilos data rate options to 10Mbps)           Quad E1 Mux gues with Core 3 Laser Card (R40/100 D BaserT RX400 D RX400			Payload Compression: TCP/UDP packet payload compression using the Deflate algorithm (RFC 1951)
Web Page Acceleration: acceleration of HTTP requests through pre-fetching of web page contents (requires TCP Acceleration)           TCP Acceleration: to 10Mbps, subject to prevailing modem data rate limits           TCP Acceleration: extends 10Mbps operation to 25Mbps, subject to prevailing modem data rate limits           Position 1           must choose 1 option)           TCP Acceleration: extends 10Mbps operation to 25Mbps, subject to prevailing modem data rate limits           Position 2           must choose 1 option)           For Farmer Control (2x10/100/1000 BaseT RU45)           Position 2           must choose 1 option)           Fer Farmer Control (2x10/100/1000 BaseT RU45)           Control (2x10/100/1000 BaseT RU45)           Position 2           Must choose 1 option)           Fer Farmer Control (2x10/100/1000 BaseT RU45)           Serial LVDS (on D25)           Serial LVDS (on D25)           Blank panel           Position 2           Must choose 1 option)           Ref Farmer Control (2x10/100/1000 BaseT RU45)           Rut DVDs (on D25)           Serial LVDS (on D25)           Blank panel           Position 2           Quad E1 Mux           Options           Ginly used with           Quad E1 Mux card)	tion)		Encryption: TCP/IP packet payload encryption using AES with 256-bit keys
Web Page Acceleration: acceleration of HTTP requests through pre-fetching of web page contents (requires TCP Acceleration)           TCP Acceleration: to 10Mbps, subject to prevailing modem data rate limits           TCP Acceleration: extends 10Mbps operation to 25Mbps, subject to prevailing modem data rate limits           Position 1           must choose 1 option)           TCP Acceleration: extends 10Mbps operation to 25Mbps, subject to prevailing modem data rate limits           Position 2           must choose 1 option)           For Farmer Control (2x10/100/1000 BaseT RU45)           Position 2           must choose 1 option)           Fer Farmer Control (2x10/100/1000 BaseT RU45)           Control (2x10/100/1000 BaseT RU45)           Position 2           Must choose 1 option)           Fer Farmer Control (2x10/100/1000 BaseT RU45)           Serial LVDS (on D25)           Serial LVDS (on D25)           Blank panel           Position 2           Must choose 1 option)           Ref Farmer Control (2x10/100/1000 BaseT RU45)           Rut DVDs (on D25)           Serial LVDS (on D25)           Blank panel           Position 2           Quad E1 Mux           Options           Ginly used with           Quad E1 Mux card)			Dynamic Routing: RIP, OSPF, BGP plus static routes
TCP Acceleration: to 10Mbps, subject to prevailing modem data rate limits           TCP Acceleration: extends 10Mbps operation to 25Mbps, subject to prevailing modem data rate limits           Position 1 must choose 1 option) hardware option         EIA-s30 (D25 DCE providing selectable R\$422/X 21/V.35/R\$232, also balanced G.703 if G.703 option fitted)           Position 2 must choose 1 option) hardware option         IP Traffic card (2x10/100/1000 BaseT RJ45)           Position 2 must choose 1 option) hardware option         IP Traffic card (2x10/100/1000 BaseT RJ45)           EIA-S30 (D25 DCE providing R\$422/X 21/V.35/R\$232, also balanced G.703 if G.703 option fitted)           Data dware option         EIA-S30 (D25 DCE providing R\$422/X 21/V.35/R\$232, also balanced G.703 if G.703 option fitted)           Data dware option         EIA-S30 (D25 DCE providing R\$422/X 21/V.35/R\$232, also balanced G.703 if G.703 option fitted)           Data dware option         Quad E1 Multiplexer (balanced G.703 on 4xRI45 of which one is enabled by default; includes Drop & Insert and IBS satellite framing)           Serial LVDS (on D25)         HSSI (on HD50 50-way SCSI-2 connector)           Blank panel         Adds Port 3 with Drop & Insert (requires Quad E1 Mux with Port 2 option plus data rate options to 10Mbps)           Options         Adds Port 3 with Drop & Insert (requires Quad E1 Mux with Port 2 & 3 options plus data rate options to 10Mbps)           Options         No BNC traffic interface           Convast Coperovaling data rate Imias         Rates 5/16, 21/44, 3/4			
TCP Acceleration: extends 10Mbps operation to 29Mbps, subject to prevailing modem data rate limits           Position 1 (must choose 1 option) hardware option         ELA-S30 (D25 DCE providing selectable RS422/X.21/V.35/RS232, also balanced G.703 if G.703 option fitted)           DR (IESS 308) hardware option         IDR (IESS 308) Blank panel           Position 2 (must choose 1 option) hardware option         IP Traffic card (2x10/100/1000 BaseT RJ45)           EIA-S30 (D25 DCE providing RS422/X.21/V.35/RS232, also balanced G.703 if G.703 option fitted)           Data data rate option         EIA-S30 (D25 DCE providing RS422/X.21/V.35/RS232, also balanced G.703 if G.703 option fitted)           Automated and the panel         Quad E1 Multiplexer (balanced G.703 on 4xRJ45 of which one is enabled by default; includes Drop & Insert and IBS satellite framing)           Serial LVDS (on D25)         HSSI (on D25)           Blank panel         Quad E1 Mux plus data rate option to 5Mbps)           Quad E1 Mux options         Adds Port 2 with Drop & Insert (requires Quad E1 Mux with Port 2 & 3 options plus data rate options to 10Mbps)           Options         Adds Port 3 with Drop & Insert (requires Quad E1 Mux with Port 2 & 3 options plus data rate options to 10Mbps)           Options         Ond SNC traffic interface         Rest (structure of E1, IP and EIA-S30 traffic types onto a single carrier; see separate Quad E1 application note for further details           Position 3         No BNC traffic interface         Reates 5/16, 21/44, 3/4 in BPSK (OPSK, OPSK; Rate 7/18 o			
Position 1 (must choose 1 option) hardware option         EIA-530 (D25 DCE providing selectable RS422/X.21/V.35/RS232, also balanced G.703 if G.703 option fitted)           IDR (IESS 308)         Blank panel           Position 2 (must choose 1 option) hardware option         IP Traffic card (2x10/100/1000 BaseT RJ45)           EIA-530 (D25 DCE providing RS422/X.21/V.35/RS232, also balanced G.703 if G.703 option fitted)           Devision 2 (must choose 1 option) hardware option         EIA-530 (D25 DCE providing RS422/X.21/V.35/RS232, also balanced G.703 if G.703 option fitted)           Quad E1 Multiplexer (balanced G.703 on 4xRJ45 of which one is enabled by default; includes Drop & Insert and IBS satellite framing)           Serial LVDS (on D25)           HISSI (on HD50 50-way SCSI-2 connector)           Blank panel           Position 2 Quad E1 Mux options           Adds Port 2 with Drop & Insert (requires Quad E1 Mux with Port 2 option plus data rate options to 10Mbps)           Quad E1 Mux card)           MultiMux multiplexes any mixture of E1, IP and EIA-530 traffic types onto a single carrier; see separate Quad E1 application note for further details           Position 3 (must choose 1 option)           Low-rate TPC Subject to prevailing data rate limits           Subject to prevailing data rate limits           High-rate TPC Subject to prevailing data rate limits           LinkGuard <sup>TM</sup> Signal-under-carrie interference detection web spectrum graph showing received spectrum and			
Description         IDR (IESS 308)           IDR (IESS 308)         Blank panel           Position 2 must choose 1 option) ardware option         IP Traffic card (2x10/100/1000 Base TRJ45)           EIA-530 (D25 DCE providing RS422/X.21/V.35/RS232, also balanced G.703 of G.703 option fitted)           Quad E1 Mutiplexer (balanced G.703 on 4xRJ45 of which one is enabled by default; includes Drop & Insert and IBS satellite framing)           Serial LVDS (on D25)           HSSI (on HD50 50-way SCSI-2 connector)           Blank panel           Position 2           Quad E1 Mux           pations           Adds Port 2 with Drop & Insert (requires Quad E1 Mux with Port 2 option plus data rate options to 10Mbps)           Quad E1 Mux card)           Position 3           must choose 1 option)           2 x BNC sockets (urbalanced G.703 750 - supplied only with G.703 option)           ardware option           2 x BNC sockets (urbalanced G.703 750 - supplied only with G.703 option)           ardware option           2 x BNC sockets (urbalanced G.703 750 - supplied only with G.703 option)           ardware option           2 x BNC sockets (urbalanced G.703 750 - supplied only with G.703 option)           ardware option           2 x BNC sockets (urbalanced G.703 750 - supplied only with G.703 option)           ardware option           2	Position 1		
Blank panel         Blank panel           Position 2 must choose 1 option) hardware option         IP Traffic card (2x10/100/1000 BaseT RJ45)           EIA-530 (D25 DCE providing RS422/X_21/V.35/RS232, also balanced G.703 if G.703 option fitted)           Quad E1 Multiplexer (balanced G.703 on 4xRJ45 of which one is enabled by default; includes Drop & Insert and IBS satellite framing)           Serial LVDS (on D25)           HSSI (on HD50 50-way SCSI-2 connector)           Blank panel           Position 2           Quad E1 Mux           Adds Port 2 with Drop & Insert (requires Quad E1 Mux plus data rate option to 5Mbps)           Quad E1 Mux card)           Adds Port 2 with Drop & Insert (requires Quad E1 Mux with Port 2 option plus data rate options to 10Mbps)           Adds Port 4 with Drop & Insert (requires Quad E1 Mux with Port 2 & 3 options plus data rate options to 10Mbps)           Adds Port 4 with Drop & Insert (requires Quad E1 Mux with Port 2 & 3 options plus data rate options to 10Mbps)           Adds Port 4 with Drop & Insert (requires Quad E1 Mux with Port 2 & 3 options plus data rate options to 10Mbps)           Adds Port 4 with Drop & Insert (requires Quad E1 Mux with Port 2 & 3 options plus data rate option to 10Mbps)           No BNC traffic interface           Position 3           Must choose 1 option)           2 x BNC sockets (unbalanced G.703 750 - supplied only with G.703 option)           2 x BNC sockets (unbalanced G.703 750 - supplied			
Position 2 must choose 1 option) hardware option         IP Traffic card (2x10/100/1000 BaseT RJ45)           EIA-530 (D25 DCE providing RS422/X.21/V.35/RS232, also balanced G.703 option fitted)         Quad E1 Multiplexer (balanced G.703 on 4xRJ45 of which one is enabled by default; includes Drop & Insert and IBS satellite framing)           Serial LVDS (on D25)         HSSI (on HD50 50-way SCSI-2 connector)           Blank panel         Blank panel           Position 2         Adds Port 2 with Drop & Insert (requires Quad E1 Mux with Port 2 option plus data rate options to 10Mbps)           Options         Adds Port 3 with Drop & Insert (requires Quad E1 Mux with Port 2 a 3 options plus data rate options to 10Mbps)           Only used with Quad E1 Mux card)         MultiMux: multiplexes any mixture of E1, IP and EIA-530 traffic types onto a single carrier; see separate Quad E1 application note for further details           Position 3         No BNC traffic interface           must choose 1 option)         2 x BNC sockets (unbalanced G.703 750 - supplied only with G.703 option)           Atds S of 16, 21/44, 3/4 in BPSK, QPSK, QOPSK; Rate 7/8 in QPSK, QQPSK; Rate 0.93 Paradise in QPSK, QQPSK; Rates 5/16, 21/44, 3/4 in BPSK, QPSK, QPSK, QPSK, Rate 7/8 in QPSK, QOPSK; Rate 0.93 Paradise in 0PSK, QQPSK; Rates 5/16, 21/44, 3/4 in BPSK, QPSK, QPSK, QPSK, Rate 7/8 in QPSK, QOPSK; Rate 0.93 Paradise in 0PSK, QQPSK; Rates 5/16, 21/44, 3/4 in BPSK, QPSK, QPSK, Rate 7/8 in QPSK, QOPSK; Rate 0.93 Paradise in 0PSK, QQPSK; Rates 5/16, 21/44, 3/4 in BPSK, QPSK, QOPSK; Rate 7/8 in QPSK, QOPSK; Rate 0.93 Paradise in 0PSK, QQPSK; Rates 5/16, 21/44, 3/4 in BPSK, QPSK, QOPSK; Rate 7/8 in QPSK, QOP	hardware option		
EIA-530 (D25 DCE providing RS422/X 21/V.35/RS232, also balanced G.703 if G.703 option fitted)         hardware option         EIA-530 (D25 DCE providing RS422/X 21/V.35/RS232, also balanced G.703 if G.703 option fitted)         Quad E1 Multiplexer (balanced G.703 on 4xRJ45 of which one is enabled by default; includes Drop & Insert and IBS satellite framing)         Serial LVDS (on D25)         HSSI (on HD50 50-way SCSI-2 connector)         Blank panel         Position 2         Quad E1 Mux         options         Adds Port 2 with Drop & Insert (requires Quad E1 Mux with Port 2 option plus data rate options to 10Mbps)         Options         (only used with Quad E1 Mux card)         Position 3         (must choose 1 option)         Adds Port 4 with Drop & Insert (requires Quad E1 Mux with Port 2 & 3 options plus data rate options to 10Mbps)         Options         (must choose 1 option)         Adds Port 4 with Drop & Insert (requires Quad E1 Mux with Port 2 & 3 options plus data rate options to 10Mbps)         (must choose 1 option)         Adds Port 4 with Drop & Insert (requires Quad E1 Mux with Port 2 & 3 option)         Low-rate TPC         Subject to prevailing data rate initis         Rates 5/16, 21/44, 3/4 in BPSK, QPSK, QPSK; Rate 7/8 in QPSK; Rate 0.93 Paradise in 16QAM (requires 16QAM option) ( <i>10Mbps maximum data rate</i> )         High-rate TPC	Position 2		
hardware option         Quad E1 Multiplexer (balanced G.703 on 4xRJ45 of which one is enabled by default; includes Drop & Insert and IBS satellite framing)           Serial LVDS (on D25)         HSSI (on HD50 50-way SCSI-2 connector)           Blank panel         Adds Port 2 with Drop & Insert (requires Quad E1 Mux plus data rate option to 5Mbps)           Quad E1 Mux options         Adds Port 2 with Drop & Insert (requires Quad E1 Mux with Port 2 option plus data rate options to 10Mbps)           Options         Adds Port 3 with Drop & Insert (requires Quad E1 Mux with Port 2 & 3 options plus data rate options to 10Mbps)           Quad E1 Mux card)         Adds Port 4 with Drop & Insert (requires Quad E1 Mux with Port 2 & 3 options plus data rate options to 10Mbps)           Position 3         Adds Port 4 with Drop & Insert (requires Quad E1 Mux with Port 2 & 3 options plus data rate options to 10Mbps)           Quad E1 Mux card)         No BNC traffic interface           Position 3         No BNC traffic interface           (must choose 1 option)         2 x BNC sockets (unbalanced G.703 75Ω - supplied only with G.703 option)           Low-rate TPC         Rates 5/16, 21/44, 3/4 in BPSK, QPSK, QPSK; Rate 7/8 in QPSK, OQPSK; Rate 0.93 Paradise in DPSK, OQPSK; Rates 3/4, 7/8, 0.93 Paradise in 8PSK (requires 8PSK option); Rates 3/4, 7/8, 0.93 Paradise in BPSK, QPSK; CQPSK; Rate 7/8 in QPSK, QOPSK; Rate 0.93 Paradise in 0PSK, OQPSK; Exters 10 approxima data rate)           High-rate TPC         Rates 5/16, 21/44, 3/4 in BPSK, QPSK, OQPSK; Rate 7/8 in QPSK, OQPSK; Rate 0.93 Paradise in 0PSK, OQPSK; Exter			
Serial LVDS (on D25)         HSSI (on HD50 50-way SCSI-2 connector)         Blank panel         Position 2         Quad E1 Mux         Options         (only used with Quad E1 Mux card)         No BNC traffic interface         Position 3         (must choose 1 option)         hardware option         Low-rate TPC         Subject to prevailing data rate limits         High-rate TPC Subject to prevailing data rate limits         Rates 5/16, 21/44, 3/4 in BPSK, OPSK, OQPSK; Rate 7/8 in OPSK, OQPSK; Rate 0.93 Paradise in 0PSK, OQPSK; Rates 3/4, 7/8, 0.93 Paradise in 8PSK (requires 8PSK option); Rates 3/4, 7/8, 0.93 Paradise in 0PSK, OQPSK; Rates 3/4, 7/8, 0.93 Paradise in 8PSK (requires 8PSK option); Rates 3/4, 7/8, 0.93 Paradise in 16QAM (requires 16QAM option) (Requires 16QAM option)         LinkGuard <sup>TM</sup> Signal-under-carrier interference detection web spectrum graph showing received spectrum and any interference underneat the received carrier while on traffic; automated alarm when interference rises above user-set threshold; supported for all non-DVB-S2 FECs and modulations	hardware option		
HSSI (on HD50 50-way SCSI-2 connector)         Blank panel         Position 2 Quad E1 Mux (only used with Quad E1 Mux card)       Adds Port 2 with Drop & Insert (requires Quad E1 Mux plus data rate option to 5Mbps)         Adds Port 3 with Drop & Insert (requires Quad E1 Mux with Port 2 option plus data rate options to 10Mbps)         Adds Port 4 with Drop & Insert (requires Quad E1 Mux with Port 2 & 3 options plus data rate options to 10Mbps)         Adds Port 4 with Drop & Insert (requires Quad E1 Mux with Port 2 & 3 options plus data rate options to 10Mbps)         Quad E1 Mux card)       MultiMux: multiplexes any mixture of E1, IP and EIA-530 traffic types onto a single carrier; see separate Quad E1 application note for further details         Position 3 (must choose 1 option) hardware option       No BNC traffic interface         Low-rate TPC Subject to prevailing data rate limits       Rates 5/16, 21/44, 3/4 in BPSK, QPSK; OQPSK; Rate 7/8 in QPSK, OQPSK; Rate 0.93 Paradise in QPSK, OQPSK; Rates 3/4, 7/8, 0.93 Paradise in 8PSK (requires 8PSK option); Rates 3/4, 7/8, 0.93 Paradise in 16QAM (requires 16QAM option) (10Mbps maximum data rate)         High-rate TPC Extension to 25Mbps subject to prevailing data rate limits       Rates 5/16, 21/44, 3/4 in BPSK, QPSK, OQPSK; Rate 7/8 in QPSK; OQPSK; Rate 0.93 Paradise in 16QAM (requires 16QAM option) (Requires 100 AM (requires 16QAM option))         LinkGuard <sup>TM</sup> Signal-under-carrier interference detection web spectrum graph showing received spectrum and any interference underneath the received carrier while on traffic; automated alarm when interference rises above user-set threshold; supported for all non-DVB-S2 FEC			
Blank panel         Position 2 Quad E1 Mux       Adds Port 2 with Drop & Insert (requires Quad E1 Mux plus data rate option to 5Mbps)         Quad E1 Mux       Adds Port 3 with Drop & Insert (requires Quad E1 Mux with Port 2 option plus data rate options to 10Mbps)         Options (only used with Quad E1 Mux card)       Adds Port 4 with Drop & Insert (requires Quad E1 Mux with Port 2 & 3 options plus data rate options to 10Mbps)         Options (only used with Quad E1 Mux card)       MultiMux: multiplexes any mixture of E1, IP and EIA-530 traffic types onto a single carrier; see separate Quad E1 application note for further details         Position 3 (must choose 1 option) hardware option       No BNC traffic interface         Low-rate TPC Subject to prevailing data rate limits       Rates 5/16, 21/44, 3/4 in BPSK, QPSK; OQPSK; Rate 7/8 in QPSK, OQPSK; Rate 0.93 Paradise in QPSK, OQPSK; Rates 3/4, 7/8, 0.93 Paradise in BPSK (requires 8PSK option); Rates 3/4, 7/8, 0.93 Paradise in QPSK, OQPSK; Rate 0.93 Paradise in QPSK, OQPSK; Rates 3/4, 7/8, 0.93 Paradise in BPSK (requires 8PSK option); Rates 3/4, 7/8, 0.93 Paradise in QPSK, OQPSK; Rate 0.93 Paradise in QPSK, OQPSK; Rates 3/4, 7/8, 0.93 Paradise in BPSK (requires 8PSK option); Rates 3/4, 7/8, 0.93 Paradise in QPSK, OQPSK; Rate 0.93 Paradise in QPSK, OQPSK; Rates 3/4, 7/8, 0.93 Paradise in BPSK (requires 8PSK option); Rates 3/4, 7/8, 0.93 Paradise in QPSK, OQPSK; Rates 3/4, 7/8, 0.93 Paradise in BPSK (requires 8PSK option); Rates 3/4, 7/8, 0.93 Paradise in QPSK, OQPSK; Rates 3/4, 7/8, 0.93 Paradise in BPSK (requires 8PSK option); Rates 3/4, 7/8, 0.93 Paradise in QPSK, OQPSK; Rates 3/4, 7/8, 0.93 Paradise in BPSK (requires 8PSK option); Rates 3/4, 7/8, 0.93 Paradise in 16QAM (requires 16QAM option) (Requires Low-rate TPC op			
Position 2 Quad E1 Mux options (only used with Quad E1 Mux card)       Adds Port 2 with Drop & Insert (requires Quad E1 Mux with Port 2 option plus data rate options to 10Mbps)         Adds Port 3 with Drop & Insert (requires Quad E1 Mux with Port 2 & 3 options plus data rate options to 10Mbps)       Adds Port 4 with Drop & Insert (requires Quad E1 Mux with Port 2 & 3 options plus data rate options to 10Mbps)         Yes       Adds Port 4 with Drop & Insert (requires Quad E1 Mux with Port 2 & 3 options plus data rate options to 10Mbps)         Yes       MultiMux: multiplexes any mixture of E1, IP and EIA-530 traffic types onto a single carrier; see separate Quad E1 application note for further details         Position 3 (must choose 1 option) hardware option       No BNC traffic interface         Low-rate TPC Subject to prevailing data rate limits       Rates 5/16, 21/44, 3/4 in BPSK, QPSK, OQPSK; Rate 7/8 in QPSK, OQPSK; Rate 0.93 Paradise in QPSK, OQPSK; Rates 3/4, 7/8, 0.93 Paradise in 8PSK (requires 8PSK option); Rates 3/4, 7/8, 0.93 Paradise in 16QAM (requires 16QAM option) (10Mbps maximum data rate)         High-rate TPC Extension to 25Mbps subject to prevailing data rate limits       Rates 5/16, 21/44, 3/4 in BPSK, QPSK, OQPSK; Rate 7/8 in QPSK, OQPSK; Rate 0.93 Paradise in QPSK, OQPSK; Rates 3/4, 7/8, 0.93 Paradise in 8PSK (requires 8PSK option); Rates 3/4, 7/8, 0.93 Paradise in 16QAM (requires 16QAM option) (Requires 16QAM, 0ption)         LinkGuard <sup>TM</sup> Signal-under-carrier interference detection web spectrum graph showing received spectrum and any interference underneath the received carrier while on traffic; automated alarm when interference rises above user-set threshold; supported for all non-DVB-S2 FECs and mod			
Quad E1 Mux       Adds Port 3 with Drop & Insert (requires Quad E1 Mux with Port 2 option plus data rate options to 10Mbps)         Adds Port 4 with Drop & Insert (requires Quad E1 Mux with Port 2 & 3 options plus data rate options to 10Mbps)         MultiMux: multiplexes any mixture of E1, IP and EIA-530 traffic types onto a single carrier; see separate Quad E1 application note for further details         Position 3 (must choose 1 option) hardware option       No BNC traffic interface         Low-rate TPC Subject to prevailing data rate limits       Rates 5/16, 21/44, 3/4 in BPSK, QPSK; QQPSK; Rate 7/8 in QPSK, OQPSK; Rate 0.93 Paradise in QPSK, OQPSK; Rates 3/4, 7/8, 0.93 Paradise in 8PSK (requires 8PSK option); Rates 3/4, 7/8, 0.93 Paradise in 16QAM (requires 16QAM option) (10Mbps maximum data rate)         High-rate TPC Extension to 25Mbps subject to prevailing data rate limits       Rates 5/16, 21/44, 3/4 in BPSK, QPSK; OQPSK; Rate 7/8 in QPSK, OQPSK; Rate 0.93 Paradise in QPSK, OQPSK; Rates 3/4, 7/8, 0.93 Paradise in 8PSK (requires 8PSK option); Rates 3/4, 7/8, 0.93 Paradise in 16QAM (requires 16QAM option) (10Mbps maximum data rate)         High-rate TPC Extension to 25Mbps subject to prevailing data rate limits       Rates 5/16, 21/44, 3/4 in BPSK, QPSK; OQPSK; Rate 7/8 in QPSK, OQPSK; Rate 0.93 Paradise in QPSK, OQPSK; Rates 3/4, 7/8, 0.93 Paradise in 8PSK (requires 8PSK option); Rates 3/4, 7/8, 0.93 Paradise in 16QAM (requires 16QAM option) (Requires Low-rate TPC coption)         LinkGuard <sup>TM</sup> Signal-under-carrier interference detection web spectrum graph showing received spectrum and any interference underneath the received carrier while on traffic; automated alarm when interference rises above user-set threshold; supported for all	Position 2		
Index out with Quad E1 Mux card)       Index out with or ope and interference data E1 matching of the opening for data the opening for data the opening in the opening of the op			
Duad E1 Mux card)       MultiMux: multiplexes any mixture of E1, IP and EIA-530 traffic types onto a single carrier; see separate Quad E1 application note for further details         Position 3 must choose 1 option) hardware option       No BNC traffic interface         100w-rate TPC Subject to prevailing data rate limits       Rates 5/16, 21/44, 3/4 in BPSK, QPSK, OQPSK; Rate 7/8 in QPSK, OQPSK; Rate 0.93 Paradise in QPSK, OQPSK; Rates 3/4, 7/8, 0.93 Paradise in 8PSK (requires 8PSK option); Rates 3/4, 7/8, 0.93 Paradise in 16QAM (requires 16QAM option) (10Mbps maximum data rate)         High-rate TPC Extension to 25Mbps subject to prevailing data rate limits       Rates 5/16, 21/44, 3/4 in BPSK, QPSK, OQPSK; Rate 7/8 in QPSK, OQPSK; Rate 0.93 Paradise in QPSK, OQPSK; Rates 3/4, 7/8, 0.93 Paradise in 8PSK (requires 8PSK option); Rates 3/4, 7/8, 0.93 Paradise in QPSK, OQPSK; Rates 3/4, 7/8, 0.93 Paradise in 8PSK (requires 8PSK option); Rates 3/4, 7/8, 0.93 Paradise in 16QAM (requires 16QAM option) (Requires Low-rate TPC option)         LinkGuard <sup>TM</sup> Signal-under-carrier interference detection web spectrum graph showing received spectrum and any interference underneath the received carrier while on traffic; automated alarm when interference rises above user-set threshold; supported for all non-DVB-S2 FECs and modulations	options		Adds Port 4 with Drop & Insert (requires Quad E1 Mux with Port 2 & 3 options plus data rate options to 10Mbps)
Position 3 (must choose 1 option) hardware option       No BNC traffic interface         2 x BNC sockets (unbalanced G.703 75Ω - supplied only with G.703 option)       2 x BNC sockets (unbalanced G.703 75Ω - supplied only with G.703 option)         Low-rate TPC Subject to prevailing data rate limits       Rates 5/16, 21/44, 3/4 in BPSK, QPSK, OQPSK; Rate 7/8 in QPSK, OQPSK; Rate 0.93 Paradise in 16QAM (requires 16QAM option) (10Mbps maximum data rate)         High-rate TPC Extension to 25Mbps subject to prevailing data rate limits       Rates 5/16, 21/44, 3/4 in BPSK, QPSK, OQPSK; Rate 7/8 in QPSK, OQPSK; Rate 0.93 Paradise in QPSK, OQPSK; Rates 3/4, 7/8, 0.93 Paradise in 8PSK (requires 8PSK option); Rates 3/4, 7/8, 0.93 Paradise in 16QAM (requires 16QAM option) (10Mbps maximum data rate)         LinkGuard™       Signal-under-carrier interference detection web spectrum graph showing received spectrum and any interference underneath the received carrier while on traffic; automated alarm when interference rises above user-set threshold; supported for all non-DVB-S2 FECs and modulations			MultiMux: multiplexes any mixture of E1, IP and EIA-530 traffic types onto a single carrier; see separate Quad E1 application note for further details
(must choose 1 option) hardware option       2 x BNC sockets (unbalanced G.703 75Ω - supplied only with G.703 option)         Low-rate TPC Subject to prevailing data rate limits       Rates 5/16, 21/44, 3/4 in BPSK, QPSK, OQPSK; Rate 7/8 in QPSK, OQPSK; Rate 0.93 Paradise in QPSK, OQPSK; Rates 3/4, 7/8, 0.93 Paradise in 8PSK (requires 8PSK option); Rates 3/4, 7/8, 0.93 Paradise in 16QAM (requires 16QAM option) (10Mbps maximum data rate)         High-rate TPC Extension to 25Mbps subject to prevailing data rate limits       Rates 5/16, 21/44, 3/4 in BPSK, QPSK, OQPSK; Rate 7/8 in QPSK, OQPSK; Rate 0.93 Paradise in QPSK, OQPSK; Rates 3/4, 7/8, 0.93 Paradise in 8PSK (requires 8PSK option); Rates 3/4, 7/8, 0.93 Paradise in 16QAM (requires 16QAM option) (Requires Low-rate TPC option)         LinkGuard <sup>TM</sup> Signal-under-carrier interference detection web spectrum graph showing received spectrum and any interference underneath the received carrier while on traffic; automated alarm when interference rises above user-set threshold; supported for all non-DVB-S2 FECs and modulations	,		No BNC traffic interface
Low-rate TPC       Rates 5/16, 21/44, 3/4 in BPSK, QPSK, OQPSK; Rate 7/8 in QPSK, OQPSK; Rate 0.93 Paradise in QPSK, OQPSK; Rates 3/4, 7/8, 0.93 Paradise in 8PSK (requires 8PSK option); Rates 3/4, 7/8, 0.93 Paradise in 16QAM (requires 16QAM option) (10Mbps maximum data rate)         High-rate TPC       Rates 5/16, 21/44, 3/4 in BPSK, QPSK, OQPSK; Rate 7/8 in QPSK, OQPSK; Rate 0.93 Paradise in 16QAM (requires 16QAM option) (10Mbps maximum data rate)         High-rate TPC       Rates 5/16, 21/44, 3/4 in BPSK, QPSK, OQPSK; Rate 7/8 in QPSK, OQPSK; Rate 0.93 Paradise in QPSK, OQPSK; Rate 3/4, 7/8, 0.93 Paradise in 8PSK (requires 8PSK option); Rates 3/4, 7/8, 0.93 Paradise in 16QAM (requires 16QAM option) (Requires 16QAM option)         subject to prevailing data rate limits       Rates 5/16, 21/44, 3/4 in BPSK, QPSK, OQPSK; Rate 7/8 in QPSK, OQPSK; Rate 0.93 Paradise in QPSK, OQPSK; Rate 3/4, 7/8, 0.93 Paradise in 8PSK (requires 8PSK option); Rates 3/4, 7/8, 0.93 Paradise in 16QAM (requires 16QAM option)         LinkGuard <sup>TM</sup> Signal-under-carrier interference detection web spectrum graph showing received spectrum and any interference underneath the received carrier while on traffic; automated alarm when interference rises above user-set threshold; supported for all non-DVB-S2 FECs and modulations	(must choose 1 option)		2 x BNC sockets (unbalanced G.703 75 $\Omega$ - supplied only with G.703 option)
Rates 3/4, 7/8, 0.93 Paradise in 8PSK (requires 8PSK option); Rates 3/4, 7/8, 0.93 Paradise in 16QAM (requires 16QAM option)         Subject to prevailing data rate limits         LinkGuard <sup>TM</sup> Signal-under-carrier interference detection web spectrum graph showing received spectrum and any interference underneath the received carrier while on traffic; automated alarm when interference rises above user-set threshold; supported for all non-DVB-S2 FECs and modulations	Low-rate TPC Subject to prevailing data		Rates 3/4, 7/8, 0.93 Paradise in 8PSK (requires 8PSK option); Rates 3/4, 7/8, 0.93 Paradise in 16QAM (requires 16QAM option)
traffic; automated alarm when interference rises above user-set threshold; supported for all non-DVB-S2 FECs and modulations	Extension to 25Mbps subject to prevailing data		Rates 3/4, 7/8, 0.93 Paradise in 8PSK (requires 8PSK option); Rates 3/4, 7/8, 0.93 Paradise in 16QAM (requires 16QAM option)
G.703 E1, T1, E2, T2 interfaces (hardware option) - requires either EIA-530 in Position 1 or 2 or BNC sockets fitted in Position 3	LinkGuard™		
	G.703		E1, T1, E2, T2 interfaces (hardware option) - requires either EIA-530 in Position 1 or 2 or BNC sockets fitted in Position 3



Configuration options continue on next page.

# **EVOLUTION Series** PD25L L-Band Satellite Modem



## Fully configurable - pay only for what you need!

]	Option	Description
Paired Carrier™		Paired Carrier™ hardware option (requires one or more options below); allows Tx & Rx carriers to be overlapped, reducing the required satellite bandwidth
Subject to prevailing modem data rate limits. Occupied bandwidth: mini- mum 30kHz; operates to maximum symbol rate of modem		Paired Carrier™ up to 256kbps (requires Paired Carrier™ hardware option)
		Extends Paired Carrier™ up to 512kbps
		Extends Paired Carrier™ up to 1.024Mbps
		Extends Paired Carrier™ up to 2.5Mbps
		Extends Paired Carrier™ up to 5Mbps
		Extends Paired Carrier™ up to 10Mbps
		Extends Paired Carrier™ up to 15Mbps
		Extends Paired Carrier™ up to 20Mbps Extends Paired Carrier™ up to 25Mbps
FastLink™ Low-latency LDPC FEC subject to prevailing modem data rate limits		Exercise Parent Carrier™ up to 2000bps FastLink™ LDPC hardware option (requires one or more additional FastLink™ options below); BPSK & QPSK provided as standard; also supports 8PSK, 8QAM, 8QAM, 16QAM, 32APSK & 64QAM subject to selection of these options
		FastLink ™ LDPC up to 1Mbps (requires FastLink LDPC hardware option)
		Extends FastLink™ LDPC to 2.5Mbps
		Extends FastLink™ LDPC to 5Mbps
		Extends FastLink™ LDPC to 10Mbps
		Extends FastLink™ LDPC to 25Mbps
		8QAM
		16APSK 32APSK
		64QAM
8PSK (Includes TCM)		Note use of 8PSK other than with TCM requires either FastLink™ LDPC or TPC FEC option Rate 2/3 8PSK Pragmatic TCM to IESS 310
16QAM		16QAM (requires either FastLink™ LDPC or TPC FEC option)
Tx-only operation		Transmit functions only
Rx-only operation		Receive functions only
24V 100W BUC PSU		P3532 AC input, 24V 100W DC to Tx BUC (hardware option)
48V 100W BUC PSU		P3531 AC input, 48V 100W DC to Tx BUC (hardware option)
24V 200W BUC PSU		P3536 AC input, 24V 200W DC to Tx BUC (hardware option)
48V 200W BUC PSU		P3535 AC input, 48V 200W DC to Tx BUC (hardware option)
48V DC Input		K3002 48V DC primary power supply input in place of 100-240V AC (hardware option)
48V in & 24V BUC PSU		K3002 + P3538: floating 48V DC input, 24V 200W DC to Tx BUC (hardware option)
48V in & 48V BUC PSU		K3002 + P3537: floating 48V DC input, 48V 200W DC to Tx BUC (hardware option)
+48V in & 48V BUC PSU		K3002 + P3539: +48V DC input, +48V 200W DC to Tx BUC (hardware option)
IBS		Satellite Framing to IESS 309 with low rate Intelsat ESC (to IESS 403) & High Rate IBS ESC
Drop / Insert (includes Extended D/I)		G.703 T1/E1 Drop & Insert; E1 CAS & T1 RBS signaling; Rx partial insert for multi-destinational working; timeslot ID maintenance for N=1 to 31
Clock Extension		Provides a high-stability reference clock over satellite (alternative to GPS)
Advanced AUX		Variable rate synchronous Aux channel; option to replace IDR audio channels with serial data
Custom		Custom Reed-Solomon values of n, k & interleaver depth; custom IBS modes; allocation of overhead between ESC & Aux; custom backward alarms
EZ BERT - PRBS Tester		Internal Bit Error Rate Tester (for non-DVB-S2 operation only)
OM-73		OM-73 Scrambling, symbol mapping and Viterbi compatibility
FSK Control Option		Allows monitor & control of a compatible BUC from the Modem (hardware option)
Adaptive Signal Pre- distorter		Use with 16QAM to relax HPA backoff by up to 1.6dB. Compensates for HPA non-linearities in ground segment and/or transponder. Requires 16QAM option.
Ruggedisation		Adds extra ruggedisation for hostile environments (extra fans, heatsinks, etc.)
Sequential FEC		Rates 1/2, 3/4, 7/8 in BPSK, QPSK, OQPSK to 2.048Mbps
Audio		P1348 emulation mode for IBS 64kbps carrier (2 x audio) or 128kbps (2 x audio + 64kbps data) - requires IBS / SMS & IDR options
Audio		

Teledyne Paradise Datacom reserves the right to change specifications of products described in this document at any time without notice and without obligation to notify any person of such changes. Refer to the website or contact Sales or Customer Service for latest product information.