

# ASMi-52

## 2/4-wire SHDSL Modem/Multiplexer



- SHDSL modem for effective provisioning of TDM and Ethernet data services at rates of up to 4.6 Mbps
- Ethernet and E1 or serial data services multiplexed over SHDSL
- Operating range of up to 7.5 km (4.6 miles) on 26 AWG
- Data rates between 64 kbps and 4608 kbps
- Special rail-mount metal chassis for railways applications

ASMi-52 is an SHDSL modem/multiplexer that operates in full-duplex mode over the 2- and 4-wire copper lines.

Multiple data rates in the range of 64 to 4608 kbps are supported. The data rates depend on the line interface, DTE interface type, and operating clock modes.

ASMi-52 employs standard SHDSL TC-PAM technology to extend the transmission range (see Table 1), thus enabling carriers to reach more customers at lower costs.

The following DTE interfaces are available: X.21, V.35, RS-530, and G.703/G.704 E1 or T1. For LAN-to-LAN connectivity the modem features a built-in 10/100BaseT bridge Ethernet port with VLAN functionality.

When equipped with two interfaces, the standalone ASMi-52 units combine and multiplex user traffic over the SHDSL link. The following DTE combinations are available:

- Serial Port (V.35, X.21, RS-530) + LAN
- E1 + LAN
- E1 + serial port (V.35, X.21, RS-530).

**Note:** T1 and Ethernet/serial combination is not available.

**Note:** In ASMi-52 with E1+V.35 combination the ETH port can be used for management only.

4-wire line interface modems can be configured to operate over 2-wire lines.

ASMi-52 uses an Embedded Operation Channel (EOC) for remote unit control and monitoring.

EOC functions without interfering with data transmission, using the SHDSL overhead bits in compliance with the ITU-T G.991.2 requirements.

ASMi-52 units can operate with centrally located LRS-102 racks with ASMi-54C/N modules, DXC-8R/10A/30 chassis with D4SL/D8SL modules, MP-2100/2104 chassis with MSL-8 modules or MP-4100 chassis with the M8SL or ASMi-54C/N modules.

User-configurable low-speed mode is available for units with serial and LAN interfaces. In this mode ASMi-52 operates at 64/128 kbps (2-wire) and 128/256 kbps (4-wire) data rates when working with devices with E1 DTE interface. The maximum data rate in low-speed mode is 2048 kbps.

Up to eight SHDSL repeaters can be installed in line to increase the operation range of E1 based modems. ASMi-52 provides basic management of the repeaters.

Table 1. Typical Ranges (26 AWG)

Data Rate [kbps]	2-wire		4-wire	
	[km]	[miles]	[km]	[miles]
64	7.5	4.6	—	—
128	7.0	4.3	7.1	4.4
256	6.7	4.1	6.8	4.2
384	6.5	4.0	6.7	4.1
512	6.3	3.9	6.6	4.1
1024	5.3	3.3	6.0	3.7
1536	5.0	3.1	5.6	3.5
2048	4.5	2.8	4.7	2.9
2304	4.2	2.6	4.5	2.8
4096	—	—	3.7	2.3
4608	—	—	3.0	1.8

**Note:** The typical ranges are based on error-free lab tests without noise.



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The minor and major alarms can be relayed to a remote alarm device via an optional terminal block port.

QoS is enhanced by prioritizing the LAN packets to the DSL line according to four levels of VLAN priorities. The user can enable or disable the VLAN priority, and each VLAN priority (0-7) tag can be assigned to one of four priority levels.

ASMi-52 is available as standalone plastic or metal enclosures, and rail-mount metal enclosures. The plastic and metal enclosures are also available in extended temperature versions (by special request).

### MANAGEMENT AND SECURITY

Management operations can be performed using an ASCII terminal, a Telnet host, a web-based management application, or RADview. The latter is a Java-based, client-server, modular, scalable element management system that provides secure configuration and fault management capabilities.

The terminal port supports a dial-up modem connection for remote management of ASMi-52 over telephone lines.

SNMP management can be performed via a 10/100BaseT port or a dedicated E1/T1 timeslot.

When ASMi-52 is ordered with only the 10/100BaseT port, it can be used to transfer both user and management data.

### MONITORING AND DIAGNOSTICS

Comprehensive diagnostic capabilities include:

- Real-time alarms to alert the user on fault conditions
- V.54 local analog and remote digital loopbacks
- SHDSL and E1/T1 statistics collection for 15-minute and 24-hour intervals.

BER test can be performed by the multiplexer units on each serial interface. The BERT generates and receives four different test patterns.

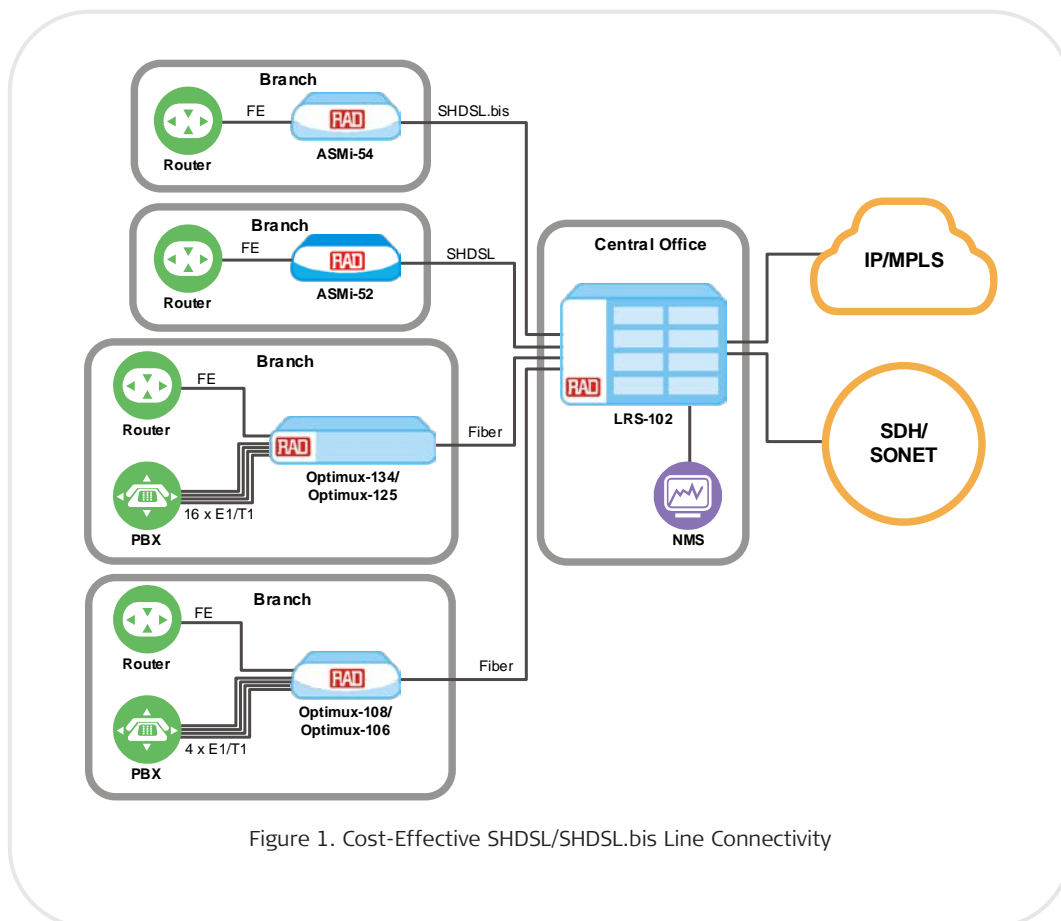


Figure 1. Cost-Effective SHDSL/SHDSL.bis Line Connectivity

## Specifications

### LINE INTERFACE

#### Type

2/4-wire unconditioned dedicated line (twisted pair)

#### Line Coding

TC-PAM

#### Range

See *Table 1*

#### Impedance

135Ω

#### Compliance

ITU-T 991.2, ETSI 101 524, ITU-T G.994.1

#### Connector

RJ-45

### DTE INTERFACE

#### Data Rate

Depends on the DTE/line interface type and clock mode:

2-wire:

- 64 to 2304 kbps (ext. clock)
- 64 to 2048, 2304 kbps (int. clock)
- 64 to 1536 kbps (T1)

4-wire:

- 128 to 4608 kbps (ext. clock)
- 128 to 4096, 4608 kbps (int. clock)
- 64 to 1536 kbps (T1)

*Note: The multiplexer option E1+V.35 can operate at up to 4096 kbps in applications with Megaplex-4 and up to 2048 kbps in all other applications.*

#### Interface and Connectors

X.21: 15-pin, D-type, female

V.35: 34-pin, female

RS-530: 25-pin, D-type, female

E1: RJ-45

T1: RJ-45

ETH (10/100BaseT bridge with VLAN support): RJ-45

### E1/T1 INTERFACE

#### Data Rate

E1: 2048 kbps

T1: 1544 kbps

#### Coding

E1: HDB3

T1: B8ZS or AMI

#### Line Impedance

Balanced E1: 120Ω

Unbalanced E1: 75Ω (via adapter cable)

Balanced T1: 100Ω

#### Connector

8-pin RJ-45

*Note: An adapter cable can be ordered for converting the main link RJ-45 connector into a pair of BNC connectors for unbalanced E1 coax interface.*

#### E1 Jitter Performance

As per ITU G.823

### USER ETHERNET INTERFACE

#### Interface

10/100BaseT

#### Connectors

RJ-45

#### Frame Size

1580 bytes

#### Compliance

IEEE 802.3, 802.3U

### MANAGEMENT PORTS

#### V.24/RS-232 Control Port

Interface: V.24/RS-232 DTE

Connector: 9-pin D-type, female

Format: asynchronous

Baud rate: 9.6 to 115.2 kbps

#### Ethernet Port

Interface: 10/100BaseT

Connector: RJ-45 shielded

### ALARM PORT

#### Type

Dry relay contacts for major and minor alarms

#### Connector

9-pin D-type female

### GENERAL

#### Timing

Internal, from internal oscillator

External, from attached DTE

Receive, from received signal (CPE only)

#### Diagnostics

Local analog loopback in compliance with ITU V.54

Remote digital loopback in compliance with ITU V.54

Remote loopback at the SHDSL repeater BER test on multiplexer units

#### Performance Monitoring

SHDSL statistics collection

E1 with CRC-4 or T1 with ESF framing (per ITU G.706)

E1 without CRC-4 or T1 with SF framing (BPV)

Compliant with G.826

#### Indicators

PWR (green) – Power on

DATA (yellow) – Transmit data (except E1 or T1 interface)

SYNC A/B (green/red) – Sync status of DSL line

E1 or T1 SYNC (red) – Loss of E1 or T1 sync (E1 or T1 interface only)

AIS (yellow) – “All 1s” string is received (E1 or T1 interface only)

ALM (red) – Alarm enters the buffer

TST (red) – Test in progress

#### Power

100–240 VAC, 50/60 Hz or 48/60 VDC nominal (40 to 72 VDC)

24 VDC nominal (18 to 36 VDC)

#### Power Consumption

4-wire: 7W max

2-wire: 6W max

## ASMi-52

## 2/4-wire SHDSL Modem/Multiplexer

**Physical**

Plastic enclosure:

Height: 43.7 mm (1.7 in)

Width: 220 mm (8.6 in)

Depth: 170 mm (6.7 in)

Weight: 0.6 kg (1.3 lb)

Metal enclosure:

Height: 43.7 mm (1.7 in)

Width: 215.5 mm (8.5 in)

Depth: 153 mm (6.0 in)

Weight: 0.7 kg (1.5 lb)

Rail-mount metal enclosure:

Height: 150 mm (5.9 in)

Width: 70 mm (2.8 in)

Depth: 163 mm (6.4 in)

Weight: 0.9 kg (1.9 lb)

**Environment**

Standard temperature: 0° to 50°C

(32° to 122°F)

Extended temperature: -20° to 70°C

(-4° to 158°F)

Humidity: Up to 90%, non-condensing

**Ordering****RECOMMENDED CONFIGURATIONS****ASMI-52/E1/2W/ETH**

E1 interface, 2-wire, second 10/100BaseT interface

**ASMI-52/E1/4W/ETH**

E1 interface, 4-wire, second 10/100BaseT interface

**ASMI-52/ETH/2W**

Single 10/100BaseT interface, 2-wire

**ASMI-52/ETH/4W**

Single 10/100BaseT interface, 4-wire

**ASMI-52/E1/2W**

Single E1 interface, 2-wire

**ASMI-52/E1/4W**

Single E1 interface, 4-wire

**ASMI-52/V35/2W/ETH**

V.35 interface, 2-wire, second 10/100BaseT interface

**ASMI-52/V35/2W**

Single V.35 interface, 2-wire

**ASMI-52/T1/4W**

Single T1 interface, 4-wire

**ASMI-52/T1/4W/ETH/ME**

T1 interface, 4-wire, second 10/100BaseT interface, metal enclosure

**SPECIAL CONFIGURATIONS**

Please contact your local RAD partner for additional configuration options

**SUPPLIED ACCESSORIES**

Power cord

AC/DC adapter plug (when -48 VDC is ordered)

**PLUG-DC/TB-S**

DC adapter plug (when 24 VDC is ordered)

**OPTIONAL ACCESSORIES****CBL-RJ45/2BNC/E1**

Interface adapter for converting a balanced E1 RJ-45 connector into a pair of BNC unbalanced coaxial connectors

**CBL-DB9F-DB9M-STR**

Control port cable

**Mount Kits****RM-33-2**

Hardware kit for mounting one or two plastic ASMi-52 units in a 19-inch rack

**RM-35/@**

Hardware kit for mounting one or two metal ASMi-52 units in a 19-inch rack

*Legend*

Ⓢ Rack mount kit (Default=both kits):

**P1** Mounting one unit**P2** Mounting two units**WM-35-TYPE4**

Hardware kit for wall mounting 8.5" units in metal enclosure