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 enables E1 and Ethernet or E1 and V.35 services combination and can be remotely powered by PFH-4 or by the MPF power feed unit, connected to Megaplex-4.

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.
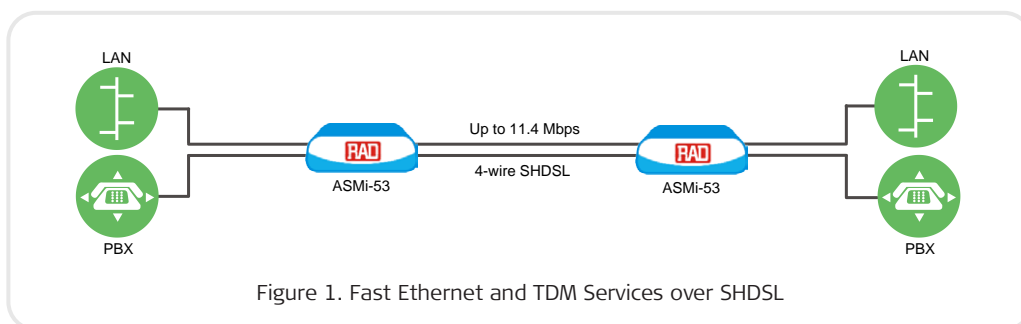

Figure 1. Fast Ethernet and TDM Services over SHDSL

EFM Bonding

When using Ethernet service, EFM (Ethernet Fist 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 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.

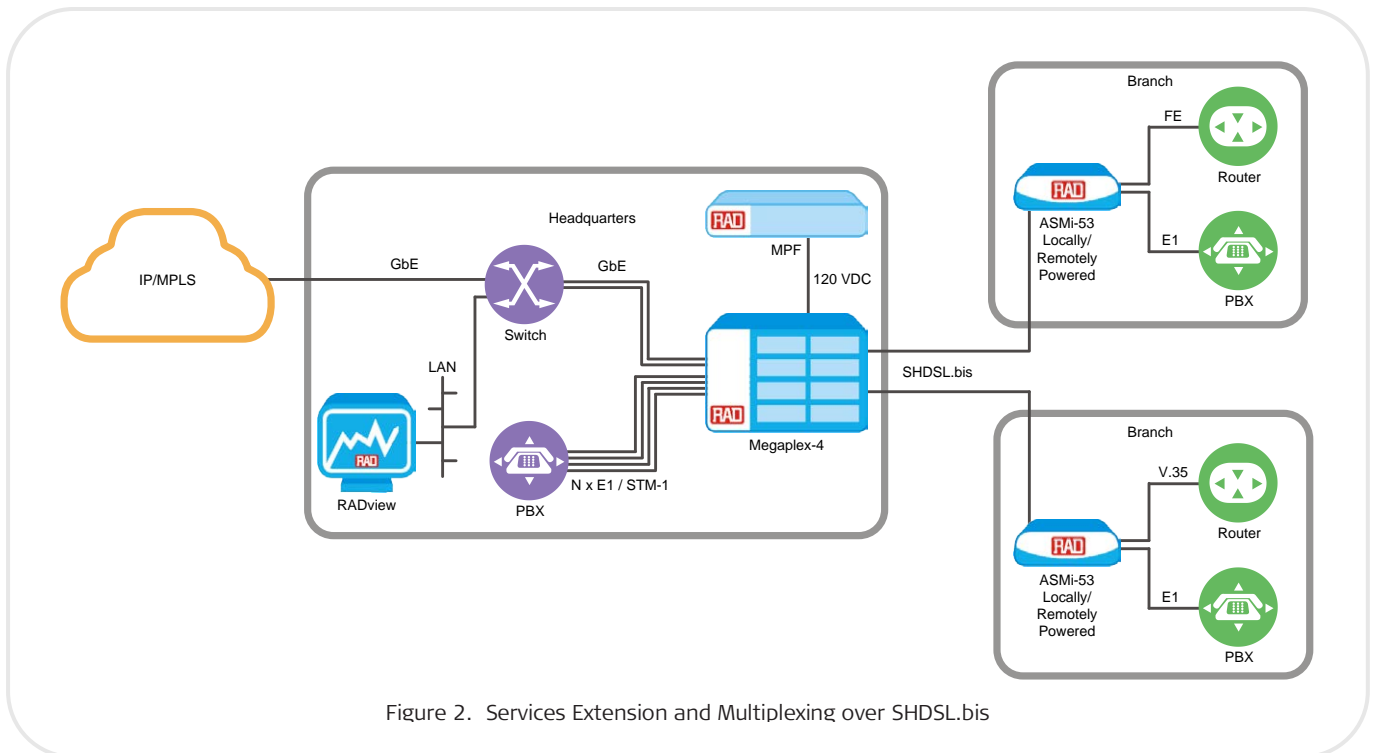Diagnostic loopbacks and internal BERT are supported.

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
120Ω, balanced

75Ω, 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

Data Rate	2-wire	
[kbps]	[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

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

Impedance

135Ω

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

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

Indicator

Tricolor LED Indicator (front panel)

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)

ASMi-53
SHDSL.bis CPE Modem

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: 44 to 72 VDC
- Remote power feeding: 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

Ordering

RECOMMENDED CONFIGURATIONS

ASMI-53/AC/4W/V35
4 –wire modem with V.35 interface

ASMI-53/AC/2W /E1
2 –wire modem with E1 interface

ASMI-53/AC/2W /ETH
2 –wire modem with ETH interface

ASMI-53/AC/4W /ETH/E1
4 –wire modem with ETH and E1 interfaces

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

P/S-AC/5/1000/EU-W/LOCK
AC power supply with European plug

PS-48V/5V
DC-to-DC power converter

Note: *The above accessories are supplied with ASMi-53/Type1 only.*

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

CBL-DB9F-DB9M-STR
Standard 9-pin male to female RS-232 control port cable

AC/DC Power adapter
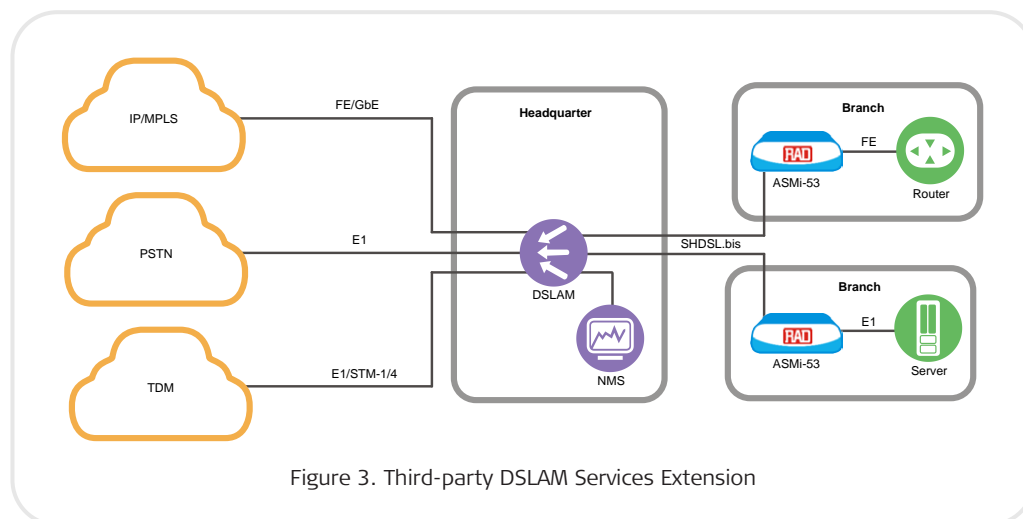AC (100 to 240 VAC) to DC (48 VDC) external power adapter for ASMi-53/Type2

Figure 3. Third-party DSLAM Services Extension