



# MUM2000-2 Multiplexer Uplink Module Installation Instructions

Document Number MUM2-A2-GZ40-00

September 2004

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## Product Documentation Online

Complete documentation for Paradyne products is available at [www.paradyne.com](http://www.paradyne.com). Select *Support* → *Technical Manuals*.

To order a paper copy of a Paradyne document, or to speak with a sales representative, please call 1-727-530-2000.

## Release Notes

Release notes for this product are available in the subscriber firmware area of [www.paradyne.com](http://www.paradyne.com). Select *Support* → *Subscriber Firmware*.

**Always review the relevant release notes before installing a new card.**

## MUM2000-2 Overview

The MUM2000-2 Multiplexer Uplink Module provides gigabit Ethernet uplink support capability and enhanced management functionality for the 4000, 4000E, 12000 and 12000E Ethernet-based Broadband Access Concentrators (BACs).

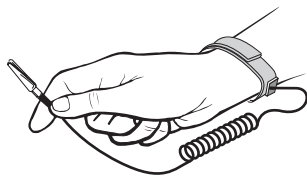
The MUM2000-2 has two modular Uplink Interface Module (UIM) slots, allowing combinations of T1, E1, DS3, E3, 10/100BaseT, and gigabit Ethernet (1000BaseT or fiber) uplinks.

The MUM2000-2 includes IP Multicast support that allows the BAC to deliver broadcast television over high speed access lines (typically 10+ Mbps ADSL). This IP Multicast support (including IGMP snooping) ensures that video traffic is intelligently forwarded only to those modules and ports that are requesting the particular video stream and protects other modules and ports from receiving unwanted traffic.

The MUM2000-2 supports up to 384 DSL ports.

## Unpacking the MUM2000-2

### HANDLING PRECAUTIONS FOR STATIC-SENSITIVE DEVICES



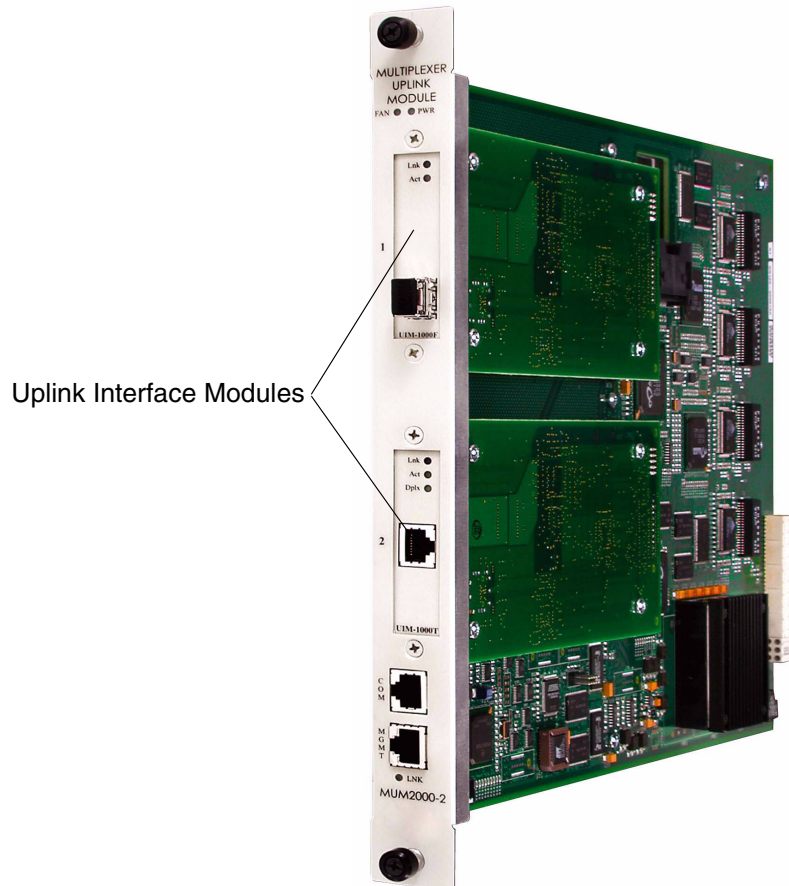
**This product is designed to protect sensitive components from damage due to electrostatic discharge (ESD) during normal operation. When performing installation procedures, however, take proper static control precautions to prevent damage to equipment. If you are not sure of the proper static control precautions, contact your nearest sales or service representative.**

Unpack and Inspect the Multiplexer Uplink Module (MUM). If there is visible damage, do not attempt to install the MUM2000-2; notify your sales or service representative.

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## Installing an Uplink Interface Module On the MUM2000-2

A Uplink Interface Module (UIM) provides the upstream network connection for the BAC. Neither a BAC nor a MUM2000-2 can function without a UIM. Any of the available Paradyne UIM models may be installed on a MUM2000-2.



### ► Procedure

To install a UIM in the MUM2000-2:

1. Select a port on the MUM2000-2 for UIM installation. Either Port 1 or 2 may be used. Although not required for operational purposes, two UIMs may be installed on a MUM2000-2 to provide redundancy.
2. Remove the cover plate from the selected port.

**CAUTION:** Cover plates should be stored for possible future use. If a UIM is removed from a MUM2000-2, it must be replaced with either another UIM or a cover plate. **Do not operate a MUM2000-2 with an open UIM port.**

3. Carefully slide the faceplate of the UIM under the lip of the MUM2000-2 faceplate at the selected port opening such that the UIM circuit board is face down and the label shows through the port opening, with the UIM model name along the right edge.

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4. Ensure that the mounting holes on the UIM are lined up with the corresponding standoffs on the MUM2000-2 circuit board and that the board-to-board connector key pins are properly aligned.
  5. Gently press down with even pressure on all four corners of the UIM until the board-to-board connector is fully seated.
  6. Secure the UIM circuit board to the MUM2000-2 circuit board at the four corners, using the provided panhead screws.
  7. Secure the UIM faceplate to the MUM2000-2 faceplate using the (2) provided beige flathead screws.

## Installing the MUM2000-2 in a BAC

The 12000 and 12000E BACs are 14-slot chassis. Slots 1–12 are reserved for interface modules (such as the SIM2000-24) and the remaining two slots (U1 and U2 in the 12000E and 13 and 14 in the 12000) are reserved for uplink modules. Although not required for operational purposes, two uplink modules may be installed in the 12000E or 12000 to provide redundancy. (Note: For redundancy, the two uplink modules in the chassis must be identical models.)

The 4000E and 4000 BACs are 5-slot chassis. Slots 1–4 are reserved for interface modules and the remaining slot (U1 in the 4000E and 5 in the 4000) is reserved for a MUM.

### ► Procedure

To install the MUM2000-2 in a BAC:

1. Align the MUM2000-2 with the slot module guides of the chosen slot for installation:
  - 12000E: Slot U1 or U2
  - 12000: Slot 13 or 14
  - 4000E: Slot U1
  - 4000: Slot 5
2. Slide the MUM2000-2 firmly into the chassis. Do not use excess force.
3. Tighten the fastening screws on the MUM2000-2 faceplate.
4. Verify that the PWR (Power) LED on the MUM2000-2 faceplate is illuminated.

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## Connecting the UIM to the Network

Connect the network line according to the UIM model type installed in the MUM2000-2. The following sections describe the general procedures. For further information refer to the Installation Instructions for the particular UIM model.

### UIM-1000T

#### ► Procedure

To connect a UIM-1000T to the network:

1. Plug your Ethernet cable into the RJ45 Ethernet port on the UIM-1000T faceplate. The UIM-1000T connects with a straight-through Category 5 Enhanced (CAT5e) cable, usually to a switch or router on the remote end. The maximum cable length is 328 feet (100 meters).
2. Verify the connection: solid illumination of the Lnk (link) LED on the UIM-1000T faceplate indicates a 1 Gbps Ethernet uplink connection has been established. The UIM-1000T Ethernet port is 1 Gbps, full duplex auto-negotiating.

The remote device to which you are connecting must be set to 1 Gbps and full duplex, or configured to auto-negotiate. A remote device that is configured to auto-negotiate must still have 1 Gbps and full duplex capabilities in order to link with the UIM-1000T.

### UIM-10/100

#### ► Procedure

To connect a UIM-10/100 to the network:

1. Configure the remote device to which you are connecting to auto-negotiate (if applicable) prior to establishing your Ethernet connection.
2. Plug your Ethernet cable into the RJ45 Ethernet port on the UIM-10/100 faceplate. The UIM-10/100 connects to a router or a PC with a straight-through cable and to a hub or a switch with a crossover cable.
3. Verify the connection: solid illumination of the Lnk (link) LED on the UIM-10/100 faceplate indicates an Ethernet uplink connection has been established. The UIM-10/100 Ethernet port is 10/100 auto-negotiating.

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## UIM-T1 and UIM-E1

### ► Procedure

To connect a UIM-T1 or UIM-E1 to the network:

1. Plug your T1 or E1 cable into the RJ45 port on the UIM-T1 or UIM-E1 faceplate. The UIM-T1 and UIM-E1 connect to a T1 or E1 network extender provider unit (TNE1500-P, TNE1500-P-12, ENE2000-P, or ENE2000-P-12) via the T1 or E1 line.
2. Verify the connection: the Lnk (link) LED on the UIM-T1 or UIM-E1 faceplate flashes green to indicate a network connection has been established.

## UIM-DS3 and UIM-E3

### ► Procedure

To connect a UIM-DS3 or UIM-E3 to the network:

1. Plug your DS3 or E3 cables into the corresponding Rx and Tx BNC ports on the UIM-DS3 or UIM-E3 faceplate. The UIM-DS3 and UIM-E3 connect to a DS3 or E3 network extender provider unit (DNE4500-P, DNE4500-P-12, ENE3400-P or ENE3400-P-12) via the DS3 or E3 line.
2. Verify the connection: the Lnk (link) LED on the UIM-DS3 or UIM-E3 faceplate flashes green to indicate a network connection has been established.

## BAC Management

The MUM2000-2 provides BAC management capability via a Command Line Interface (CLI), Simple Network Management Protocol (SNMP), and a web-based Network Management System (NMS). For access and configuration instructions, refer to the CLI, SNMP, and NMS User's Guides.

# LED Indicators

**Table 1. MUM2000-2 LEDs**

LED	STATE	INDICATION	ADDITIONAL INFORMATION
PWR (Power)	Solid Green	MUM2000-2 is receiving power	Both BAC power terminals are connected.
	Pulsing Green*	MUM2000-2 is operational	It can take 5–10 seconds after a power-up or reboot before the LED begins to pulse. Both BAC power terminals are connected.
	Solid Amber	MUM2000-2 is receiving power	Only one of the two BAC power terminals is connected.
	Pulsing Amber*	MUM2000-2 is operational	It can take 5-10 seconds after a power-up or reboot before the LED begins to pulse. Only one of the two BAC power terminals are connected.
	No Illumination	No power	The MUM2000-2 is not receiving power. The BAC may or may not be receiving power.
Fan	Solid Green	All fans are functioning	All four of the fans on the BAC fan card are functioning.
	Solid Amber	Non-functioning fan	At least one of the four fans on the BAC fan card is not functioning.
Lnk (Link)	Solid Green	Direct Ethernet management connection is established	The Lnk LED applies only to direct physical connections with the MGMT port. It does not apply to uplink network connections or connections via the RS232 COM Port. The MGMT port is a 10/100 auto-negotiating Ethernet port.
	Flashing Green*	Traffic is flowing through the MGMT port	At either 10 Mbps or 100 Mbps.
	No Illumination	no direct connection via the MGMT port is established	
[UIM] Lnk (Link)	Solid Green	UIM-10/100 or UIM-1000T Ethernet uplink connection is established	For further information regarding UIM-10/100 and UIM-1000T LEDs, refer to the corresponding UIM Installation Instructions.
	Flashing Green*	UIM-T1/E1 or UIM-DS3/E3 uplink connection is established	For further information regarding UIM-T1/E1 or UIM-DS3/E3 LEDs, refer to the corresponding UIM Installation Instructions.
	No Illumination	No uplink connection is established	Applicable to all UIM model types.

\* A pulsing LED blinks steadily at a rate of once per second. A flashing LED blinks at a more rapid, less constant rate.

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## **Regulatory Compliance for Class A Equipment**

The following regulatory compliance information applies to a MUM2000-2 as installed in a BAC.

### **US Federal Communications Commission (FCC)**

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Caution: Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

### **Industry Canada**

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la Classe A est conforme à la norme NMB-003 du Canada.

### **Europe**

This Class A product complies with European Norm EN55022.

Warning: In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures to correct the situation.

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## Warranty, Sales, Service, and Training Information

Contact your local sales representative, service representative, or distributor directly for any help needed. For additional information concerning warranty, sales, service, repair, installation, documentation, training, distributor locations, or Paradyne worldwide office locations, use one of the following methods:

- **Internet:** Visit the Paradyne World Wide Web site at [www.paradyne.com](http://www.paradyne.com).  
(Be sure to register your warranty at [www.paradyne.com/warranty](http://www.paradyne.com/warranty).)
- **Telephone:** Call our automated system to receive current information by fax or to speak with a company representative.
  - Within the U.S.A., call 1-800-870-2221
  - Outside the U.S.A., call 1-727-530-2340



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