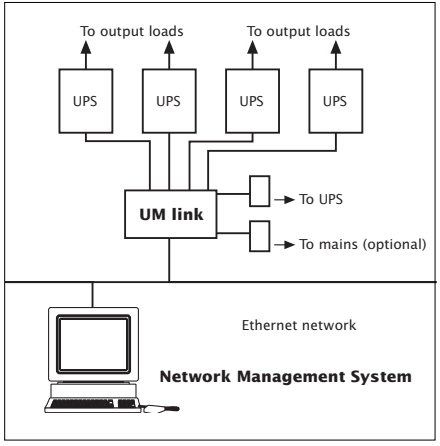
# general contents / sommaire général

## introduction and overview

UM link is an SNMP adapter designed for management of UPSs manufactured by MGE UPS SYSTEMS. UM link allows connection of four UPSs to a network station running an SNMP-based management software such SOLUTION-PAC, MANAGEMENT-PAC or HP Open View to monitor the status of the UPSs as well as to configure them.




UM link is equipped with built-in SNMP agent software and processing hardware, an Ethernet port, and four communications ports for UPS connections, permitting management of the UPSs from a network manager station using a standard management protocol.

## about this release of UM link

This release of UM link implements many new features and enhanced functionalities which are summarized hereafter:

- **Dual power supply**: Two Input AC power adapter's sockets allow to have two different source of power to supply to the UM link SNMP adapter.
- **Serial Line Internet Protocol (SLIP)** available on the COM1 UM link serial port. This Internet protocol is used to run IP over the serial RS-232 cable interconnecting UM link with another system such as an UM view Out-of-Band management application.
- **BootP client**: This Internet protocol allows UM link to discover some startup information, such as its IP addresses, from another system which acts as a bootP server (for example an UM view management application).
- **Trivial File Transfer Protocol (TFTP)**: This Internet protocol is used to transfer configuration data to the UM link Adapter from files found on a host system.
- **IETF standard UPS MIB**: The Internet Engineering Task Force (IETF) has published a new portion of the Management Information Base (MIB) for managing Uninterruptible Power Supply (UPS) systems. These objects are part of the UPS MIB defined in RFC1628 and are implemented in this UM link release making mib2.33 MIB subtree available from a management application. Configuration parameters allow your UM link adapter to send standard SNMP IETF traps or entreprise specific MGE traps to any manager on the network.
- **Shutdown / restart sequences**: This functionality allowing automatic management of scheduled on/off sequences has been implemented to be used with latest release of MGE UPSs.
- **UM link serial communication to UPSs** has been improved to handle more MGE varieties of UPS models.

# backward compatibility

This UM link release is based on the MGE UPS MIB version V1.6

The Software Signature of this release is “Merlin Gerin UM link, <x.xx> <data>”.

<x.xx> is the software version number later than 3.16

The boot program has not changed.

This UM link release can be used with the management applications based on the previous release (MGE MIB versions V1.1 and V1.5). This release of the UM link Software can also be downloaded in previous releases of UM link hardware.

### Old versions refered as:

| | |
|---|---|
| **BOOT ROM signature:** | “UM link BOOT ROM, V1.1, Aug. 15,1994” |
| **Software signature:** | “Merlin Gerin UM link, V3.15, Mar. 17,1997” |
| **Configuration signature:** | 1.1 |

### New release refered as:

| | |
|---|---|
| **BOOT ROM signature:** | “UM link BOOT ROM, V1.10, Aug. 15,1994” |
| **Software signature:** | “Merlin Gerin UM link, <x.xx>, <date>” |
| **Configuration signature:** | y.y |

where:

<x.xx> is software version number,

<date> is release date of this software,

<y.y> is MIB version.

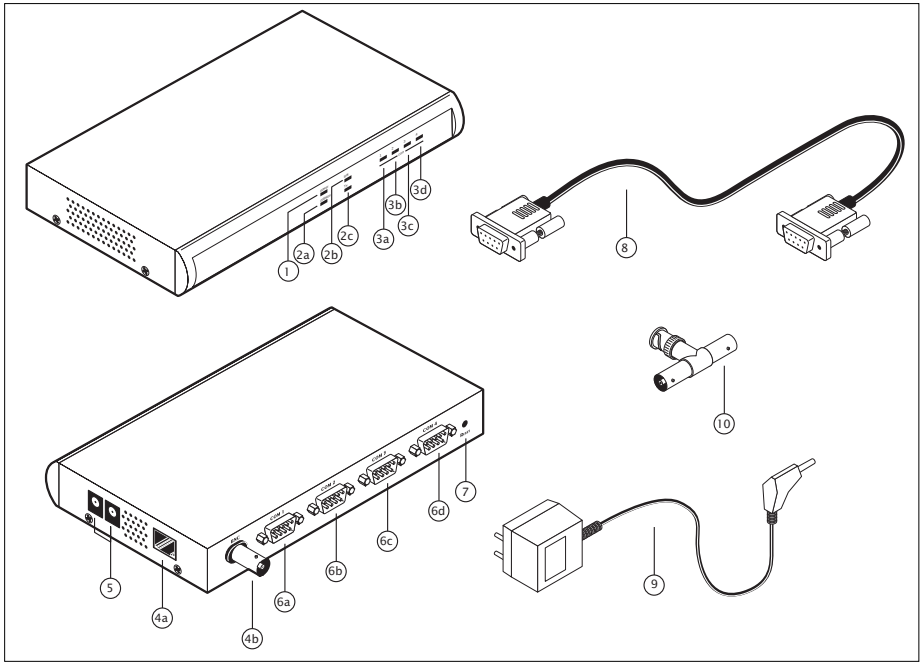
# UM link presentation

You will find enclosed with the UM link SNMP Adapter the components which are described in the following sections.

## hardware components

The following diagrams show you the hardware components of the package:

- The UM link SNMP adapter box.
- The AC/DC power adapter supply.
- The serial communication cable to PC dumb terminal for configuration.
- The BNC T-connector.




### Keys to diagrams

(1) LED light for AC input power status

(2) LED lights for network status & activity report

- 2a Collision
- 2b Data link (UTP cable)
- 2c Network data transmission

(3) LED lights for UPS connection status & activity report

- 3a COM1 connection
- 3b COM2 connection
- 3c COM3 connection
- 3d COM4 connection

(4) Ethernet network port

- 4a RJ-45 connector (for UTP network cable)
- 4b BNC connector (for thin coaxial network cable)

(5) Input AC power adapter's socket

(6) For connection to UPSs

- 6a COM1 port
- 6b COM2 port
- 6c COM3 port
- 6d COM4 port

For connection to terminal/console or modem (6a) COM1 port

(7) Reset switch

(8) Cable for configuration UM link/PC

(9) Input AC power adapter (One is supplied standard)

(10) T-connector (for thin coaxial network cable)

## software components

The software components are listed hereafter:-

◗ The UM link SNMP adapter user manual (this manual).

◗ The UM link software diskette (3.5" DOS formatted disk), which includes the following files:

❍ readme.xxx
The readme text file for UM link x.xx software.

❍ denomination umlxxx.bin where xxx is based on the x.xx software version number. The runtime code image for UM link, which can be used by download.exe (see section "Upgrading software").

❍ download.exe
The DOS program to do software download ("Upgrading software").

❍ default1.cfg
❍ default2.cfg
The default UPS configuration files which can be used by dloadcfg.exe (see section "Downloading configuration file").

❍ dloadcfg.exe
The DOS program to do configuration download (see section "Downloading configuration file").

❍ ups-mib.yy where yy is based on the y.y MIB version number.
The ASN.1 MGE MIB file.

❍ rfc 1628.txt
The IETF UPS MIB text file (see also agentmib.doc).

❍ agentmib.doc
Explanation in English of the agent MIB.

❍ mibagent.doc
Explanation in French of the agent MIB.

The installation of UM link consists of a number of steps, which are described in the following sections.

## connection to network

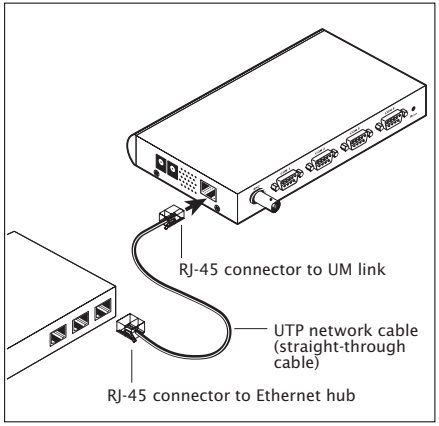
One port is provided for connection to an Ethernet network. For installation flexibility, this port is equipped with two connector types: (1) an RJ-45 connector for use with the unshielded twisted-pair (UTP) cable and (2) a BNC connector for use with the thin coaxial cable. You can use only one connector at a time. If you use the BNC connector, do not use the RJ-45 connector. Vice versa, if you use the RJ5-45 connector, do not use the BNC connector.

You may disconnect the network cable from one connector and connect it to the other connector anytime, even during the course of UM link's operation. UM link detects which connector is being connected to the network and automatically switches network data transfer through this connector.

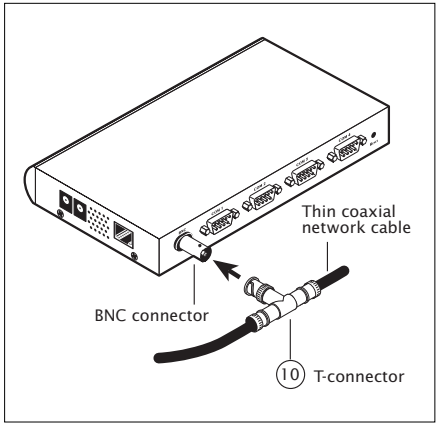
### Connecting to UTP cable

Normally, the RJ-45 connector should be connected to the network through a 10BASE-T Ethernet hub. The cable that connects to the hub is a straight-through UTP cable (see the UTP cable wiring diagram at the end of the manual).

You may also connect the RJ-45 connector directly to a 10BASE-T interface (Ethernet adapter) in the PC that runs SOLUTION-PAC, MANAGEMENT-PAC or open view. In this case, the UM link and the PC are the only two nodes on the network. If you select this type of connection, use a cross-wired UTP cable (see the UTP cable wiring diagram at the end of the manual).




### Connecting to thin coaxial cable




**Note**: If you leave any open end on the T-connector, attach a 50-ohm terminator to this end.

## connecting to UPSs

Each UPS is equipped with a communications (COM) port. Four COM ports are provided on the UM link for connection to four UPSs. If you have installed more than four UPSs on your

network, use additional UM links to connect them.

**Caution**: You should use the cables supplied with the UPS to connect the UM-LInk to the UPSs. Mark these cables clearly to avoid mistakes. These cables can only be used for communication between the UM link and MGE UPSs (and not necessarily other vendors'UPSs).

You can also use standard 3-wire straight-through serial cables.

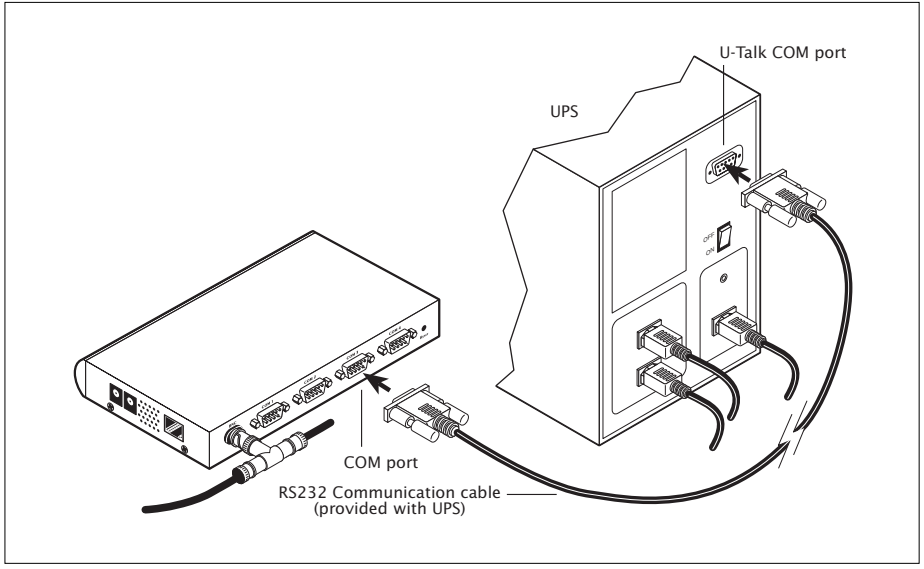
There are many other ways to connect UPSs to your UM link adapter depending on the model and location of these systems:

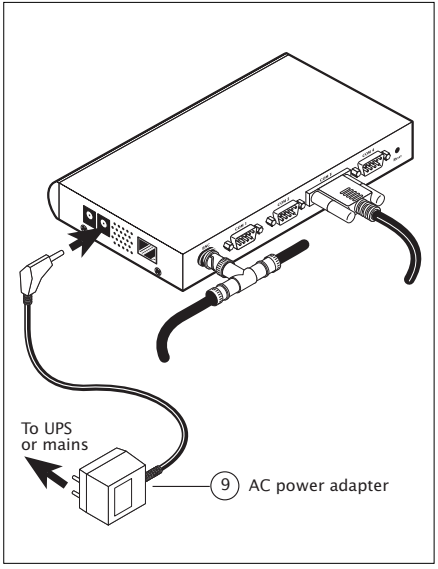
- You can connect a Merlin Gerin "2 Contacts" UPS through a specific adapter which converts these dry contacts to RS-232 ascii commands.
- You can use a "UM sensor" interface which will provide externally supplied dry contacts and other information such as temperature and humidity to your UM link adapter.
- You can also establish connection to a remote UPS using automatic response modems.

## connecting AC power adapter

There is no power switch on the UM link. The power is turned ON as soon as the AC power adapter is connected.

**Caution**: Check the input AC power voltage before you connect the AC power adapter. The voltage and rating of the AC power adapter are indicated on its label. If the specifications of the input AC power and the AC power adapter are not compatible, do NOT connect the AC



power adapter. You will risk damage to both the AC power adapter and the UM link. Change to a proper AC power adapter or contact your reseller to obtain a correct one.

You have also possibility to use a second AC power adapter with same specification as the one which is provided with your UM link package. In that case, the first available source which is connected to the UM link will supply power to the SNMP adapter. If a power failure occurs on this source, UM link will automatically switch the power entry to the second source.

Not all of MGE UPSs have output compatible with the power adapter plug. You may have to purchase specific CE22/FT-UL adapters.

## checking LED lights

A power-on self test (POST) should take place when the AC power adapter is connected. A successful completion of this test indicates that there is no problem with the UM link. You can proceed to the normal operation of UM link.

◗ If POST successfully completes, each of the “COM” LED lights should flash once, starting from LED “1”, then LED “2”, LED “3”, LED “4”; afterward, they should flash one more time in the backward direction, starting from LED “3”, then LED “2”, then LED “1”.

Subsequently, (1) the “power” LED light should be ON, (2) the “link” LED light should be ON (if the UTP cable is connected and the power of the Ethernet hub to which the UM link is connected is turned ON), (3) the “Tx” LED light should blink (when there is network data going through the UM link), (4) the “collision” LED might occasionally blink (when heavy network traffic occurs), and (5) the “COM” LED lights (of the COM ports that are connected to the UPS in operation) should also blink.

◗ If POST fails, all four “COM” LED lights should flash continuously. Refer to sections “Power-on LED display sequence” and section “Using diagnostic program” for instruction details.

## checking NMS connection

The network manager system (NMS) should be running an SNMP-based network management program such as SOLUTION-PAC, MANAGEMENT-PAC (programs specifically designed to manage the UPSs through UM link) or HP-open view.

The SNMP agent software inside UM link contains a set of default configuration. This default configuration includes an IP address and Community Name, among others, that screen access from an NMS to the UM link (and in turn, to the UPSs).

If your NMS uses the same configuration, you should be able to see the UPSs (those connected to UM link) on the screen of the PC running SOLUTION-PAC, MANAGEMENT-PAC. If not, you will have to change the UM link’s “agent configuration”. Refer to section “Using terminal program” for how to change this “agent configuration”.

This section tells you how to configure the SNMP agent software residing in the UM link's hardware. This agent software allows the UPSs connected to UM link to communicate with a network manager system (NMS) running an SNMP-based management software.

The following lists the default agent software configuration. Four sets of default configuration are kept, each for one of the four UPSs connectable to UM link.

- IP address: 168.8.xx.aa
- Subnet mask: 255.255.0.0
- Gateway: 0.0.0.0
- Baud rate: 2,400 bps
- UPS polling rate: 1,000 ms
- Trap ACK timeout: 5 sec
- Trap ACK retry: 6 times
- Community name-RO: public
- Community name-RW: public
- BootP enabled: YES
- TFTP enabled : NO
- Auto learning enabled : NO

The program used to change this configuration is the terminal program, which is built into the UM link.

**Note**: In addition to this built-in terminal program, you may also use the SNMP-based UM view management program to alter UM link's COM ports' default configuration. UM view can be installed on a PC for comprehensive configuration and status/statistic monitoring of the UPSs through UM link.

## accessing terminal program

The terminal program built into the UM link can be accessed by connecting a VT100 terminal to UM link's COM1 port. If you have a PC, run a VT100 terminal emulation program. The procedure is described below:

**1**- You may access the terminal program anytime while the UM link is in operation. You may not access the terminal program if UM link's POST cannot be successfully completed.

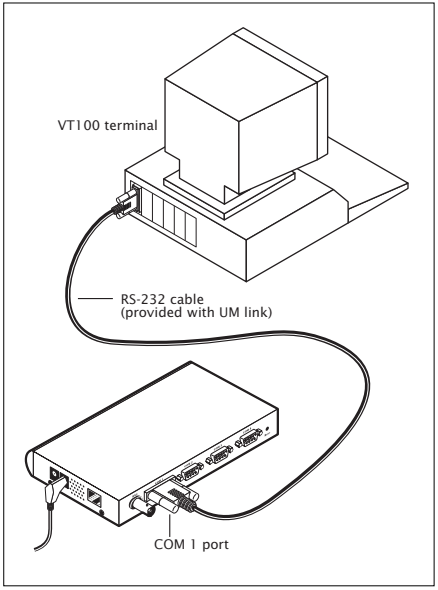
**2**- Configure the COM port of the terminal as follows:

- 2400 bps
- No parity
- 8 data bits
- 1 stop bit

**Note**: If using Windows 3.x terminal.exe emulator, do not select "Use function key arrows and ctrl" in the "terminal parameters" menu.

This is the configuration of UM link's COM1 port while the UM link is in the operation mode.

**3**- Connect UM link's COM1 port to the terminal using the cable provided with your UM link.



**4-** UM link will automatically detect the terminal as soon as it is connected. Press "+" twice. UM link's built-in terminal program will be invoked and the following main menu will be brought up to the terminal 's screen.

```
MGE UPS SYSTEMS UM link Configuration

                                    UPS unit: 1
1. Agent configuration
2. Manager table
3. Duplicate configuration
4. Factory reset
5. Exit
```

**Terminal program's main menu**

This program use the following keys for operation:

↑↓ **Arrow keys**: Move up and down a field or selection item

**Tab**: Move to the next column

**Enter**: Select a menu item or confirm an answer to a screen prompt

To select an item on the main menu, use the ↑ and ↓ arrow keys, then press **Enter** to enter the sub-menu of the selected item. To return to the main menu screen, press **F4**.

# setting agent configuration

"Agent configuration" on the main menu can be selected to change the default agent software configuration for each of the four UPSs connected to the UM link. Note that the configuration will be saved in the UM link's memory, so it does not matter whether the UPSs are actually connected to the COM ports.

**1-** Select "Agent configuration" from the main menu to display the following screen:

```
MGE UPS SYSTEMS UM link Configuration

                                    UPS unit: 1
Agent MAC address          0080c80d2023
IP address                 168.8.32.35
Subnet mask                255.255.0.0
Default gateway            0.0.0.0
Baud rate                  2400
UPS polling rate (ms)      1000
Trap ACK timeout (sec)     5
Trap retry count           6
Community name-RO          public
Community name-RW          public
BOOTP enable               YES
TFTP enable                NO
Auto learning enabled      NO
```

**2-** The screen initially displays the agent configuration of "UPS unit 1" (i.e. COM1 port). To select the next "UPS unit", press **F3** once. To select the previous "UPS unit" (i.e. COM 4 port), press **F3** three times.

**3-** To change any configuration, position the cursor on the desired field, then overtype the value being displayed.

**4-** To save the new configuration in the UM link, press **F2**.

**5-** Repeat steps 2, 3, 4 above to set configuration for all other COM ports.

The following explains the meanings of the configuraiton fields.

◗ **MAC address**: This is the Ethernet data link layer address burned into an EPROM inside the UM link. The address is labeled on the UM link metal case.

◗ **IP address**: Each COM port has a default IP address of 168.8.xx.aa, where xx and aa are identical to the last two bytes of the UM link's MAC address for COM1, and aa is the last byte + 1 for COM2, + 2 for COM3 and + 3 for COM4. Usually, this default IP address must be changed in order for the COM ports to communicate with an NMS. Consult your network administrator and assign a new IP address for each port.

**NOTE**: **IP address 0.0.0.0** means the unit is disabled.

◗ **Subnet mask**: This is used to mask the network ID part of the IP address. The default value is 255.255.0.0. You may change the default to fit one of the three classes of subnets:

❍ Class A
internet address: 255.0.0.0.
❍ Class B
internet address: 255.255.0.0.
❍ Class C
internet address: 255.255.255.0.

◗ **Default gateway**: This is the IP address of the gateway. If the NMS and the UM link are not on the same network, the IP address of the gateway must be specified for to tell UM link how to find the NMS. The default value is 0.0.0.0, meaning there is no gateway.

- **Baud rate**: The baud rate is fixed at 2,400 bps for each COM port in the operation mode (when in communication with the UPS).
- **UPS polling rate**: This is the time interval for the COM port to poll its UPS for status. The default value is 1,000 ms. The configuration range is 500 - 3,000 ms.
- **Trap ACK timeout**: This is the timeout for trap receive acknowledgement. If there is no ACK at timeout, a trap resend will be retried from the UM link to an NMS.
- **Trap retry count**: This is the number of times UM link retries to send a trap for which no acknowledgement has been received from the NMS.
- **Community name-RO**: This parameter is the common community name which provides the read-only access right.
- **Community name-RW**: This parameter is the common community name which provides the read-write access right.

A community name is a character string which is used to check the access right to each of the COM port (hence, its connected UPS). Only NMS having the same Community name as set for the COM port will be allowed to access the UPS.

For SNMP SET request, a manager should use the ReadWrite community name. For SNMP GET and GET_NEXT requests, a manager can use either the Read-Write community name or the Read-Only community name.

- **BootP enabled**: This is the parameter enabling or disabling the bootP process.

The bootstrap protocol is an Internet standard protocol used to get from a workstation (bootP server) an IP address and a bootfile name.

- **TFTP enabled**: This is the parameter enabling or disabling the use of the Trivial File Transfer Protocol for transfering files from an ghost workstation to the UM link (software or configuration download).

The bootstrap process and download functionality are described hereafter with regards to the different combinations:

| BootP | TFTP | UM link process |
|---|---|---|
| **YES** | **YES** | At power on time, UM link will use bootP to get IP address and bootfile name on the network (from a bootP server). It will then use TFTP to get the bootfile (software upgrade through downloading this file). It will also respond to further TFTP request for both software download and configuration download. |
| **YES** | **NO** | At power on time, UM link will use bootP to get IP address and bootfile name on the network. Nothing further will be done (no software upgrade), and it will not respond to TFTP write request (neither software download nor configuration download). |
| **NO** | **YES** | Not any bootP process will be enacted at power on time. UM link will respond to further TFTP write request (software download and configuration download). |
| **NO** | **NO** | UM link will do neither bootP operations nor software/ configuration download via TFTP. |

- **Auto learning enabled**: This is the parameter enabling or disabling the so called “auto learning” process. This functionality when enabled create automatic insertion in the MGE MIB manager table of a default description for any new manager accessing the UM link UPS agent. The manager is automatically inserted in the table only if the request made (SNMP SET or GET or GET_NEXT) was accepted by the UM link SNMP agent. This will give this manager ability to receive traps, even if it does not have write access to the agent with SNMP set commands.

Although these three later parameters (bootP, TFTP & autolearning) can be set for any of the four COM ports of the UM link, only one value is memorized to maintain consistency. Thus, when you will modify one of this objects for a COM ports it will modify the objects on the other 3 ports.

## setting manager tables

“Manager table” on the main menu can be selected to set up a list of NMSs.

For each UPS, you can set up a table consisting of a number of NMSs that you allow to manage. In this table, you will specify the IP addresses of the NMSs, and the community names that they must provide to gain access to the UPS. Traps will be automatically sent from the UM link to these NMSs.

NMSs whose IP addresses are not found in the table, or NMSs that provide the incorrect community names can still manage the UPSs if they know the IP addresses and community names of the COM ports (in the UM link) to which the UPSs are connected (see section “Setting agent configuration”).

**1-** Select “manager table” from the main menu to display the following screen:

```
MGE UPS SYSTEMS UM link Configuration

                                        UPS unit: 1
Manager table (I)
   IP address  NMS  Trap   Community  Trap
                    level             ack
1._________   ___  ____   _________  ____
2._________   ___  ____   _________  ____
3._________   ___  ____   _________  ____
4._________   ___  ____   _________  ____
5._________   ___  ____   _________  ____
6._________   ___  ____   _________  ____
7._________   ___  ____   _________  ____
8._________   ___  ____   _________  ____
```

**2-** The screen initially displays the table for “UPS unit 1” (i.e. COM1 port). To select the next “UPS unit”, press **F3** once. To select the previous “UPS unit” (COM4 port), press **F3** three times.

**3-** The table is initially blank. If you have set up a table for the COM port before, the IP addresses, community names and others will be listed. You can make the changes by overtyping what is being displayed.

There are many entries for each COM ports. The exact number of entries depends on the version of firmware inside the UM link. Eight entries are displayed on a screen. To display the next eight entries (if available), press “+”. To display the previous eight entries, press “–”.

**4-** For each NMS, type in an IP address, a trap level and a community name. See the explanation below for the meaning of “trap level”. To select a type of NMS, press the space bar to toggle among the selection.

To change any configuration, position the cursor on the desired field, then overtype the value being displayed.

**5-** Press **F2** to save the table in the UM link.

**6-** Repeat steps 2 to 5 above to set up a table for all other COM ports.

The following explains the meanings of the fields.

- **IP address**: This is the IP address of the NMS.
- **NMS**: This field lists the name of the SNMP network management program software installed on the NMS. When adding manager on this table, you should not let NMS remain empty. Empty value for this field is related to internal management of the autolearning process.
- **Trap level**: A trap is a message reporting the event occuring at the UPS side. Traps are grouped into levels according to the seriousness of the events. Trap level 7 signifies the least serious events, while trap level 1 signifies the most serious events. A trap level can be set from 0 to 7. If you specify the trap level to be 0, no traps will be sent. If you specify the trap level to be 3, traps belonging to levels equal to and smaller than 3 (levels 1, 2 and 3) will be sent to the NMS. Refer to the manuals of the SNMP software programs for the grouping of traps by levels.
- **Community name**: This parameter is the manager community name which will be used by UM link when sending traps to the manager.
- **Trap ack**: This is the parameter enabling or disabling the acknowledgement process when sending traps to a specific manager.

  Setting MG NOACK to this parameter will indicate that this manager will receive MGE Enterprise Traps but will not acknowledge these traps. Then UM link will send trap to this manager only once.

  Setting MG ACK to this parameter will allow this manager to receive MGE enterprise traps. The Trap will be sent again to this manager until it is acknowledged by the manager or it has been already sent too many times (see section “Setting agent configuration” for parameters configuring the acknowledgement process).
  Setting IETF NOACK to this parameter will indicate that this manager will receive

IETF traps and will not adknowledge them (see agentmib.doc for IETF traps description). In that case MGE entreprise traps will not be sent to this manager.

## duplicating configuration

"Duplicate configuration" on the main menu can be selected to duplicate the configuration that you have set for one COM port to another COM port. The duplication process can be between any two COM ports of the same UM link. You can use this function to simplify operation by copying the configuration from one source, then make modifications on the copied configuration at the destination.

**1**- Select "Duplicate configuration" from the main menu to display the following screen:

```
MGE UPS SYSTEMS UM link Configuration

            Duplicate configuration:
Source unit              _____________
Destination unit         _____________
IP of destination unit   _____________
```

**2**- Type in the numbers of the source and destination (1 to 4). Type in the IP address of the destination unit.

**3**- Press **F3** to start copying.

## software-resetting all COM ports

The selection "factory reset" on the main menu can be used to perform a reset of all COM ports' configuration.

A reset reverts all configuration settings of the COM ports to their factory-set default settings. See the beginning of this section "Using terminal program" for a list of default settings.

Note that this function has the same effect as pressing continuously the "reset" switch on the back panel of the UM link, power off and on UM link and wait until LED lights 3a, 3b, 3c, 3d blink together four times.

To reset the configuration of the COM ports to their default values, do as follows:

**1**- Select "factory reset" from the main menu.

**2**- Press **F3** to reset.

```
MGE UPS SYSTEMS UM link Configuration

Confirm to factory
reset on device          ___________
```

# hardware-resetting all COM ports

The “Reset” switch on the UM link’s back panel is used to reset all COM ports’ configuration to their default values. The default values are listed at the beginning of section “Using terminal program”.

The hardware reset operation must be done when the UM link’s power is turned ON and while a system boot is being performed.

**1-** If the power of the UM link has been turned ON, turn it OFF by disconnecting the AC power adapter.

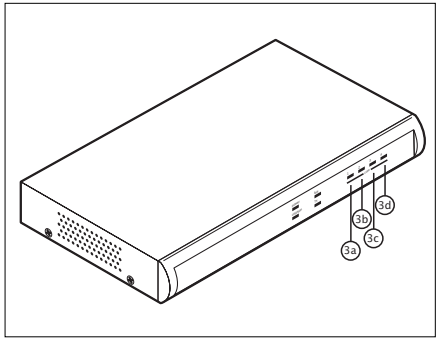
**2-** Re-connect the AC power adapter to boot.

**3-** Use a pen tip, depress the “Reset” switch and keep this switch pressed until the power-on self test (POST) of the UM link is completed. To find out when POST is completed, see the next section.

**4-** Check the “COM” LED lights to verify the configuration reset. All four “COM” LED lights should flash four times to indicate that a reset has taken effect.

# power-on LED display sequence

This section describes the UM link's power-on self test (POST). The LED lights on the front panel are used to indicate results of each of sub-tests that comprise POST. The results for the sub-test can also be displayed on the screen by connecting a VT100 terminal to the UM link's COM1 port. Refer to section "Using diagnostic program", for details.




**LED lights used by power-on self-test**

**1-** As soon as the AC power adapter is connected to the UM link, the "power" LED light (1) should be ON; all other LED lights except for "collision" (2a) and "Tx" (2c) should blink momentarily, then turn OFF.

**2-** Subsequently, the following sub-tests will be performed. LED lights (3a), (3b), (3c) and (3d) are used to indicate the results of these sub-tests. If a sub-tests fails, its LED light(s) should blink five times, then the UM link will enter the diagnostic mode; all subsequent sub-tests will be suspended. You will know that the UM link is in the diagnostic mode when all four LED lights (3a), (3b), (3c) and (3d) blink continuously.
You should then connect UM link's COM1 port to a terminal to run the diagnostics.
The following indicates which LED light(s) is/are used by which sub-test.

**3-** If all sub-tests succeed, each of the "COM" LED lights should flash once, starting from LED (3a), then LED (3b), LED (3c), LED (3d); afterward, they should flash one more time in the backward direction, starting from LED (3c), then LED (3b), then LED (3a).

**4-** Subsequently, (1) the "power" LED light should be ON, (2b) "link" LED light should be ON (if the UTP cable is connected and the power of the Ethernet hub to which the UM link is connected is turned ON), (2c) the "Tx" LED light should blink (when there is network data going through the UM link), (2a) the "collision" LED might occasionally blink (when heavy network traffic occurs), and (3a), (3b), (3c), (3d) the "COM" LED lights (of the COM ports that are connected to the UPS in operation) should also blink.

| Sub-test | (3a) | (3b) | (3c) | (3d) | Test time |
|---|---|---|---|---|---|
| 1. CPU test | o | | | | 0.5 sec. |
| 2. EPROM checksum | ——— | o | | | 0.5 sec. |
| 3. RAM test | o ——— | o | | | 1 sec. |
| 4. Flash memory | ——————— | | o | | 1 sec. |
| 5. EEPROM memory checksum | o ——————— | | o | | 1 sec. |
| 6. LAN controller | ——— | o —— | o | | 1 sec. |
| 7. COM ports 1 & 2 | o ——— | o —— | o | | 0.5 sec. |
| 8. COM ports 3 & 4 | ——————————— | | | o | 0.5 sec. |
| 9. MAC address | o ——————————— | | | o | 0.5 sec. |

## when should you run diagnostic program?

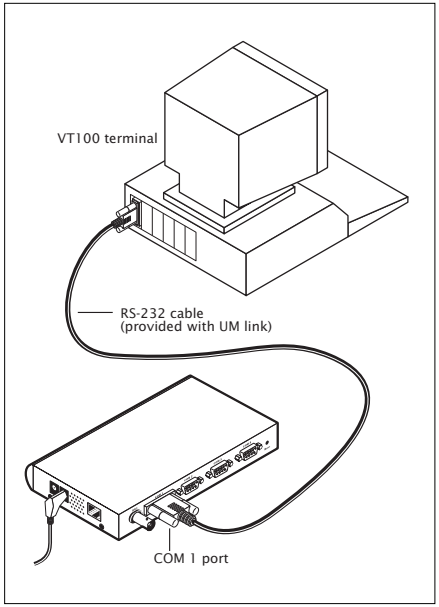
When the UM link is powered ON (AC power adapter is connnected), a power-on self test (POST) should take place. POST consists of a number of sub-test, each verifying a particular component of the UM link.

Some components are more critical to the operation of the UM link. For example, if the CPU malfunctions, the UM link will not work. Or, if the software program codes in the flash memory are lost damaged, a software download must be performed before the UM link can successfully run.

In case a sub-test of a critical component fails, UM link will automatically enter into the diagnostic mode. You should then connect the UM link's COM1 port to a terminal to display the test results and perform diagnostic functions.

In case all sub-tests succeed but you want to download a new configuration file or system program codes to the UM link, you should also connect the UM link's COM1 port to terminal to run the diagnostic program.

When all four COM LED lights flash continuously and endlessly, the UM link is in the diagnostic mode. Within five seconds after a screen message is displayed, press "+" to allow the terminal to communicate with the UM link in this diagnostic mode.




## connecting to terminal

COM1 port is used for diagnostics. The following lists the configuration of this port while the UM link is in the diagnostic mode:

- 9600 bps
- No parity
- 8 data bits
- 1 stop bit

**1-** Prepare a VT100 terminal. If you have a PC, run a VT100 emulation program to have the PC emulate a VT100. Set the terminal's (or PC's) COM port to the same configuration as the UM link's COM1 port's (shown above).

**2-** Connect UM link's COM1 port to the terminal using the cable provided with your UM link.

**3-** Within 5 seconds, hit the "+" character on the terminal's keyboard to enter the diagnostic program. If you do not to hit this character in time, the terminal will fail to connect to the UM link's diagnostic program. In this case, disconnect the AC power adapter from UM link, then re-connect it to start the power-on self test again.

The diagnostic program's main menu is shown in the following screen:

```
MGE UPS SYSTEMS UM link - Ethernet ©97,98

 0. Display this menu
 1. Show self test result
 2. Download configuration
 3. Software upgrade
 4. Exit
```

**Diagnostic program's main menu**

A function can be selected from the main menu by pressing an appropriate key on the terminal's keyboard. To return to the main menu, press **0**.

## checking result of self test

Function **1**, "Show self test result" in the diagnostic program is main menu can be used to display the result of the UM link's power-on self test. This self test consists of a number of sub-tests. The results of these sub-tests will be displayed on the screen after you select **1** from the main menu. The following shows an example screen.

Note that if there is a hardware problem and the self test terminated somewhere in the middle, the sub-tests that are subsequent to the one that failed will not be carried out. In this case, the screen will only display the results of the sub-tests that were performed.

```
1. CPU test ..... ok
2. EPROM checksum ..... ok
3. RAM test ..... ok
4. Flash memory checksum test ..... 00 ..... ok
5. EEPROM memory checksum test ..... 00 ..... ok
6. LAN controller test ..... 00 ..... ok
7. COM port 1 test ..... 00 ..... ok
   COM port 2 test ..... 00 ..... ok
8. COM port 3 test ..... 00 ..... ok
   COM port 4 test ..... 00 ..... ok
9. MAC address ..... 00-8O-C8-0B-A5-4A ..... ok
```

## downloading configuration file

Function **2**, "Download configuration" in the diagnostic program's main menu can be used to download the configuration from a disk file to the UM link's EEPROM. This function is useful when the configuration stored in the EEPROM becomes lost, and you can download the previously set configuration from a disk file to the EEPROM. Or when you changed the hardware configuration (e.g. connecting different types of UPSs to the UM link), and a different configuration must be set in the EEPROM.

Use the software programs that MGE UPS SYSTEMS provides to prepare and download configuration files. When you select 2 from the main menu, you will be prompted to exit from the terminal program and execute a program to download configuration.

```
Please run "dloadcfg.exe" from the
distribution diskette. Select 9600
baud on the first menu. It will take
30 seconds to complete. Hit <cr> to
continue, or any other key to abort...
```

Specify the drive and path of the configuration file to download the configuration file's content to the UM link's EEPROM, overwriting whatever is residing in the EEPROM.

**Note**: Note that MGE "MANAGEMENT-PAC" also provides functions for download of configuration files. If you wish to use "MANAGEMENT-PAC" instead

of the diagnostic program, install "MANAGEMENT-PAC" on a PC and download a configuration file to the UM link from this PC.

The limitation on the file that can be downloaded with the dloadcfg.exe program is 239 lines. This file should have ".cfg" extension name. It is an ASCII file with following syntax:

- First line is the "Configuration signature".

It includes four fields, which are the MIB version number string, the MIB object identification, the configuration file name, and the date of the configuration file. Only the first two fields are required.

**Tabulation** or **Space** are used as separators between fields.

Example: For version 1.6 of UM link, the signature line should be:

"1.6" 705.1

- Each one of the other lines in the Configuration file describes a configuration value to be set to a MIB object.

It includes four fields which are the object_value, the object_id_number, the object_id_name and the comment.

Only the first two fields are required.

**Tabulation** or **Space** are used as separators between fields.

The object_value is a string, an integer, or an IP address.

The object_id_number, is the MIB OID starting with the MIB object identification prefix given in the signature line (705.1).

The object_id_name which is optional gives the MIB object string identification. The end of the line is managed as a comment. A sample of such lines could be:

The default.cfg files which are provided with the UM link package are sample files giving the object_id_number for a list of MIB configuration objects.

| | | | |
|---|---|---|---|
| "SV6" | 705.1.1.2.0 | upsidentModelname | The model name |
| 4 | 705.1.2.2.1.4.1 | managerCommType | SNMPv1 for manager #1 |
| 4 | 705.1.2.2.1.4.2 | managerCommType | SNMPv1 for manager #2 |
| 168.8.0.43 | 705.1.2.2.1.6.5 | managerAddress | IP address manager #5 |

## upgrading software

UM link's flash memory contains the system software program codes. These program codes comprise the SNMP agent, the communication program with the UPSs, the terminal program and others that are inside the UM link. When the codes are lost or damaged, you should download the newest version of these codes to the UM link to make it work. Or when a new version of program codes becomes available, you should upgrade the current ones by downloading the new codes.

Function **3**, "Software upgrade" in the diagnostic program's main menu can be used to download the system program codes to the UM link's flash memory. Once you have pressed 3 to invoke the function, the following message will be displayed on the screen:

```
Please run "download.exe" from the
distribution diskette. Select 9600
baud on the first menu. It will take 5
minutes to complete. Hit <Enter> to
continue, or any other key to abort...
```

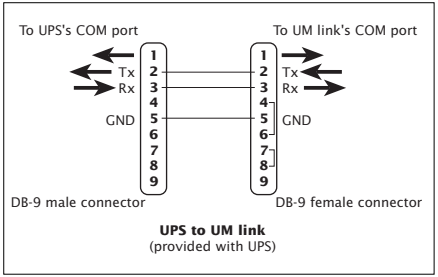
The baud rate of the PC's COM port should remain at 9,600 bps as described in section 7.2. "Connecting to terminal". Insert the diskette containing the program "download.exe", then execute the program. Your PC will now enter the software download mode. Follow the screen prompt to specify the file name and path for the system software program codes'file.

**Note**: Note that MGE "MANAGEMENT-PAC" software program also provides facility for download of software. If you wish to use "MANAGEMENT-PAC" instead of the diagnostic program, install "MANAGEMENT-PAC" on a PC. Software download to the UM link can be carried out from this PC.

# technical data

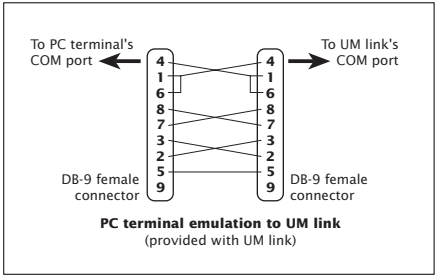
- Number of Ethernet port: 1
- Connectors on Ethernet port: 1 RJ-45, 1 BNC
- Number of COM ports: 4
- Number of diagnostic LED lights: 8
- Ethernet standard: IEEE 802.3 10BASE-T, 10BASE2
- SNMP agent MIB: SNMP MIB-II, MGE MIB V1.6, IETF UPS MIB (RFC1628)
- Operating temperature: 0-45 degrees C (32-113 degrees F)
- Humidity: 10% - 90% non-condensing
- Dimensions: 194 x 115 x 28 mm (7.66 x 4.53 x 1.1 inches)
- Weight: 500 g
- AC power adapter

| | Europe | U.S. |
|---|---|---|
| **Input power** | AC 220 volts 50/60 Hz | AC 120 volts 50/60 Hz |
| **Output power** | DC 5.0 volts unregulated, 1 Ampere | |
| **Maximum power consumption** | 5.0 watts | |
| **Plug type** | DIN | NEMA |
| **Safety standard** | EN 60950 | UL/CSA |
| **Radiation standard** | EN 55022<br>EN 50081-1<br>EN 50082 IEC 801-2 level 4<br>EN 50082 IEC 801-3 level 3<br>EN 50082 IEC 801-4 level 4<br>EN 50082 IEC 801-5 level 10 | FCC Class B |



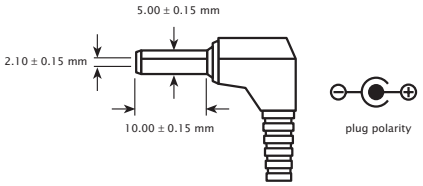

**UPS to UM link**
(provided with UPS)

**Note**: UPS reception through pin 2 (Tx), UPS transmission through pin 3 (Rx). You can also use standard 3-wire (2,3,5) straight-through serial cables to connect UPS to your UM link.

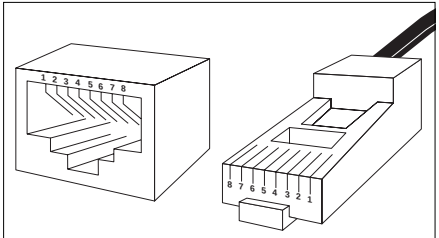



**PC terminal emulation to UM link**
(provided with UM link)

**Note**: You can use one supplied serial cable with a null modem adapter between your PC on terminal enulation mode, and the UM link COM 1 port.

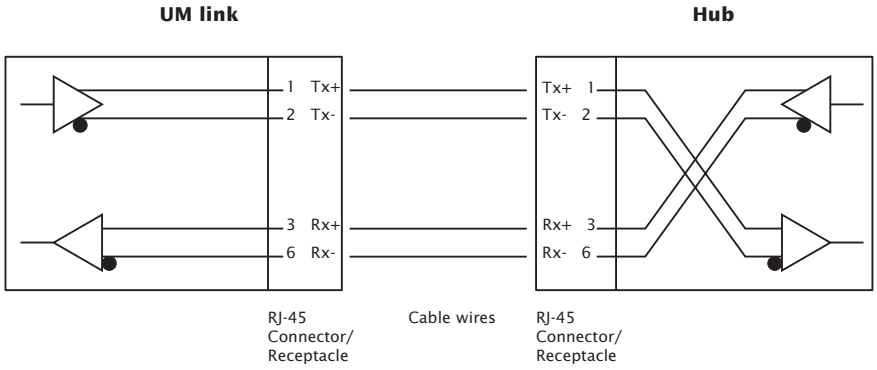



**AC power adapter's plug**

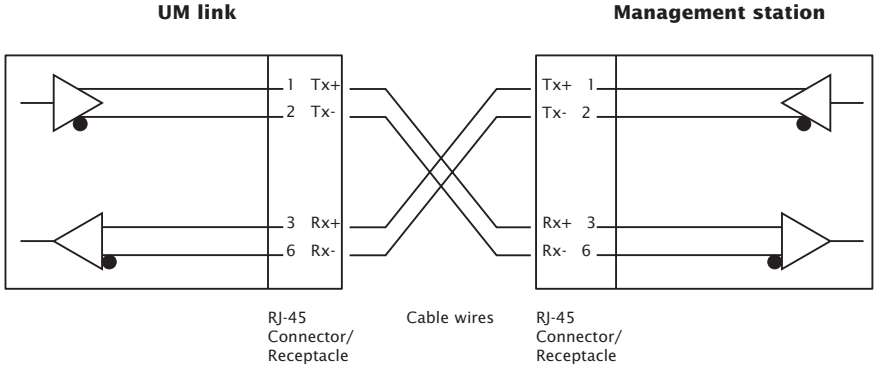



**RJ-45 receptacle/connector showing pin numbers**

| Contact | Media Direct Interface Signal |
|---|---|
| 1 | Tx+ |
| 2 | Tx- |
| 3 | Rx+ |
| 4 | Not used |
| 5 | Not used |
| 6 | Rx- |
| 7 | Not used |
| 8 | Not used |




**Signal transmission of straight-through 10BASE-T cable**




**Signal transmission of cross-over 10BASE-T cable**