

ASMi-54L

SHDSL.bis Modem



High-speed Ethernet and E1 traffic over copper links

- Managed modem transmitting full-duplex at data rates of up to 5.7 Mbps over 2-wire and 11.4 Mbps over 2/4-wire lines
- Dual Bearer mode for E1 and Ethernet HDLC
- Extended rates of up to 11.4/15 Mbps over 2-wire with RAD proprietary solution
- SHDSL bonding - for EFM: PAF according to IEEE802.3, for HDLC: M-Pair according to G.991.2
- SHDSL ITU-T G.991.2 and ETSI 101524 compliance
- 4-port 10/100BaseT interface with integrated Ethernet switch
- Full interoperability with Megaplex-4100/LRS-102 ASMi-54C and ASMi-54C/N cards and/or point-to-point applications

ASMi-54L is a simple, cost-effective, dedicated managed SHDSL.bis modem that extends the range of high-speed services over existing copper pairs. The modem is used for point-to-point Ethernet and E1 service extension at rates of up to 11.4 Mbps/15 Mbps over 2-wire lines using bonding technology (see *Figure 1*).

A special RAD proprietary solution provides extended rates of up to 15 Mbps over 2-wire lines and up to 30 Mbps over 4-wire lines.



ASMi-54L

SHDSL.bis Modem

The modem employs TPS-TC framing 64/65o for EFM (IEEE802.3) and HDLC (G.991.2) on the SHDSL link.

ASMi-54L performs line probing according to G.991.2. When enabled, the DSL interface adapts its rate to the condition of the line (noise, loop attenuation, etc.). When disabled, traffic on the DSL line is transmitted at a fixed rate selected by the user.

ASMi-54L can operate as a CO device or a CPE device according to user configuration.

The modem uses an Embedded Operation Channel (EOC) for controlling and monitoring the SHDSL/SHDSL.bis repeaters. Up to eight SHDSL/SHDSL.bis repeaters can be installed in line to increase the operation range of E1- and Ethernet-based modems.

EFM BONDING

EFM bonding on the Ethernet interface ensures that a failure or addition of a link does not drop the traffic being transmitted over the other wires in the group. The capacity of the group does not decrease when a new link is added at a lower rate.

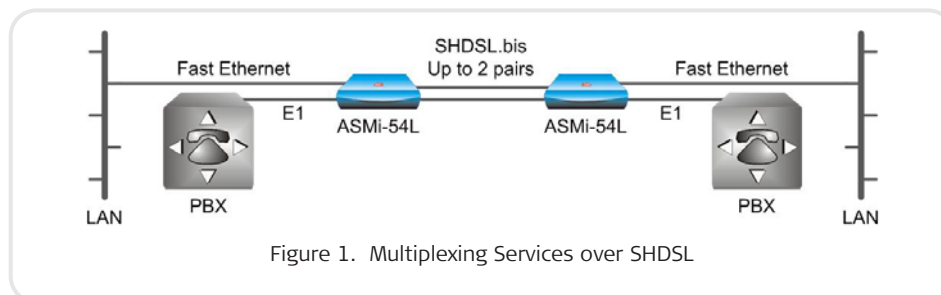


Figure 1. Multiplexing Services over SHDSL

ETHERNET SUPPORT

ASMi-54L features up to four Ethernet 10/100BaseT ports with half/full-duplex, autonegotiation and flow control. The fault propagation functionality enables the unit to shut down the Ethernet user port when an SHDSL line failure is detected. LANs are connected by bridging.

The internal forwarding of Ethernet traffic can be configured in two ways:

- By specifying the ports (a mode identified as *unaware* in accordance with Metro Ethernet Forum (MEF) standards). In this mode, all the Ethernet traffic reaching one of the ports is forwarded to the other port, and vice versa
- By using VLANs for classification: (a mode identified as *aware* in accordance with Metro Ethernet Forum (MEF) standards). In this mode, Ethernet traffic reaching one of the ports is forwarded to another port in accordance with its VLAN identifier.

QUALITY OF SERVICE

The 802.1D, DSCP, and Per Port priority schemes allow users to define different QoS levels according to application requirements.

The modem implements the IEEE's 802.1q standards to provide VLAN-tagging with four levels of prioritization, enabling carriers to offer differentiated Ethernet services. VLAN tagging can also be employed to separate traffic, ensuring transparency of the customer traffic and bolstering security of management traffic. The user can activate or deactivate the priority mechanism, and each priority (VLAN priority, DSCP or per port) can be configured and mapped to one of four priority queues.

Ingress data rate can be limited on each Ethernet port.

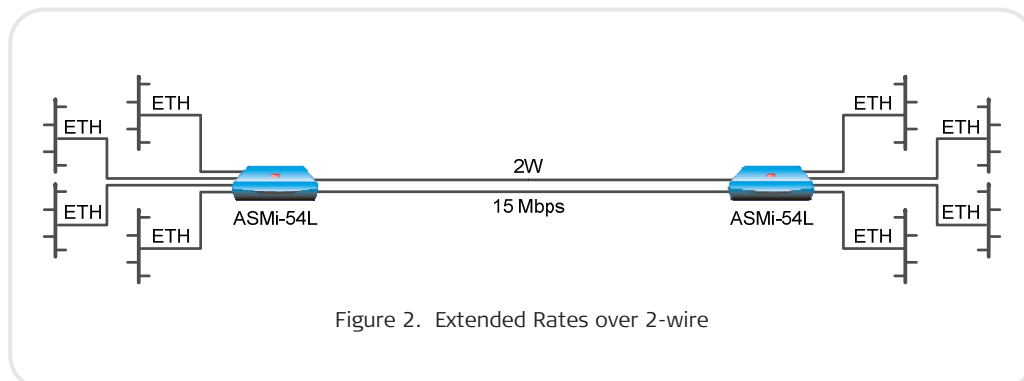


Figure 2. Extended Rates over 2-wire

ASMi-54L

SHDSL.bis Modem

MANAGEMENT

The ASMi-54L unit can be managed using the following connections:

- Local RS-232 terminal
- Telnet server, SNMP (Ver.1)
- Web server
- Inband management with or without dedicated VLAN.

ASMi-54L supports the IEEE 802.3ah (IEEE 802.3-2005) standard for Operation, Administration, and Maintenance (OAM), originally developed for Ethernet in the First Mile (EFM) applications. OAM is a set of functions designed to monitor network operation on an SHDSL line, in order to detect line faults and measure performance.

DYING GASP

Dying Gasp condition occurs if there is an interruption in the ASMi-54L power source. ASMi-54L reports power failures to the specified network management stations by sending an SNMP trap. This helps a service provider identify and isolate the end-point device experienced a power failure.

PHYSICAL

ASMi-54L is available with several power supply options:

- AC/DC wide range (100 to 240 VAC, -48 to -60 VDC nominal)
- 24 VDC.

The modem is encased in a compact half-19" plastic enclosure that can be mounted alone or in pairs in a 19-inch rack using RAD's optional rack mount kits (see *Ordering*). The modem is available in extended temperature versions (by special request).

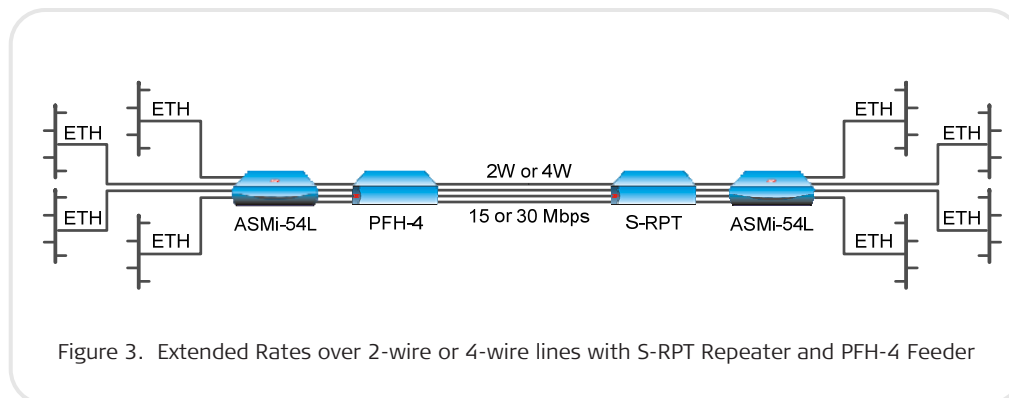


Figure 3. Extended Rates over 2-wire or 4-wire lines with S-RPT Repeater and PFH-4 Feeder

Specifications

LINE INTERFACE

Line Type

Symmetrical PSD
2/4-wires unconditioned dedicated line
(twisted pair)

EFM Bonding

Per IEEE802.3ah and ITU-T G.991.2 (for Ethernet only)

OAM

According to IEEE 802.3ah (passive and active)

Line Coding

TC-PAM 16/32/64/128

Frame Size

2047 bytes

Line Rate

For EFM: 192 to 15296 kbps in steps of
n x 64 kbps for each pair
For HDLC: 192 to 8576 kbps in steps of
n x 64 where n=134 for each pair

SHDSL Reference Clock

E1+Ethernet user interfaces:
Clock Mode 1 or 2
Ethernet only user interface:
Clock Mode 3a

Range

See Table 1, noise-free environment (per pair) on 26 AWG wire

Extended Range over DSL Line

License key for transmitting up to
15 Mbps over 1 pair or up to 30 Mbps
over 2 pairs (point-to-point only)

Impedance

135Ω

Connectors

RJ-45

Compliance

ITU-T G.991.2, ETSI TS 101524

E1 PORT

Coding

HDB3

Line Impedance

120Ω, balanced
75Ω, unbalanced (via adapter cable)

Jitter Performance

As per ITU G.823

Connector

RJ-45

Diagnostics

Local analog loopback
Remote digital loopback

Table 1. Typical Ranges

Data Rate [kbps]	Range	
	[km]	[miles]
192	6.6	4.1
1536	4.9	3.0
2048	4.5	2.8
4096	3.2	2.0
4608	3.0	1.9
5696	2.6	1.6
11400	1.2	0.7

ASMi-54L

SHDSL.bis Modem

CONTROL PORT

Interface

V.24/RS-232

Type

DCE

Format

Asynchronous; 8 bits, 1 stop bit, no parity

Data Rate

9.6, 19.2, 115.2 kbps

Connector

9-pin, D-type, female

ETHERNET PORTS

Interface

10/100BaseT

Connectors

4 x RJ-45

Frame Size

1580 bytes

INDICATORS

Front Panel

PWR (green) -

On: power supply is on

Off: power supply is off

TST (yellow) -

On: a test is active

Off: no test is active

ALM (red) -

On: new alarm in the alarm buffer

Off: no alarms in the alarm buffer

SHDSL SYNC (green/red) -

Green: the SHDSL line is synchronized and can pass data

Green flashing: the SHDSL line is in training process

Red flashing: the SHDSL line is in PAF/M-pair establishment stage

Red: the SHDSL line is either not

synchronized, or in training process or in PAF/M-pair establishment stage

Rear Panel

Ethernet Ports LINK/ACT (per port)

ACT (yellow) -

Flashing: Ethernet traffic on the port

LINK (green) -

On: Ethernet port link is up

Off: No Ethernet link on the port

E1 LOC (red) -

On: Loss of signal or sync loss (in framed mode only) or unframed AIS is received on the E1 port

E1 REM (red) -

On: Remote alarm is received on the E1 port

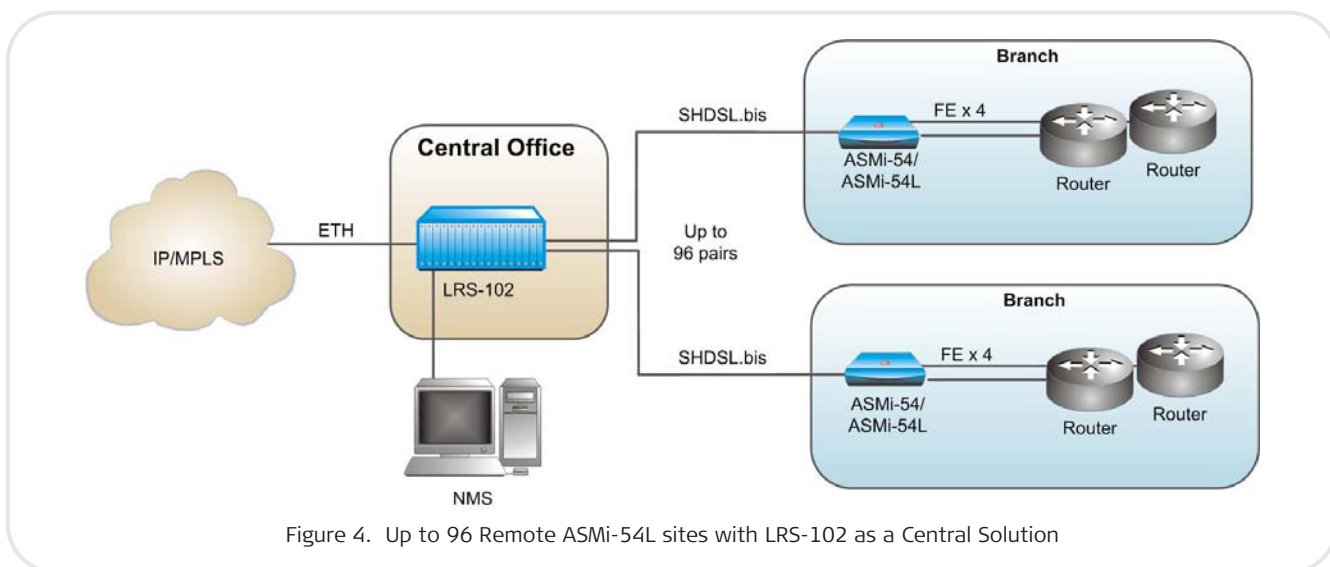


Figure 4. Up to 96 Remote ASMi-54L sites with LRS-102 as a Central Solution

GENERAL

Power Supply

Wide-range AC/DC: 100 to 240 VAC,
-48 to -60 VDC nominal
DC: 24 VDC nominal

Timing

For CO:

Internal – derived from the modem
External – derived from E1 port

For CPE:

Receive – derived from the SHDSL line

Performance Monitoring

SHDSL and E1 statistics collection

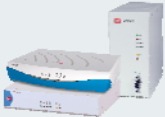


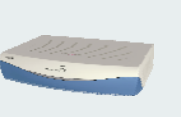

Physical

Height: 43.7 mm (1.7 in)
Width: 217 mm (8.5 in)
Depth: 170 mm (6.7 in)
Weight: 0.6 kg (1.2 lb)

Environment

Temperature: 0°C to 50°C (32°F to 122°F)
Extended temperature (4 X ETH interface version only): -20°C to 70°C (-4°F to 158°F)
Humidity: Up to 90%, non-condensing

Table 2. Modem Comparison Chart

Feature	ASMi-52 (Ver. 2.7)	ASMi-52L (Ver. 2.0)	ASMi-54 (Ver. 3.5)	ASMi-54L (Ver. 2.6)	ASMi-54LRT (Ver. 2.1)
					
Max. data rate (Mbps)	2.3/4.6	2.3/4.6	5.7/11/22	5.7/11.4 (11.4/15 per pair with license key)	5.7/11
Interface	V.35, RS-530, X.21, E1, ETH	V.35, X.21, E1, ETH, 4 x ETH	4 x ETH, E1/4 x E1	4 x ETH, E1	4 x ETH, E1
Router					✓
Line	2W/4W	2W/4W	2W/4W/8W	2W/4W	2W/4W/8W

ASMi-54L

SHDSL.bis Modem

Ordering

STANDARD CONFIGURATIONS

- ASMi-54L/4ETH/2W/ETR
- ASMi-54L/4ETH/4W/ETR
- ASMi-54L/24V/4ETH/4W/ETR
- ASMi-54L/4ETH/4W/E1/ETR
- ASMi-54L/4ETH/2W/E1
- ASMi-54L/4ETH/4W/E1
- ASMi-54L/4ETH/4W

SPECIAL CONFIGURATIONS

ASMi-54L/\$/#/*/@/^/ε

Legend

- \$ Optional 24 VDC power supply (Default=wide-range AC/DC power supply, 100 to 240 VAC, -48 to -60 VDC):
24V 24 VDC
- # Ethernet interface (mandatory):
4ETH Four-port ETH module with 4 x RJ-45 connectors
- * SHDSL interface:
2W 2-wire (1 pair)
4W 4-wire (2 pairs)
- @ User interface (Default=no E1 interface):
E1 E1
- ^ Extended temperature for device with 4 X ETH interface (Default= 0°C-50°C/32°F- 122°F)
ETR -20°C to 70°C (-4°F to 158°F) range (according to special request)
- ε License key for high data rate (Default=no key)
HR License key for 11.4 Mbps data rate per pair)

ASMi-54L-LIC/HR

License key for high data rate

SUPPLIED ACCESSORIES

- Power cord
- AC/DC adapter for -48 VDC

OPTIONAL ACCESSORIES

- RM-33-2**
Hardware kit for mounting one or two plastic ASMi-54L units in a 19-inch rack
- CBL-DB9F-DB9M-STR**
Standard 9-pin male to female RS-232 control port cable
- CBL-RJ45/2BNC/E1**
Interface adapter for converting a balanced E1 RJ-45 connector into a pair of BNC unbalanced coaxial connectors

503-110-02/12 (2.6) Specifications are subject to change without prior notice. © 1989-2012 RAD Data Communications Ltd. The RAD name, logo, logo type and the terms EtherAccess, TDMoIP and TDMoIP Driven and the product names Optlinux and Ipnux, are registered trademarks of RAD Data Communications Ltd. All other trademarks are the property of their respective holders.

International Headquarters
 24 Raoul Wallenberg Street
 Tel Aviv 69719, Israel
 Tel. 972-3-6458181
 Fax 972-3-6498250, 6474436
 E-mail market@rad.com



12 avenue des prés
78059 St Quentin en Yvelines

Tel: 33 (0)1 77 55 03 00
Fax: 33 (0)1 30 44 11 95

E-mail: sales@cbnetworks.fr

<http://www.cbnetworks.fr>



data communications
 The Access Company