



ME0011A-VDSL



**CUSTOMER
SUPPORT
INFORMATION**

Order toll-free in the U.S.: Call 877-877-BBOX (outside U.S. call 724-746-5500)
FREE technical support 24 hours a day, 7 days a week: Call 724-746-5500 or fax 724-746-0746
Mailing address: Black Box Corporation, 1000 Park Drive, Lawrence, PA 15055-1018
Web site: www.blackbox.com • E-mail: info@blackbox.com

CONTENTS

1.0	Warranty Information	4
1.1	Radio and TV Interference.....	4
1.2	CE Notice.....	4
1.3	FCC Part 68.....	5
1.4	Industry Canada Notice	6
1.5	Service.....	6
2.0	General Information	7
2.1	Features.....	7
2.2	Description.....	7
3.0	Installation	9
3.1	Standalone unit installation.....	9
3.2	Rack card installation.....	10
3.3	Connecting the Twisted-Pair Line Interface.....	11
3.4	Connecting the 10/100Base-T Ethernet Interface	12
	Connecting the 10/100Base-T Ethernet Port to a Hub.....	13
	Connecting the 10/100Base-T Ethernet Port to a PC (DTE).....	13
3.5	Connecting the POTS/ISDN line.....	13
3.6	Connecting Power	14
4.0	Configuration	15
4.1	Configuring the hardware DIP switches.....	15
4.2	Configuring DIP Switch S1	17
	Switch S1-1: Ethernet Auto Sense	17
	Switches S1-2 and S1-4: Data Rate.....	17
5.0	Operation	19
5.1	Power Up.....	19
5.2	Front Panel LED Status Monitors	19
A		
	Specifications	21
A.1	LAN Connection	21
A.2	Transmission Line	21
A.3	VDSL Line Rate	21
A.4	VDSL Distance	21
A.5	VDSL Surge Suppressor	21
A.6	LED Status Indicators	21
A.7	Power Supply	21
A.8	Temperature Range	21
A.9	Humidity	21
A.10	Dimensions	21
C		
	ME0011A-vDSL Series Interface Pin Assignment	23
C.1	10/100Base-T Interface	23
	RJ-45.....	23

C.2	VDSL Interface	23
	RJ-45	23
	Terminal Block	23
	RJ-45	23
D	DISTANCE CHART, BASED ON 24 AWG (0.5 MM).....	24

1.3 FCC PART 68



The Model ME0011A-vDSL is not intended to be connected to the public telephone network.

This equipment complies with Part 68 of the FCC Rules. Please note the following:

- The required Universal Service Order code (USOC) jack: RJ-11C

The REN helps you determine the number of devices you can connect to your telephone line and still have all of those devices ring when your number is called. In most, but not all, areas, the sum of the RENs of all devices should not exceed five (5.0). To be certain of the number of devices you can connect to your line, you should call your local telephone company to determine the maximum REN.

- The Facility Interface Code: **02LS2**
 - The Service Order Code(s) (SOC): **9.0F**
 - REN No.: **0.2**
2. Your telephone company may make changes to its facilities, equipment, operations, or procedures that could affect the proper functioning of your equipment. The telephone company will notify in advance of such changes to give you an opportunity to maintain uninterrupted telephone service.

3. If your ME0010A-VDSL causes harm to the telephone network, the telephone company may temporarily discontinue your service. If possible, they will notify you in advance, but if advance notice is not practical, you will be notified as soon as possible and will be informed of your right to file a complaint with the FCC.
4. If you experience trouble with the ME0010A-VDSL, please contact Black Box Corporation for service or repairs. Repairs should be performed only by Black Box technicians.
5. You are required to notify the telephone company when you disconnect the ME0010A-vDSL from the network.

1.4 INDUSTRY CANADA NOTICE

NOTICE: This equipment meets the applicable Industry Canada Terminal Equipment Technical Specifications. This is confirmed by the registration number. The abbreviation, IC, before the registration number signifies that registration was performed based on a Declaration of conformity indicating that Industry Canada technical specifications were met. It does not imply that Industry Canada approved the equipment.

1.5 SERVICE

All warranty and non-warranty repairs must be returned freight prepaid and insured to Black Box. All returns must have a Return Materials Authorization number on the outside of the shipping container. This number may be obtained from a Black Box Customer Sales representative at:

- Tel: **(724) 746-5500**
- Email: **techsupport@blackbox.com**
- URL: **<http://www.blackbox.com>**

Note Packages received without an RMA number will not be accepted.

2.0 GENERAL INFORMATION

Thank you for your purchase of this Black Box product. This product has been thoroughly inspected and tested and is warranted for one year for parts and labor. If any questions or problems arise during installation or use of this product, contact Black Box Technical Support at (724) 746-5500.

2.1 FEATURES

- Easy to install standalone VLINK modems—*no configuration required*
- Auto-sensing full or half-duplex Ethernet
- Auto-sensing 10/100Base-T
- Extends network connections up to 6,652 ft (2.03 km) over 2-wire 24-AWG unconditioned lines
- Switch selectable line rates up to 16.67 Mbps
- 7 symmetric or asymmetric settings via DIP switch
- POTS/ISDN splitter on board
- Transparent operation
- LED indicators for Power, Ethernet Link & Activity, VLINK & Quality of Line (QOL)
- Surge suppression up to 20 kA (8/20 μ s)
- Available in rack-mount or standalone configurations
- Made in the USA

2.2 DESCRIPTION

The Black Box model ME0011A-vDSL* modems provide high-speed LAN connections between peered Ethernet LANs, remote PC's, or any other network enabled 10/100Base-T device.

Operating in pairs, the ME0011A-vDSL located at one end of the LAN extension and another ME0011A-vDSL at the other end, these units can automatically forward LAN broadcasts, multicasts, and frames across a 2-wire voice-grade twisted-pair link. The data is passed

transparently (unmodified) through the units. The ME0011A-vDSL's automatically add and delete MAC addresses, only passing packets across the VDSL link that are meant for the remote peered LAN.

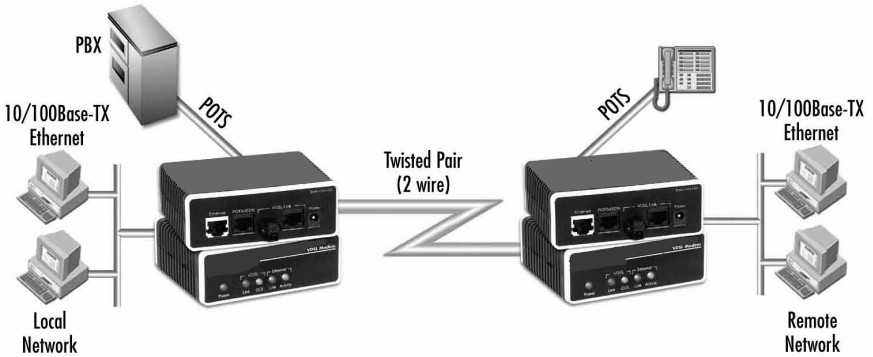


Figure 1. Typical application

The units work together to create a transparent extension between two peered Ethernet LANs. POTS/ISDN calls can be made over a VDSL link without interfering with the data. Figure 1 shows a typical point-to-point application using ME0010A-vDSL units.

3.0 INSTALLATION

Because the ME0011A-vDSL requires no configuration, it can be installed quickly. If you are installing a standalone unit, refer to section 3.1 “Standalone unit installation”. Otherwise, refer to section 3.2 “Rack card installation”.

Note If asymmetric transmission or line rates other than 12.5 Mbps are required, refer to section 4.0, “Configuration” on page 15.

3.1 STANDALONE UNIT INSTALLATION

Do the following:

1. Connect the line interface between the units (refer to section 3.3, “Connecting the Twisted-Pair Line Interface” on page 11)

Note See Figure 2 for the standalone unit’s rear panel arrangements.

2. Connect the Ethernet interface (refer to section 3.4, “Connecting the 10/100Base-T Ethernet Interface” on page 12).
3. Connect the power plug (refer to section 3.6, “Connecting Power” on page 14).

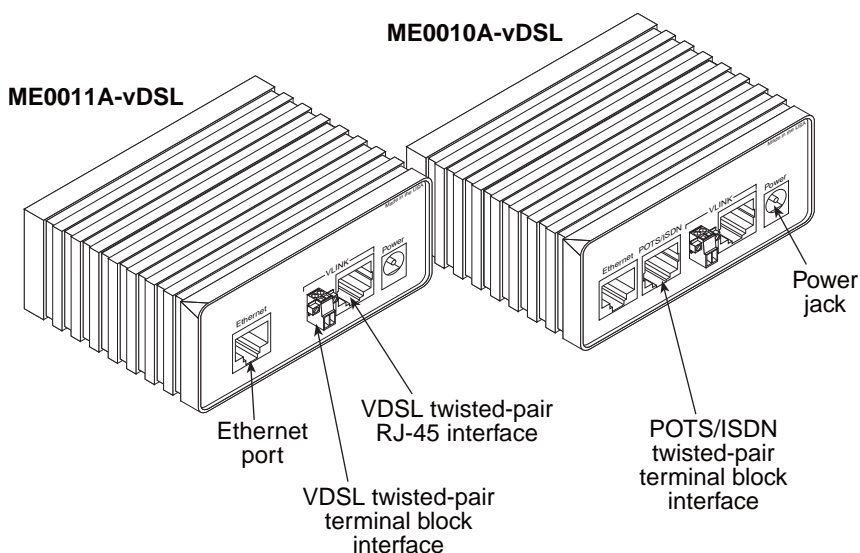


Figure 2. ME0011A-vDSL standalone rear panel

3.3 CONNECTING THE TWISTED-PAIR LINE INTERFACE

The ME0011A-vDSL supports communication between two peer Ethernet LAN sites over a distance of up to 6,652 ft (2.03 km) over 24 AWG (0.5 mm) twisted-pair wire.

Note Actual distance and link performance may vary depending on the environment and type/gauge of wire used.

Follow the steps below to connect the ME0011A-vDSL Interfaces.

Note The ME0011A-vDSL units work in pairs.

1. To function properly, the two ME0011A-vDSLs must be connected together using twisted-pair, unconditioned, dry, metal wire, between 19 (0.9mm) and 26 AWG (0.4mm). Leased circuits that run through signal equalization equipment are not acceptable.
2. The ME0011A-vDSL is equipped with two interface jacks that can be used on the VDSL interface, an RJ-45 or a terminal block. These VDSL interfaces are a two-wire interface. Observe the signal/pin relationships on the units VDSL interface jacks.

The RJ-45 connector on the ME0011A-vDSL's twisted pair interface is polarity insensitive and is wired for a two-wire interface. The signal/pin relationship is shown in Figure 4.

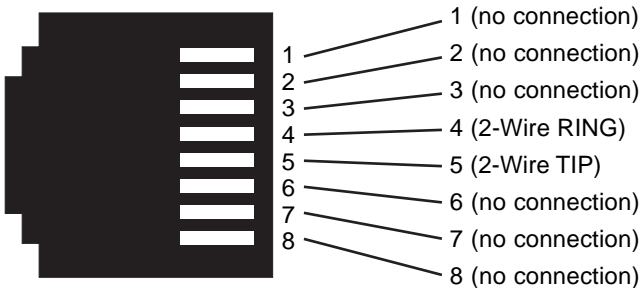


Figure 4. ME0011A-vDSL (RJ-45) twisted pair line interface.

The terminal block connector on the ME0011A-vDSL's twisted pair interface is polarity insensitive and is wired for a two-wire interface. The signal/pin relationships is shown in Figure 5.

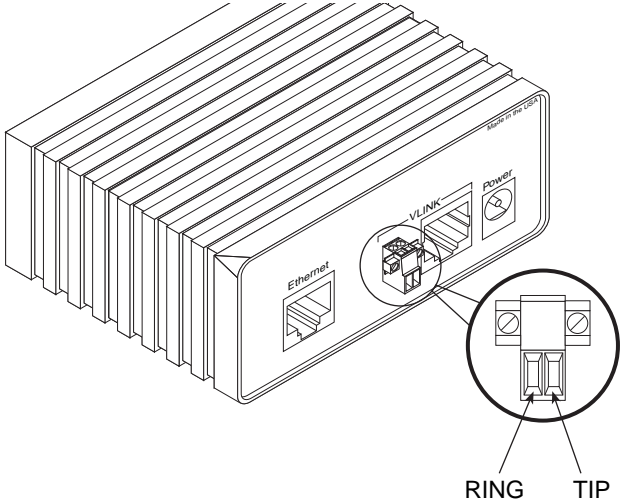


Figure 5. ME0011A-vDSL (Terminal Block) twisted pair line interface.

3.4 CONNECTING THE 10/100BASE-T ETHERNET INTERFACE

The shielded RJ-45 port labeled *Ethernet* is the 10/100Base-T interface. This port is designed to connect directly to a 10/100Base-T network. Figure 6 shows the signal/pin relationships on this interface. You may connect this port to another Ethernet device via a Type 4 or Type 5 cable that is up to 328 ft long.

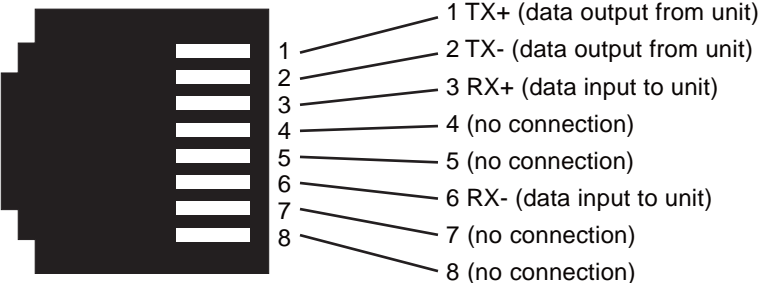


Figure 6. ME0011A-vDSL 10/100Base-T RJ-45 Connector Pinout.

Connecting the 10/100Base-T Ethernet Port to a Hub

The ME0011A-vDSL 10/100Base-T interface is configured as DTE (Data Terminal Equipment), just like a 10/100Base-T network interface card in a PC. Therefore, it “expects” to connect to a 10/100Base-T Hub using a straight-through RJ-45 cable. Figure 7 diagrams the cable wiring for connecting the ME0011A-vDSL to a 10/100Base-T hub.

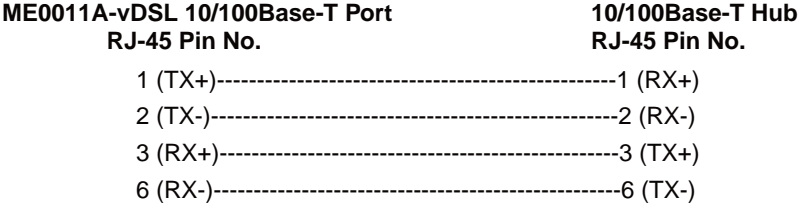


Figure 7. Wiring diagram for connecting the ME0011A-vDSL to a 10/100Base-T hub

Connecting the 10/100Base-T Ethernet Port to a PC (DTE)

The ME0011A-vDSL 10/100Base-T interface is configured as DTE (Data Terminal Equipment). If you wish to connect the ME0011A-vDSL to another DTE devices such as 10/100Base-T network interface card in a PC (or ME0011A -vDSLs) in a back-to-back arrangement), you must construct a 10/100Base-T crossover cable as shown in Figure 8.

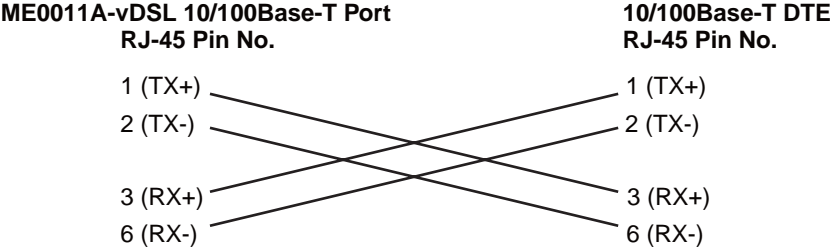


Figure 8. 10/100Base-T crossover cable

3.5 CONNECTING THE POTS/ISDN LINE

The RJ-45 port labeled “POTS/ISDN” is the POTS/ISDN interface. A telephone or an ISDN device may be connected to this port and carried over the VDSL line. The units do not need power for the POTS interface to

work. The RJ-45 connector in the model ME0010A-vDSL's POTS/ISDN interface is wired as shown in Figure 9.

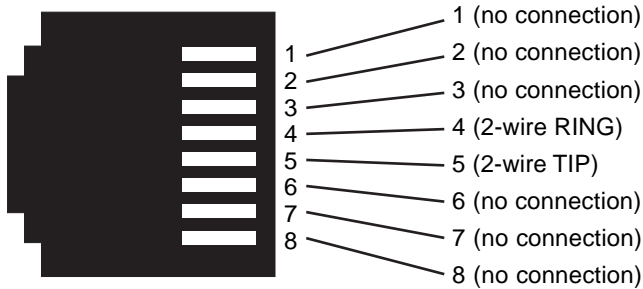


Figure 9. ME0010A-vDSL (RJ-45) POTS/ISDN interface

3.6 CONNECTING POWER

An external AC or DC power supply is available separately. This connection is made via the barrel jack on the rear panel of the ME0011A-vDSL. No configuration is necessary for the power supply (See Appendix B for domestic and international power supply and cord options).

DC power (supplied via the power supply jack to the unit) must meet the following requirements; DC power supplied must be regulated $+5\text{VDC} \pm 5\%$, 1.0A minimum. Center pin is +5V. The barrel type plug has a 2.5/5.5/10mm I.D./O.D./Shaft Length dimensions.

The ME0011A-vDSL does not have a power switch, so it powers up as soon as it is plugged in.

4.0 CONFIGURATION

The ME0011A-vDSL has four DIP switches for configuring the unit for a wide variety of applications. This section describes switch locations and explains the different configurations.

4.1 CONFIGURING THE HARDWARE DIP SWITCHES

Using a small flat-tip screwdriver, remove the protective cover located on the underside of the ME0011A-vDSL (see Figure 10)

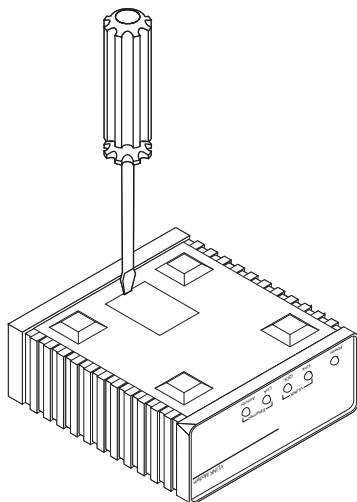


Figure 10. Removing protective cover

Figure 11 and Figure 12 on page 16 show the orientation of the DIP switches in the On and Off positions.

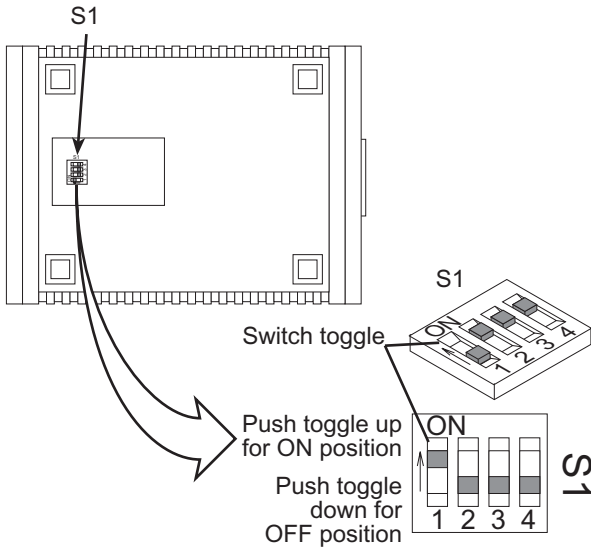


Figure 11. DIP switch orientation

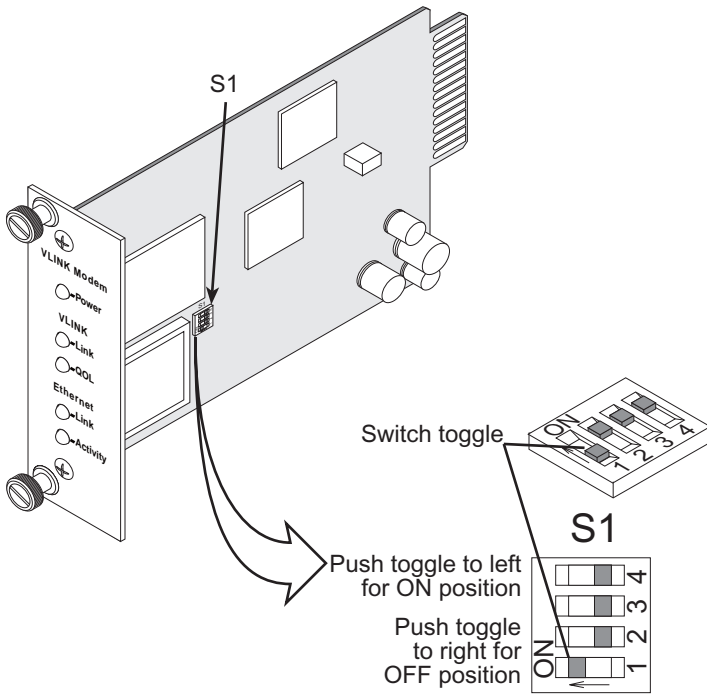


Figure 12. Rack card DIP switch orientation

4.2 CONFIGURING DIP SWITCH S1

DIP switch S1 is where you configure the VDSL line rate, symmetric or asymmetric, Ethernet full auto sense capability (100BaseT full or half duplex, 10BaseT full or half duplex) or limited auto sense (only 100BaseT half duplex, 10BaseT full or half duplex). Table 1 summarizes default positions of DIP switches S1-1 through S1-4. Detailed descriptions of each switch follow the table.

Table 1: S1 Summary

Position	Function	Factory Default
S1-1	Ethernet Auto Sense	OFF Full Auto Sense capability
S1-2	Line Rate	ON
S1-3	Line Rate	OFF 12.5Mbps Symmetric
S1-4	Line Rate	OFF

Switch S1-1: Ethernet Auto Sense

Use switch S1-1 to configure the unit for full auto sense capability or limited auto sense capability. Full Auto sense capability consists of standard Ethernet Auto sensing (100BaseT full duplex, 100BaseT half duplex, 10BaseT full duplex, and 10BaseT half duplex). Limited Auto sensing capability consists on only auto sensing for 100BaseT half duplex, 10BaseT full duplex, and 10BaseT half duplex. The limited auto sensing feature is used when an Ethernet device does not comply with IEEE 802.3x (back pressure flow control) at 100M full duplex.

Table 2: Ethernet Auto Sense Selection Chart

S1-1	Setting
OFF	Full Auto Sensing (100 Mbps, Full or Half Duplex) (10 Mbps, Full or Half Duplex)
ON	Limited Auto Sensing (100 Mbps Half Duplex) 10 Mbps Full or Half Duplex)

Switches S1-2 and S1-4: Data Rate

Use switches S1-2 and S1-4 to configure the VDSL line rates.

Table 3: Symmetric VDSL Line Rates Selection Chart

S1-2	S1-3	S1-4	Symmetric Line Rate
ON	ON	ON	6.25 Mbps
ON	ON	OFF	9.38 Mbps

Table 3: Symmetric VDSL Line Rates Selection Chart

S1-2	S1-3	S1-4	Symmetric Line Rate
ON	OFF	OFF	12.5 Mbps
ON	OFF	ON	16.67 Mbps

Table 4: Asymmetric VDSL Line Rates Selection Chart

S1-2	S1-3	S1-4	Asymmetric Line Rates DS/US
OFF	OFF	ON	4.17 Mbps/1.56 Mbps
OFF	ON	ON	9.38 Mbps/1.56 Mbps
OFF	ON	OFF	16.67 Mbps/2.34 Mbps

5.0 OPERATION

Once the ME0011A-vDSLs are properly installed, they should operate transparently. No user settings required. This section describes reading the LED status monitors.

5.1 POWER UP

Before applying power to the ME0011A-vDSL, please review section 3.6, “Connecting Power” on page 14 to verify that the unit is connected to the appropriate power source.

5.2 FRONT PANEL LED STATUS MONITORS

The ME0011A-vDSL features five front panel LEDs that monitor power, the Ethernet signals, and the VDSL connection. Figure 13 (standalone version and Figure 14 on page 20 (rack card version) show the front panel location of each LED. Table 5 on page 20 describes the LED functions.

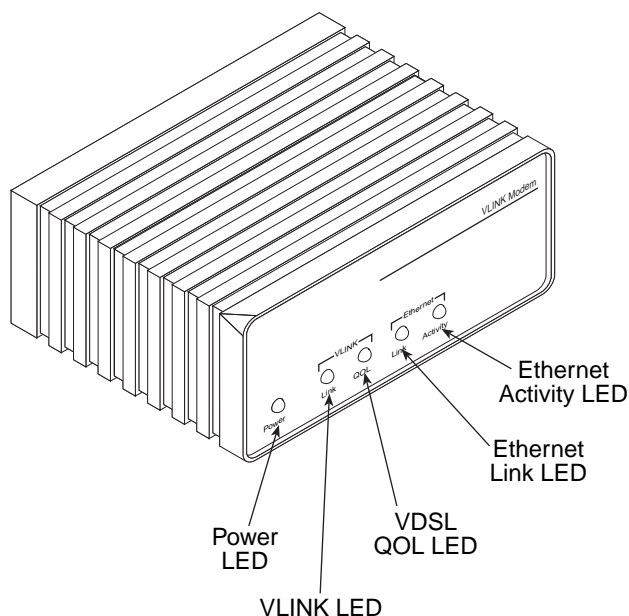


Figure 13. ME0011A-vDSL standalone unit front panel

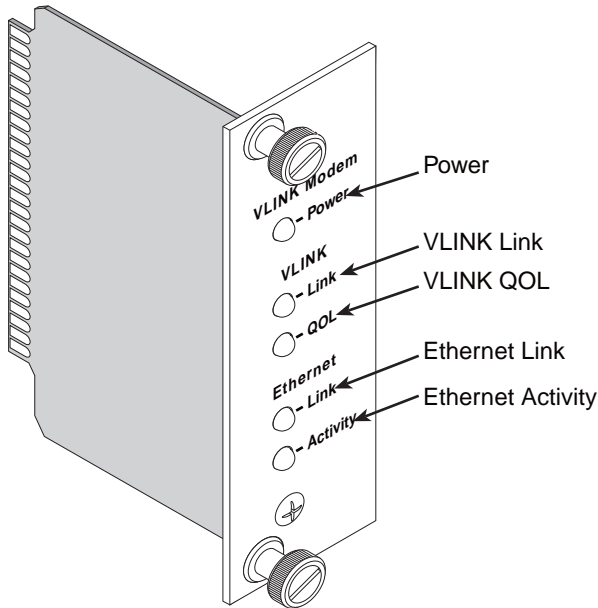


Figure 14. rack card front panel

Table 5: Front panel LED description

LED	Description
Power	Solid GREEN to indicate the unit is powered on.
VLINK Link	(Active Green) Solid green (ON) to indicate that the end-to-end VDSL link between the UNITS is established. The VLINK LED is OFF when the link is down.
VLINK QOL	(Active Yellow) Flashes YELLOW to indicate the processor is correcting an error in the data thus preventing the transmission of corrupted data to the Ethernet port. The more error corrections, the more often the LED blinks. If the light remains lit continuously, it means that the VDSL line is noisy—although the data at the Ethernet port remains uncorrupted. Further impairment of the line however, risks having the line fail, as indicated by the green VLINK Link LED extinguishing.
Ethernet Link	(Active Green) Solid Green indicates that 10/100Base-T Ethernet link has been established.
Ethernet Activity	(Active Yellow) Flashes yellow to indicate Ethernet activity on the ME0011A-vDSL 10/100Base-T Ethernet port.

APPENDIX A

SPECIFICATIONS

A.1 LAN CONNECTION

- Shielded RJ-45, 10/100Base-T, IEEE 802.3 Ethernet
- VDSL Connection: RJ-45 and Terminal Block

A.2 TRANSMISSION LINE

Two-wire unconditioned twisted pair.

A.3 VDSL LINE RATE

16.67 Mbps, symmetric upstream/downstream. Additional symmetric and asymmetric rates are available via DIP switch settings.

A.4 VDSL DISTANCE

6,000 ft (1.83 km) at 1.56 Mbps upstream/4.17 Mbps downstream

Note Distances depend on selected line rate.

A.5 VDSL SURGE SUPPRESSOR

Gas tube with maximum current surge: 20 kA (8120 μ s).

A.6 LED STATUS INDICATORS

- Power (Green)
- VDSL: Link (Green) & QOL (Red)
- Ethernet: Link (Green) & Activity (Yellow)

A.7 POWER SUPPLY

External AC and DC options:

- AC: 120 VAC, 220 VAC, and UI (120–240 VAC)
- DC: 12 VDC, 24 VDC and 48 VDC
- Power consumption: 450 mA at 5 VDC

A.8 TEMPERATURE RANGE

0–50°C

A.9 HUMIDITY

Up to 90% non-condensing.

A.10 DIMENSIONS

1.58H x 4.16W x 3.75D in. (10.6H x 4.1W x 8.8D cm)

APPENDIX C

ME0011A-vDSL SERIES INTERFACE PIN ASSIGNMENT

C.1 10/100BASE-T INTERFACE

RJ-45

- Pin 1: TX+
- Pin 2: TX-
- Pin 3: RX+
- Pin 6: RX-
- Pins 4, 5, 7, 8: no connection

C.2 VDSL INTERFACE

RJ-45

- Pin 4: RING
- Pin 5: TIP
- Pins 1, 2, 3, 6, 7, 8: no connection

Terminal Block

See Figure 5 on page 12.

C.3 POTS/ISDN INTERFACE ME0010A-vDSL

RJ-45

- Pin 4: 2-wire RING
- Pin 5: 2-wire TIP
- Pins 1, 2, 3, 6, 7, 8: no connection

APPENDIX D

DISTANCE CHART, BASED ON 24 AWG (0.5 MM)

Symm Line Rate (DS/US)	Distance in feet (km)
6.25 Mbps	4,500 (1.37)
9.38 Mbps	4,150 (1.26)
12.5 Mbps	4,000 (1.22)
16.67 Mbps	3,300 (1.00)

Asymm Line Rate (DS/US)	Distance in feet (km)
4.17 Mbps/1.56 Mbps (Mode 0)	6,000 (1.83)
9.38 Mbps/1.56 Mbps	5,500 (1.68)
16.67 Mbps/2.34 Mbps	5,000 (1.52)

Copyright © 2001, 2002

All Rights Reserved.