User's Manual

Revision: 2.0

CTC union Technologies Co.,Ltd.

Table of Contents

Table of Figures

Revision Marks

Revision	Date	Notes
V2.0	May 25, 2000	Software: 2.11B-H30.02-F45.108

1. Overview

The *SDTU-01/ET10* is an SDSL modem supporting ATM bridging with 4-port 10Base-T Ethernet hub. The SDSL front end provides symmetrical data rates from 144Kbps up to 2320Kbps in programmable rate steps of 8Kbps. The *SDTU-01/ET10* can be configured to inter-operate with SDSL DSLAM or to support Point-to-Point data transmission applications by flexible CO/RT configuration.

2. Features

- ✓ High Speed Symmetrical Data Transmission on Single Twisted Copper Pair Wire
- ✓ 2B1Q Line Coding
- ✓ Symmetrical Multi-rate data transmission from 144Kbps up to 2320Kbps
- ✓ RFC 1483 Bridging over ATM over SDSL
- ✓ 4-port 10Base-T Ethernet hub for PC/LAN
- ✓ High quality, simple operation, low power consumption
- ✓ Compatible and interoperable with major Central Office side SDSL DSLAM or Multi-service Access System
- ✓ Local OAM&P through command line interface via RS-232 Craft port
- ✓ Local Telnet through the Ethernet interface
- ✓ Remote Telnet through SDSL interface
- ✓ Supports point-to-point applications

3. Packaging

This package consists of the following items:

- The *SDTU-01/ET10* unit
- AC Adapter
- Installation and Operation Manual
- 9-pin to 9-pin serial configuration cable

4. Appearance

Front Panel

Alarm: Blinks while booting up, and On when there is an error, continuous "On" indicates internal error

WAN Status: Blinks while training with DSLAM and On when SDSL link is ready

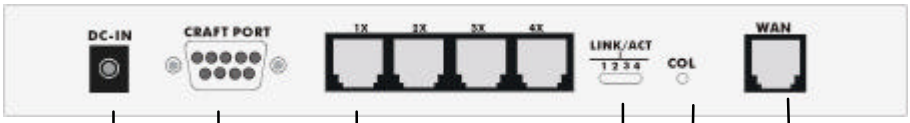
LINK Status**:** On when one of Ethernet ports is properly connected to a LAN or PC

Activity: Blinks while transmitting or receiving packets over one of Ethernet ports

Power: On when the power supply is properly connected.

Figure 1: Front Panel

Rear Panel



RJ11, SDSL inlet

Red LED, on when Ethernet collision occur

Green LED*4, On while corresponding Ethernet port is connected. Blinks while transmitting or receiving packets

RJ45*4, for connection to LAN or PC

DB9, serial port for connection to ASCII data terminal

Power Jack, for connection to an AC-DC power adapter, 12VDC, 1A

Figure 2: Rear Panel

5. Hardware Installation

1. Connect the SDSL cable, (item 1) indicated in Figure 3, to the LINE port of RJ-11 socket.
2. Use a RJ-45 cable, (item 2) indicated in Figure 3, to connect the *SDTU-01/ET10* to the LAN or a PC with Ethernet adapter installed.

   Note: Be sure to use RJ-45 cross-over cable when connecting to a hub.
3. Plug in the AC adapter to an AC power socket, then connect the DC jack, (item 3) indicated in Figure 3, the DC inlet of the *SDTU-01/ET10*.
4. Use a 9-pin RS-232 cable (item 4) indicated in Figure 3, to connect the Console Port to a serial port of a terminal such as PC with data terminal emulation software (Hyper Terminal) installed, in order to perform local management.

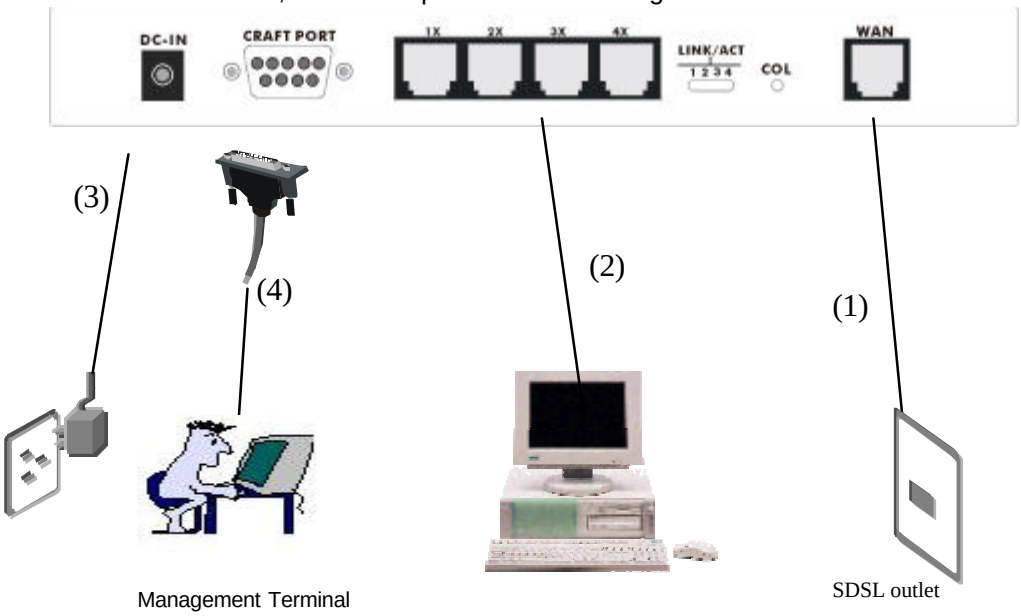


Figure 3: Hardware Installations

6. Management

SDTU-01/ET10 supports simple, flexible and easy-to-operate methods for management purposes. The *SDTU-01/ET10* can be managed via the following paths, refer to Appendix B for detailed information.

- ✓ Console port – use the RS-232 cable for connecting *SDTU-01/ET10* to a console terminal or a PC running terminal emulation program, such as Hyper Terminal, see Appendix A for proper console setup.
- ✓ Local Ethernet Port – connect the Ethernet port to your local area network or to a PC directly, "*Telnet*" *SDTU-01/ET10* from any workstation on the LAN.
- ✓ SDSL port from remote site – while SDSL connection is in service, you may remotely "*Telnet*" *SDTU-01/ET10* from a workstation networking to the CO equipment.

Note: As operating SDSL modem requires technical know-how and experience, it is recommended that management of the *SDTU-01/ET10* be performed by qualified technical staff only.

7. Default values

SDTU-01/ET10 is pre-configured with the following parameters; the user may also re-load the default parameters by selecting ***Default*** from the main menu.

LAN and VC setting	**WAN and SDSL**
Ethernet (local) IP: 192.168.2.1	Side selected: CPE (RT) side
Subnet mask: 255.255.255.0	Auto Rate: disable
Protocol: RFC1483, bridge Mode	Rate select: 2320Kbps
VPI/VCI: 8/35	Sign/Magnitude Bit Sequence: reverse
Spanning tree: disable	Data Bit Polarity: Normal
Packet control: IP and PPPoE	Scrambling: enable
	Idle-cell-sending: enable

8. Software Upgrade

You may easily upgrade the *SDTU-01/ET10's* embedded software by obtaining the compressed upgrade kit, ZIP file, from the service provider then following the steps:

- ✓ Extract the ZIP file
- ✓ Connect *SDTU-01/ET10* via the local Ethernet port or remote SDSL link, make sure the *SDTU-01/ET10* Ethernet IP address is set and your terminal is properly configured so you can successfully "*ping*" *SDTU-01/ET10*.
- ✓ Under a DOS prompt, execute the command line **"xupgrade *<IP address of SDTU-01/ET10>*"**, for instance "**xupgrade 192.168.2.1**".
- ✓ This upgrade process may take as long as 60 seconds.
- ✓ *Then reboot SDTU-01/ET10* with new software.

NOTE: Strictly maintain stable power to SDTU-01/ET10 while upgrading software. If power fails during the upgrading process, contents in the memory could be destroyed and the system may hang. In such a case, you must call the dealer or system integrator for repair.

Appendix A. Console Setup

Connect the RS-232 console port to an ASCII data terminal or a PC with Windows serial Terminal mode of VT-100 (Hyper Terminal). To Start the Hyper-terminal, following the steps below:

1. Start "Hyper-terminal" program --

– On Windows 98 or Windows NT: start Tool Bar → Program → Accessory → Hyper Terminal Group → Double Click Hypertrm.exe → Enter Connection Name → Select Icon → Click OK

2. Select COM port to communicate with *SDTU-01/ET10*

– Choose direct to COM1 or COM2 → click OK

3. Set Port Properties --

‣ Port Setting:

– **Bit per second: 9600**

– **Data bits: 8**

– **Stop bits: 1**

– **Parity bits: None**

– **Flow Control: None**

Appendix B. Command Line Interface

The command line interface allows you to change the SDSL, ATM and Ethernet parameters, and display the status as well. Some commands must be followed by parameters for proper configuration of the modem. Conventionally, there shall be a "**space**" between a command and its corresponding parameters.

The punctuation marks in the command line interface have their different meanings. The syntax **< >** means the parameters that are enclosed are **compulsory**, **[ ]** means that the parameters are **optional**, and | between parameters means **either….or**. In the **parameters section " "** means that the parameters are **Key Words.** Furthermore, after entering the password, the screen will show the prompt as **>** for command entry.

There are two hierarchical levels in the command line interface. The command tree below will show the user the hierarchical relationship and commands supported:

Note 1: When password is applied, the connection will time out after 3 minutes if there is no access to the modem. Password entering is necessary to resume connection.

Note 2: All settings will become effective only after being saved.

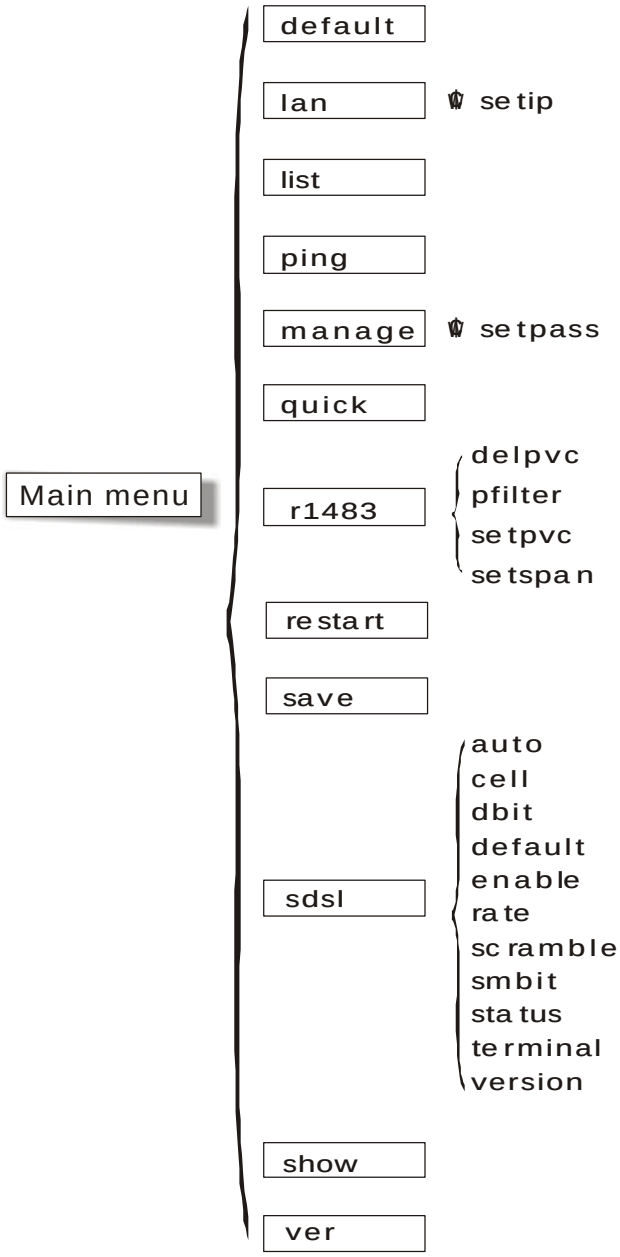


Figure 4: Command Tree

COMMAND LINE INTERFACE CONVENTIONS

HELP or ?

Lists all commands at the current level menu and follow by simple description of each command

Syntax:	help
Parameters:	
Example:	> help

Syntax:	?
Parameters:	
Example:	> ?

HELP <command> or ? <command>

Display the description and usage of particular command in each level.

Syntax:	Help <command>
Parameters:	command: Enter each command
Example:	>sdsl> help terminal Display the description and syntax of **terminal** command
Response:	terminal -Configure the device to COE or CPE mode Usage: terminal <coe>|<cpe> > coe - COE mode is selected > cpe - CPE mode is selected

Syntax:	? <command>
Parameters:	command: Enter each command
Example:	>sdsl> ? terminal Display the description and syntax of **terminal** command
Response:	terminal -Configure the device to COE or CPE mode

Usage: terminal <coe>|<cpe>

> coe - COE mode is selected

> cpe - CPE mode is selected

HOME

Go back to the upper level menu

Syntax:	home
Parameters:	

Example: > home

MAIN MENU COMMANDS:

default	lan	list	manage
ping	quick	r1483	restart
save	sdsl	show	ver

DEFAULT

Set all configuration to factory setting

Syntax:	default
Parameters:	

Example: > default

Response: Set to default successfully.

LAN

Enter to LAN menu. More commands under LAN menu, see detail after.

Syntax:	lan
Parameters:	

Example: > lan

LIST

Display the status for each enabled VC

Syntax:	list
Parameters:	

Example: > list

Response:
```
Port ethernet
 0:  Enabled    TxPkts: 1    RxPkts: 0/0
Port sdsl
 0:  Enabled  TxPkts: 56       RxPkts: 37/0  TxVPI/VCI:
                    0/35   RxVPI/VCI: 0/35
```

Explanation: Information for Ethernet port:

0 (Status of port number 1)……Enabled

TxPkts (transmitted packets)……..1

Explanation: RxPkts (received packets)……0/0 (correct/error)

Information for SDSL port:

0 (Status of port number 1)…….enabled

TxPkts (transmitted packets)…….56

RxPkts (received packets)……...37/0 (correct/error)

TxVPI/VCI (transmitted VC)……..……0/35

RxVPI/VCI (received VC)……..0/35

MANAGE

Enter to MANAGE configuration menu. More commands under MANAGE menu, see detail after.

Syntax:	manage
Parameters:	

Example: > manage

PING

Ping a specific IP address for testing purpose

Syntax:	ping <ipaddress>

Parameters:	ipaddress: IP address, in the format of 4 decimals separated by dots

Example1: > ping xxx.xxx.xxx.xxx

Response: > ip: ping - reply received from xxx.xxx.xxx.xxx

Explanation: Successful ping

Example2: > ping 299.999

Response: > Invalid IP

Explanation: Invalid IP address

Example3: > ping xxx.xxx.xxx.xxx

Response: >ip: ping - no reply received

Explanation: Wrong IP address

QUICK

Enter a VC with RFC1483/bridge mode by an interactive user interface

Syntax:	quick
Parameters:	

Example: > quick

Response: Please input vpi: *1***[Enter]**

Please input vci: *37***[Enter]**

Please choose package filter (Any(a)/IP(i)/PPPOE(p))

i **[Enter]**

Do you want to use spanning tree? <y/n>

y **[Enter]**

Configuration

MODE: Bridge

FUNCTION: R1483

Spanning Tree: Enable

#1 VPI VCI Packet filter

1. 1 37 IP

Do you want to preserve the configuration? <y/n>

*y***[Enter]**

Type “save” to effect setting

R1483

Enter to R1483 menu. More commands under R1483 menu, see detail after.

Syntax:	r1483
Parameters:	

Example: > r1483

RESTART

Reboot the SDSL modem

Syntax:	restart
Parameters:	

Example: > restart

Response:

```
NBfs5
Helium Family PP flash boot 6.1.0.25 (22 October
1999)
(c) Copyright Virata 1999
SDRAM size = 0x800000, type = 0x5
Booting...
>>
System start...
```

SAVE

Save the configuration into flash memory, and restart modem

Syntax:	save
Parameters:	

Example: > save

Save configuration then restart modem

SDSL

Enter to SDSL configuration menu. More commands under SDSL menu, see detail after.

Syntax:	sdsl
Parameters:	

Example: > sdsl

SHOW

Display the configuration of each enabled VC and Ethernet

Syntax:	show
Parameters:	

Example: > show

Response:

```
Ethernet ip: 192.168.2.1
Subnet mask: 255.255.255.0

FUNCTION  VPI  VCI Spanning  Pkt Filter
Rfc1483   0    35  Disable   ANY
```

Explanation: Information for Local Ethernet IP, subnet mask and each enabled VC

Ethernet IP (local)……..192.168.2.1

Subnet mask……..255.255.255.0

Function (Protocol in use)……RFC1483

VPI/VCI (Connected VC channel)……..0/35

Spanning (Spanning tree setting)……disable

Pkt Filter (packet control)..……Any (Allow to pass both IP and PPPOE packet.)

(Note: IP – only allow to pass IP packet; PPPoE – only allow to pass PPPoE packet)

VER

Display the software version number

Syntax:	ver
Parameters:	

Example: > ver

LAN MENU COMMANDS

SETIP

Setup the IP address, and subnet mask for the Ethernet LAN connection

Syntax:	setip <etherip>[<subnet mask>]
Parameters:	etherip: Ethernet IP address, in the format of 4 decimals separated by dot subnet mask: Subnet mask, the default is 255.255.255.0

Example: > lan> setip 192.168.2.32

Set a new IP address = 192.168.2.32 and

Subnet mask is default = 255.255.255.0

MANAGE MENU COMMANDS

SETPASS

Change password

Syntax:	setpass
Parameters:	Up to 18 alphanumeric characters. Upper case and lower case are different numbers.

Example 1: *For enabling a new password*

> manage> setpass

Response: The password is disabled!!

New Password: ****

Confirm password again: ****

Password has been changed and will be effective

only after save!

Saving configuration...Configuration saved.

Explanation: *You will be asked to key in new password and confirm the new password again.*

Example 2: *For changing old password:*

Response:

> manage> setpass

Old Password: ****

New Password (press ENTER to disable): ****

Confirm password again: ****

Password has been changed!

Saving configuration...Configuration saved.

Explanation: *You will be asked to key in old password. Type the new password and confirm the new password again.*

Example 3: *For disabling old password:*

Response:

> manage> setpass

Old Password: ********

New Password (press ENTER to disable):

Are you sure to disable password (y/n)?

The password has been disabled!

Saving configuration...Configuration saved.

Explanation: *You will be asked to key in old password and press enter to disable old password and confirm it again.*

R1483 MENU COMMANDS

delpvc	pfilter	setpvc	setspan

DELPVC

Disable a VC by giving a VPI and VCI numbers

Syntax:	delpvc <all>|[<vpi>/]<vci>
Parameters:	"all": disable all VCs
	vpi: decimal value of VPI number, 0 to 127
	vci: decimal value of VCI number, 0 to 1023
Example:	>r1483> delpvc 1/32
	Disable VC=1/32 in configuration setting

PFILTER

Packet filtering control on a specific VC

Syntax:	pfilter [<vpi>/]<vci> <any|ip|pppoe>
Parameters:	vpi: decimal value of VPI number, 0 to 127. Defined by setpvc command previously
	vci: decimal value of VCI number, 0 to 1023. Defined by setpvc command previously
	"any": Allow to pass both IP and PPPOE packet
	"ip": only allow to pass IP packet
	"pppoe": only allow to pass PPPoE packet
Example:	>r1483> pfilter 1/32 ip
	Configure VC 1/32 to filter IP packet only

SETPVC

Enable a VC by giving the VCI and VPI numbers

Syntax:	setpvc [<vpi>/]<vci>
Parameters:	vpi: decimal value of VPI number, 0 to 127
	vci: decimal value of VCI number, 0 to 1023
Example:	>r1483> setpvc 1/32
	Configure vpi=1 and vci= 32

SETSPAN

Enable or disable Spanning Tree under Bridge mode for all enabled VC

Syntax:	setspan <Enable>|<Disable>
Parameters:	"Enable": enable spanning tree
	"Disable": disable spanning tree
Example:	>r1483> setspan Disable
	Disable spanning tree

SDSL MENU COMMANDS:

auto	cell	dbit	default
enable	rate	scramble	smbit
status	terminal	version	

AUTO

Enable auto-speed function to allow CPE to follow the speed of CO terminal or disable auto-speed function

Syntax:	auto <disable>|<enable>
Parameters:	"disable": disable auto-baud rate function
	"enable": enable auto-baud rate function
Example:	>sdsl> auto enable
	Enable auto-speed function.

CELL

Enable or disable the idle-cell header

Syntax:	cell <enable>|<disable>
Parameters:	"enable": enable idle-cell header
	"disable": disable idle-cell header
Example:	>sdsl> cell enable

Enable idle-cell header

DBIT

Configure the SDSL data bit to normal or reverse polarity

Syntax:	dbit <normal>|<reverse>
Parameters:	"normal": configure data bit to normal polarity
	"reverse": configure data bit to reverse polarity
Example:	>sdsl> dbit normal
	Configure data bit to normal polarity

DEFAULT

Set SDSL configuration back to factory setting

Syntax:	default
Parameters:	
Example:	>sdsl> default
Response:	Set SDSL configuration back to factory setting
	The default:
	terminal - cpe
	auto - disable
	rate - 2320
	smbit - reverse
	dbit - normal
	scramble - enable
	cell - enable

ENABLE

Activate the last updated SDSL parameters without saving and restarting system.

Syntax:	enable

Parameters:	
Example:	>sdsl> enable

RATE

Manually configure the SDSL line rate

Syntax:	rate <n*8>
Parameters:	N*8: 144 to 2320, decimal value of rate (Kbps), step by 8 Kbps; i.e. 160K = 20*8K
Example 1:	>sdsl> rate 160
	Set SDSL line rate to 160Kbps.
Example 2:	> sdsl> rate 155
Response:	rate - Manually configure the SDSL line rate
	can use 144 <= (n*8) <= 2320 K

SCRAMBLE

Enable/Disable scrambling on ATM cell

Syntax:	scramble <enable>|<disable>
Parameters:	"enable": enable scrambling
	"disable": disable scrambling
Example:	>sdsl> scramble enable
	Enable scrambling on ATM cell

SMBIT

Configure the sign/magnitude bit sequence

Syntax:	smbit <normal>|<reverse>
Parameters:	"normal": normal sign/magnitude bit sequence
	"reverse": reverse sign/magnitude bit sequence
Example:	>sdsl> smbit normal
	Configure sign/magnitude bit to normal sequence

STATUS

Display the configuration and status of current SDSL setting

Syntax:	status
Parameters:	

Example: >sdsl> status

Response:
```
Version: Ver 1.08 Date 15 May 2000
terminal        - cpe
auto            - disable
rate            - 2320
smbit           - reverse
dbit            - normal
scramble        - enable
cell            - enable
SDSL Module     -> enable

Status:
Bitpump F/W Version: 4.5
Bitpump: present
CO/RT Select: cpe
Auto Rate: disable
Rate: 2320
Sign/Magnitude Bit Sequence: reverse
Data Bit Polarity: normal
DSL Status: normal operation
Noise Margin: -16.0
```

Explanation: Information for SDSL configuration setting:

Version (SDSL driver version number)……..Ver1.08

SDSL module (SDSL interface)…….enable (enable: normal operation, disable: malfunction)

Explanation: Information for SDSL line status:

Bitpump F/W version (SDSL firmware version number)……..4.5

Bitpump (status of chipset)…..…….present (present: normal operation, unpresent: malfunction)

CO/RT select (terminal)……..cpe

Auto rate (auto)…….disable

Rate (line rate)……..2320Kbps

Sign/magnitude bit sequence (smbit)…….reverse

Data bit polarity (dbit)…….normal

DSL status……..normal operation
(normal operation: connected / during startup: without connection yet)

Noise margin (noise margin after connection)……..-16.0

(“?” before connection)

TERMINAL

Configure modem to COE or CPE terminal

Syntax:	terminal <coe>|<cpe>
Parameters:	“coe”: central office equipment
	“cpe”: remote terminal
Example:	>sdsl> terminal coe
	Configure unit as central office equipment, in order for point-to-point application

VERSION

Display the SDSL firmware version

Syntax:	version
Parameters:	
Example:	>sdsl> version

Appendix C. Specifications

Hardware Specifications

- LAN Interface
- Type -- 10BaseT Ethernet, IEEE 802.3
- Connector – 4 x RJ-45

- WAN -- SDSL Line I/F
- Data Rate: 144Kbps to 2320Kbps
- Rate adjustable step: 8Kbps
- Line Code: 2B1Q
- Line Impedance: 135 Ω
- Connection Loops: One Pair (2-wire)
- Connector: RJ-11

- LED Indication
- Power -- Green LED, indicate power status
- Alarm -- Green LED, device error or operation in faulty status
- Link -- Green LED, physical connection at LAN data link
- Act -- Green LED, transmitting / receiving data over LAN data link.
- WAN -- Green LED, SDSL data link status
- Collision – Red LED, Ethernet collision indication

- OAM&P
- Local: RS-232 Craft Port, Telnet via local Ethernet
- Remote: SNMP, Telnet via SDSL

- Environment
- Temperature: 0°C ~ 50°C
- Humidity: 5% ~ 95%, NC

-

- Physical Dimensions: (WxDxH) 220mm X 169mm X 40m

- Electrical
- AC Adapter: Input 110/220 VAC, 50/60Hz; Output 12VDC 1A
- Power Consumption: Less than 10 Watts

- Safety -- UL & CE
- EMC/EMI --
- FCC

- Surge -- Meet IEC 1000-4-5 class 2

Software Specifications

- ATM
  - ATM Cell over SDSL, AAL5
  - 1 PVC for bridge
  - Support UBR & CBR

- Bridging
  - Transparent Bridging (IEEE 802.1D)
  - RFC 1483
  - Spanning Tree Protocol (IEEE 802.1D)
  - IP and/or PPPoE filtering
- Management
  - Telnet
  - SNMP MIB II
  - ILMI
  - TFTP