

LRS-102 Module

# ASMi-54C/N

E1 and Ethernet over SHDSL/SHDSL.bis 8-Port Module



- E1 and Ethernet services over 2W (1 pair) or 4W (2 pairs) SHDSL/SHDSL.bis lines
- Data rates of up to 5.7 Mbps for 2W and up to 11.4 Mbps for 4W
- Operation opposite RAD's ASMi-52/ASMi-52L (SHDSL) and ASMi-54/ASMi-54L (SHDSL.bis)
- E1 and Ethernet extension over copper line in addition to LRS-102 fiber connectivity
- Remote power feeding to multiple SHDSL/SHDSL.bis lines eliminating the need for local power at remote sites

ASMi-54C/N is a SHDSL/SHDSL.bis E1 and Ethernet multiplexer module for the LRS-102 chassis that delivers digital data to customer premises over existing copper cables of the distribution network while eliminating the need for repeaters. It forwards transparently E1 data and optionally Ethernet, over 1 or 2 pairs of SHDSL.bis/SHDSL copper lines to ASMi-54/ASMi-54L (SHDSL.bis) or ASMi-52/ASMi-52L (SHDSL) standalone modems on the remote site. ASMi-54C/N operates in the LRS-102 chassis that can contain up to 12 card modules, to provide a simple and low-cost connectivity solution using High speed Digital Subscriber Line (SHDSL/SHDSL.bis) technology, as standardized by ITU-T Rec. G.991.2.

Using TC-PAM 16/32 line coding SHDSL/SHDSL.bis technology, the modem operates in full-duplex mode at the data rate of up to 5.7 Mbps per port.

The module operates as a Central SHDSL/SHDSL.bis (STU-C) Terminal Unit opposite up to 8 ASMi-54/ASMi-54L or ASMi-52/ASMi-52L standalone modems.

Multiplexing E1 and  
Ethernet over  
SHDSL/SHDSL.bis  
copper lines



**data communications**

The Access Company

# ASMi-54C/N

## E1 and Ethernet over SHDSL/SHDSL.bis 8-Port Module

The following types of ports are available:

- Eight SHDSL/SHDSL.bis independently configurable external ports
- Eight independently configurable E1 ports for E1 services
- Two 10/100 Mbps Ethernet ports for Ethernet services (optional)

Table 1. Power Feeding and Data Lines

Groups Engaged in Data Transfer with Power Feeding	Lines Left for Data Transfer without Power Feeding
0	8 x 2W
1 Group (2W)	7 x 2W
1 Group (4W)	3 x 4W
2 Groups (2W)	6 x 2W
2 Groups (4W)	2 x 4W
3 Groups (2W)	5 x 2W
3 Groups (4W)	1 x 4W
4 Groups (2W)	4 x 2W
4 Groups (4W)	0

### REMOTE POWER FEEDING

The ASMi-54C/E1/ETH/N module has a special remote power feeding version that delivers power and data over 2 or 4 wires to up to 4 SHDSL/SHDSL.bis remote modems or repeaters) and eliminates the need for locally powered modems or repeaters.

The module supplies each line with 180 VDC at a maximum of 60 mA with current limit protection for each channel.

Front-panel LEDs indicate the power feeding status for each line and provide warnings for current and temperature overload conditions.

Two 4-section DIP switches (external and internal) enable selective power feeding for each individual line.

While some of the SHDSL/SHDSL.bis lines are used for remote power feeding, the rest of the lines can be used for regular data transfer. *Table 1* illustrates the number of free lines that can be used for data transfer depending on the number and type of lines engaged in power feeding.

The power feeding model occupies two adjacent slots in the LRS-102 chassis.

### MANAGEMENT

Setup, control, and diagnostics are performed via a supervisory port on the LRS-102 CL module using an ASCII terminal, Telnet, or any SNMPc application. The remote ASMi-52/ASMi-52L modems can be configured and monitored from the central ASMi-54C/N card via EOC.

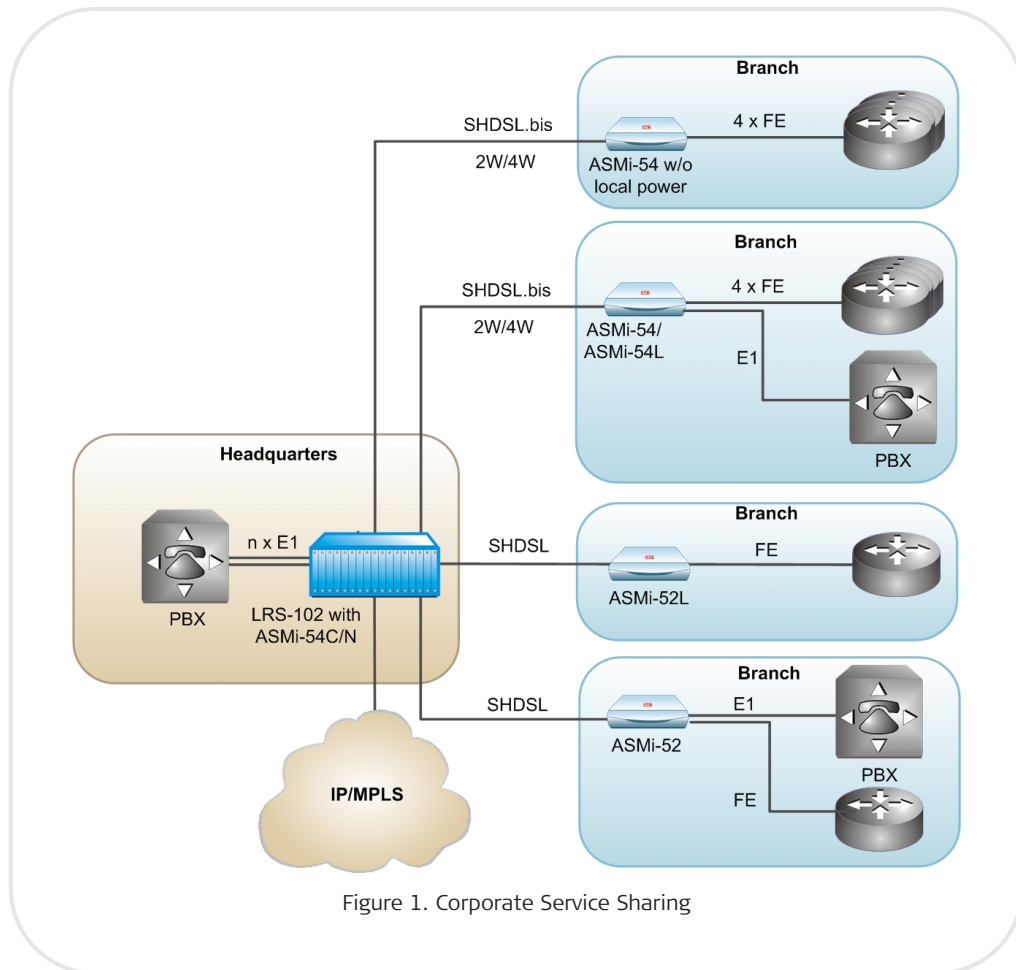


Figure 1. Corporate Service Sharing

## Specifications

### SHDSL.bis INTERFACE

#### Number of Ports

8 x 2W (8 x 2W, 4 x 4W or any other combination of 2W/4W pairs up to 16W)

#### Compliance

ITU-T G.991.2, ETSI TS 101524

#### Signal Format

ASMi-52/52L: TC-PAM16

ASMi-54/54L: TC-PAM32/TC-PAM16

#### Connectors

DB-26 convertible to 8 RJ-45 connectors via adaptor cable (regular model)

Single-pair female 2-pin terminal block for each port (power-feed model)

#### Impedance

135Ω

#### Typical Range

See *Table 2*

### E1 INTERFACE

#### Number of Ports

8

#### Coding

HDB3

#### Line Impedance

Balanced E1: 120Ω

Unbalanced E1: 75Ω (via adapter cable)

#### E1 Jitter Performance

As per ITU G.823

#### Connector

DB-44 convertible to RJ-45 or BNC connectors via adaptor cables

### ETHERNET INTERFACE

#### Number of Ports

2 UTP or 2 fiber-optic

#### Data Rate

10/100 Mbps (Fast Ethernet)

Autonegotiation

#### Connectors

2 x RJ-45, shielded

2 x SFP transceivers (see *Ordering*)

#### SFP Characteristics

For full details, see the *SFP Transceivers* data sheet at [www.rad.com](http://www.rad.com)

#### Maximum Frame Size

1600 bytes

#### Indicators (per port)

LINK/ACT

On (green): link is up

Off: link is down

Flashes: frames are transmitted/received

100

On (yellow): 100 Mbps mode

Off: 10 Mbps mode

### POWER FEED

#### Number of Ports

8 (4 line groups A,B,C,D) supporting 4 remote units

#### Power Feeding

180 VDC at 60 mA maximum per group

#### Connectors

Single-pair female 2-pin terminal block per port

#### Power Feeding Control Switches

External 2-position DIP switch per group for operation control

Internal 2-position DIP switch per group for 2/4-wire operation control

#### LED Indicators

4 dual-color P-FEED LEDs on the front panel. Each LED indicates the condition of a specific line group:

- Off – No digital power is supplied to the ASMi-54C/N card
- Steady green light – The line group carries power of 180 VDC
- Blinking green 1Hz – The line group front-panel DIP-switch is off
- Steady red light – ASMi-54C/N suffers from overheating
- Blinking red 10 Hz:
  - The line group suffers from leakage current to the ground OR
  - 48 VDC is not supplied to the ASMi-54C/N module

- Blinking red 1 Hz – The line group suffers from overload (more than 60 mA used in the group).

### GENERAL

#### Diagnostics

Loopbacks on local and remote E1 ports  
Loopbacks and BERT on the SHDSL line

#### Performance Monitoring

Per ITU-T Rec G.991.2, G.826

#### Power Consumption

ASMi-54C/E1/N: 7.3W

ASMi-54C/E1/ETH/N: 12W

Table 2. Typical Ranges

Data Rate [kbps]	2-wire		4-wire	
	[km]	[mi]	[km]	[mi]
192	6.6	4.1	-	-
1536	4.9	3.0	5.05	3.14
2048	4.5	2.8	5.0	3.11
4096	3.2	2.0	4.2	2.6
4608	3.0	1.9	4.0	2.5
5696	2.6	1.6	3.6	2.2

*Note: The typical ranges are based on error-free lab tests without noise and obtained on a 26 AWG cable line simulator (DLS-400). For ASMi-52/52L on the far end, only ranges up to 2048 are relevant.*

## ASMi-54C/N

## E1 and Ethernet over SHDSL/SHDSL.bis 8-Port Module

## Ordering

**ASMi-54C/E1/N**

E1 over SHDSL 8-Port Module

**ASMi-54C/E1/ETH/#/N**

E1 and Ethernet over SHDSL/SHDSL.bis 8-port module

**ASMi-54C/E1/ETH/#/PF/N**

E1 and Ethernet over SHDSL/SHDSL.bis 2-slot module with remote power feeding

**Note:** Power feeding modules require a -48 VDC (nominal) source. This power can be provided by the 48 VDC-powered LRS-102 chassis.

## Legend

# Interface and Connectors

UTP 2 UTP (RJ-45 connectors)

SFP&amp; 2 SFP sockets including SFP transceivers (see below for &amp;)

&amp; SFP transceivers for Ethernet

100BaseFx Interface

1 Fast Ethernet/STM-1, 1310 nm, multimode, LED, 2 km (1.2 mi)

1D Fast Ethernet/STM-1, DDM, internal calibration, 1310 nm, multimode, LED, 2 km (1.2 mi)

2 Fast Ethernet/STM-1, 1310 nm, single mode, laser, 15 km (9.3 mi)

2D Fast Ethernet/STM-1, DDM, internal calibration, 1310 nm, single mode, laser, 15 km (9.3 mi)

3 Fast Ethernet/STM-1, 1310 nm, single mode, laser, 40 km (24.8 mi)

3D Fast Ethernet/STM-1, DDM, internal calibration, 1310 nm, single mode, laser, 40 km (24.8 mi)

10a Fast Ethernet/STM-1, Tx - 1310 nm, Rx - 1550 nm, single mode (single fiber), laser (WDM), 20 km (12.4 mi)

10b Fast Ethernet/STM-1, Tx - 1550 nm, Rx - 1310 nm, single mode (single fiber), laser (WDM), 20 km (12.4 mi)

18a STM-1/OC-3, Tx - 1310 nm, Rx - 1550 nm, 9/25 single mode (single fiber), laser (WDM), 40 km (24.8 mi)

18b STM-1/OC-3, Tx - 1550 nm, Rx - 1310 nm, 9/25 single mode (single fiber), laser (WDM), 40 km (24.8 mi)

19a STM-1/OC-3, Tx - 1490 nm, Rx - 1570 nm, 9/25 single mode (single fiber), laser (WDM), 80 km (49.7 mi)

19b STM-1/OC-3, Tx - 1570 nm, Rx - 1490 nm, 9/25 single mode (single fiber), laser (WDM), 80 km (49.7 mi)

## Notes.

- For the complete list of SFPs, refer to the SFP Transceivers data sheet.
- It is strongly recommended to order ASMi-54C/N with original RAD SFPs installed. This will ensure that prior to shipping, RAD has performed comprehensive functional quality tests on the entire assembled unit, including the SFP devices. RAD cannot guarantee full compliance to product specifications for ASMi-54C/N units using non-RAD SFPs.

## OPTIONAL ACCESSORIES

**CBL-DB26-8SHDSL**

Cable for splitting a single 26-pin SHDSL.bis connector to 8 x RJ-45 connectors

**Note:** This cable is required for the module operation. It can either be ordered from RAD or manufactured by the customer according to pinouts provided in the manual.

**Cables for E1 Interface****CBL-G703-8/RJ45**

Splitter cable for splitting the 44-pin E1 module connector to 8 E1 balanced RJ-45 connectors

**CBL-G703-8/RJ45/X**

Splitter cross-cable for splitting the 44-pin E1 module connector to 8 E1 balanced RJ-45 connectors

**CBL-G703-8/COAX**

Splitter cable for splitting the 44-pin E1 module connector to 8 pairs of E1 unbalanced BNC connectors

**CBL-G703-8/OPEN/2M**

Open-ended cable with DB-44 connector for balanced E1 applications

All cables are 2m (6.6 ft) long.

**International Headquarters**

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

**North America Headquarters**

900 Corporate Drive  
Mahwah, NJ 07430, USA  
Tel. 201-5291100  
Toll free 1-800-4447234  
Fax 201-5295777  
E-mail market@radusa.com

**www.rad.com**

Order this publication by Catalog No. 803886

**data communications**

The Access Company