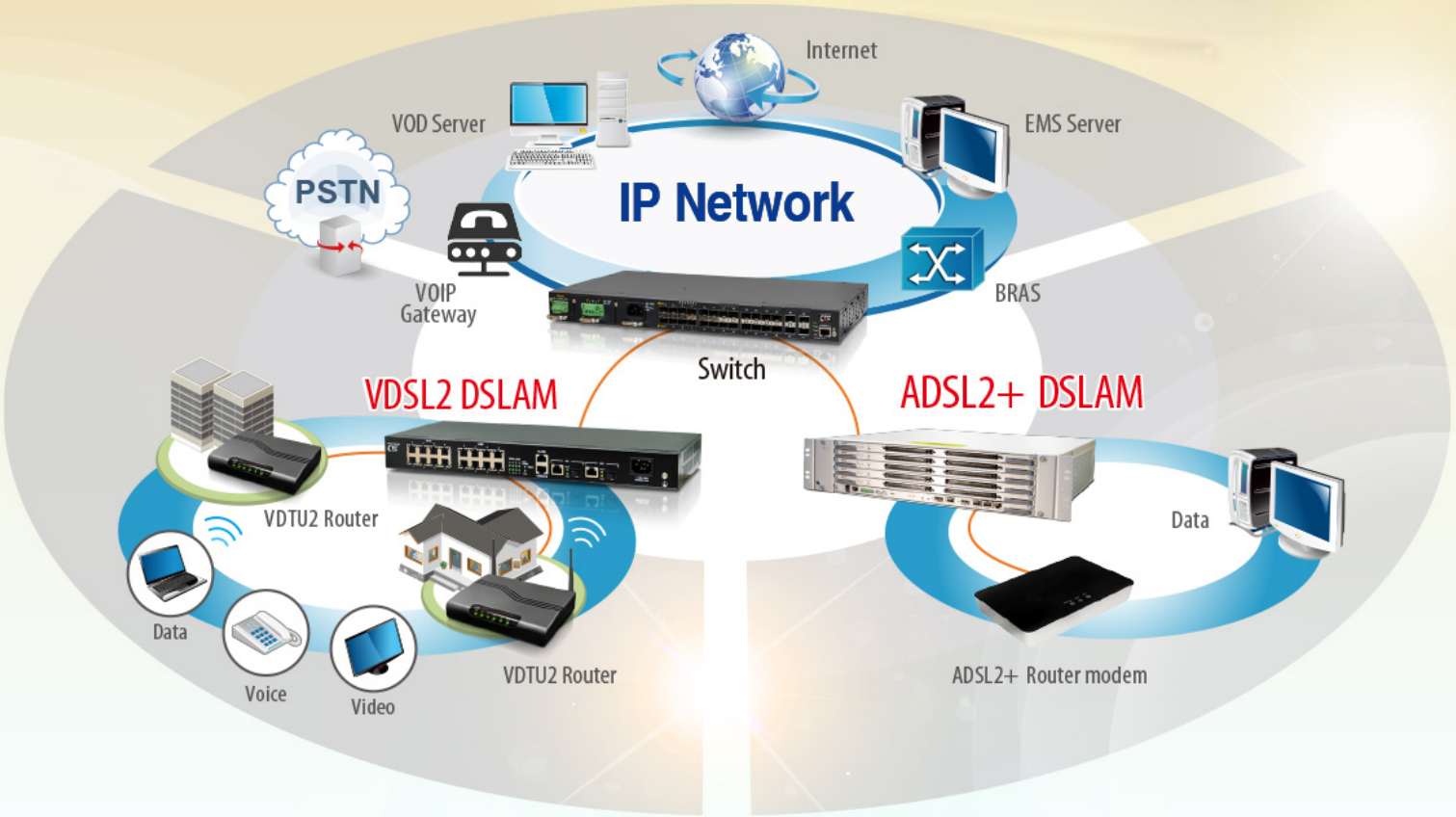
DSL Series

VDSL2 IP DSLAM
ADSL2+
G.SHDSL TDM & ATM
EFM LAN Extender



Remote *Local*

VDTU2A-104-4PH

4-Port PoE Ethernet Extender with Power Feeding *(Phone Line)*

VDTU2A-104-4PH are a pair of devices that support remote power feeding to a non-managed Fast Ethernet PoE (Power over Ethernet) switch and provides Ethernet LAN extension up to 1.2km. Housed in a rugged metal chassis, the LAN extender provides an excellent solution in IP surveillance networks to extend both Ethernet and power over a simple single pair telephone wire. Up to 4 remote IP cameras (or other PoE PD devices) may be powered, with a maximum budget of 40 watts PoE available, without the requirement to run any extra electrical power lines. Standard operating temperature range is -20 to 50°C.

Features

- Local unit accepts universal AC power
- Remote power feeding eliminates the need for power service at remote unit
- IP30 rugged metal housing
- 4 port with IEEE 802.3af/at PSE at remote (40W budget)
- Remote power feeding and data operate over one twisted pair over up to 1200 meters
- Simple DIP switch setting to set and forget
- Twisted pair with auto polarity detection for easy installation
- Twisted pair connects with terminal block or RJ-11

Specifications

Standards	IEEE802.3 10BASE-T
	IEEE802.3u 100BASE-TX
	IEEE802.3x Flow Control and Back Pressure
	IEEE802.3af/at PoE
Data Architecture	Store and Forward
PoE RJ-45 pin assignment (VDTU2A-104R-4PH)	RJ-45 port 1~ 4 support IEEE 802.3at/af Positive (VCC+): RJ-45 pin 4, 5 Negative (VCC-): RJ-45 pin 7, 8 Data (1,2,3,6)
PoE standard	IEEE802.3at/af (VDTU2A-104R-4PH)
Connector	RJ11 x 1 or Terminal block x 1 for Twisted pair Phone line 4-Port RJ-45 for 10/100Base-TX Ethernet, and IEEE802.3 af/at PoE (PoE port only for VDTU2A-104R-4PH)
Ethernet Cable	UTP/STP above Cat. 5e cable, EIA/TIA-568 100-ohm (100m)
Phone line cable	Phone twisted pair above AWG24
Power deliver	Distance : 1200Meter by Twisted pair Phone line PoE 40Watt totally Supports PTZ IP cam
Power feeding Watt	Power feeding by Phone line up to 40W for Total @1,200KM, Supports Per Ethernet port up to IEEE802.3at 30W maximum
Performance and Power feeding	Phone line Distance vs Speed and Power

Distance (Meter)	300	600	900	1200
Throughput Down load /Up load	45/81	29/62	15/43	6.5/28
Power feeding by Phone line	40W	40W	40W	40W

Tested under room temperature 25°C; 24AWG twisted-pair cable

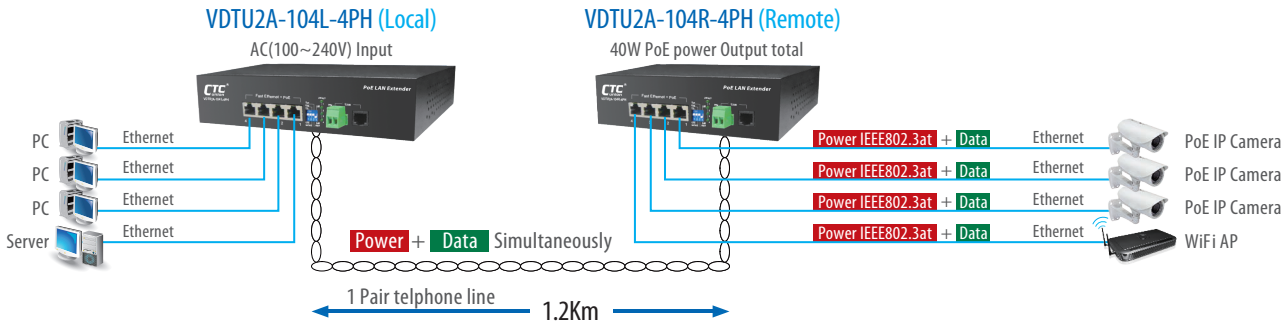
Power Input	100~240VAC (VDTU2A-104L-4PH)

DIP SW	

DIP SW	SW 1 CO / CPE	SW 2 Transmitt Mode (1)	SW 3 Transmitt Mode (2)	SW 4 Signal S/N
ON	CO	Fast	Symmetric	6 dB
OFF	CPE	Interleave	Asymmetric	9 dB

LED	RJ-45 Per port 1~4 : Link/Active (Green) Power : Green (ON: Device Power ON) CO LED OFF: Act as CPE, ON: Act as CO Link(Phone) On: Link, Flash: Linking on going, Off: disconnect
Operating Temperature	-20 ~ 50°C
Dimensions	VDTU2A-104L-4PH : 190 x 200 x 48 mm (D x W x H) VDTU2A-104R-4PH : 170 x 170 x 44 mm (D x W x H)
Housing	Metal Case
Weight	1.3KG (VDTU2A-104L-4PH) 1.0KG (VDTU2A-104R-4PH)
Operating Humidity	5 ~ 95% (Non-condensing)
Installation	Desk and Wall Mounting
Short circuit protection	Present (Phone line Power feeding short circuit protection)
Surge protection for Phone, Network Line	EN61000-4-5 Level 3 Criterial B (Line to Ground 2KV)
Reverse polarity protection	Phone line DC Power feeding polarity protection RJ-45 Network Line PoE DC Power polarity protection
Certification	CE, FCC
EMI	FCC Part 15 Subpart B Class B, EN 55022 Class B

Application



Ordering Information

Model Name	Description
VDTU2A-104-4PH	Ethernet Extender by phone line With Power Feeding and PoE (VDTU2A-104L-4PH and VDTU2A-104R-4PH)

EFM-10/20/40

4-Port EFM G.SHDSL.bis LAN Extender

EFM is an Ethernet Network Extender designed to provide bonded high-speed Ethernet First Mile services over SHDSL on existing copper infrastructure. It is a bridge mode modem that delivers Ethernet services with symmetrical bandwidth at rates up to 22.8 Mbps (4 Pairs, Standard mode with TC-PAM 32) and 61 Mbps (4Pairs, Enhanced mode with TC-PAM 128). Implemented on IEEE 802.3ah EFM standards for advanced performance and management features. EFM ensures high reliability, low expense and maximum throughput. The introduction of EFM copper bonding technology allows delivery of higher bandwidth to longer distances over multiple copper pairs, enabling a good alternative in place where fiber is not economical to deploy. This Ethernet-pure solution provides a seamless integration into today and tomorrows networks. Designed with standard-based EFM technology (2BASE-TL), deployment of Ethernet services with EFM is quick and simple on the existing copper plant.

Features

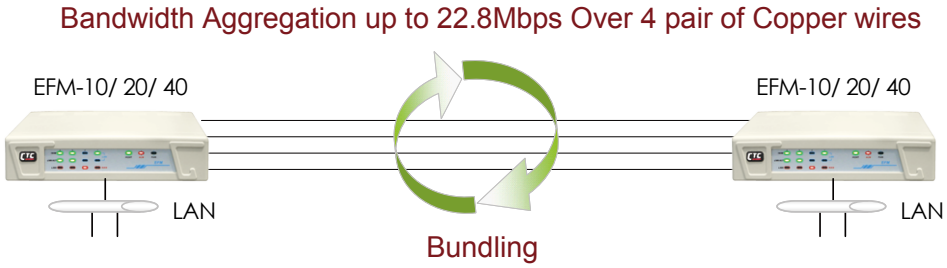
- Extending Ethernet Services to sites with existing copper infrastructure
- Supports TC-PAM 32 for 5.7 Mbps over single pair copper
- EFM Bonding up to 61 Mbps (4 pairs, TC-PAM 128)
- Flexible and Rapid Service Deployment
- Flexible configuration as CPE or CO
- Supports EFM OAM complying IEEE 802.3ah
- Low Delay, Jitter and packet loss for delay sensitive applications
- Comprehensive and easy OAM & P functions in provisioning and management
- QoS feature for guaranteed Ethernet service
- Future-proof Ethernet traffic management and QoS features

Specifications

Standards	LAN	4-Port switching hub
		10/100Base-T auto-negotiation & sensing
		Auto MDI/MDI-X
	WAN	ITU-T G.991.2.(2004)
		EFM bonding (IEEE 802.3ah OAM)
		2BASE-TL
		Data Rate: • N x 64 Kpbs (N=3~89) using TC-PAM 16/32 • Max. 5.696Mbps (1-Pair) • Max. 11.392Mbps (2-Pair) • Max. 22.784Mbps (4-Pair) • N x 64 Kbps (N=3~239) using TC-PAM 64/128 • Max. 15.296 Mbps (1-Pair) • Max. 30.592 Mbps (2-Pair) • Max. 61.184 Mbps (4-Pair) • Supports of Annex A, Annex B, Annex AF & Annex BG
LAN Protocols	802.1d Transparent Bridging	
	Up to 2K MAC Address learning bridge	
Hardware Interface	DSL : RJ-45 x 1, LAN : RJ45 x 4, Console Port x 1	
	MGMT : RJ45 x1, DC Power Jack x 1	
	Reset Button : Load Factory Default	
Indicator	LAN : Link/Act, 10/100 per port	
	System : Power, Alarm, MGMT	
	WAN : Link per loop	

Management Interface	Easy to use web-based GUI for quick setup, configuration and management
	Menu-driven interface for local console and telnet access
	Password protected management and access control list for administration
	SNMP v1/v2 (RFC1157/1901/1905) agent and MIB II (RFC1213/1493)
	EFM OAM (IEEE 802.3ah)
	Software upgrade via web-browser / TFTP
VLAN Support	IEEE 802.1Q VLAN Tagging
	Up to 8k 802.1q VLANS (ID Range 1~4094)
	Port Based VLAN, VLAN Stacking (Q-in-Q)
QoS Support	Rate limiting by rule-based/port-based
	Traffic classification based on port/802.1p/ DSCP
	WRR (Weighted Round Robin) / SPQ (Strict Priority Queuing) scheduling algorithm, IPv6 (RFC 5430) pass through
Environment	Operating Temperature : 0 ~ 50°C
	Storage Temperature : -40 ~ 85°C
	Relative Humidity : 98%, non-condensing
Regulatory	ISO 9001 Quality Management, CE Approval
Physical / Electrical	Dimension : 195 x 48 x 168mm (D x W x H)
	AC Power Adapter (100 ~ 240VAC)
	Weight : 1.3kg
Memory	2MB Flash Memory, 8MB SDRAM

Application



Ordering Information

Model Name	Description
EFM-10	2W, 2Base-TL EFM LAN Extender with 4x10/100Base-TX
EFM-20	4W, 2Base-TL EFM LAN Extender with 4x10/100Base-TX
EFM-40	8W, 2Base-TL EFM LAN Extender with 4x10/100Base-TX

EFM – □□

Example: EFM – 10

VDSM2-1524

24-Port VDSL2 IP DSLAM

VDSM2-1524 is a 24-port VDSL2 IP DSLAM with 2 Gigabit Ethernet Combo interfaces built-in a 1.5U height design. VDSM2-1524 offers the fastest data rate over the existing copper infrastructure. In order to connect with the growing broadband applications, VDSM2-1524 provides the idea solution in the last mile. VDSM2-1524 is able to provide a faster data transmission easily with the latest VDSL2 technology in order to handle the rapidly growing demands of triple-play media. VDSM2-1524 supports the switch management functions, such as port speed configuration, port link aggregation, IEEE 802.1Q VLAN, Q-in-Q VLAN, and ACL security. In addition, it is featured with advanced functions, such as IGMP snooping, QoS, bandwidth control and etc. VDSM2-1524 allows its users to provide a better secured network service with enforcing security policies, such as MAC filter, Static MAC, IP/MAC binding and port security.

Features

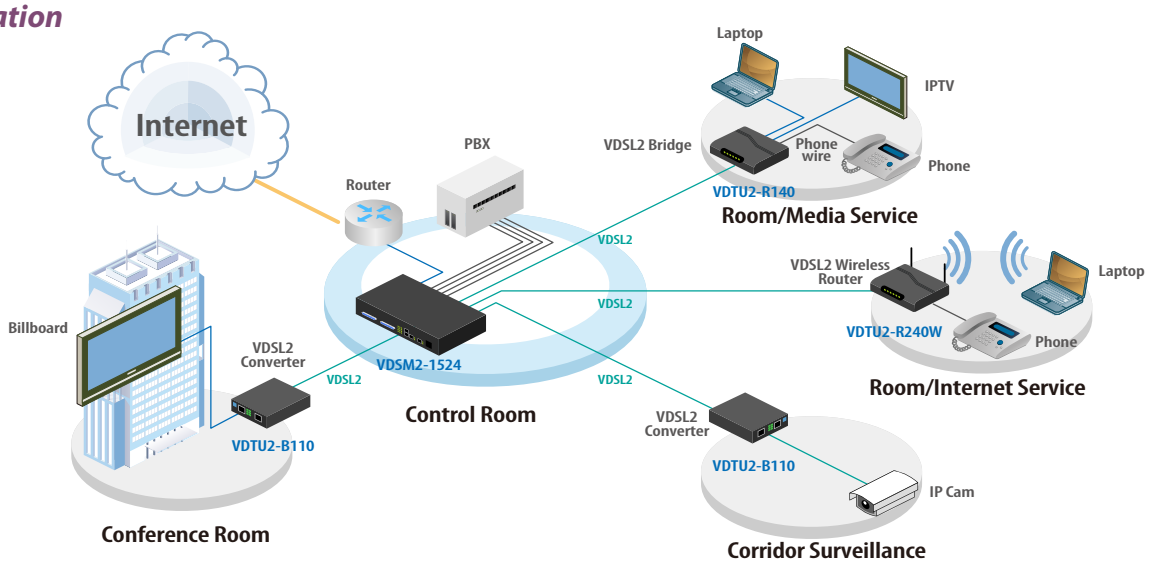
- 1.5U design, 24 VDSL2 ports splitter
- Supports VDSL2 Profiles, 8a, 8b, 8c, 8d, 12a, 12b, 17a and 30a
- Supports Traffic Classification, such as QoS, ToS, DSCP, etc
- Supports L2/L3 Content Filtering
- Configuration backup and restoration
- Supports, Port-Based VLAN, Protocol-Based VLAN, VLAN Mapping, etc
- Supports L2 Bridge Functions (IEEE 802.1d) and Multicast.
- DHCP Server/Relay/Client
- DNS Proxy
- Flexible Deployment and Maintenance.
- Web-based management with a user friendly interface.

Specifications

Chassis	1.5U High
Interfaces	24 VDSL2 Ports
	Two RJ-45 100/1000Mbps Ethernet Combo Ports
	Management Ethernet
	1 x RS-232 Serial Console
	POTS Splitter
LED Indicators	SYS, ALM, LINK, ACT
	24 x VDSL LEDs
Standards	VDSL2 ITU-T G.993.2
	VDSL2 Profiles: 8a, 8b, 8c, 8d, 12a, 12b, 17a and 30a
	802.1d L2 Bridging
	DHCP Server/Client/Relay
	IEEE 802.1Q VLAN (Port-based VLAN and Protocol-Based VLAN)
	VLAN Stacking (Q-in-Q)
	IEEE 802.1p Spanning Tree Protocol (STP)
	IEEE 802.3ad Link Aggregation

Protocols	IGMP Snooping/Proxy v1 and v2
	Multicast Forwarding with IGMP Snooping v1 and v2 (RFC 1112 and RFC 2236)
	Up to 512 Multicast Channels
	Fast and Normal Leave Modes
Security	L2 Frame Filtering by MAC Addresses
	L3 Frame Filtering by IP Addresses, protocol ID, and TCP/UDP
	DHCP and ARP Broadcasting Frames Filtering
	Supports Secured Forwarding
Management	Supports OAM&P Functions
	Supports VLAN Priority Queue (IEEE 802.1p)
	Supports CoS, ToS, DSCP, etc.
	Supports SNMP v1/v2/v3 and MIB I/II
	Web-based Graphical User Interface, Telnet, CLI and SSH
Environment	Operating Temperature : -10 ~ 50°C
	Storage Temperature : -40 ~ 70°C
	Relative Humidity : Up to 95% (non-condensing)

Application



Ordering Information

Model Name	*Description*
VDSM2-1524	24x 10/100-TX Ports VDSL2 IP DSLAM with 600 ohm POTS Splitter

VDSM2-1008

1U, 8-Port VDSL2 IP DSLAM

NEW

VDSM2-1008 is a compact 8-port VDSL2 IP DSLAM with 2 Gigabit Ethernet Combo interfaces and built-in POTS splitter. It is compliant to ITU-T G.993.2 standard and supports VDSL2 30a profile that features 100Mbps of symmetric data rate over the existing copper wires. VDSM2-1008 is an ideal choice for ISPs and System Integrators that are looking for a high performance broadband solution for their triple play (Video, Voice and Data) applications.
VDSM2-1008 is designed to connect with the growing Carrier Ethernet infrastructure, it provides great flexibility for service providers to customize their services and brings them reliable, secure and high quality network access at low cost. In addition, VDSM2-1008 offers user-friendly management interfaces that allow service providers to monitor and control their services in a highly secure and efficient way. It features the supports for Port-based/Protocol-based VLAN, Q-in-Q, VLAN Mapping, VLAN translation, L2/L3 frame filtering and secured forwarding. Furthermore, VDSM2-1008 supports traffic classification including CoS (802.1), VLAN ID, ToS and DSCP. With all these powerful and advanced features, VDSM2-1008 VDSL2 Mini IP DSLAM is the perfect solution for service providers to deploy their broadband access, IP Surveillance, Hospitality and MTU/MDU applications.

Features

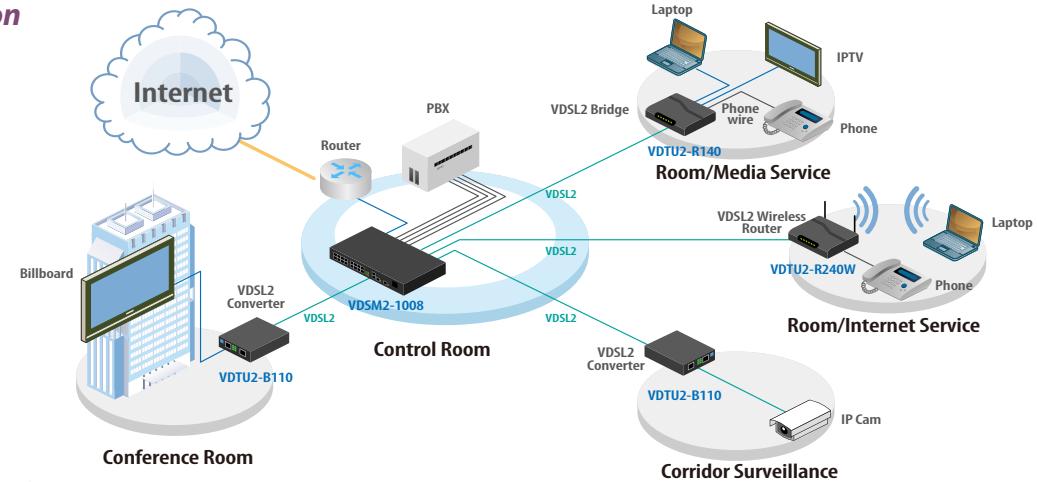
- 1U design, 8 VDSL2 ports with POTS splitter
- Provides 3-FAN cooling mechanism and support low/middle/full speed based on programming temperature
- Supports VDSL2 profiles 8a/8b/8c/8d/12a/12b/17a/30a
- Supports traffic classification, such as QoS, ToS and DSCP
- Supports Port Security with MAC address filtering
- Supports Port-Based VLAN, Protocol-Based VLAN and VLAN Mapping
- Supports IEEE 802.1d STP/IEEE802.1w RSTP & IEEE-802.1s MSTP
- DHCP /Client/Relay/Option82, DNS Proxy
- Flexible deployment and maintenance
- Web-based management with a user friendly interface
- Configuration backup and restoration

Specifications

Interfaces	RJ-11 x 8 VDSL2 Ports / RJ-11 x 8 POTS Ports
	2x Gigabit Ethernet Combo ports (100/1000Base-T and SFP)
	1x RJ-45 Console Port
	1x RJ-45 Alarm Port for 4 Alarm Inputs
LED Indicators	System : PWR
	Gigabit Port : LINK/ACT, SPEED 1000/100
	Alarm : RUN/ALARM
	VDSL : VDSL Link/Sync
Standards	VDSL2 ITU-T G.993.2
	VDSL2 Profiles: 8a, 8b, 8c, 8d, 12a, 12b, 17a and 30a
	802.1d L2 Bridging
	DHCP/Client/Relay/Option82
	IEEE 802.1q VLAN Tag base
	VLAN Stacking (Q-in-Q)
	IEEE 802.1d Spanning Tree Protocol (STP)
	IEEE 802.3ad Link Aggregation
Certification	CE, FCC Part 15 Subpart B, VCCI, EN60950
Dimensions	404 x 174 x 44.5 mm (D x W x H)
Power	100-240 V AC, 50-60 Hz

Power Consumption	30Watts maximum
Protocols	IGMP Snooping/Proxy v1, v2 and v3
	Multicast Forwarding with IGMP Snooping v1 and v2 (RFC 1112 and RFC 2236)
	Multicast MAC address mapping
	Up to 512 Multicast Channels
	Profile-based Multicast Access Control (up to 8 profiles)
	Fast and Normal Leave Modes
Security	L2 Frame Filtering by MAC Addresses
	L3 Frame Filtering by IP Addresses, protocol ID, and TCP/UDP
	DHCP and ARP Broadcasting Frames Filtering
	Supports Secured Forwarding
Management	Local Management: RS-232 and Telnet CLI, Web/SNMP management
	Remote in-band Management: Web/SNMP/Telnet
	Supports SNMP v1/v2/v3
Environment	Operating Temperature : -10°C to 50°C
	Storage Temperature : -40°C to 70°C
	Humidity : 10% - 95% (non-condensing)

Application



Ordering Information

Model Name	Description
VDSM2-1008	8-Port VDSL2 IP DSLAM with POTS Splitter (600 ohm)

Specifications & design are subject to change without prior notice. Please visit CTC Union website for more details.

NEW

VDTU2-R240W

VDSL2 802.11n Wireless Router

VDTU2-R240W is a VDSL2/ADSL2+ 802.11n Wireless router with four fast Ethernet LAN ports and USB Host. It is compliant to ITU-T G.993.2 standard and supports VDSL2 30a profile that features 100Mbps of symmetric data rate over local loop. With built-in 802.11n technology, VDTU2-R240W can deliver wireless speed up to 300 Mbps and is perfectly suitable for triple play applications (video, voice and data). VDTU2-R240W VDSL2 Router is designed to meet the requirements of ISPs and carriers that intend to use one DSL device to cover end users in different loop range areas, it provides a great flexibility for their end-users to comply today's rapid-changing Internet demands. VDTU2-R240W VDSL2 is a cost-effective and high-speed Internet access solution that can provide users a smooth and reliable wireless connection.

Features

- Automatically switches from VDSL2 to ADSL2+
- Supports VDSL2 profiles 8a/8b/8c/8d/12a/12b/17a/30a
- Equipped with a one-click Wi-Fi Protected Setup (WPS) button
- Security protection with firewall
- Web-based management with user friendly interface.
- Configuration backup and restoration
- TR-069 Remote Management (Optional)

Specifications

Interfaces	
LAN	4x RJ-45 10/100Base-T Auto-sensing and Auto-MDIX switch, supports IPv6
USB	USB host x 1
Wi-Fi	802.11b/g/n and 2 External antennas
RST	"Factory reset" button & reboot button
WPS	WPS push button
Power	ON/OFF switch
DSL Compliance	
ADSL	G.dmt (ITU G.992.1) Annex A, B
	G.lite (ITU G.992.2) Annex A, B
	G.hs (ITU G.994.1)
	G.bond (ITU G.998.1)
	Maximum rate : 8 Mbps for downstream / 1 Mbps for upstream
	G.dm.bist + A196 (ITU G.992.3) Annex A, B
	G.lite.bis (ITU G992.4) Annex A, B
	Maximum rate : 12 Mbps for downstream / 1 Mbps for upstream
	G.dmt.bisplus (ITU G992.5) Annex A, B
	Maximum rate : 24 Mbps for downstream / 1,2 Mbps for upstream
ADSL2+	Up to 8 PVCs
	Supports encapsulation of bridged Ethernet over AAL5 (RFC 2684,formerly RFC1483)
	Supports encapsulation of routed IP over Ethernet over AAL5(IPoE)
	Supports encapsulation of routed IP over AAL5 (IPoA)
	Supports Classical IP according to RFC 2225 (formerly RFC1577)
	Supports PPPoA according to RFC 2364
	Supports PPPoE(default) according to RFC 2516
	Supports multiple levels of QoS
VDSL2	ITU G993.2 Annex A, B, C
	VDSL2 (ITU G993.2) Annex A,B,C, support Band plans 997, 998 refer to Annex B
	Up to 17 Mhz profile (POTS/ISDN)
	Supports VDS2 profile 8a, 8b, 8c, 8d, 12a, 12b, 17a, 30a
	Supports ATM and PTM transparent (dual-priority & dual latency) for user data

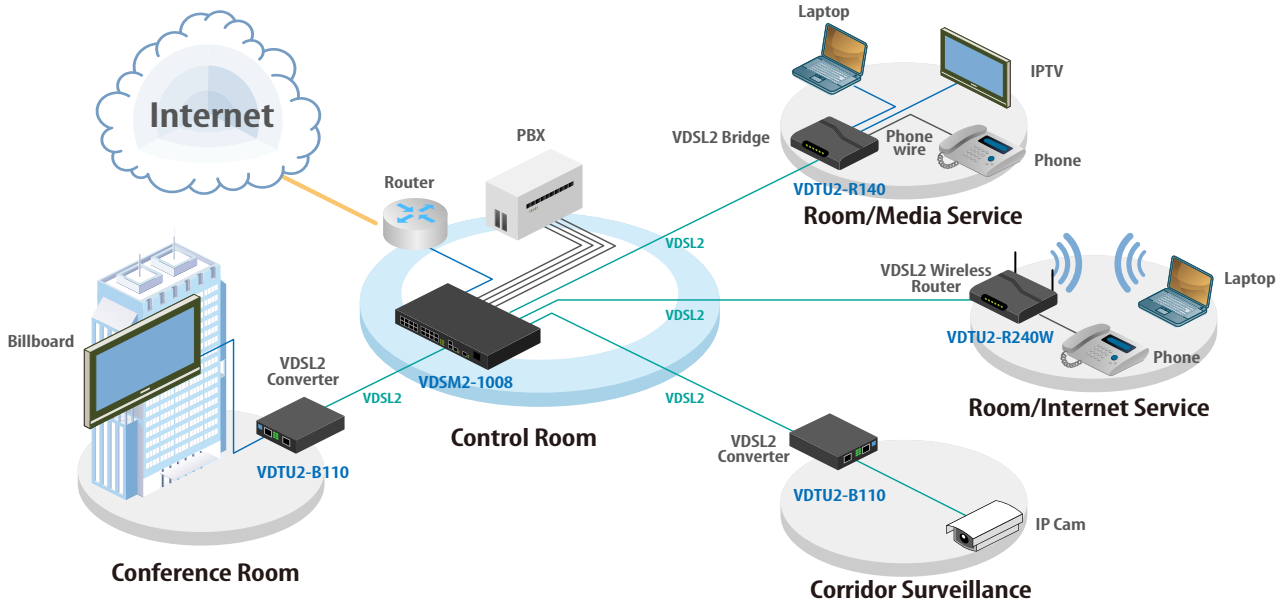
WLAN	Compliant with IEEE 802.11b, 802.11g, and IEEE 802.11n standards
	2.4 GHz configurable (5 GHz Optional)
	Up to 300 Mbps wireless operation rate
	RF Output Power: 15 ± 1.5 dBm in 2.4 GHz
	64/128-bit Wireless security with WPA/WPA-PSK, PA2/ WPA2-PSK, Mixed WPA/WPA2 support
	WPS (WiFi Protected Setup) for easy setup
USB	File Sharing
	3G backup support
VPN	VPN Pass-through
Management	Web-based GUI for remote and local management (HTTP/ HTTPS)
	Quick Start Wizard
	Configuration Backup and Restoration
	Firmware upgrade through TFTP/FTP and HTTP
	SNMP management with SNMP agent and MIB II
	Supports Syslog
	TR-069 (Optional)
QoS	ATMQoS : UBR (Default), CBR, VBR-rt, VBR-nrt
	802.1p
	IP DSCP

Specifications

Firewall	IPv6 Firewall
	Packet filtering
	URL filtering
	Parental control
Routing	Static routing and RIP v1/v2 (RFC 1058/2453)
	Supports IP/TCP/UDP/ARP/IGMP
	IP multicast and IGMP proxy (RFC 1112/2236)
	Network Address Translation (NAT/PAT)
	DNS relay and caching (RFC 1034/1035)
	DHCP server
	IP precedence (RFC 791) (Firewall router)

Power	AC Adapter : 100V-240V± / 10%
	Output : DC 12VDC
Certification	CE, FCC, RoHS compliant

Application



Ordering Information

Model Name	Description
VDTU2-R240W	VDSL2 Wi-Fi Router with 4-Port 10/100-TX Ethernet

NEW

VDTU2-R140

4-Port VDSL2 Router

VDTU2-R140 is a single-VDSL2-port router with 4 10/100Mbps Ethernet ports. It adopts the latest VDSL2 technology (ITU G.922.3), which has the extraordinary bandwidth and supports up to VDSL2 profile 30a, and it is perfectly suitable for triple play applications (video, voice and data). VDTU2-R140 is a cost effective solution that delivers high-speed Internet access to end-users over existing copper wire infrastructure. Also, it is designed to meet the requirements of ISPs and carriers that intend to use one DSL device to cover end users in different loop range areas. In addition, it provides great flexibility for their end-users to comply today's rapid-changing Internet demands. Based on the latest VDSL2 technology, VDTU2-R140 presents a cost-effective solution with high-speed Internet access over standard copper telephone cable.

Features

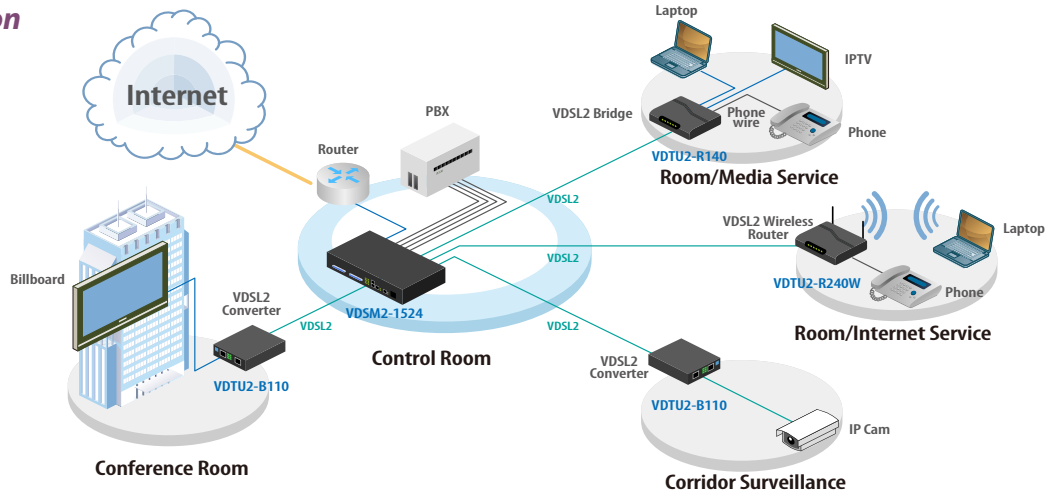
- Supports point-to-point mode (support both CO and CPE modes)
- Interoperable with major VDSL2 chipset solutions including Ikanos, Infineon, and Broadcom
- Supports up to VDSL2 profile 30a
- Supports up to 100Mbps for both Upstream and Downstream
- Build-in UPnP available, which allows automatic discovery and the broadband router's configuration
- IP/MAC address filtering
- Static route/RIP/RIP v2 routing functions
- Dynamic IP assignment
- Supports QoS to enhance traffic efficiency
- Supports NAT, which allows multiple users access the Internet with only one single external IP address
- IGMP Proxy and fast leave
- DHCP Server/Relay/Client. DNS Proxy, DDNS
- Embedded SNMP agent
- Web-based management with a friendly graphical user interface
- Configuration backup and restoration

Specifications

Standards	Compliant with ITU VDSL2 standard G.993.2 Annex A, Annex B and Annex C
	Supports VDSL2 profile: 8a, 8b, 8c, 8d, 12a, 12b, 17a and 30a
	Band plan profile: symmetric (Plan 997) and asymmetric (Plan 998)
	Built-in POTS splitter to share voice and data (Optional)
Management	Web-based GUI for quick setup, configuration and management
	Firmware upgradable from Web
	SNMP management with SNMP agent and MIB II
Interfaces	Ethernet: 4 X RJ-45 connectors for Ethernet 10/100Mbps ports with Auto-MDI/MDIX
	VDSL : 1 X RJ-11 connector for VDSL2 port
QoS	Port Based
	802.1p
	ToS/DSCP
	4 priority queues per port
	WRR/WFQ/SP/BE
Power	AC Adapter : 100V-240V± / 10%
	Output : DC 12VDC

LAN	Filtering functions for MAC/IP/Port.
	Port Based VLAN & IEEE 802.1q VLAN Tagging
	Port configuration for Bandwidth/Duplex/Speed/Flow control
Routing	Static routing and RIP v1/v2(RFC 1058/2453)
	Support IP/TCP/UDP/ARP//IGMP
	IGMP snooping and proxy (RFC 1112/2236)
	NAT ALGs for ICQ/NetMeeting/MSN/Yahoo Messenger
	DNS relay and caching (RFC 1034/1035)
	DHCP server, client and relay (RFC 2131/2132) Dynamic DNS
	IP precedence (RFC 791) (Firewall router)
Firewall	DMZ host
	Virtual server mapping (RFC1631)
	VPN pass-through for PPTP/ L2TP/ IPSec tunneling
	NAT firewall
	User access control
Weight	300g
Dimensions	131.5 x 180 x 36.5 mm (D x W x H)

Application



Ordering Information

Model Name	Description
VDTU2-R140	VDSL2 Router with 4-Port Ethernet and POTS splitter 600 ohm

VDTU2-B110

VDSL2 Ethernet Bridge

VDTU2-B110 Ethernet Extender is a high-speed Ethernet Extender with one Ethernet port (RJ-45 connector) and one VDSL port (RJ-45 connector). It is a bridge mode modem, well accommodating VDSL2 (Very-high-data-rate Digital Subscribe Loop) technology to extend Ethernet service over single-pair phone line. It is compliant to ITU-T G.993.2 standard and supports VDSL2 30a profile that features 100Mbps of symmetric data rate over the existing copper wires. Supporting both symmetric and asymmetric transmission, it can reach up to 100/100 Mbps bandwidth (line rate) within 300M or 10/10 Mbps (line rate) for 1 Km long range connections. By providing ultra-high speed, VDTU2-B110 Ethernet Extender makes your telephone line achieve its best performance than before. It has the advantage of minimum installation time (simply as plug-n-play) and minimum expense by allowing video streaming and data to share the same telephone pair without interference. VDTU2-B110 Ethernet Extender delivers everything needed to quickly deploy a high-speed IP-based network for providing high-speed Internet access, video-on demand services and voice services. The resulting compact, cost-effective form factor offers Systems Integrators, small business owners an attractive Long Reach Ethernet solution.

Features

- Cost effective bridge function to connect two Ethernet LAN
- Supports flow control on Fast Ethernet port via PAUSE frame or Back Pressure
- EEE 802.1Q VLAN tag transparent
- Easy installation via simple plug-and-play
- Selectable CPE and CO mode via DIP switch: Two working modes are built in the same unit, which keep the flexibility of installation and easy provision of service but lower inventory of service provider
- Selectable VDSL2 profile mode (17a or 30a): Support up to VDSL2 30a profile to ensure high data rate.
- Selectable target band plan:
  Symmetric: Support the band plan G.997 and provide the symmetric transmission on both downstream and upstream.
  Asymmetric: Provides highest line rate in short range in asymmetric mode.
- Selectable target SNR margin

Specifications

4-Pole DIP Switch	Selectable CO or CPE mode
	Selectable 30a or 17a (VDSL2 Profile)
	Selectable Band plan (Symmetric or Asymmetric)
	Selectable target SNR margin (6dB or 9dB)
LAN Interface	RJ-45 connector
	Complies with IEEE 802.3/802.3u/802.3x
	10/100 Base-T Auto-Negotiation, Auto-MDI/MDI-X
LED	LAN : ACT/LNK,10/100Mpbs, Half/Full Duplex
	VDSL : Power On/Off, CO/CPE, Idle/Trained/Link
Power supply	DC 12 Volt over 3.5mm DC jack ; 4.2 Watt maximum

VDSL Interface	RJ-45 connector
	DMT Encoding
	Complies with ITU-T G993.1/993.2/G.997.1
	On-board surge protection
Dimensions	73.4 x 96.2 x 22.8 mm (D x W x H)
Temperature	0°C ~45°C
Humidity	0%~95%RH (non-condensing)
Certification	CE
	FCC Part 15 Class B
	EN60950

Application

Ordering Information

Model Name	Description
VDTU2-B110	VDSL2 10/100-TX Ethernet Bridge
FMC-CH17-AC/DC/AD	2U, 17-slot FMC converter Chassis with AC, DC or AD Power

VDTU2 – □□□□
Example: VDTU2 – B110

Chassis Power Type
FMC-CH17 – □□
Example: FMC-CH17 – AD

VDTU2A-301

VDSL2 LAN Extender

The VDTU2A-301 is our lowest cost LAN extension solution using the G993.1/993.2 VDSL2 technology and providing up to 100Mbps throughput with only a single copper wire pair. A LAN extender is a device that forwards traffic between LANs transparently to higher network-layer protocols over distances that far exceed the distance limitations of standard Ethernet. A LAN is a high-speed data network (usually employing Ethernet technology) that connects computer workstations, printers, servers, and other devices. Designed specifically for LAN to LAN extension and supporting both symmetrical and asymmetrical transmission at up to 100/75Mbps within 300 meters or 10/10Mbps rate at 1000 meters, this is a perfect solution to extend a LAN to an adjacent building, garage or any location outside of the 100 meter reach of Ethernet UTP.

Features

- Cost effective bridge function to connect two Ethernet LANs
- 100/75Mbps @ 300m (980 Ft)
- 10/10Mbps @ 1km (3300 Ft)
- Supports flow control via Pause frame or back pressure
- 802.1Q VLAN tag transparent
- Selectable CPE and CO mode via DIP switch
- Selectable fast and interleaved mode
- Selectable target band plan
- Selectable target SNR margin 9dB or 6dB

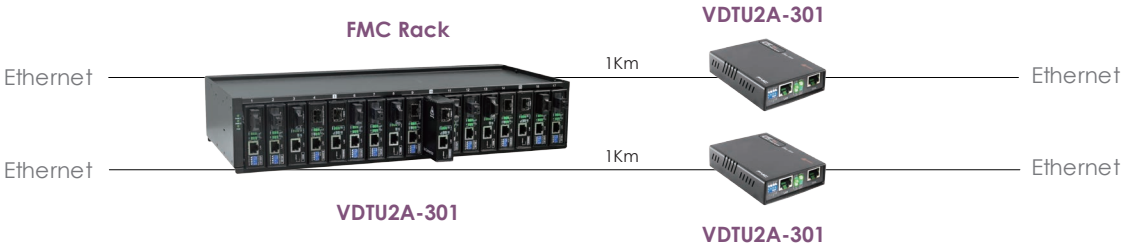
Specifications

LAN Interface	Complies with IEEE 802.3 10Base-T and
	802.3u 100Base-TX
	Connector : RJ45
	MTU : 1536 Bytes
VDSL2 Interface	Complies with ITU-T G993.1/993.2/ G997.1
	Connector : RJ45
	DMT encoding
	On-board surge protection
4-position DIP Switch	Selectable CO or CPE mode
	Selectable fast or interleave mode (Impulse noise protection)
	Selectable Band plan (Symmetric or Asymmetric)
	Selectable target SNR margin (6dB or 9dB)

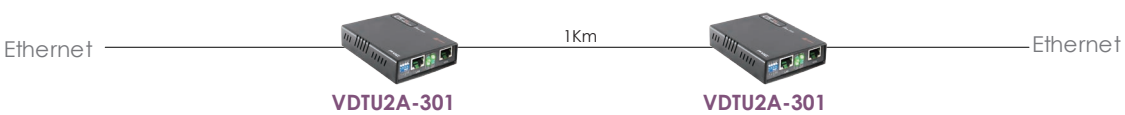
Indicator	LAN : Act/Link, 10/100Mbps, Half/Full duplex
	VDSL : CO/CPE, Idle/Trained/Link, Power
Standard	ITU-T G.993.1, 993.2, IEEE802.3, 802.3u
Power	DC 12V via AC switching adapter
Power Consumption	4.2W
Dimensions	97 x 73 x 23mm (D x W x H)
Weight	80g
Temperature	0 ~ 50°C (Operating), -10 ~ 70°C (Storage)
Humidity	10 ~ 90% non-condensing
Certification	CE, FCC, RoHS compliant
MTBF	50,000 hrs

Application

Rack to Standalone Solution



Standalone to Standalone Solution



Ordering Information

Model Name	*Description*
VDTU2A-301	VDSL2 LAN Extender with 1x 10/100Base-TX
FMC-CH17-AC/DC/AD	2U, 17-slot FMC converter Chassis with AC, DC or AD Power

VDTU2A – □□□
Example: VDTU2A – 301

Chassis Power Type
FMC-CH17 – □□
Example: FMC-CH17 – AD

VDTU2A-304

4-Port VDSL2 LAN Extender

The VDTU2A-304 VDSL2 LAN Extender is a long reach Ethernet extender with four Ethernet ports and two phone jacks, in which one is for VDSL2 connection and the other is for POTS (Plain Old Telephone Service) connection. It has built-in POTS splitter to share the existing phone line with POTS eliminating the need for replacing the existing copper wiring. It is ideal for use as an Ethernet extender to an existing Ethernet network. While accommodating VDSL2 (Very-high-data-rate Digital Subscribe Loop) technology to extend Ethernet service over single-pair phone line, VDTU2A-304 can reach up to 100/75 Mbps bandwidth (line rate) within 300M or 40/10 Mbps bandwidth (line rate) for 1 Km long-range connections. By providing ultra-high speed, VDTU2A-304 LAN Extender makes your telephone line achieve its best performance ever. It has the advantage of minimum installation time (simple as plug-n-play) and minimum expense by allowing video streaming and data to share the same telephone pair without interference. VDTU2A-304 delivers everything needed to quickly deploy a high-speed IP-based network for providing high-speed Internet access, video-on demand services and voice services. The resulting compact, cost-effective form factor offers systems integrators and small business owners an attractive long reach Ethernet solution.

Features

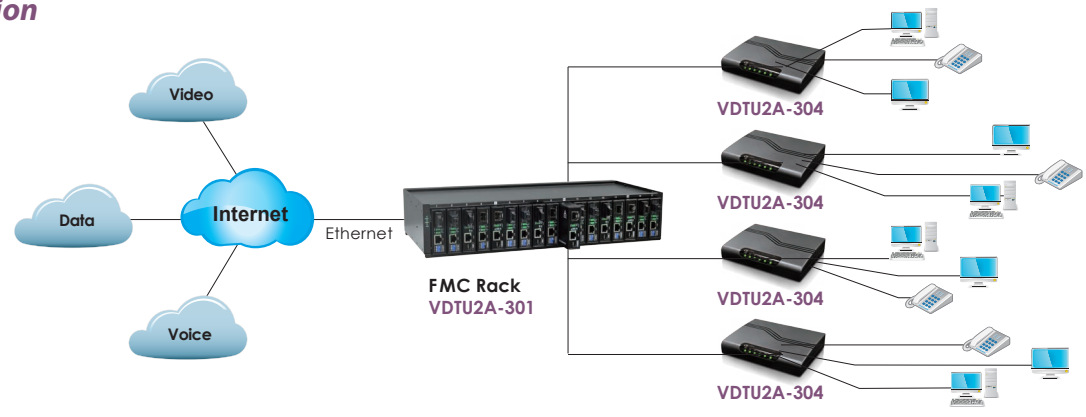
- Cost effective bridge function to connect two Ethernet LAN
- Easy installation via simple plug-and-play
- Selectable CPE and CO mode : Two working modes are built in the same unit, which keep the flexibility of installation and easy provision of service but lower inventory of service provider.
- Selectable fast and interleaved mode: Fast mode guarantees a minimum end to end latency less than 1 mS. Interleaved mode provides impulse noises protection for any impulse noise with duration less than 250uS. Interleaved mode has a maximum end to end latency of 10mS.
- Selectable target band plan : VDSL2 defines multiple band plans and configuration modes to allow asymmetric and symmetric services in same binder for data transmission.
- Asymmetric is selected that provides better downstream performance. Symmetric is selected that provides better upstream performance.
- Selectable target SNR margin: It has the ability to select fixed SNR margin value on 9 dB or 6db. The systems will maintain the SNR margin at their value across all usable loop length. The higher SNR value gets better line quality, but lower performance.

Specifications

Standards	Compliant with ITU VDSL2 standard G.993.2 Annex A, Annex B and Annex C
	Supports VDSL2 profile : 8a, 8b, 8c, 8d, 12a, 12b and 17a
	Band plan profile: symmetric (Plan 997) and asymmetric (Plan 998)
	Supports fast and interleaved mode
	Target SNR Margin : Selectable
	Built-in POTS splitter to share voice and data (Optional)
Management	Web-based GUI for quick setup, configuration and management
	Firmware upgradable from Web
LAN	Filtering functions for MAC/IP/Port
	QoS for Port/VLAN/DSCP/TCP-UDP Port number
	Port Based VLAN & IEEE 802.1q VLAN Tagging
	Port configuration for Bandwidth/Duplex/Speed/Flow control/Broadcast storm

Interfaces	Ethernet : 4x RJ-45 connectors for Ethernet 10/100Mbps ports with Auto-MDI/MDIX
	VDSL : 1 X RJ-11 connector for VDSL2 port
	Phone : 1 X RJ-11 connector for POTS Splitter (Optional)
	General : PWR and SYS
	WAN (VDSL2) : CO, CPE, LINK and ALM
	LAN (Ethernet) : 1, 2, 3, 4 LNK/ ACT
Indicators	General : PWR and SYS
	WAN (VDSL2) : CO, CPE, LINK and ALM
	LAN (Ethernet) : 1, 2, 3, 4 LNK/ ACT
Power	Input : AC 90~240V/50 ~ 60Hz ; Output : DC 12V/1A
Power consumption	9 watts maximum
Environment	Temperature : 0 ~ 45°C
	Humidity : 0% ~ 95% (non-condensing)
Dimensions	131.5 x 180 x 36.5 mm (D x W x H)
Weight	300g

Application



Ordering Information

Model Name	Description
VDTU2A-304/US	VDSL2 LAN Extender with 4-port 10/100Base-TX, splitter 600 ohm

Specifications & design are subject to change without prior notice. Please visit CTC Union website for more details.

MD15

48-Port Managed IP DSLAM with GbE Combo Uplink

The MD15 is a 1.5U 19" rack mountable "pizza box" type ADSL2+ IP DSLAM with temperature hardening. The system provides 48 ADSL2/2+ ports with built-in POTS splitters and is able to provide broadband data communication services and multimedia services on the same copper line. The unit is capable of delivering high speed data services, full-rate of ADSL2+ (up to 24mbps download) for 48 subscribers with 2 Gigabit uplinks or 10 Mbps per port for 96 subscribers in a two 48-port stacked boxes configuration. With advanced QoS features, the MD-15 is ideal for next generation broadband networks capable of delivering rich video content, DSL, POTS, and VoIP service over ADSL2+ link. The MD-15 provides two uplink ports with both electrical and optical (SFP) Gigabit Ethernet (GbE) interfaces for cascading, ring architecture or 802.3ad link aggregation. The MD15 is suitable for small size applications or deployment in remote location such as business parks or street cabinets to extend the service reach distance from central office.

Features

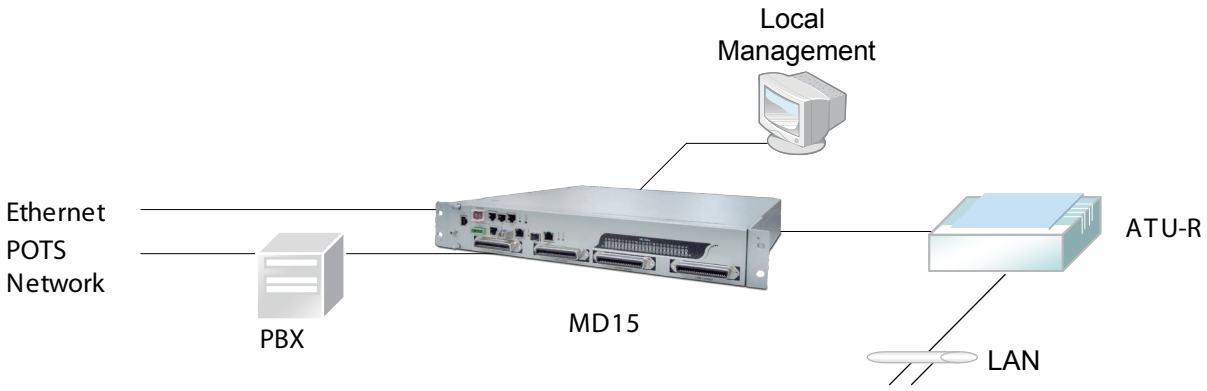
- 48 ports ADSL2/2+ solution in 1.5U chassis
- 1+1 Gigabit Ethernet trunk with combo SFP and RJ45
- Multi-ADSL speed offerings supporting ADSL, ADSL2, ADSL2+ over POTS or ISDN
- Built-in POTS splitters
- Backup firmware partition aids in upgrade failure recovery
- Temperature monitor and system over temperature protection with trap alarm
- Configuration backup and restore via TFTP
- RS-232 serial CLI and separate LAN port for web based management
- NMS/EMS for Multiple nodes management based on SNMP (option)

Specifications

VDSL2 standards	Network Interface	2x 10/100/1000Based-T or 2x SFP (IP)
	Line Interface	ADSL2/2+/ POTS(G.992.1 .2 .3 .5)
Management	Ethernet	IEEE 802.1d Spanning Tree Protocol (STP)
		IEEE 802.3ad Link aggregation
		Password Security on console access
	OSI Layer 2	MAC filtering and count limit
	Functionality	Access control list (ACL)
		Multicasting support
		Port based and 802.1p/q Tag-based VLAN
		IGMP V1/V2 snooping and proxy
		SNMP V1/V2C
System	Multiple session Telnet, web based and SNMP	
Configuration	Supports point to point VCC link Software remote upgrade	
MTBF	50,000 hrs	

Alarm and Status	Automatic alarm/LED indication for alarm and system status Four housekeeping inputs and one alarm contact closure output
Management	Provides all system OAM&P functionalities, software remote updates
	RS-232 local console interface for basic provisioning plus out-band Ethernet interface for Telnet or Web
Indications	GbE 1/2 link, RST, ACO, ALM, SYS, DSL Status 1 ~ 48
Power Input	Dual A+B feeds, -42V ~ -56VDC
	AC: 100V ~ 240VAC
Power Consumption	130W
Dimensions	265 x 482 x 66mm (D x W x H)
Weight	3.5kg
Temperature	-40 ~ 65°C (Operating), -40 ~ 70°C (Storage)
Humidity	10~90% non-condensing
Certification	CE, FCC, RoHS compliant, ITU-T, ETSI

Application



Ordering Information

Model Name	Description
MD15-48A6-AC	1.5 U 19" Rack 48-port Anx A 600Ω AC Power
MD15-48A6-DC	1.5 U 19" Rack 48-port Anx A 600Ω DC Power

MD15 – □□□□ – □□ (Power Type)

Example: MD15 – 48A6 – AC

MD30

24 ~ 120 Ports Modular Managed IP DSLAM with GbE Combo Uplink

The MD30 is a 3U 19" rack mountable ADSL2+ IP DSLAM with temperature hardening. The modular design allows hot swapping of major components such as uplink trunk card, 24-port tributary cards and cooling fan module. The system provides 24/48/72/96/120 ADSL2/2+ ports with built-in POTS splitters and is able to provide broadband data communication services and multimedia services on the same copper line. The unit is capable of delivering high speed data services, full-rate of ADSL2+ (up to 24mbps download) for 120 subscribers with 2 Gigabit uplinks. With advanced QoS features, the MD-30 is ideal for next generation broadband networks capable of delivering rich video content, DSL, POTS, and VoIP service over ADSL2+ link. The MD30 provides two uplink ports with both electrical and optical (SFP) Gigabit Ethernet (GbE) interfaces for cascading, ring architecture or 802.3ad link aggregation. The MD30 is suitable for small size applications or deployment in remote location such as business parks or street cabinets to extend the service reach distance from central office.

Features

- 3U 19(23)" 5-slot ADSL2/2+ chassis
- Modular design with hot swappable field replaceable units
- 1+1 Gigabit Ethernet trunk with combo SFP and RJ45
- Temperature monitor and system over temperature protection with trap alarm
- Backup firmware partition aids in upgrade failure recovery
- Configuration backup and restore via TFTP
- RS-232 serial CLI and separate LAN port for web based management
- NMS/EMS for Multiple nodes management based on SNMP (option)

Specifications

Network Interface	2x 10/100/1000Based-T or 2x SFP (IP) Subscriber Interface	
	ADSL2/2+/ POTS/ISDN (G.992.1 .2 .3 .5) or G.SHDSL	
Line Interface : ADSL	24 ports per card	
	Fast/Interleave latency modes for G.dmt	
	Supports Interleave mode for G.Lite	
	ADSL to ATM signal conversion	
	Build-in POTS splitter circuit	
	Power Consumption : 25 W(max)	
4-position DIP Switch	24 ports per card	
	Signal modulation and demodulation	
	G.SHDSL to ATM signal conversion	
	Power Consumption : 21 W(max)	
Indicator	LAN: Act/Link, 10/100Mbps, Half/Full duplex	
	VDSL : CO/CPE, Idle/Trained/Link, Power	
Standard	ATM	QoS (UBR, rt-VBR, nrt-VBR, CBR)
		PVC default priority and PVC-to VLAN maping
		Traffic scheduling/shaping/policing
	Ethernet	IEEE 802.1d Spanning Tree Protocol (STP)
		IEEE 802.3ad Link aggregation
		Password Security on console access
Management	OSI Layer 2 Functionality	
	MAC filtering and count limit	
	Access control list (ACL)	

Management	Multicasting support
	Port based and 802.1p/q Tag-based VLAN
	IGMP V1/V2 snooping and proxy
	SNMP V1/V2C
System Configuration	Multiple session Telnet, Web based and SNMP
	Supports point to point VCC link
	Software remote upgrade
Alarm and Status	Automatic alarm/LED indication for alarm and system status
Management	Four housekeeping inputs and one alarm contact closure output Provides all system OAM&P functionalities, software remote updates.RS-232 local console interface for basic provisioning plus out-band Ethernet interface for Telnet or Web Indications GbE 1/2 link, RST, ACO, ALM, SYS, DSL Status 1 ~48
Power Input	Input : -48 V DC (-42 V to -56 V)
	Dual A+B -48 V DC power input terminal
Power Consumption	130W
Dimensions	304 x 482 x 133 mm (D x W x H)
Weight	4.5kg
Temperature	-40 ~ 65°C (Operating), -40 ~ 70°C (Storage)
Humidity	10 ~ 90% non-condensing
Certification	CE, FCC, RoHS compliant, ITU-T, ETSI

Application

Ordering Information

Model Name	Type	Description
MD30-MA1A	Chassis	3U,19" 5 slot chassis with DC power, Cooling Fan
MD00-GE1A	Trunk Card	Giga Ethernet Uplink card with 2xGbe Combo
MD00-AL5A	Link Card	24-Port ADSL 2 Line card 600 ohm Splitter ANX-A

Chassis Type
MD30 – □□□□
Example: MD30 – MA1A

Card Type
MD00 – □□□□
Example: MD00 – GE1A

Specifications & design are subject to change without prior notice. Please visit CTC Union website for more details.

MD15A

24-Port Managed IP DSLAM with Gigabit Uplink

The MD15A is a 1.5U 19" rack mountable "pizza box" type ADSL2+ IP DSLAM with temperature hardening. The system provides 24 ADSL2/2+ ports with built-in POTS splitters and is able to provide broadband data communication services and multimedia services on the same copper line. The unit is capable of delivering high speed data services, full-rate of ADSL2+ (up to 24mbps download) for 24 subscribers with one Gigabit copper uplinks. With advanced QoS features, the MD-15A is ideal for next generation broadband networks capable of delivering rich video content, DSL, POTS, and VoIP service over ADSL2+ link. The MD15A is suitable for small size applications or deployment in remote location such as business parks or street cabinets to extend the service reach distance from central office.

Features

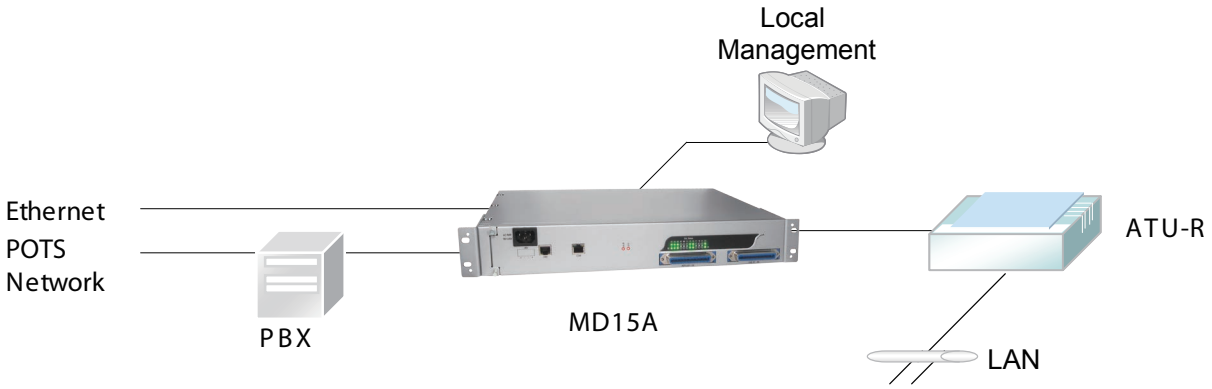
- 24 ports ADSL2/2+ solution in 1.5U chassis
- One copper Gigabit Ethernet uplink design
- Multi-ADSL speed offerings supporting ADSL, ADSL2, ADSL2+ over POTS or ISDN
- Built-in POTS splitters
- Configuration backup and restore via TFTP
- Monitors of line attenuation, noise margin, current rate, second performance data
- Backup firmware partition aids in upgrade failure recovery
- RS-232 serial CLI and separate LAN port for web based management
- NMS/EMS for Multiple nodes management based on SNMP (option)

Specifications

Network Interface	1x 10/100/1000Base-T	
Line Interface	ADSL2/2+/ POTS(G.992.1 .2 .3 .5)	
	Ethernet	Password Security on console access
	OSI Layer 2	MAC filtering and count limit
	Functionality	Access control list (ACL)
		Multicasting support
		Port based and 802.1p/q Tag-based VLAN
		IGMP V1/V2 snooping and proxy
		SNMP V1/V2C
System Configuration	Multiple session Telnet, web based and SNMP Supports point to point VCC link Software remote upgrade	
MTBF	50,000 hrs	

Alarm and Status	Automatic alarm/LED indication for alarm and system status
Management	Maintenance signal for OAM functionalities.
	Software remote updates.
	RS-232 local console interface for basic provisioning plus out-band Ethernet interface for Telnet or Web
Indications	GbE link, RST, ACO, ALM, SYS, DSL Status
Power Input	-42V ~ -56VDC, 100V ~ 240VAC
Power Consumption	130W
Dimensions	265 x 482 x 66 mm (D x W x H)
Weight	3.5kg
Temperature	-40 ~ 65°C (Operating), -40 ~ 70°C (Storage)
Humidity	5 ~ 95% non-condensing
Certification	CE, FCC, RoHS compliant, ITU-T, ETSI

Application



Ordering Information

Model Name	Description
MD15A-24A6-AC	1.5 U 19" Rack 24 port Anx A 600Ω AC Power
MD15A-24A6-DC	1.5 U 19" Rack 24 port Anx A 600Ω DC Power

Power Type

MD15A – 24A6 – □□

Example: MD15A – 24A6 – AC

TDM SHDSL Modem

2-wire G.SHDSL TDM
SHDTU03-E1, SHDTU03-ET100, SHDTU03-V35
4-wire G.SHDSL.bis TDM
SHDTU03bA-31

SHDSL TDM modem Series is a telecommunication product designed for carriers and SME users. The standalone modems offer a variety of choices for data interfaces to meet different connection needs. SHDSL TDM modem series features E1/T1, Data and Ethernet interfaces, allowing connection to different DTE types. When equipped with multiple interfaces, the standalone SHDSL modem combines user traffic over the SHDSL link. Available DTE combinations include E1+Ethernet, T1+Ethernet that can work simultaneously to share the DSL bandwidth. The SHDSL modem supports two different connectors for G.703 E1 application that link to TDM service either by balanced 120Ω RJ45 jack or unbalanced 75Ω dual BNCs with bit rates from 64kbps to 2.048Mbps. For T1 connection, the SHDSL modem offers balanced 100Ω RJ45 Jack to carry bit rates from 64Kbps to 1.544Mbps. For Ethernet interface application, the SHDSL modem supports 10/100Mbps auto-detected Fast Ethernet with a RJ45 connector, and provides customer premise with LAN to high-speed TDM services. The data rate of LAN interface is up to 2.3Mbps (SHDSL) for one pair of copper wires and 11.4Mbps (SHDSL.bis) for two pairs of copper wires. The SHDSL modem can be configured and managed via EOC, or menu-driven Asynchronous Terminal Interface, either locally or remotely.

Features

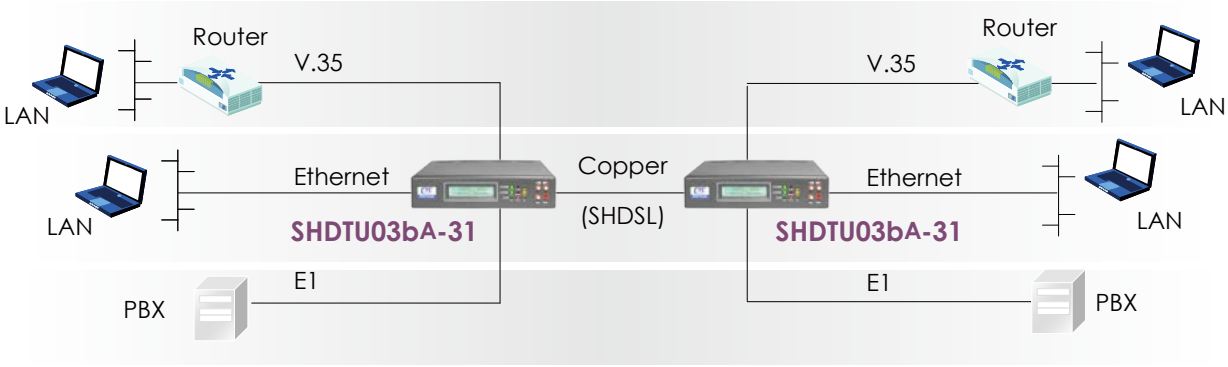
- Standard ITU-T G.991.2 supports improvement on reach, speed and interoperability in contrast to conventional SHDSL devices
- Fast and cost-effective services as voices or TDM leased line services or LAN
- Efficient usage of single wire pair on existing copper loop infrastructures
- Bandwidth guaranteed transmission equipment
- Supports multiple DTE interfaces working simultaneously on back-to back connection
- Auto rate installation maximizes data rate based on loop conditions
- Local management interface with LCD display
- Remote line loopback
- SHDSL Line performance monitoring (data rate and SNR)
- Raw and per time interval statistics

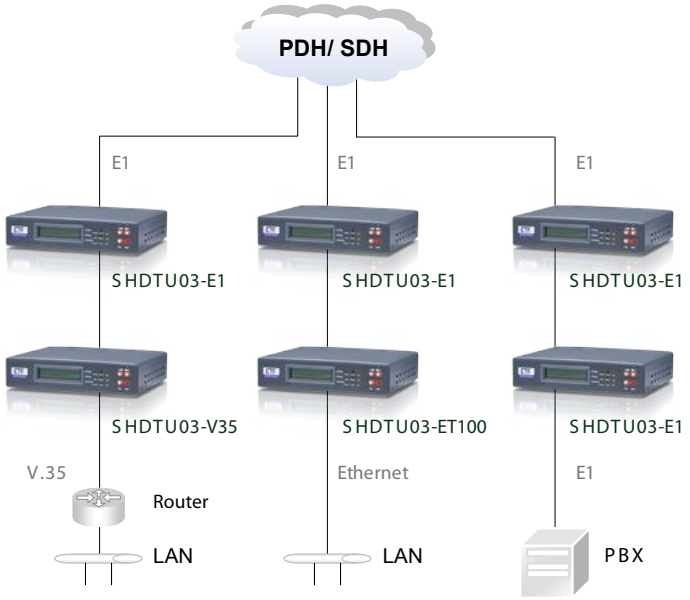
Specifications

Network Interface	Line Rate : ITU-T G.991.2 (2004), ITU-T G.994.1	
	Connection : RJ-45	
	Impedance : 135 ohms	
	SHDSL.bis	Coding : trellis coded pulse amplitude modulation (TC-PAM16 and TC-PAM32)
		Supports : Annex A, B, F and G
		Payload Rates •64Kps to 5.696Mbps (N=1 to 89) for 2-wire model •128Kbps to11.392Mbps (N=2 to 178) for 4-wire model
	SHDSL	Coding : trellis coded pulse amplitude modulation (TCPAM-16)
		Supports : Annex A (ANSI) and Annex B (ETSI)
		Payload Rates: 64kbps to 2.304Mbps (N x 64kbps, N=1 to 36)
	Connection : RJ-45 jack (2-wire or 4-wire)	
	Impedance : 135 ohms	
G.703 Interface (E1)	Connection : RJ-45 for balanced 120Ω E1 cable and	
	BNC for unbalanced 75Ω E1 cable	
	Line Rate : 2048KHz +/- 50ppm	
	Line coding : HDB3/AMI	
	Framing : PCM30/PCM30C/PCM31/PCM31C and Unframed	
	Data Rate : 64Kbps to 2.048Mbps (Nx64Kbps, N=1 to 32)	
	Operation : Full E1 and Fractional E1	
G.703 Interface (T1)	Connection : RJ-45C for balanced 100Ω T1 cable	
	Line Rate : 1544KHz +/- 50ppm	
	Line coding : B8ZS	
	Framing : SF/ESF/Unframed	
	Data Rate : 64kbps to 1.544Mbps (N=1 to 24)	
	Operation : Clear Channel and Factional T1	

LAN Interface (Ethernet)	Single Ethernet Interface
	Payload rates : Up to 5.696Mbps (for 2-wire model) or Up to 8.192Mbps (for 4-wire model)
	10/100Mpbs Half/Full Duplex, Auto-sensing, Auto-MDI/MDIX
	Up to 1024 MAC address learning
Jitter and Wander	Meets G.823 and G.824 jitter and wander requirements
DSL Timing	Internal
	From E1/T1 Recovery (E1/T1)
Performance Monitoring	ES, SES, UAS, LOWS for SHDSL
	ES, SES, UAS for E1/T1
	Alarms and Errors for SHDSL or interface
Loopback Tests (for E1, T1 only)	Local Digital Loopback
	Local Loopback
	Remote Line Loopback
	Remote Payload Loopback
	Far-end Line Loopback
	Far-end Payload Loopback
	Build-in 2047 (2^{11}-1) Bit Error Rate Tester
Management	Configuration with keypads and LCD display
	Console port (RJ45, RS232C)
	Support firmware upgradeable
Certification	CE Approval & EN60950 Certificate
Dimensions	195 x 48 x 168 mm (D x W x H)
Power	AC Input : 90~240V with 50~60Hz
	DC Input : -36V~-72V
Power Consumption	10W Max
Environment	Operation temperature : 0 to 50°C
	Humidity : Up to 95% (non-condensing)

Application





Ordering Information

2-wire G.SHDSL TDM

Model Name	*Description*
SHDTU03-E1-AD	E1 NTU, AC+DC Power (2-wire 2.3Mbps)
SHDTU03-ET100-AD	Ethernet 10/100Base-TX Ethernet Bridge NTU, AC+DC Power (2-wire 2.3Mbps)
SHDTU03-V35-AD	V35 TDM NTU, AC+DC Power w/V35 Cable (2-wire 2.3Mbps)

4-wire G.SHDSL.bis TDM

Model Name	*Description*
SHDTU03bA-31-AD	E1/V35/LAN multi-interface NTU with AC+DC Power (4-wire 11.4Mbps)

SHDTU03 – ☐☐ – ☐☐ (Interface / Power Type)

Example: SHDTU03 – E1 – AD

ATM SHDSL Router

2-wire G.SHDSL ATM
SHDTU03F-ET10R, SHDTU03AF-ET10RS
2/4-wire G.SHDSL.bis ATM
SHDTU03bF-ET10RS, SHDTU03bAF-ET10RS

The SHDSL ATM modem series is 2-wire or 4-wire Ethernet Bridge/Router that complies with G.991.2 standards and has an optional built-in four port 10Base-T /100Base-TX auto-negotiation and auto-MDIX switch. The SHDSL ATM modem provides business-class, multi-rate 2-wire up to 5.7Mbps (SHDSL.bis) and 2.3Mbps (SHDSL) or 4-wire 11.4Mbps (SHDSL.bis) and 4.6Mbps (SHDSL) payload rates over existing single or two pair copper wire. SHDSL ATM modem is designed not only to optimize the service bit rate from central office to customer premises but also integrates high-end Bridging/ Routing EFM bonding capabilities with advanced functions such as virtual server mapping and VPN pass-through. The SHDSL ATM modem allows customers to leverage the latest in broadband technologies to meet their growing data communication needs. In bridge mode, the four switching ports may be configured for IEEE802.1Q VLAN or port based VLAN applications. The modem can be configured in either central or client mode providing a point-to-point solution

Features

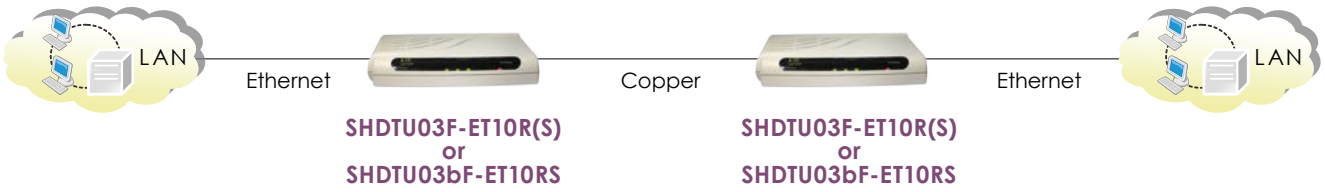
- Supports Ethernet over ATM over SHDSL
- Full ATM protocol stack implementation over G.SHDSL
- Adaptive rate installation maximizes data rate based on loop conditions
- Standard ITU G.991.2 (2004) supports improved reach, speed and interoperability compared to conventional G.SHDSL
- Supports point-to-point configurations
- Local management interface via console port
- Intuitive Web based management
- SNMP management with SNMPv1/v2 and MIB II
- Build-in advanced SPI firewall (Firewall routers)
- Efficient IP routing and transparent learning bridge to support broadband Internet services
- VPN pass-through for safeguarded connections
- DMZ host/Multi-DMZ/Multi-NAT; multiple PCs on a LAN with only one IP address
- PPPoA and PPPoE support user authentication with PAP/CHAP/MSCHAP
- Raw and time stamped statistics
- Supports firmware upgrade via web interface
- EFM (Ethernet in the First Mile) bonding per IEEE 802.3-2005; 2/4-wire bonding for HDLC per G991.2

Specifications

Ports	LAN Interface	10Base-T /100 Base-TX auto-negotiation
		Auto-MDIX
		Connector: RJ-45
	WAN Interface	SHDSL: ITU-T G.991.2(Annex A/B) ITU-T G.994.1
		SHDSL.bis: ITU-T G.991.2 2004(Annex A/B/F/G) ITU-T G.994.1
		Encoding scheme: TC-PAM16, TC-PAM32
		Data Rate: N x 64Kbps (N=3~89)
		Impedance: 135 ohm
		Data Rate :
		SHDSL: 2-wire up to 2.3Mbps
		SHDSL.bis: 2-wire up to 5.7Mbps, 4-wire up to 11.4Mbps
ATM	Up to 8 PVCs	
	OAM F4/F5 loopback test , AAL5	
ATM QoS	UBR (Unspecified Bit Rate)	
	CBR (Constant Bit Rate)	
	VBR-rt (Variable Bit Rate Real Time)	
	VBR-nrt (Variable Bit Rate Non-real Time)	
AAL5 Encapsulation	VC multiplexing and SNAP/LLC	
	Ethernet over ATM (RFC 2684/1483)	
	PPP over ATM (RFC 2364)	
	Classical IP over ATM (RFC 1577)	
PPP	PPP over Ethernet for fixed and dynamic IP (RFC 2516)	
	PPP over ATM for fixed and dynamic IP (RFC 2364)	
	User authentication with PAP/CHAP/MS-CHAP	
Indications	General: PWR	
	WAN: LNK, ACT	
	LAN: 1, 2, 3, 4 (ET10RS)	
	LAN: Link, ACT (ET10R)	
	SHDSL: ALM	
Power Input	DC 9V-12V in	
Power Consumption	< 9W	

Routing	Supports IP/TCP/UDP/ARP/ICMP/IGMP protocols
	IP routing with static routing and RIPv1/RIPv2 (RFC1058/2453)
	IP multicast and IGMP proxy (RFC1112/2236)
	Network Address Translation (NAT/PAT) (RFC1631)
	NAT ALGs for MSN/Yahoo Messenger
	DNS relay and caching (RFC1034/1035)
	DHCP server, client and relay (RFC2131/2132)
Bridging	IEEE 802.1D Transparent Bridging
	IEEE 802.1Q VLAN
	Port-based VLAN
Security	DMZ host/Multi-DMZ/Multi-NAT function
	Virtual server mapping (RFC1631)
	VPN pass-through for PPTP/L2TP/IPSec tunneling
	NAT firewall
	Advanced stateful packet inspection (SPI) firewall
	Denial of service protection
	User access control
Management	Easy-to-use web-based GUI for quick setup, configuration and management
	Menu-driven interface for local console and Telnet access
	Password protected management and access control list for administration
	SNMP management with SNMPv1/SNMPv2c (RFC1157/1901/1905), MIB II (RFC1213/1493)
	Software upgrade via web-browser/TFTP server
	Console port: RJ-232
Dimensions	145 x 187 x 33 mm (D x W x H)
Weight	0.58kg
Temperature	0 ~ 50°C (Operating), -10 ~ 70°C (Storage)
Humidity	10 ~ 90% non-condensing
Certification	CE, FCC, RoHS compliant
MTBF	57,000 hrs

Application



	SHDTU03F-ET10R	*SHDTU03F-ET10RS*	*SHDTU03bF-ET10RS*	*SHDTU03bAF-ET10RS*
WAN	2-wire	2-wire	2-wire	4-wire
LAN	1	4	4	4
Auto-MDIX	Yes	Yes	Yes	Yes
Port-based VLAN	None	Yes	Yes	Yes
802.1Q VLAN	1LAN / 1WAN	4LAN / 1WAN	4LAN / 8WAN	4LAN / 8WAN
Firewall	No	No	Yes	Yes
Maximum data rate	2.3Mbps	2.3Mbps	5.7Mbps	11.4Mbps
Minimum data rate	64Kbps	64Kbps	192Kbps	384Kbps

Ordering Information

2-wire / 4-wire G.SHDSL ATM

Model Name	*Description*
SHDTU03F-ET10R	1-Port 10/100Base-TX ATM Bridge / Router w/Firewall (2-wire 2.3Mbps)
SHDTU03F-ET10RS	4-Port 10/100Base-TX ATM Bridge / Router w/Firewall (2-wire 2.3Mbps)

2-wire / 4-wire G.SHDSL.bis ATM

Model Name	*Description*
SHDTU03bF-ET10RS	4-Port 10/100Base-TX ATM Bridge / Router w/Firewall (2-wire 5.7Mbps)
SHDTU03bAF-ET10RS	4-Port 10/100Base-TX ATM Bridge / Router w/Firewall (4-wire 11.4Mbps)

SHDTU03F – □□□□□

Example: SHDTU03F – ET10R

G.SHDSL.bis Router / NTU Performance

4 wires Rate (kbps)	2 wires Rate (kbps)	N	AWG#26 (0.4mm)	AWG#26 (0.4mm)	AWG#24 (0.5mm)	AWG#24 (0.5mm)	AWG#22 (0.6mm)	AWG#22 (0.6mm)
			kft	km	kft	km	kft	km
384	192	3	24	7.3	30	9.1	36	11
512	256	4	23	7	28.5	8.6	34.5	10.5
1024	512	8	19.5	5.9	24	7.3	29.5	9
1920	960	15	17	5.2	21	6.4	25.5	7.8
2176	1088	17	16.5	5	20.5	6.2	24.5	7.5
2560	1280	20	16	4.9	20	6.1	21.5	6.6
3584	1792	28	14	4.3	17.5	5.3	21	6.4
3840	1920	30	14	4.3	17.5	5.3	20	6.1
4352	2176	34	13.5	4.1	16.5	5	19.5	5.9
4608	2304	36	13	4	16	4.8	19.5	5.9
5120	2560	40	12.5	3.8	15.5	4.7	19	5.8
5632	2816	44	12.5	3.8	15.5	4.7	18.5	5.6
6400	3200	50	12	3.7	15	4.5	18	5.5
6912	3456	54	11	3.4	13.5	4.1	16.5	5
7424	3712	58	11	3.4	13.5	4.1	16	4.9
7680	3840	60	10.5	3.2	13	3.9	15.5	4.7
7936	3968	62	10.5	3.2	13	3.9	15	4.6
8448	4224	66	10	3	12.5	3.8	15	4.6
8960	4480	70	10	3	12.5	3.8	15	4.6
9472	4736	74	9.5	2.9	11.5	3.5	14.5	4.4
10240	5120	80	9.5	2.9	11.5	3.5	14	4.3
11136	5568	87	8.5	2.6	10.5	3.2	12.5	3.8
11392	5696	89	8.5	2.6	10.5	3.2	12	3.7

2.3Mbps G.SHDSL Router / NTU Performance

Line Speed kbps	AWG#26 (0.4mm)	AWG#24 (0.5mm)	AWG#22 (0.6mm)
64	9.7	12.8	16.0
128	8.1	10.6	13.2
192	6.9	9.1	11.4
256	6.7	8.7	11.0
320	6.7	8.7	11.0
384	6.5	8.5	10.5
448	6.4	8.4	10.5
512	6.2	8.1	10.1
576	6.1	8.0	10.0
640	5.9	7.8	9.7
704	5.8	7.7	9.6
768	4.8	6.3	7.9
832	5.5	7.2	9.0
896	5.3	6.9	8.7
960	4.9	6.5	8.1
1024	5.1	6.7	8.5
1088	5.0	6.6	8.3
1152	4.8	6.3	7.9
1216	4.8	6.3	7.9
1280	4.3	5.6	7.0
1344	4.1	5.4	6.7
1408	4.4	5.8	7.2
1472	4.4	5.8	7.2
1536	4.3	5.6	6.9
1600	4.4	5.8	7.2
1664	4.4	5.8	7.2
1728	4.2	5.4	6.8
1792	4.2	5.4	6.8
1856	4.1	5.4	6.7
1920	4.1	5.4	6.7
1984	4.0	5.2	6.5
2048	3.6	4.2	5.5
2304	3.3	3.9	4.8