

# 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
- Utilizes TC-PAM line coding for extending the operation range to up to 10 km (6.2 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 performance monitoring
- Major and minor alarm relay
- SHDSL repeaters for increased transmission distance
- Available in a half 19-inch metal or plastic enclosure, suitable for side-by-side rack mounting, or in a rail-mounting metal enclosure
- Available as a dual- or quad-modem card for LRS-24 modem rack with SNMP management
- Fully compatible with LRS-52 dedicated SHDSL modem rack

# ASMi-52

## 2/4-Wire SHDSL Modem

### DESCRIPTION

- ASMi-52, an SHDSL modem, 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), or an IP router (IR-IP).
- A modem with a 4-wire line interface 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 64/128/256 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 the modem. ASMi-52 provides basic management of the repeaters.
- The ASMi-52CD card includes two SHDSL modems that operate over 2- and 4-wire lines and support a wide range of serial, E1 and Ethernet DTE interfaces.

- The ASMi-52CQ card contains four SHDSL modems that operate over 2-wire lines. It supports only serial and E1 DTE interfaces.
  - The ASMi-52CD and ASMi-52CQ cards support internal, external and system timing modes.
  - 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.

**Note:** For ASMi-52 units with a serial DTE interface, the 10/100BaseT port serves for management only. When ASMi-52 is ordered only with the 10/100BaseT port, it is used to transfer the user and management data.

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

### APPLICATION

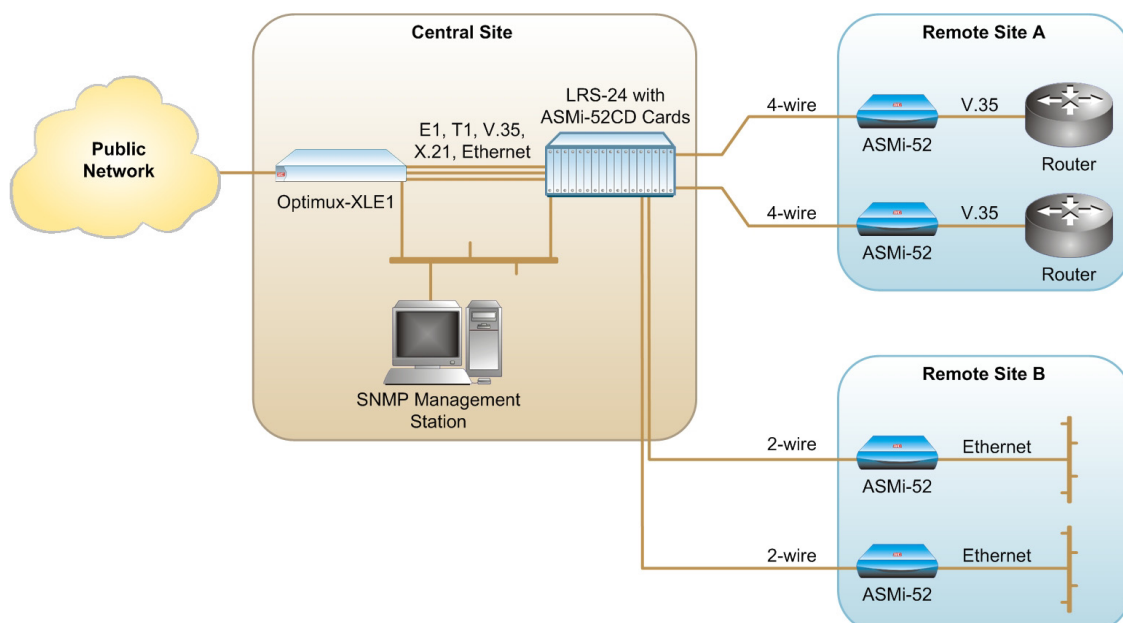


Figure 1. ASMi-52 Modems Operating opposite ASMi-52CD Cards over 2- and 4-Wire Lines

## 2/4-Wire SHDSL Modem

- 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.
- The modem provides high-voltage line protection in compliance with ITU K.21 and UL1950 requirements.

**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
- **E1 Jitter Performance**  
As per ITU G.823

- **Connectors**
  - ASMi-52: RJ-45
  - ASMi-52CD: Two RJ-45
  - ASMi-52CQ: Four RJ-11 or terminal blocks

### DTE INTERFACE

- **Type**  
ASMi-52:
  - 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 (10BT bridge), IR-ETH/Q (10BT bridge with VLAN support), 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
  - E1 balanced – 4 × RJ-11
  - E1 unbalanced – 25-pin, D-type, female

- **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: 64–4608 kbps (ext. clock), 64–4096, 4608 kbps (int. clock)
  - ASMi-52CD/4W: 128–4608 kbps (ext. clock), 128–4096, 4608 kbps (int. clock)

- **Coding**
  - E1: HDB3
  - T1: B8ZS or AMI
- **Line Impedance**
  - E1: 120Ω, balanced or 75Ω, unbalanced (via adapter cable)
  - T1: 100Ω, balanced

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

# ASMi-52

## 2/4-Wire SHDSL Modem

### • Environment

- Temperature:  
Standalone: 0–50°C/32–122F  
Card: 0–50°C/32–122F  
Rail-mount: –20–70°C/–4–158F
- 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 Hz–13.2 Hz, 90 min.;  
0.7g, 13.2 Hz–100 Hz, 90 min.;  
3.5 mm, 3 Hz–9 Hz, 10 cycles,  
1 octave/min.; 1g, 9 Hz–150 Hz  
10 cycles, 1 octave/min.

### • Physical

- Plastic enclosure:
- Height: 43.7 mm / 1.7 in  
Width: 240 mm / 9.4 in  
Depth: 170.5 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

## 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

\* Specify DTE interface:

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

- ASMi-52CD/2W: IR-ETH/QN, IR-IP, E1,  
X.21, V.35
- ASMi-52CD/4W: X.21, V.35, RS-530, E1,  
IR-ETH/QN, IR-IP
- ASMi-52CQ: X.21, V.35, RS-530, E1, T1.

For all ASMi-52 types:

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

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

**RS530** for RS-530 interface

**IP** for IR-IP module

**E1** for E1 interface

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

Standalone ASMi-52 only:

**T1** for T1 interface

**ETH** for 10/100BaseT port

ASMi-52CD, ASMi-52CQ only:

**E1B** for E1 balanced interface

**E1UB** for E1 unbalanced interface

**UTPQN** for IR-ETH/QN interface

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

**Note:** Omit @ for VAC or -48 VDC option. The  
internal power supply accepts both AC and DC.  
An AC/DC adapter is supplied with the unit for  
-48 VDC power connection

^ Specify chassis type:

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

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

# Specify line interface:

**2W** for 2-wire interface

**4W** for 4-wire interface

% Specify **ETH** for the out-of-band  
10/100BaseT management port  
(ASMi-52 units with serial DTE  
interfaces only)

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

? Specify **ME** for metal enclosure

& Specify line interface connector:

**RJ** for RJ-11 line connector

**TB** for terminal block line connector

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

### RAIL-MOUNT ENCLOSURES

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

4-wire SHDSL rail-mount modem

24V version

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

4-wire SHDSL rail-mount modem

VAC or -48 VDC version

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

### CABLES

**Note:** Cables are not supplied with the modems  
and should be ordered separately.

#### ASMi-52 Cables

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

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

#### 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

Hardware kit for mounting one  
ASMi-52 unit in plastic enclosure into  
a 19-inch rack

#### RM-35

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

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