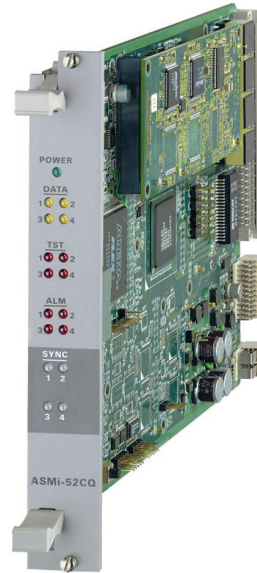


# ASMi-52

## 2/4-Wire SHDSL Modem



### FEATURES

- Dedicated managed SHDSL modem
- Operates over 2-wire and 4-wire lines, enabling service over any copper infrastructure
- Multiplexes of two data streams (E1, Ethernet, Serial) over SHDSL
- Utilizes TC-PAM line coding for extending the operation range to up to 7.5 km (4.66 miles)
- Operates at multiple data rates between 64 kbps and 4608 kbps, enabling single platform system upgrades
- Features X.21, V.35, RS-530, G.703/G.704 E1/T1 and Ethernet interfaces, allowing connection to different DTE types
- Supports an embedded operation channel for end to end system management and supervision, as per ITU-T G.991.2
- Management via:
  - V.24/RS-232 terminal port
  - 10/100BaseT out-of-band management port
  - Dedicated E1/T1 timeslot
- Provides extensive diagnostics, including loopbacks, SHDSL and E1 or T1 performance monitoring
- Major and minor alarm relay
- SHDSL repeaters for increased transmission distance
- Built-in BER tester
- Four levels of VLAN priority
- Available in a half-19" metal or plastic enclosure, suitable for side-by-side rack mounting, or in a rail-mounted metal enclosure
- Available as a dual- or quad-modem card for RAD's LRS-24 and DXC modem racks with SNMP management
- Fully compatible with RAD's LRS-52 dedicated SHDSL modem rack

# ASMi-52

## 2/4-Wire SHDSL Modem

### DESCRIPTION

- ASMi-52 is an SHDSL modem that operates in full-duplex mode over 2-wire and 4-wire lines.
- Multiple data rates in the range of 64 to 4608 kbps are supported. The data rates depend on the line interface, DTE interface types, 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 using SHDSL technology, the modem supports a built-in 10/100BaseT bridge Ethernet port with VLAN support (IR-ETH/QN for card versions), or an IP router (IR-IP).
- When equipped with two interfaces, the standalone ASMi-52 units combine 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 multiplexer units are not available.*
- A 4-wire line interface modem can be configured to operate over 2-wire lines.
- The modem uses an Embedded Operation Channel (EOC) for controlling and monitoring the remote unit. The management channel uses SHDSL overhead bits in compliance with ITU-T G.991.2 requirements, operating without interfering with the data transmission.
- ASMi-52 units operate opposite centrally located LRS-52 and ASMi-52CD/ASMi-52CQ cards installed in a LRS-24 rack (see Figure 1).
- User-configurable low-speed mode is available for units with serial and LAN interfaces. In this mode ASMi-52 supports 64/128 kbps (2-wire) and 128/256 kbps (4-wire) data rates when operating opposite devices with E1 DTE interface. The maximum data rate in the 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.
- The minor and major alarms can be relayed to a remote alarm device via an optional terminal block port.

### APPLICATION

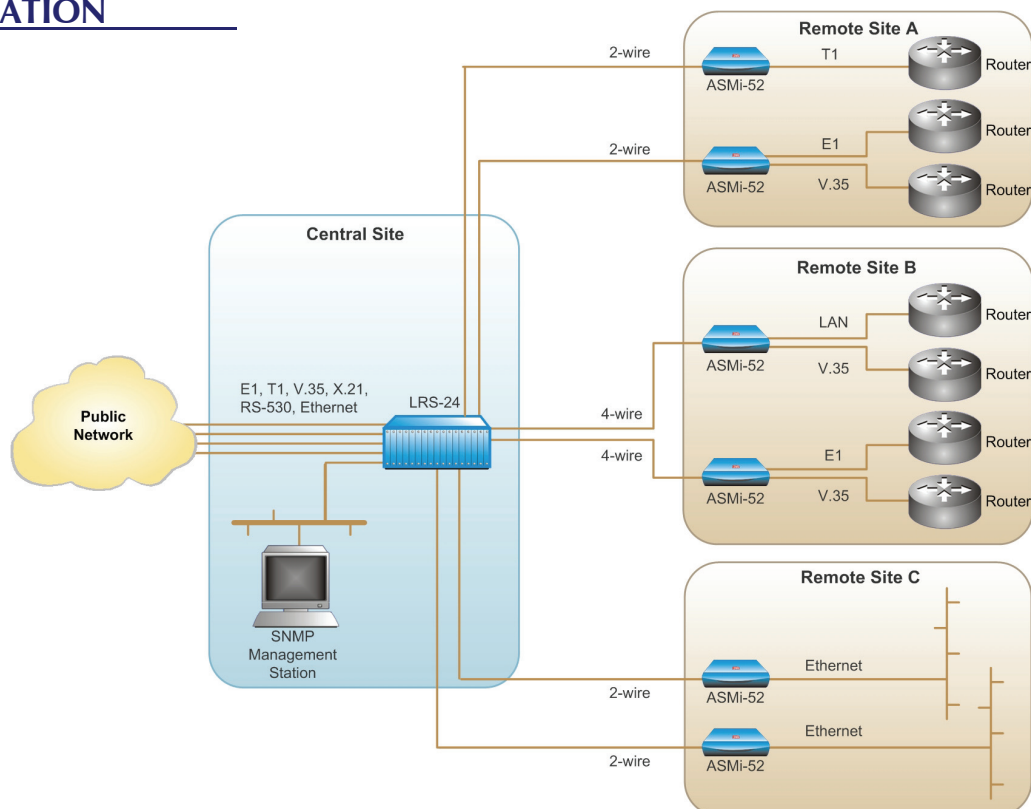


Figure 1. ASMi-52 Modems Operating opposite ASMi-52CD Cards over 2- and 4-Wire Lines

- VLAN priority enhances the QoS by enabling prioritization of the LAN packet to the DSL line according to four levels of VLAN priorities. The user can enable or disable the VLAN priority, and each VLAN tag priority (0–7) can be configured to one of four classes of priority level.
- BER test can be performed by the multiplexer units on each serial interface. The BERT generates and receives four different test patterns
- The modem provides high-voltage line protection in compliance with ITU K.21 and UL1950 requirements.

### ASMi-52 CARDS

- The ASMi-52CD card includes two SHDSL modems that operate over 4-wire lines and support a wide range of serial, E1, and Ethernet interfaces.
- The ASMi-52CQ card contains four SHDSL modems that operate over 2-wire lines. It supports serial, Ethernet, and E1/T1 interfaces.
- The ASMi-52CD and ASMi-52CQ cards support internal, external and system timing modes.

### MANAGEMENT

- Supervision and configuration activities are performed using an ASCII terminal, IP hosts using the Telnet protocol, Web-based ConfiguRAD, or RADview-EMS, (Java-based, modular, client-server, scalable element management system), providing 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 dedicated E1/T1 timeslot.

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

- Comprehensive diagnostic capabilities include:
  - Real-time alarms to alert 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.

**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

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

ASMi-52CD/4W operates at data rates up to 4608 kbps, depending on internal or external clock.

### SPECIFICATIONS

#### LINE INTERFACE

- **Type**  
2/4-wire unconditioned dedicated line (twisted pair)
- **Line Coding**  
TC-PAM
- **Range**  
See *Table 1*
- **Impedance**  
135Ω
- **Standards**  
ITU-T 991.2, ETSI 101 524.
- **Protection**  
As per ITU K.21 and UL1950
- **Connectors**
  - ASMi-52: RJ-45
  - ASMi-52CD: Two RJ-45
  - ASMi-52CQ: Four RJ-11 or terminal blocks

#### DTE INTERFACE

- **Data Rate**  
Depends on the DTE/line interface type and clock mode:
  - 2-wire: 64–2304 kbps (ext. clock), 64–2048, 2304 kbps (int. clock)
  - 4-wire: 128–4608 kbps (ext. clock), 128–4096, 4608 kbps (int. clock)
  - ASMi-52CD/4W: 128–4608 kbps (ext. clock), 128–4096, 4608 kbps (int. clock)

*Note:* The multiplexer option supports up to 2048 kbps only.

- **Coding**
  - E1: HDB3
  - T1: B8ZS or AMI
- **Line Impedance**
  - E1: 120Ω, balanced  
75Ω, unbalanced (via adapter cable)
  - T1: 100Ω, balanced
- **E1 Jitter Performance**  
As per ITU G.823
- **Connector Type**  
Standalone:
  - X.21 – 15-pin, D-type, female
  - V.35 – 34-pin, female
  - RS-530 – 25-pin, D-type, female
  - G.703/G.704 E1 – RJ-45
  - T1 – RJ-45
  - IR-IP (IP router) – RJ-45
  - ETH (10/100BT bridge with VLAN support) – RJ-45
 ASMi-52CD:
  - V.35, X.21, RS-530 – 2 × SCSI-26
  - IR-ETH/QN (10/100BT bridge with VLAN support) – 2 × RJ-45
  - E1 balanced – 2 × RJ-11
  - E1 unbalanced – 25-pin, D-type, female
 ASMi-52CQ:
  - V.35, X.21, RS-530 – SCSI-68
  - ETH (10/100BT bridge with VLAN support) – RJ-45
  - E1 balanced – 4 × RJ-11
  - E1 unbalanced – 25-pin, D-type, female
  - T1 – 4 × RJ-11

#### 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

#### GENERAL

- **Timing**  
Standalone:
  - Internal, from internal oscillator
  - External, from attached DTE
  - Receive, from received signal (CPE only)
 ASMi-52CD, ASMi-52CQ:
  - Internal, from internal oscillator
  - External, from attached DTE
  - Station, from external clock source via LRS-24
- **Diagnostics**  
Loopbacks:
  - Local analog loopback in compliance with ITU V.54
  - Remote digital loopback in compliance with ITU V.54
 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)

- **Indicators**

- PWR (green) – Power
- 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**

- AC/DC: 100–240 VAC, -48/-60 VDC nominal
- DC: 24 VDC

- **Power Consumption**

- Standalone:
  - 7W max (4-wire)
  - 6W max (2-wire)
- ASMi-52CD:
  - 7.5W max (2-wire)
  - 10W max (4-wire)
- ASMi-52CQ:
  - 8.5W max

- **Physical**

Plastic enclosure:

- Height: 43.7 mm (1.7 in)
- Width: 217 mm (8.5 in)
- Depth: 170 mm (6.7 in)
- Weight: 0.5 kg (1.1 lb)

Metal enclosure:

- Height: 47.3 mm (1.8 in)
- Width: 215 mm (8.4 in)
- Depth: 147 mm (5.8 in)
- Weight: 0.7 kg (1.5 lb)

Rail-mount metal enclosure:

- Height: 150 mm (5.9 in)
- Width: 70 mm (2.7 in)
- Depth: 160 mm (6.3 in)
- Weight: 0.75 kg (1.65 lb)

### ENVIRONMENT

- **Temperature:**

- Plastic enclosure:
  - 0°–50°C (32°–122°F)
- Metal enclosures:
  - 20°–70°C (-4°–158°F)
- Card:
  - 0°–45°C (32°–113°F)

- **Humidity:**

- Up to 90%, non-condensing

- **Shock (Rail-Mount):**

- IEC 60068-2-27 shock 15g, 11 ms duration, 18 shocks

- **Vibration (Rail-Mount):**

- IEC 60068-2-6 vibration 1 mm, 2–13.2 Hz, 90 min.; 0.7g, 13.2–100 Hz, 90 min.; 3.5 mm, 3–9Hz, 10 cycles, 1 octave/min.; 1g, 9–150 Hz 10 cycles, 1 octave/min.

# ASMi-52

## 2/4-Wire SHDSL Modem

### ORDERING

**ASMi-52/@/\*/#/%/\$/?**

2/4-wire SHDSL standalone modem

**ASMi-52CD ^/\*/#/RJ-45**

Dual-modem card version for LRS-24 modem rack

**ASMi-52CQ ^/\*/2W/&**

Quad-modem card version for LRS-24 modem rack

**ASMi-52/24/ETH/4W/ME/AR/RAIL**

4-wire SHDSL rail-mount modem 24 VDC version

**ASMi-52/ETH/4W/ME/AR/RAIL**

4-wire SHDSL rail-mount modem VAC/-48 VDC version

**Note:** The line interface is TB for rail-mount versions.

@ Specify **24V** for 24 VDC option.

**Note:** Do not specify @ for the default VAC or -48 VDC option.

^ Specify chassis type:

**F** for ETSI-type LRS-24 rack

**B** for ANSI-type LRS-24 rack

\* Specify DTE interface:

**Note:** The ASMi-52 cards support the following DTE interfaces:

• ASMi-52CD/4W: X.21, V.35, RS-530, E1B, E1UB, UTPQN, IP

• ASMi-52CQ: X.21, V.35, RS-530, E1U, E1UB, T1, ETH.

**X.21** for X.21 interface

**V.35** for V.35 interface

**E1** for E1 interface

**RS530** for RS-530 interface

**IP** for IR-IP module

**Note:** For E1 unbalanced, order cable CBL-RJ45/2BNC/E1/X.

Standalone and ASMi-52CQ:

**ETH** for 10/100BaseT interface

**T1** for T1 interface

ASMi-52CD and ASMi-52CQ:

**E1B** for E1 balanced interface

**E1UB** for E1 unbalanced interface

**UTPQN** for IR-ETH/QN interface (for ASMi-52CD only)

# Specify line interface:

**2W** for 2-wire interface

**4W** for 4-wire interface

% Specify second interface type:

**ETH** for 10/100BaseT interface (Standalone with E1 or serial DTE interfaces only)

**V.35** for V.35 interface (Standalone with E1 interfaces only)

\$ Specify **AR** for 6-pin alarm relay port

? Specify **ME** for metal enclosure

& Specify line interface connector:

**RJ** for RJ-11

**TB** for terminal block

**RJ45** for RJ-45

**Note:** ASMi-52CQ cards with E1 or T1 interface are available with terminal block line connectors only.

### SUPPLIED ACCESSORIES

Power cord

AC/DC adapter plug for -48 VDC

### OPTIONAL ACCESSORIES

#### ASMi-52 Cables

**CBL-RJ45/2BNC/E1/X**

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

**CBL-DB9F-DB9M-STR**

Control port cable

#### ASMi-52CD Cables

**CBL-SCS26/530/F**

One SCSI-26 to one female RS-530 (DB-25) connector

**CBL-SCS26/X21/F**

One SCSI-26 to one female X.21 (DB-15) connector

**CBL-SCS26/V35/F**

One SCSI-26 to one female V.35 (34-pin) connector

**CBL-LRSI25/DB25/UB/M**

One DB-25 to four male BNC coax connectors

#### ASMi-52CQ Cables

**CBL-CQ-RS530/F**

One SCSI-68 to four female RS-530 (DB-25) connectors

**CBL-CQ-V35/F**

One SCSI-68 to four female V.35 (34-pin) connectors

**CBL-CQ-X21/F**

One SCSI-68 to four female X.21 (DB-15) connectors

**CBL-LRSI21/DB25/UB/M**

One DB-25 to eight male BNC coax connectors

**CBL-LRSI21/DB25/UB/F**

One DB-25 to eight female BNC coax connectors

#### RM-33

Kit for mounting 1 single-interface unit (plastic enclosure) in a 19-inch rack

#### RM-33-2

Kit for mounting 1 or 2 dual-interface unit/s (plastic enclosure) in a 19-inch rack

#### RM-35/@

Kit for mounting 1 or 2 unit/s (metal enclosure) in a 19-inch rack

@ Specify rack mounting kit type:

**P1** for mounting one unit

**P2** for mounting two units



data communications

[www.rad.com](http://www.rad.com)

- **International Headquarters**  
24 Raoul Wallenberg Street  
Tel Aviv 69719, Israel  
Tel: 972-3-6458181  
Fax: 972-3-6498250  
Email: [market@rad.com](mailto:market@rad.com)
- **North America Headquarters**  
900 Corporate Drive  
Mahwah, NJ 07430, USA  
Tel: (201) 529-1100  
Toll free: 1-800 444-7234  
Fax: (201) 529-5777  
Email: [market@radusa.com](mailto:market@radusa.com)

148-100-08/06