Network Management Card & Modbus/Jbus (66103)

Installation manual
The Network Management Card & Modbus/Jbus (66103) 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 shutdown modules installed on the protected servers (Network Shutdown Module),
- 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 (66103)
- One serial cable for configuration (34003918),
- One installation manual (34003906).

**CHECK ON UPS VERSION**

The Network Management Card & Modbus/Jbus (66103) is compatible with the Pulsar range UPSs available since 2006. Note.

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<table>
<thead>
<tr>
<th>UPS Type</th>
<th>Technical level (NT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulsar 700/1000/1500</td>
<td>02</td>
</tr>
<tr>
<td>Pulsar M 2200/3000</td>
<td>03</td>
</tr>
<tr>
<td>Pulsar MX 4000/5000/10000</td>
<td>04</td>
</tr>
<tr>
<td>Pulsar MX Frame 15/20 kVA</td>
<td>01</td>
</tr>
</tbody>
</table>

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If the technical level of the UPS is lower than that indicated in the table, contact EATON.
OVERVIEW

MAC address

ETHERNET port
Service port (Settings/Sensor)
Orange LED: RS232 activity
Green LED: communication with the UPS
Catalogue number
Orange LED: 10/100M
Green LED: connection + activity

INDICATIONS

<table>
<thead>
<tr>
<th>LED</th>
<th>Colour</th>
<th>Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT</td>
<td>Green</td>
<td>• OFF</td>
<td>Card not connected to network</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ON</td>
<td>Card connected to network, but no activity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Flashing</td>
<td>Port is sending/receiving</td>
</tr>
<tr>
<td>100M</td>
<td>Orange</td>
<td>• OFF</td>
<td>Port operating at 10 Mbits/s</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ON</td>
<td>Port operating at 100 Mbits/s</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LED</th>
<th>Colour</th>
<th>Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UPS Data</td>
<td>Green</td>
<td>• OFF</td>
<td>Card starting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ON</td>
<td>Communicating with UPS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Flashing</td>
<td>Normal operation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Communication with UPS is operational</td>
</tr>
<tr>
<td>RS232</td>
<td>Orange</td>
<td>• OFF</td>
<td>Normal operation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ON</td>
<td>Configuration menu activated</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Flashing</td>
<td>Communication with Environment Sensor (option)</td>
</tr>
</tbody>
</table>
The Network Management Card & Modbus/Jbus (66103) can be hot-plugged on all UPSs from EATON equipped with a Minislot. 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

<table>
<thead>
<tr>
<th>Bits per second</th>
<th>Data bits</th>
<th>Stop bits</th>
<th>Parity</th>
<th>Flow control</th>
</tr>
</thead>
<tbody>
<tr>
<td>9600</td>
<td>8</td>
<td>1</td>
<td>none</td>
<td>none</td>
</tr>
</tbody>
</table>

*Echo typed characters locally* option: disabled

- Type EATON (or eaton).

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
```
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: 00:06:23:00:1C:07
  - Mode: DHCP
  - IP address: 172.17.23.18
  - Subnet mask: 255.255.248.0
  - Gateway: 172.17.17

- 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 provided on the Solution-Pac 2 CD-ROM or at www.eaton.com. It must be installed on a network connected PC.

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: 00:06:23:00:1C:07
  - Mode: DHCP
  - IP address: 172.17.23.18
  - Subnet mask: 255.255.248.0
  - Gateway: 172.17.17

- 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 provided on the Solution-Pac 2 CD-ROM or at www.eaton.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)
- 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 [172.17.16.16] 172.17.16.18
- Subnet mask IP address [255.255.0.0] 255.255.255.0
- Gateway address IP address [0.0.0.0] 172.17.17.1

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).
To check whether the Network Management Card & Modbus/Jbus (66103) is operational after installation and configuration, proceed as follows.

- Run a browser
- Enter in the address bar: `http://IP address/` (e.g. `http://172.16.1.82/`)
- The home page is displayed

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

**ACCESS TO SUPERVISION**

**USER MANUAL**

This manual provides all the information required to install and configure the Network Management Card & Modbus/Jbus (66103).

For more information on the supervision, control and configuration functions offered by the Network Management Card & Modbus/Jbus (66103), see the user manual on the Solution-Pac 2 CD-ROM or in the Products/Power Management section of the [www.eaton.com/powerquality](http://www.eaton.com/powerquality) site.
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.
RS232 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 100 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

Others settings
4 wires connection

Card settings of an intermediate cubicle

Others settings

Link without polarity and without termination.

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

<table>
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<tr>
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<td>none</td>
</tr>
</tbody>
</table>

*Echo typed characters locally* option: disabled

- Check that UPS power is on.
- Type EATON (or eaton).

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 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

* 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://172.16.1.82`)
- The home page is displayed
- Select the setting menu

![Network Management Card & ModBus/Jbus](image)

- Set the parameters.
- Select the «Save» button to save the new parameters.
## TECHNICAL CHARACTERISTICS

### Physical characteristics
- Dimensions (W x D x H): 132 x 66 x 42 mm
- Weight: 70 g
- RoHS: 100% compatible

### Storage
- Storage temperature range: -10°C to 70°C

### Ambient conditions
- Operating temperature range: 0°C to 40°C
- Relative humidity: 90% RH max. without condensation

### Card performance
- Supply voltage: 5V ±5%
- Supply current (all LEDs ON and Environment Sensor connected): 300 mA max.

### Functions
- Web supervision: 5 browsers max. (http), 2 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
- FTP 1.1, SNMP V1, NTP, TFTP, BOOTP/DHCP
- Identification: User name and password
- Security: SSL 2.0, TLS 1.0
- Browsers: Microsoft Internet Explorer 6.x or higher
- NMS: Enterprise Power Manager (EPM)
- Management-Pac 2
- MIB: MIB II standard - UPS EATON MIB V1.7
- Settings (default values)
  - IP network: BOOTP/DHCP enabled
  - IP address: 172.17.16.16 (manual configuration)
  - Subnet mask: 255.255.0.0
  - Gateway: 0.0.0.0
  - NTP server: pool.ntp.org
  - Web-page access control: User name: EATON, Password: EATON
  - Service-port menu access control: Password: EATON or eaton (not modifiable)
  - Date and time: Synchronize with an NTP server (GMT)
  - Service port: 9600 black, 3 bits, 1 bit stop, no parity
  - RS485 port: Slave nb:0x01, 9600 black, 8 bits, 1 bit stop, no parity
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
- Low voltage: 73/23/EEC and 93/68/EEC.
- EMC: 89/336/EEC and 93/68/EEC.

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 in the download section of the EATON site (www.eaton.com/powerquality).