Realgain 4E - G.SHDSL Modem

Overview

Realgain-4E G.SHDSL modems offer extended distances and variable data rates from 64 kbps to 4608 kbps using G. SHDSL technology compliant to ITU-T G.991.2. The modem using a single pair offers capabilities equivalent to normal HDSL modems on two pairs, offering 50 % saving in copper cost. The modem supports G.703 E1, G.703 Co-directional, V.35 and X.21 interfaces. It also supports Ethernet interface with a built-in bridge allowing LAN-to-LAN connectivity.

G.SHDSL technology extends transmissions farther than any other DSL technology, opening the door for service providers to deliver low cost, multi-service, broadband access to a wider subscriber base. The technology also offers interoperability flexibility to the users to use different makes of compatible G.SHDSL modems at two ends

Key Features

- Provides High-speed data connectivity on Two/Single unconditioned twisted copper pairs/pair.
- Tolerates bridge taps and cable gauge changes. For enhanced performance also supports Asymmetrical PSD mode.
- Operates at multiple data rates between 64 kbps and 4608 kbps enabling single-platform system upgrades.
- Supports G.703 E1, G.703 Co-directional, V.35, 10/100 Base-T and X.21 interfaces, allowing connection to different DTE types.
- Optionally, Realgain-4E also supports multiple interfaces providing time slot sharing between G.703, V.35 & Ethernet Interfaces, configurable through front end user interface.
- The modem supports an Embedded Operation Channel (EOC) for controlling, configuring and supervising the remote unit. The channel uses G. SHDSL overhead bits, operating without interfering with the data transmission in compliance with the ITU-T G.991.2 requirements.
- Various types of enclosures including table top, rack/standard 19" shelve is supported.
- 15 Nos. of Systems can be incorporated in a 19" Shelf.
- LCD display is provided (16x2) for system status & Configuration.
- Supports SNMP V1/V2 for extensive diagnostics, including loop-backs, G.SHDSL and E1 performance monitoring.
- Structured and unstructured modes, locally settable, provided.
- Complies with EMI/EMC specifications CISPR 22 {1993} for Class B equipment.
- OAM operations through VT 100 dumb terminal.
- 160 to 240VAC and –40 V to –60 VDC.
- Available in Metallic & Plastic enclosure

Applications

- 2.048 Mb/s structured and unstructured. P2P & P2MP applications.
- Public switch to ISDN/PABX switch.
- Client-to-Client (2-pair) @ 4.608 Mb/sec and N x 64 Kb/s (where N= 1 to 72).
- Client-to-Client (1-pair) @ 2.304 Mb/sec and N x 64 Kb/s (where N= 1 to 36).
- Network to Client @ 2.048Mb/sec and N x 64 Kb/s (where N= 1 to 32).
- Network to client @ 2.048 Mb/sec with time slot sharing between V.35 interface & G.703 Interface. This enables user to interface PABX & Router simultaneously.
- LAN Bridging.

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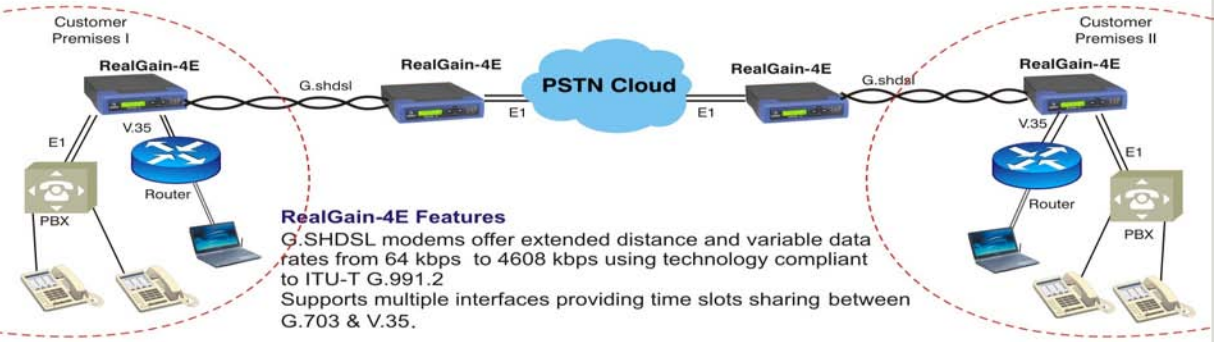
Leased Line Application

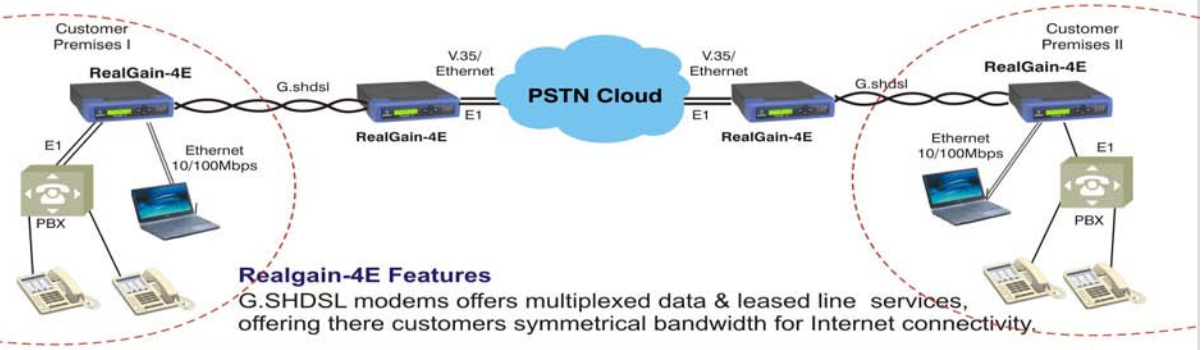


RealGain-4E Features

G.SHDSL modems offer extended distance and variable data rates from 64 kbps to 4608 kbps using technology compliant to ITU-T G.991.2

Supports multiple interfaces providing time slots sharing between G.703 & V.35.

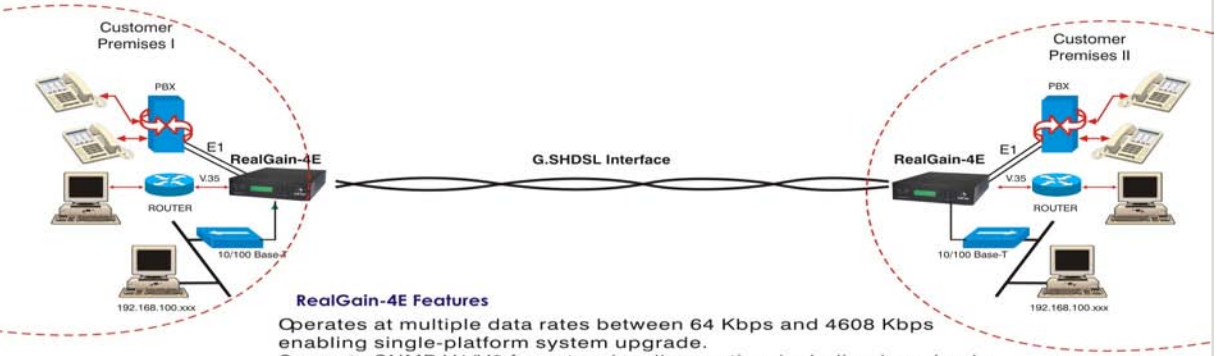
G.SHDSL Realgain-4E Telecom & ISP



Realgain-4E Features

G.SHDSL modems offers multiplexed data & leased line services, offering there customers symmetrical bandwidth for Internet connectivity.

G.SHDSL Realgain-4E Campus Installation



RealGain-4E Features

Operates at multiple data rates between 64 Kbps and 4608 Kbps enabling single-platform system upgrade.

Supports SNMP V1/V2 for extensive diagnostics, including loop-backs BERT test, G. Shdsl and E1 performance monitoring

Provides High-speed data connectivity on Two/Single unconditioned twisted copper pairs/pair.

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Realgain 4E - G.SHDSL Modem

Specifications

Model	Realgain-4E
Hardware Specifications	
Power supply	230 V A.C nominal (160V to 240V) / -48 V D.C nominal (-36V to -60V)
Dimensions	Single Slot (S. S.) Enclosure: 245 x 306 x 62 mm & 19" shelf: 586 x 355 x 435 mm
Operating environment	-15 ~55 degree C, 5%~90%RH,QM-333 compliant
Interfaces	
DSL Line	G.SHDSL compliant to G.991.2, ETSI 101 524
Copper pairs	Two/One. Refer Table 1 &2 for the reach.
Line Coding & Impedance	TC-PAM line coding; 135 Ohms
Protection	ITU K.20 & K.21
Connectors	RJ45 & Terminal Block
Network Interface	
G.703 (2Mbps)	120 Ohms(balance) /75 ohms(unbalance) network interface
Standards	Complies with G.703, G.704, G.706,G.823 & G.732
Modes	Structured / Unstructured modes e.g. PCM-31,PCM-31C,PCM-30,PCM-30C,
Line Code	HDB3
	LIU Sensitivity: (I) Short Haul.0 to -6dB (II) Long Haul.0 to –34dB (III) Ext. Long Haul. -20 to –48dB
Clock Options	Internal Clock/ External Clock/ G.703 Recovered Clock
Connectors	RJ45/Terminal Block & BNC
G.703 (Co-directional)	120 Ohms /75 ohms network interface
Standards	Complies with G.703
Line Code	AMI
Clock Options	Internal Clock/ External Clock/ G.703 Recovered Clock
Connectors	RJ45/Terminal Block & BNC
Synchronous Interface V.35/V.36/X.21/RS530	Standard M34 pin Connector
	Client interface providing up to 2.048 Mb/sec data
	N x 64 Kbps (N=1 to 32) user configurable as bandwidth requirements
Clock/data	Inverting/Non-inverting Slave/Loop
	DTE, DCE soft configurable (Optional)
Control signals	DTR,DSR,DCD etc signals are supported
Ethernet	Compliance to IEEE 802.3, IEEE 802.3U standards
Protocol	Supports standard HDLC protocol
	10 /100 Base-T (RJ-45), half & full duplex
MAC address	Dynamically learning and aging up-to 2048 MAC addresses
Management	
Front panel LEDs	• Power supply Indication, • Sync1 & Sync 2: G.SHDSL synchronization. • Margin (1/2): Indicates status of link as marginal on pair-1 & pair-2. • TD/RD: Transmit & Receive data. • LOS: Loss of E1 signal. • Fault: E1 Faults (LOS, AIS or Loss of frame). • Test: System under TEST.
LCD with front panel switches	16x2 LCD for System Information, Configuration & Fault Diagnostics
Loop backs	• Compliant to ITU V.54 • Exchange-to-Exchange loop back at LTU • Exchange-to-Exchange loop back at NTU • Customer-to-Customer loop back at NTU • Customer-to-Customer loop back at LTU
BER meter	Yes with PRBS generator of 2E11-1 & various data patterns. Compliant to V.52 & O.152
Console	RS232 connector for PC connectivity
Telnet & SNMP	Via External Ethernet Management port

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Table (1) Typical distance over Single pair(2Wire).

Data Rate (in Kbps)	Distance(Km)@ 24 AWG (0.51 mm) UTP
64	12.0
128	11.0
256	8.0
512	7.0
1024	6.2
2048	5.5
2304	4.2

Table (2) Typical distance over two pairs(4Wire).

Data Rate (in Kbps)	Distance(Km)@ 24 AWG (0.51 mm) UTP
384	8.7
512	8.0
1024	7.0
2048	6.2
4096	5.0
4608	4.2

Ordering Information

RTS-Realgain-4E–XXXX–YY (Unmanaged)
RTS-Realgain-4E–XXXX–YY-M (Managed)

XXXX (interfaces)

XXXX	Interface Description
052A	G.703 (2 Mbps)
052B	V.35
052C	V.35 & G.703 (2 Mbps)
052D	Ethernet
052E	Ethernet/V.35
052F	G.703(2Mbps) & V.35 & Ethernet with Time- slot Sharing(optional)
052G	G.703 (64 Kbps Co-Directional)
052H	G.703 (2Mbps) & V.35 With Time slot Sharing.(optional)
052I	G.703(2Mbps)/Ethernet
052J	G.703(2Mbps) & V.35 & Ethernet without Time- slot Sharing(optional)
052K	G.703(2Mbps) & G.703 (64 Kbps Co-Directional)

YY (Features)

Features (YY)	Copper pair		Power Options	Mechanical	
	2 wire	4 wire		Single Slot Chassis	19" Shelf Mounted
00	√	-	220VAC	√	-
01	√	-	48VDC	√	-
02	√	-	220VAC/48VDC	√	-
03	-	√	220VAC	√	
04	-	√	48VDC	√	
05	-	√	220VAC/48VDC	√	
06	√	-	48VDC		√
07	-	√	48VDC		√

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