

# ASMi-53

## SHDSL.bis CPE Modem



- Managed SHDSL.bis 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 enabling E1 or V.35 service combination with Ethernet
- High Ethernet performance including QoS and EFM bonding
- Operating as STU-C (CO) or STU-R (CPE)
- Full interoperability with Megaplex-4, LRS-102 (ASMi-54C and ASMi-54C/N modules), and third-party equipment
- Remote power feeding

ASMi-53 is a cost-effective, dedicated, managed SHDSL.bis modem that extends the range of high-speed services over existing copper pairs. The modem is used for Ethernet, E1 and V.35 service extension at rates of up to 11.4 Mbps over 4-wire lines using bonding technology.

The modem features an Ethernet, E1 or V.35 user interface.

ASMi-53/Type1 can be ordered with:

- Ethernet interface
- Ethernet and E1 interfaces
- Ethernet and V.35 interfaces.

ASMi-53/Type2 provides the following combinations:

- E1 and Ethernet
- E1 and V.35.

In addition, it offers the following capabilities:

- Remote power-up by PFH-4 or by the MPF power feed unit, connected to Megaplex-4

- Point-to-point configuration
- Additional LED showing the E1 link/Data status.

### MARKET SEGMENTS AND APPLICATION

ASMi-53 targets the following market segments:

- Service providers
- Corporate, utilities and transportation companies looking for economical delivery of voice and broadband data traffic.

ASMi-53 operates as a CO (Central Office) device or CPE (Customer Premises Equipment) in point-to-point applications (*Figure 1*).

### INTEROPERABILITY

ASMi-53 is interoperable with the following CO devices:

- Megaplex-4 or LRS-102 chassis, equipped with ASMi-54C or ASMi-54C/N modules (*Figure 2*)

- Third-party DSLAMs (*Figure 3*).

### SHDSL

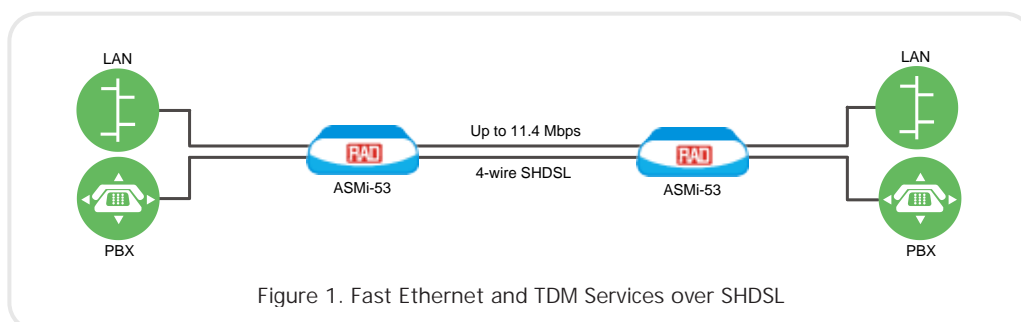
The modem employs TPS-TC framing 64/65o for EFM (IEEE802.3) and HDLC (G.991.2) on the SHDSL link.

In CPE mode, ASMi-53 can be remotely managed by Megaplex-4 or LRS-102 through EOC (Embedded Operations Channel), VT (Virtual Terminal) or Telnet.

### ETHERNET

ASMi-53 features one Ethernet 10/100BaseT port with half/full-duplex, autonegotiation and flow control. LAN is connected to network by bridging.

The Ethernet port operates in a VLAN unaware mode (802.1d **unaware**). In this mode, all the Ethernet traffic reaching the port is forwarded to the network port and vice versa.



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### EFM Bonding

When using Ethernet service, EFM (Ethernet First Mile) bonding is applied. EFM bonding allows multiple pairs to be used as a single, high capacity link, providing more bandwidth over the existing copper infrastructure.

EFM bonding shares Ethernet payload between the connected SHDSL lines, ensuring user traffic reliability in case of one pair failure.

### Traffic Management/QoS

The DSCP priority schemes, and 802.1p priority classification allow users to define different QoS levels according to application requirements.

The modem implements the IEEE's 802.1q standard to provide four levels of prioritization, enabling carriers to offer differentiated Ethernet services.

Management traffic can be transferred via a separate VLAN, ensuring transparency of the customer traffic and enhanced management security.

The user can activate or deactivate the priority mechanism. The priority can be configured and mapped to one of four priority queues.

Ethernet port ingress and egress data rates can be limited.

### TDM

ASMi-53 transports:

- Framed and unframed E1 traffic
- V.35 serial data stream with the maximum data rate of 2.048 Mbps
- E1 and V.35 traffic with the maximum aggregate rate of 4 Mbps.

**Note:** TDM traffic is supported in the HDLC mode only.

### TIMING AND SYNCHRONIZATION

In CO mode, ASMi-53 generates an internal synchronization signal or receives it from the E1 channel.

In CPE mode, ASMi-53 receives the synchronization signal from the CO unit.

### MANAGEMENT AND SECURITY

ASMi-53 can be managed :

- Locally, by an RS-232 terminal
- Inband, via EOC (in CPE mode only)
- By virtual terminal (in CPE mode only)
- Via Telnet (in CPE mode via Megaplex only).

### MONITORING AND DIAGNOSTICS

ASMi-53 features an alarm system, physical layer performance monitoring (SHDSL, E1 and ETH statistics collection), and standard loopback diagnostics.

The fault propagation functionality enables the unit to shut down the Ethernet port when an SHDSL line failure is detected.

Diagnostic loopbacks and internal BERT are supported.

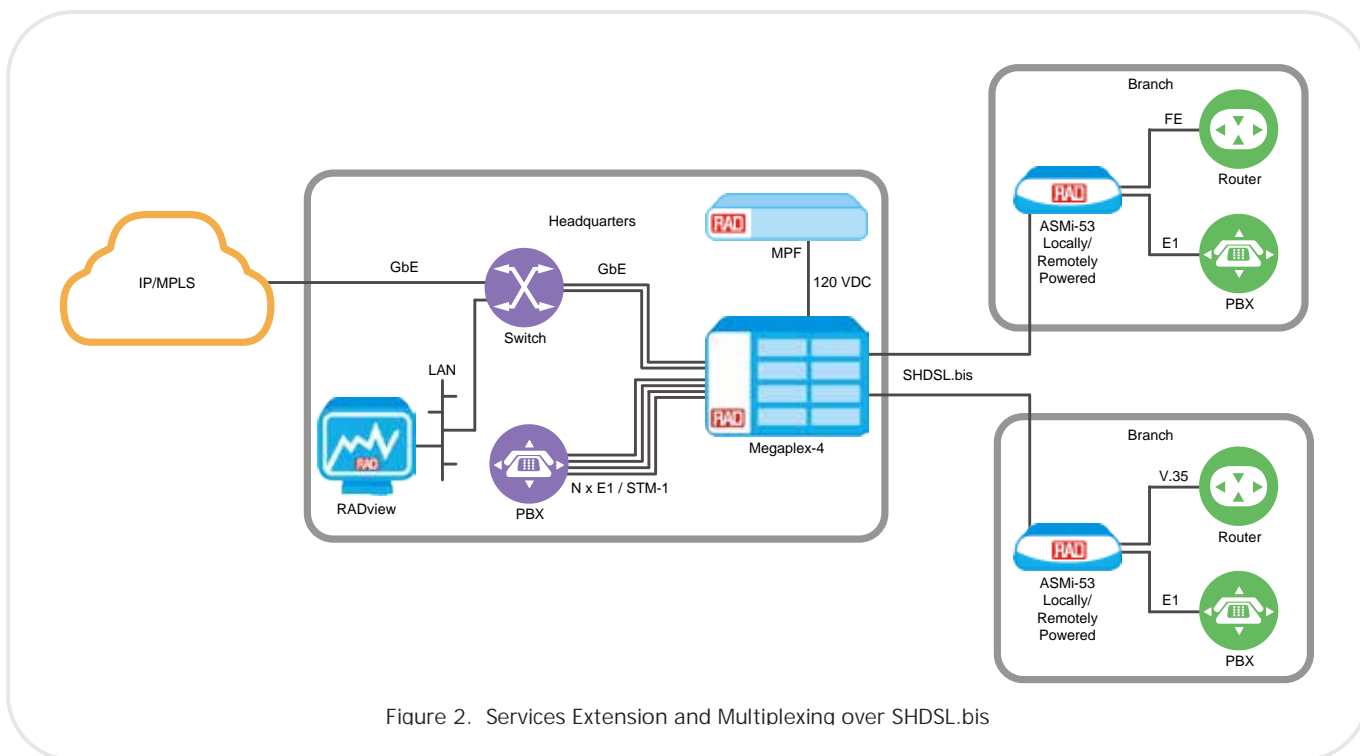


Figure 2. Services Extension and Multiplexing over SHDSL.bis

## Specifications

### ETHERNET INTERFACE

**Number of Ports**

1

**Type**

10/100BaseT

**Compliance**

IEEE 802.3x

**Connector**

RJ-45

**Max. Frame Size**

2000 bytes

### E1 INTERFACE

**Number of Ports**

1

**Line Coding**

HDB3

**Compliance**

G.703, G.704, G.732N

**Impedance**

120W, balanced

75W, unbalanced (via BE-1 adapter)

**Jitter**

As per ITU G.823

**Connector**

RJ-45 (ASMi-53/Type1 and Type2)

BNC (ASMi-53/Type2)

### SERIAL V.35 DTE INTERFACE

**Rate**

64 to 2048 kbps, with steps of 64 kbps

**Interface**

V.35

**Connector**

M.34 (ASMi-53/Type1)

DB-25 (ASMi-53/Type2)

**Note:** DB-25 connector requires an adapter cable for connection to the standard V.35 interface.

### SHDSL INTERFACE

**Number of ports**

2

**Line Type**

Symmetrical PSD

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

**Compliance**

ITU-T G.991.2, ETSI TS 101524

**Operation Mode**

EFM with EFM bonding per ITU-T G.991.2 (for Ethernet service only)

M-Pair with HDLC encapsulation

**Line Coding**

TC-PAM 16/32

**Line Rate**

2-wire line: 192 to 5696 kbps

4-wire line: 192 to 11392 kbps

**SHDSL Reference Clock**

Receive, derived from the SHDSL received line signal (CPE mode)

**Range**

Typical Ranges  
(26 AWG, noise-free, per pair)

Data Rate [kbps]	2-wire	
	[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

**Impedance**

135

**Connector**

RJ-45

### BRIDGE

**Compliance**

IEEE 802.1q unaware, 802.1d

**Filtering and Forwarding**

Transparent or filter

**Maximum Frame Size**

2000 bytes

**MAC Address Table**

Up to 1,024 MAC addresses (learned)

### QUALITY OF SERVICE

**Compliance**

IEEE 802.1d, DSCP priority with four levels of class of service

802.1p

**Rate Limitation**

Ethernet port ingress and egress data rates can be limited within 64-11400 kbps

### MANAGEMENT

**Control Port**

RS-232, DCE

**Management Options**

- Local RS-232 terminal
- Inband management via EOC
- Virtual terminal
- Telnet

### GENERAL

**Environment**

Temperature: -10°C to 50°C (14°F to 122°F)

Humidity: Up to 90%, non-condensing

**Indicators (Type 1)**

Tricolor LED Indicator (front panel)

**Indicators (Type 2)**

PWR (Green)

- On: The modem is powered on
- Off: The modem is off

TST (Yellow)

- On: A test is active
- Off: No test is active

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### ALM (Red)

- On: Alarm is active
- Off: No alarm

### SHDSL SYNC A/B (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 not synchronized, in training process or in PAF/M-pair establishment stage

### DATA/E1 SYNC (Yellow)

- On: Data/E1 link is synchronized and can pass data
- Off: Data/E1 link is off/not synchronized

### Physical (ASMi-53/Type1)

Height: 43.5 mm (1.71 in)  
Width: 210.3 mm (8.28 in)  
Depth: 136 mm (5.35 in)  
Weight: 0.6 kg (1.3 lb)

### Physical (ASMi-53/Type2)

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)

### Power

#### ASMi-53/Type1 External Power Supply:

- AC: 100 to 240 VAC
- DC: 40 to 72 VDC.

#### AC power consumption for different 4-wire options:

- Single Ethernet interface: 5.2W
- E1 and Ethernet interfaces: 5.4W
- V.35 and Ethernet interfaces: 5.9W

#### DC power consumption for different 4-wire options:

- Single Ethernet interface: 4.4W
- E1 and Ethernet interfaces: 4.6W
- V.35 and Ethernet interfaces: 5.4W

#### ASMi-53/Type2:

- DC: 48V or 60V nominal DC voltage (44 to 72 VDC)
- AC/DC wide-range:
  - § 115V or 230V nominal AC voltage (90 to 264 VAC range)
  - § 48V or 60V nominal DC voltage (44 to 72 VDC range).

In addition, ASMi-53/Type2 with the DC PS can be powered remotely over the SHDSL. Supported remote power feeding voltage is 60 to 140 VDC.

#### AC power consumption (with AC-to-DC adapter) for different 4-wire options:

- E1 and Ethernet interfaces: 5.4W
- E1 and V.35 interfaces: 6.7W

#### DC power consumption for different 4-wire options:

- E1 and Ethernet interfaces: 4.6W
- E1 and V.35 interfaces: 5.6W

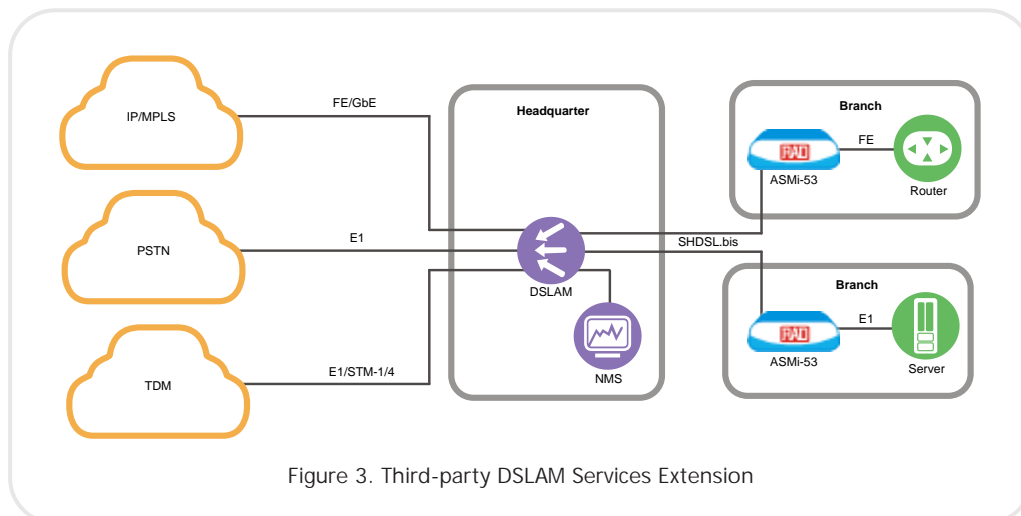


Figure 3. Third-party DSLAM Services Extension

## ASMi-53

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## Ordering

## RECOMMENDED CONFIGURATIONS

**ASMi-53/AC/V35/4W**

4-wire modem, Type 1, with V.35 interface, external AC power supply

**ASMi-53/AC/E1/2W**

2-wire modem, Type 1, with E1 interface, external AC power supply

**ASMi-53/AC/ETH/2W**

2-wire modem, Type 1, with ETH interface, external AC power supply

**ASMi-53/AC/ETH/E1/4W**

4-wire modem, Type 1, with ETH and E1 interfaces, external AC power supply

**ASMi-53/V35/2W**

2-wire modem, Type 2, with V.35 interface, wide-range AC/DC power supply

**ASMi-53/ETH/4W**

4-wire modem, Type 2, with ETH interface, wide-range AC/DC power supply

**ASMi-53/ETH/2W**

2-wire modem, Type 2, with ETH interface, wide-range AC/DC power supply

**ASMi-53/E1/2W**

2-wire modem, Type 2, with E1 interface, wide-range AC/DC power supply

## SPECIAL CONFIGURATIONS

Please contact your local RAD partner for additional configuration options.

## SUPPLIED ACCESSORIES

**P/S-AC/5/1000/US-W/LOCK**

AC power supply with US plug for ASMi-53/Type1

**P/S-AC/5/1000/EU-W/LOCK**

AC power supply with European plug for ASMi-53/Type1

**PS-48V/5V**

DC-to-DC power converter for ASMi-53/Type1

## OPTIONAL ACCESSORIES

**RM-47**

Hardware kit for mounting one or two plastic ASMi-53/Type1 units in a 19-inch rack

**RM-33-2**

Hardware kit for mounting one or two plastic ASMi-53/Type2 units in a 19-inch rack

**ST-35**

Stacking tray for up to three plastic ASMi-53/Type1 units

**CBL-DB9F-DB9M-STR**

Standard 9-pin male to female RS-232 control port cable

**AC/DC Power adapter**

External mechanical adapter for ASMi-53/Type2 operating with DC mains

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