

# Network Management Card & Modbus/ Jbus

Installation manual

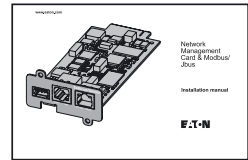
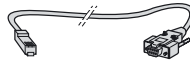
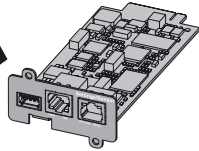
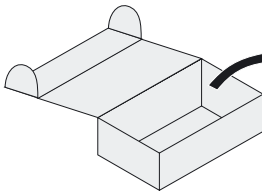


The **Network Management Card & Modbus/Jbus** is recommended for central UPSs protecting entire networks or for UPS units backing up critical loads. With the card installed, the UPS has its own IP address and uses the local computer capabilities to:

- ▶ Supply web pages (http or https (SSL)) with information on status conditions and measurements/settings/alarms,
- ▶ Integrate an SNMP-based NMS such as HP OpenView, IBM Tivoli Netview and Computer Associates Unicenter,
- ▶ Communicate with the protection software installed on the protected servers (Network Shutdown Module or Netwatch),
- ▶ Send e-mail and SMS messages,
- ▶ Control the ON/OFF function of the UPS and the outlets,
- ▶ Monitor the Environment Sensor (optional, cat. no. 66846).

## UNPACKING AND CHECKS

- ▶ One **Network Management Card & Modbus/Jbus**
- ▶ One serial cable for configuration (34003918),
- ▶ One installation manual (34003906).



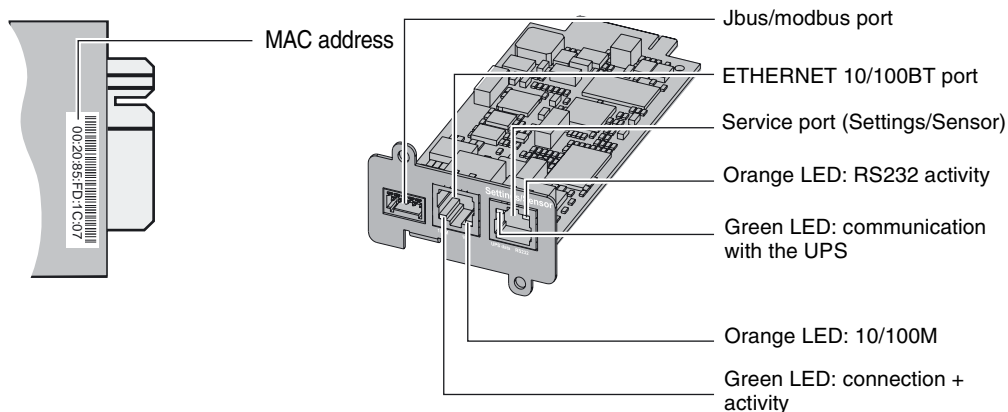
## CHECK ON UPS VERSION



**Important. Before installing the card, check that the UPS technical level (NT) is at least equal to that indicated in the compatibility list (For latest information, check the website according to your product : [download.mgeops.com](http://download.mgeops.com) for MGE Office Protection Systems products, [www.powerware.com](http://www.powerware.com) for Powerware products).**

- ▶ If the technical level of the UPS is lower than that indicated in the compatibility list, contact EATON.

# OVERVIEW



# INDICATIONS

## ETHERNET port

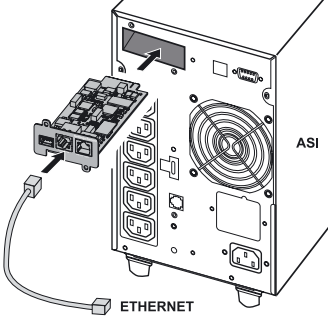
LED	Colour	Status	Description
ACT	Green	<ul style="list-style-type: none"> <li>▶ OFF</li> <li>▶ ON</li> <li>▶ Flashing</li> </ul>	<ul style="list-style-type: none"> <li>▶ Card not connected to network</li> <li>▶ Card connected to network, but no activity</li> <li>▶ Port is sending/receiving</li> </ul>
100M	Orange	<ul style="list-style-type: none"> <li>▶ OFF</li> <li>▶ ON</li> </ul>	<ul style="list-style-type: none"> <li>▶ Port operating at 10 Mbits/s</li> <li>▶ Port operating at 100 Mbits/s</li> </ul>

## Service port (Settings/Sensor)

LED	Colour	Status	Description
UPS Data	Green	<ul style="list-style-type: none"> <li>▶ OFF</li> <li>▶ ON</li> <li>▶ Flashing</li> </ul>	<ul style="list-style-type: none"> <li>▶ Card starting</li> <li>▶ Communicating with UPS</li> <li>▶ Normal operation</li> <li>Communication with UPS is operational</li> </ul>
RS232	Orange	<ul style="list-style-type: none"> <li>▶ OFF</li> <li>▶ ON</li> <li>▶ Flashing</li> </ul>	<ul style="list-style-type: none"> <li>▶ Configuration menu activated</li> <li>▶ Normal operation</li> <li>Configuration menu not activated</li> <li>▶ Communication with Environment Sensor (option)</li> </ul>

The **Network Management Card & Modbus/Jbus** can be hot-plugged on all UPSs compatible with the card. It is not necessary to shutdown the UPS, disconnect the load or restart the UPS.

- ▶ Remove the plastic cover of the Minislot.
- ▶ Note the MAC address of the card before inserting it.



- ▶ Insert and secure the card with the screws.
- ▶ Connect the ETHERNET cable.
- ▶ Check the ETHERNET port indications.
- ▶ Wait until the UPS Data LED flashes regularly (approx. two minutes), indicating that card start-up has terminated correctly.

**Note.** Connection detection continues until the card has been connected to the network. Once connection is made, card start-up continues.

## IP SETTINGS

Once the card has started, proceed as indicated below.

- ▶ Connect the serial cable to card's service port and PC's COM port
- ▶ Use a terminal emulator such as HyperTerminal™ with these settings

Bits per second	Data bits	Stop bits	Parity	Flow control
9600	8	1	none	none

"Echo typed characters locally" option: disabled

- ▶ Type admin.

The main configuration menu is displayed:

```

EATON
NETWORK MANAGEMENT CARD
  1 : Reset
  2 : Network configuration
  3 : Set Login Password to Default
  4 : Return to Default Configuration
  5 : Jbus configuration
  6 : Sensor configuration
  0 : Exit
    
```

## Your network is equipped with a BOOTP/DHCP server (default)

The card is configured by default with this service enabled. No manual configuration is required. The IP parameters are automatically collected by the card.

From the main configuration menu: (see above)

- ▶ Press the 2 key (Network configuration).
- ▶ Press the 1 key (Read Network settings).

The settings supplied by the server are displayed:

Network configuration :

MAC address : 00:20:85:FD:1C:07

Mode : DHCP

IP address : 166.99.23.18

Subnet mask : 255.255.248.0

Gateway : 166.99.17

- ▶ Note the IP address.
- ▶ Press the 0 key (Exit).
- ▶ Press the 0 key (Exit).

**You can also use NMC Tool software utility to view the card IP address**

The tool is available at [download.mgeops.com](http://download.mgeops.com). It must be installed on a network connected PC.

## Your network is not equipped with a BOOTP/DHCP server

Manual configuration is required.

To set the network configuration, use terminal emulation (see above)

From the main configuration menu:

- ▶ Press the 2 key (Network configuration).
- ▶ Press the 2 key (Modify Network settings).
- ▶ Follow the instructions and enter the IP parameters:

1 : Read Network settings

2 : Modify Network settings

3 : Set ethernet speed

0 : Exit

For each of the following questions, you can press "Return" to select

the value shown in braces, or you can enter a new value

Should this target obtain IP settings from the network?[N] N

Static IP address [166.99.16.16]? 166.99.1.82

Subnet mask IP address [255.255.0.0]? 255.255.255.0

Gateway address IP address [0.0.0.0]? 166.99.17.1

Done

Wait until "Done" is displayed, indicating that the IP parameters have been saved.

- ▶ Press the 0 key (Exit).
- ▶ Press the 1 key (Reset).
- ▶ Press the 2 key (Restart).

The card restarts with the new IP settings (after approx. one minute).

# ACCESS TO SUPERVISION

To check whether the **Network Management Card & Modbus/JBus** is operational after installation and configuration, proceed as follows.

- ▶ Run a browser
- ▶ Enter in the address bar:  
**http://IP address/** (e.g. **http://166.99.1.82/**)
- ▶ The home page is displayed

## Network Management Card & ModBus/JBus

The screenshot displays the 'UPS Properties' page for a 'Pulsar M 2200 Computer Room' UPS. The interface includes a left-hand navigation menu with sections for 'UPS', 'Logs and Notification', 'Settings', and 'ModBus/JBus serial'. The main content area shows a schematic diagram of the UPS system, a 'UPS Status' dropdown menu, and a table of operational parameters.

UPS Status	
Power source :	AC Power
Output load level :	0%
Output :	Master : On Group1 : On Group2 : On
Battery	
Battery load level :	92% Charging
Remaining backup time :	4 h 39 mn 30 s
Battery status :	OK
ModBus/JBus port :	Not used
Last update : 2008.05.29 11:10:07	

- ▶ Set the time by clicking the Time command.
- ▶ Continue configuration via the sections in the Settings menu.

# USER MANUAL

This manual provides all the information required to install and configure the **Network Management Card & Modbus/Jbus**.

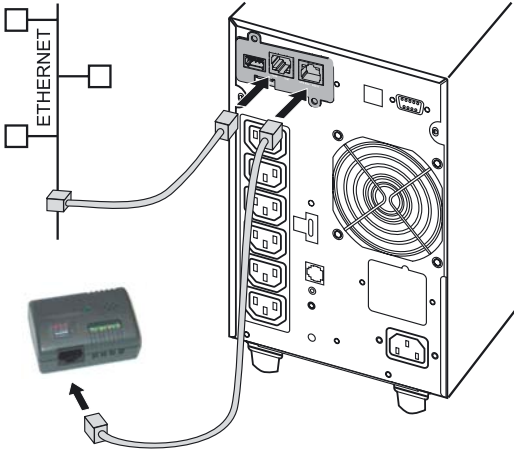
For more information on the supervision, control and configuration functions offered by the **Network Management Card & Modbus/Jbus**, see the user manual available at [download.mgeops.com](http://download.mgeops.com) or in the Products/Power Management section at [www.powerware.com](http://www.powerware.com).

# SENSOR CONNECTION (option)

The Environment sensor is a **Network Management Card & Modbus/Jbus** option. It is available from EATON (cat. no 66846).

The sensor remotely monitors the UPS environment by regularly measuring the temperature and humidity, and checking the states of two external contacts. It can also send alarms (e-mail, SNMP trap) tripped by pre-set thresholds.

Connection is made via the Service port (Settings/Sensor) on the **Network Management Card & Modbus/Jbus**. The sensor is detected automatically. Configuration and supervision use a menu that may be accessed directly from the home page. For more information, see the user manual of the **Network Management Card & Modbus/Jbus**.



*Network Management Card & ModBus/JBus*

- UPS**
  - UPS Properties
  - UPS Control
  - Weekly Schedule
  - Shutdown Parameters
- Logs and Notification**
  - Measurements
  - Event Log
  - System Log
  - Email Notification
- Settings**
  - Network
  - System
  - Notified Applications
  - Access Control
  - Time
  - Firmware Upload
- ModBus/JBus serial**
  - Settings
- Environment**
  - Status
  - Settings
  - Log

**Environment Status**
**Help**

**Pulsar M 2200**
**Computer Room**

**Temperature**

0      **22.7 °C**      70

Min: 22.1 recorded on 2008/05/29 13:59:39

Max: 22.7 recorded on 2008/05/29 14:03:16

[Configure thresholds on Environment Settings](#)

**Humidity**

0 %      **48.8 %**      100 %

Min: 46.7 % recorded on 2008/05/29 13:59:19

Max: 51.4 % recorded on 2008/05/29 14:02:48

[Configure thresholds on Environment Settings](#)

**Input #1**

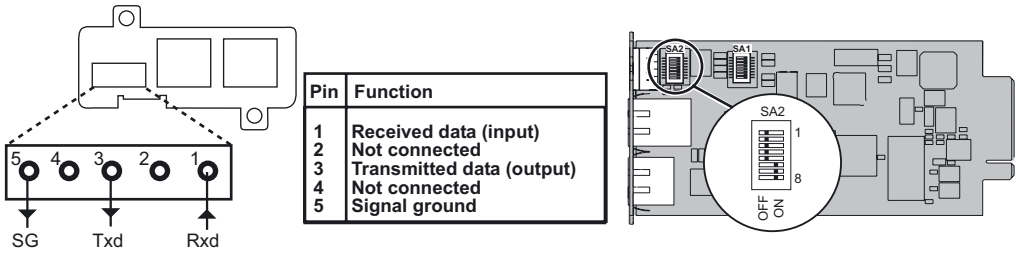
2008/05/29 14:01:43      Input #2 open

**Input #2**

2008/05/29 14:03:16      Input #2 closed

# JBUS/MODBUS

## RS232 link configuration and connection



## RS485 link configuration and connection

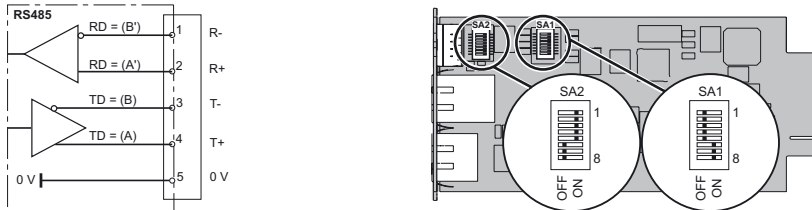
For proper operation, the polarity of EIA RS485 2-wire and 4-wire lines must be set at only one point and the lines terminated at the end.

### Polarity

Normally, the master of the network sets the polarity of the line. The receiver inputs have a true failsafe feature which eliminates the need for external bias resistors and ensures a logic high output level when the inputs are open or shorted. This guarantees that the receiver outputs are in a known state before communication begins and when communication ceases.

### Termination

Termination is used to match impedance of a node to the impedance of the transmission line being used. When impedance are mismatched, the transmitted signal is not completely absorbed by the load and a portion is reflected back into the transmission line. The termination line is not necessary if the speed on the line is much less than 115Kbauds



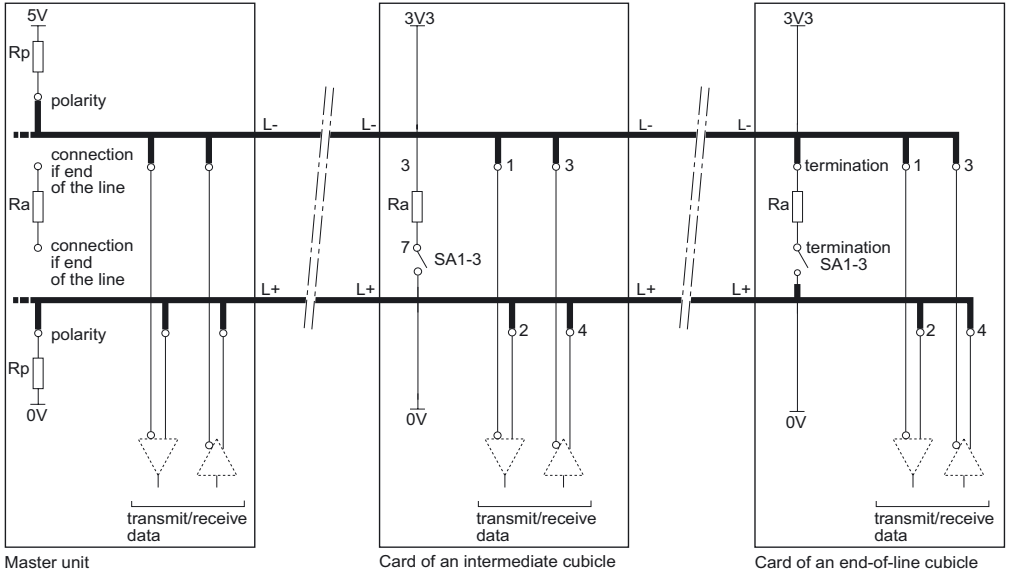
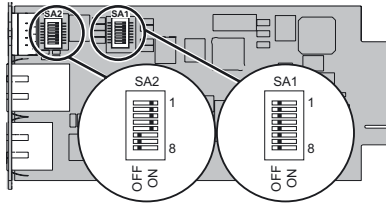
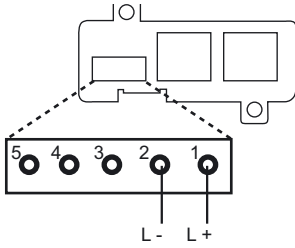
The default setting of the RS485 is a 4 wires configuration without polarity and without termination.

SA1 switches are used to make the termination and the topology of the line (2 or 4 wires). The termination resistance value is 166 Ω.

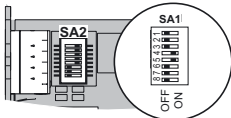
### SA1 description:

- 1 : reserved
- 2 : reserved
- 3 : link termination between T- to R- (2 wires configuration) if set to ON
- 4 : connection T- to R- (2 wires configuration ) if set to ON
- 5 : connection T+ to R+ (2 wires configuration ) if set to ON
- 6 : reserved
- 7 : reserved
- 8 : link termination between R+ and R- if set to ON

## 2 wires connection

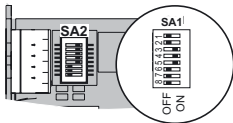


## Card settings of an intermediate cubicle



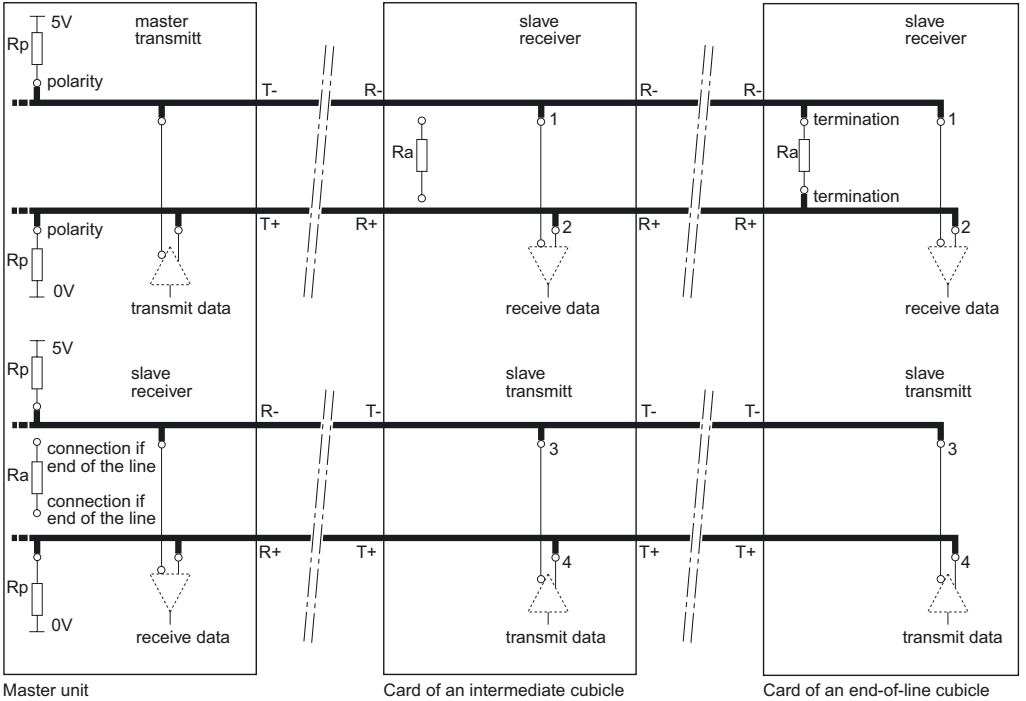
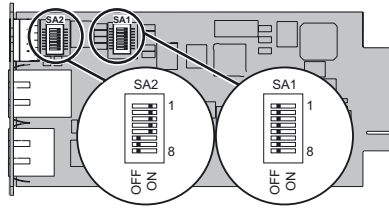
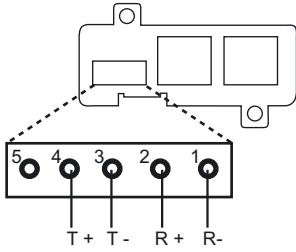
Link without polarity and without termination.

## Others settings

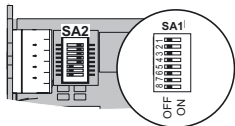


Link with termination.

# 4 wires connection

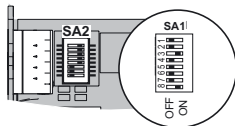


## Card settings of an intermediate cubicle



Link without polarity and without termination.

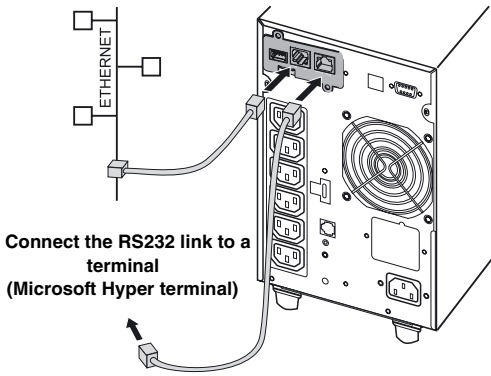
## Others settings



Link with termination.

# Configuration of the JBUS/MODBUS communication parameters

## Through settings port



- ▶ Use the cord supplied with the card
- ▶ Connect the card to a computer
- ▶ Use a terminal emulator such as HyperTerminal™ with these settings

Bits per second	Data bits	Stop bits	Parity	Flow control
9600	8	1	none	none

"Echo typed characters locally" option: disabled

- ▶ Check that UPS power is on.
- ▶ Type admin.

The main configuration menu is displayed:

```
EATON
NETWORK MANAGEMENT CARD
 1 : Reset
 2 : Network configuration
 3 : Set Login Password to Default
 4 : Return to Default Configuration
 5 : Jbus configuration
 6 : Sensor configuration
 0 : Exit
```

- ▶ Press the 5 key (Jbus configuration).

The Jbus configuration menu is displayed:

```
Jbus settings
 1 : Display Jbus settings
 2 : Modify Jbus settings
 3 : Display Jbus diagnostics
 4 : Reset Jbus diagnostics
 5 : Return to Jbus Default Configuration
 6 : Display Jbus frames
 0 : Exit
```

- ▶ Press the 2 key (Modify Jbus settings)
- ▶ Press «Return» key to modify the Jbus settings

Setting Jbus configuration  
 Set Slave number : 0x1\*  
 Set the Baud Rate [1:38400,2: 19200, 3:9600, 4: 4800, 5: 2400, 6: 1200] :3  
 Set data format[1: 8 bits, 2: 7 bits] :1  
 Set stop bit[1: 1 bits, 2: 2 bits] :1  
 Set parity [1: None, 2: Even, 3: Odd] :1

Wait during the new setting is saved ...  
 TLS/Slave JBUS initialized  
 The Jbus configuration is now updated.

\* Hex format.

- ▶ Press the 0 key (Exit).
- ▶ Press the 0 key (Exit).

**Through a web browser**

- ▶ Run a browser
- ▶ Enter in the address bar:  
**http://IP address/** (e.g. http://166.99.1.82/)
- ▶ The home page is displayed
- ▶ Select the Modbus/Jbus setting menu.

*Network Management Card & ModBus/JBus*

The screenshot shows a web interface for configuring ModBus/JBus settings. The main panel is titled 'ModBus/JBus Settings' and includes a 'Help' link. The device is identified as 'Pulsar M 2200' in the 'Computer Room'. The configuration parameters are as follows:

Parameter	Value
Slave Number (Hex)	1
Serial speed	9600
Data format	8
Stop bit	1
Parity	None

Below the settings, there is a 'Save modified settings:' section with a 'Save' button and a 'Factory Reset' button.

The left sidebar contains the following menu items:

- UPS**
  - UPS Properties
  - UPS Control
  - Weekly Schedule
  - Shutdown Parameters
- Logs and Notification**
  - Measurements
  - Event Log
  - System Log
  - Email Notification
- Settings**
  - Network
  - System
  - Notified Applications
  - Access Control
  - Time
  - Firmware Upload
- ModBus/JBus serial**
  - Settings

- ▶ Set the parameters.
- ▶ Select the «Save» button to save the new parameters.

# TECHNICAL CHARACTERISTICS

<b>Physical characteristics</b>	
Dimensions (W x D x H)	132 x 66 x 42 mm
Weight	70 g
RoHS	100% compatible
<b>Storage</b>	
Storage temperature range	-10°C to 70°C
<b>Ambient conditions</b>	
Operating temperature range	0°C to 40°C
Relative humidity	90% RH max. without condensation
<b>Card performance</b>	
Supply voltage	5V ±5%
Supply current (all LEDs ON and Environment Sensor connected)	300 mA max.
<b>Functions</b>	
Web supervision	5 browsers max. (http), 3 browsers max. (https)
Languages	English, French, German, Italian, Spanish
Alarms	E-mail, SNMP TRAP, Web page
Log	400 measurements or events
Server protection	Up to 100 servers protected
Network	Fast ETHERNET, 10/100 Mbits, auto-negotiation HTTP 1.1, SNMP V1, NTP, TFTP, SMTP, BOOTP/DHCP
Identification	User name and password
Security	SSL 3.0, TLS 1.0
Browsers	Microsoft Internet Explorer 6.x or higher
NMS	Enterprise Power Manager (EPM) Management Pac 2
MIB	MIB II standard - UPS MGE MIB V1.7
<b>Settings (default values)</b>	
IP network	BOOTP/DHCP enabled IP address: 166.99.16.16 (manual configuration) Subnet mask: 255.255.0.0 Gateway: 0.0.0.0 NTP server: pool.ntp.org
Web-page access control	User name: admin Password: admin
Service-port menu access control	Password: admin (not modifiable)
Date and time	Synchronise with an NTP server (GMT)
Service port	9600 bits/s, 8 bits, 1 bit stop, no parity
RS485 port	Slave nb:0x01, 9600 bits/s, 8 bits, 1 bit stop, no parity

# ELECTROMAGNETIC COMPATIBILITY

When correctly installed and used in accordance with manufacturer instructions, the card complies with the following standards:

- ▶ ITE (Information Technology Equipment) safety: IEC/EN 60950-1 2002
- ▶ EMC: EN 61000-6-2 (2002), EN 61000-6-3 (2002), IEC/EN 62040-2 (2002)

In compliance with European directives:

- ▶ Low voltage: 73/23/EEC and 93/68/EEC.
- ▶ EMC: 89/336/EEC and 93/68/EEC.

## **Federal Communication Commission (FCC) statement**

This equipment has been tested and found to comply with the limits for a **Class B** 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.

## WEB SITE

The information presented in this manual is also available in other languages at [download.mgeops.com](http://download.mgeops.com) for MGE Office Protection Systems products, [www.powerware.com](http://www.powerware.com) for Powerware products.

