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1 Introduction

The embedded application of the Modbus MS Card (previously INMC) is based on the Network MS Card (previously NMC). For all common features, the user manual is the same as NMC (see reference below). In this document, only JBUS/MODBUS requirements are described.

- Reference
  Network Management Card – User Manual 34003990XT_FR/EF
2 Presentation

2.1 Overview

The Modbus MS Card provides the same functions than the Network MS card described in the previous section of this document.

The adding function consists to provide UPS (Uninterruptible Power Supply) data (states and measures) to be sent a computer system.

The JBUS hexadecimal (MODBUS RTU) communication protocol is used in slave mode. The system provides a communication channel with an RS485 or RS232 interface.

Note:
2 wires or 4 wires RS485 link are available.

Warning:
RS232 and RS485 communication ports cannot be used together.

JBUS/MODBUS communication is operational 2 minutes after the startup of the card.
## 2.3 Technical characteristics

<table>
<thead>
<tr>
<th>Functions</th>
<th>Parameters</th>
<th>Default values</th>
<th>Possible values</th>
</tr>
</thead>
<tbody>
<tr>
<td>JBUS/MODBUS communication</td>
<td>- Baud rate</td>
<td>- 9600 bauds</td>
<td>- 1200, 2400, 4800, 9600, 19200, 38400</td>
</tr>
<tr>
<td></td>
<td>- Parity</td>
<td>- without parity</td>
<td>- Without parity, even parity, odd parity</td>
</tr>
<tr>
<td></td>
<td>- Bit number</td>
<td>- 8</td>
<td>- 1, 2</td>
</tr>
<tr>
<td></td>
<td>- Stop bit</td>
<td>- 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Slave number</td>
<td>- Slave nr 1</td>
<td>1 to FF (hexadecimal)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RS232 link</td>
<td>- Link connection in transmit</td>
<td>- Rx on pin 1</td>
<td>- Rx on pin 1</td>
</tr>
<tr>
<td></td>
<td>data (Tx) or receive data (Rx)</td>
<td>- Tx on pin 3</td>
<td>- Tx on pin 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RS485 link</td>
<td>- Termination</td>
<td>- No termination</td>
<td>- With or without (2 or 4 wires)</td>
</tr>
</tbody>
</table>
3 Installation

3.1 RS232 link configuration and connection

Set the SA2 switches like below:

The next figure shows the details of the connection in RS232 mode:

<table>
<thead>
<tr>
<th>Pin number</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Received data (input)</td>
</tr>
<tr>
<td>2</td>
<td>Not connected</td>
</tr>
<tr>
<td>3</td>
<td>Transmitted data (output)</td>
</tr>
<tr>
<td>4</td>
<td>Not connected</td>
</tr>
<tr>
<td>5</td>
<td>Signal Ground</td>
</tr>
</tbody>
</table>
3.2 RS485 link configuration and connection

3.2.1 RS485 connection

Normally, the master of the network sets the polarity of the line. The Modbus MS card is a slave equipment and don't have polarisation resistor.

The two ends of the line must be terminated. Allow for 1 or 2 terminators to avoid mismatching the line when any equipment at the end of the line is disconnected.

The next figure gives the detail of the RS485 connector and the internals drivers:

<table>
<thead>
<tr>
<th>Pin number</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>R- : Receiver - (input)</td>
</tr>
<tr>
<td>2</td>
<td>R+ : Receiver + (input)</td>
</tr>
<tr>
<td>3</td>
<td>T- : Transmitter - (output)</td>
</tr>
<tr>
<td>4</td>
<td>T+ : Transmitter + (output)</td>
</tr>
<tr>
<td>5</td>
<td>0 V</td>
</tr>
</tbody>
</table>

Important notes:

Use twisted pair cable (cable specification 0.3mm² and capacitance 42pF/m)
The transmission range will increase if a cable with lower capacitance and larger diameter is used.
Use shielded cable in heavy industrial environments.
The settings of the RS485 link are made through the SA1 switches:

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
3.2.2 RS485 link configuration for 2 wires connexion

Set the SA2 switches like below to set the RS485 mode:

Set the SA1 switches to select the two wires configuration with no termination:
Set the SA1 switches to select the **two wires** configuration with **termination**:

The next figure gives a typical bus structure in the two wires configuration:
3.2.3 RS485 link configuration for 4 wires connexion

Set the SA2 switches like below:

Set the SA1 switches to select the four wires configuration with no termination:
Set the SA1 switches to select the **four wires** configuration with **termination**:

The next figure gives a typical bus structure in the four wires configuration:
3.3 Configuration of the JBUS/MODBUS communication parameters

Use the cord supplied with the card.

Connect the RS232 link to a terminal (Microsoft Hyper terminal).

Connect the card to a computer equipped with a Hyper terminal type emulator. The serial link must be set at 9600 baud, 8 bits, no parity, 1 stop bit, and without flow control.

Check that UPS power is on.

Enter the admin password (not upgradable).
The next menu appears:

```
EATON NETWORK MANAGEMENT – JBUS 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
```

Type 5 and return to display the JBUS configuration menu.

The next menu appears:

```
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
```

### 3.3.1 Choice 1: Display Jbus settings

Enables reading of the card’s Jbus settings

```
Jbus configuration :
    Slave number : 1
    Speed : 9600 bds
    Data : 8 bits
    stop bit : 1
    Parity : None
```

### 3.3.2 Choice 2: Modify Jbus settings

Enable the modification of Jbus settings.
Setting Jbus configuration:

- Set Slave number: 0x1
- Set data format [1: 8 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 configuration is saved ...

Slave JBUS initialized

The Jbus configuration is now updated.

### 3.3.3 Choice 3: Display Jbus diagnostics

Enable reading of the Jbus diagnostics.

#### Jbus diagnostics:

- Cpt1 - Bus Message Count: 0
- Cpt2 - CRC Error Count: 0
- Cpt3 - Slave Exception Error Count: 0
- Cpt4 - Slave Message Count: 0
- Cpt5 - Slave No Response Count: 0
- Cpt6 - Slave NAK Count: 0
- Cpt7 - Slave Busy Count: 0
- Cpt8 - Bus Character Overrun Count: 0
- Cpt9 - Slave Correct Response Count: 0

### 3.3.4 Choice 4: Reset Jbus diagnostics

Reset the Jbus diagnostic counters.

### 3.3.5 Choice 5: Return to Jbus Default Configuration

Returns to the Jbus default configuration (0x01, 9600, 8, 1, none)

Wait during Jbus configuration returns to default ...

Jbus Configuration has been set to default one.

### 3.3.6 Choice 6: Display Jbus frames

Enable the display of the Jbus frames:
<table>
<thead>
<tr>
<th>Recv</th>
<th>01 01 00 00 00 64 3d e1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Send</td>
<td>01 81 02 c1 91</td>
</tr>
<tr>
<td>Recv</td>
<td>01 03 00 62 00 64 e5 ff</td>
</tr>
<tr>
<td>Send</td>
<td>01 03 c8 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 ...</td>
</tr>
<tr>
<td>Recv</td>
<td>01 01 00 00 00 64 3d e1</td>
</tr>
<tr>
<td>Send</td>
<td>01 81 02 c1 91</td>
</tr>
<tr>
<td>Recv</td>
<td>01 03 00 62 00 64 e5 ff</td>
</tr>
<tr>
<td>Send</td>
<td>01 03 c8 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 ...</td>
</tr>
</tbody>
</table>
4 Additional Web pages

The Modbus MS card parameters could be set through the next page:

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

<table>
<thead>
<tr>
<th>Modbus/JBus Settings</th>
<th>Help</th>
</tr>
</thead>
<tbody>
<tr>
<td>Username</td>
<td></td>
</tr>
<tr>
<td>Serial speed</td>
<td>9600</td>
</tr>
<tr>
<td>Data format</td>
<td>8 N</td>
</tr>
<tr>
<td>Stop bit</td>
<td>1</td>
</tr>
<tr>
<td>Parity</td>
<td>None</td>
</tr>
</tbody>
</table>

Save modified settings: [Save]

[Factory Reset]
5 Menu/CLI interfaces

The parameters links to JBUS communication are also accessible via Telnet, SSH or CLI interface. Those parameters are:
Slave address
Bauds rate
Bit number
Stop bit
Parity

5.1 Menu interface

5.1.1 Main menu

This screen is the main screen displayed when the connection is established.

EATON NETWORK MANAGEMENT- JBUS CARD
Main menu

1 : Reset
2 : Network settings
3 : Trap receivers
4 : System settings
5 : Shutdown settings
6 : Access control
7 : Date and Time
8 : Environment settings
9 : Modbus/Jbus settings
10 : Set login password to default
11 : Default configuration

Quit : Close session

5.1.2 Modbus/Jbus menu

These menus are used to visualize or modify the Jbus network settings and to visualize the status of the communication.
EATON NETWORK MANAGEMENT - JBUS CARD
Modbus/Jbus settings

1 : Serial link
2 : Diagnostic counters
0 : Exit

EATON NETWORK MANAGEMENT - JBUS CARD
Modbus/Jbus settings – Serial link

1 : Slave address [1]
2 : Baud rate (1200, 2400, 4800, 9600, 19200, 38400) [9600]
3 : Data bits (8) [8]
4 : Stop bits (1, 2) [1]
5 : Parity (0=None, 1=Odd, 2=Even) [0]

0 : Exit

EATON NETWORK MANAGEMENT - JBUS CARD
Modbus/Jbus settings – Serial link

: Buss message [24]
: CRC error [0]
: Slave exception error [0]
: Slave message [24]
: Slave no response [0]
: Slave NAK [0]
: Slave busy [0]
: Bus character overrun [0]
: Slave correct response [0]
10 : Reset diagnostic counter

0 : Exit

All items (1 à 9) are read only.
5.2 Command Line Interface

Command Line Interface (CLI) API provides functions for building and processing a user-defined HMI. To use the CLI, the parameter "HMI type" has to be equal to "CLI".

When opening a new session, TELNET or SSH, a specific prompt "#>" is sent to the client. The user can enter a command. If the command is recognized, it is processed, else a warning message is sent to the client. The syntax used is based on that already implemented for the XML description of objects. The blank character is not allowed in command arguments except for the strings. The strings are in double quotes ("").

The recognized commands are given in the following chapters and may be updated later.

5.2.1 “getJBUS”

<table>
<thead>
<tr>
<th>Purpose</th>
<th>To read a JBUS network setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syntax</td>
<td>getJBUS [option1] [option2]...</td>
</tr>
<tr>
<td></td>
<td>options :</td>
</tr>
<tr>
<td></td>
<td>SlaveAddress</td>
</tr>
<tr>
<td></td>
<td>Speed</td>
</tr>
<tr>
<td></td>
<td>DataBit</td>
</tr>
<tr>
<td></td>
<td>StopBit</td>
</tr>
<tr>
<td></td>
<td>Parity</td>
</tr>
<tr>
<td>Examples</td>
<td>#&gt; getJBUS Speed Parity</td>
</tr>
</tbody>
</table>

5.2.2 “setJBUS”

<table>
<thead>
<tr>
<th>Purpose</th>
<th>To modify a JBUS network setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syntax</td>
<td>setJBUS [option1] [option2]...</td>
</tr>
<tr>
<td></td>
<td>options :</td>
</tr>
<tr>
<td></td>
<td>SlaveAddress = xxx (1..255)</td>
</tr>
<tr>
<td></td>
<td>Speed = xxxx (1200</td>
</tr>
<tr>
<td></td>
<td>DataBit = x (8)</td>
</tr>
<tr>
<td></td>
<td>StopBit = x (1</td>
</tr>
<tr>
<td></td>
<td>Parity = x (0=None, 1=Odd, 2=Even)</td>
</tr>
<tr>
<td>Examples</td>
<td>#&gt; setJBUS Speed = 19200 Parity = 2</td>
</tr>
</tbody>
</table>
5.2.3 “getJBUSCounter”

<table>
<thead>
<tr>
<th>Purpose</th>
<th>To read a JBUS diagnostic counters</th>
</tr>
</thead>
</table>
| Syntax  | getJBUSCounter [option1] [option2]...
|         | options :
|         | BusMessage
|         | CRCError
|         | SlaveException
|         | SlaveMessage
|         | SlaveNoResponse
|         | SlaveNAK
|         | SlaveBusy
|         | Overrun
|         | SlaveCorrectResponse
|         | All |
| Examples| `#> getJBUSCounter All` |

5.2.4 “setJBUSCounter”

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Reset of the JBUS diagnostics counters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syntax</td>
<td>setJBUSCounter [option1]</td>
</tr>
</tbody>
</table>
|         | options :
|         | RAZ |
| Examples| `#> setJBUSCounter RAZ` |
# 6 JBUS table

## 6.1 Data for Pulsar 700 / 1000 / 1500

### 6.1.1 Status table

<table>
<thead>
<tr>
<th>Status description</th>
<th>Status to 0</th>
<th>Status to 1</th>
<th>Word (hex)</th>
<th>Bit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load protected</td>
<td>no</td>
<td>yes</td>
<td>40</td>
<td>0</td>
</tr>
<tr>
<td>UPS coupled</td>
<td>no</td>
<td>yes</td>
<td>40</td>
<td>1</td>
</tr>
<tr>
<td>Unit general alarm</td>
<td>no</td>
<td>yes</td>
<td>40</td>
<td>2</td>
</tr>
<tr>
<td>UPS in backup</td>
<td>no</td>
<td>yes</td>
<td>40</td>
<td>4</td>
</tr>
<tr>
<td>Battery low warning</td>
<td>no</td>
<td>yes</td>
<td>40</td>
<td>5</td>
</tr>
<tr>
<td>Low battery</td>
<td>no</td>
<td>yes</td>
<td>40</td>
<td>6</td>
</tr>
<tr>
<td>Operation on static switch</td>
<td>no</td>
<td>yes</td>
<td>40</td>
<td>7</td>
</tr>
<tr>
<td>Communication fault</td>
<td>absent</td>
<td>present</td>
<td>40</td>
<td>9</td>
</tr>
<tr>
<td>UPS overload</td>
<td>no</td>
<td>yes</td>
<td>40</td>
<td>A</td>
</tr>
<tr>
<td>Emergency stop</td>
<td>absent</td>
<td>present</td>
<td>40</td>
<td>B</td>
</tr>
<tr>
<td>Battery to be checked</td>
<td>no</td>
<td>yes</td>
<td>40</td>
<td>D</td>
</tr>
<tr>
<td>Device ventilation fault</td>
<td>no</td>
<td>yes</td>
<td>40</td>
<td>E</td>
</tr>
<tr>
<td>Battery present</td>
<td>absent</td>
<td>present</td>
<td>42</td>
<td>0</td>
</tr>
<tr>
<td>Mains 1 voltage out of tolerance</td>
<td>no</td>
<td>yes</td>
<td>44</td>
<td>8</td>
</tr>
<tr>
<td>Mains 1 frequency out of tolerance</td>
<td>no</td>
<td>yes</td>
<td>44</td>
<td>B</td>
</tr>
<tr>
<td>Bypass status</td>
<td>no</td>
<td>yes</td>
<td>46</td>
<td>7</td>
</tr>
<tr>
<td>Charger general fault</td>
<td>no</td>
<td>yes</td>
<td>49</td>
<td>0</td>
</tr>
<tr>
<td>Battery charge</td>
<td>not in charge</td>
<td>in charge</td>
<td>49</td>
<td>1 &amp; 3</td>
</tr>
<tr>
<td>Converter fault</td>
<td>no</td>
<td>yes</td>
<td>4A</td>
<td>1</td>
</tr>
<tr>
<td>Inverter fault</td>
<td>no</td>
<td>yes</td>
<td>4C</td>
<td>1</td>
</tr>
</tbody>
</table>
### 6.1.2 Measurements table

<table>
<thead>
<tr>
<th>Description of the physical quantity</th>
<th>Word (hex)</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>I output</td>
<td>109</td>
<td>A</td>
</tr>
<tr>
<td>U output</td>
<td>124</td>
<td>V</td>
</tr>
<tr>
<td>U battery</td>
<td>12D</td>
<td>V</td>
</tr>
<tr>
<td>Output active power</td>
<td>136</td>
<td>W</td>
</tr>
<tr>
<td>Output apparent power</td>
<td>137</td>
<td>VA</td>
</tr>
<tr>
<td>% output load level</td>
<td>139</td>
<td>%</td>
</tr>
<tr>
<td>Power factor (Cos PHI)</td>
<td>13D</td>
<td>-</td>
</tr>
<tr>
<td>Mains 1 frequency</td>
<td>13E</td>
<td>Hz</td>
</tr>
<tr>
<td>Output frequency</td>
<td>141</td>
<td>Hz</td>
</tr>
<tr>
<td>Battery backup time</td>
<td>149</td>
<td>Min</td>
</tr>
<tr>
<td>Battery charging level</td>
<td>14B</td>
<td>%</td>
</tr>
<tr>
<td>U mains 1</td>
<td>150</td>
<td>V</td>
</tr>
<tr>
<td>Nominal voltage of battery element</td>
<td>213</td>
<td>V</td>
</tr>
</tbody>
</table>
### 6.2 Data for Pulsar M 2200 / 3000

#### 6.2.1 Status table

<table>
<thead>
<tr>
<th>Status description</th>
<th>Status to 0</th>
<th>Status to 1</th>
<th>Word (hex)</th>
<th>Bit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load protected</td>
<td>no</td>
<td>yes</td>
<td>40</td>
<td>0</td>
</tr>
<tr>
<td>UPS coupled</td>
<td>no</td>
<td>yes</td>
<td>40</td>
<td>1</td>
</tr>
<tr>
<td>Unit general alarm</td>
<td>no</td>
<td>yes</td>
<td>40</td>
<td>2</td>
</tr>
<tr>
<td>UPS in backup</td>
<td>no</td>
<td>yes</td>
<td>40</td>
<td>4</td>
</tr>
<tr>
<td>Battery low warning</td>
<td>no</td>
<td>yes</td>
<td>40</td>
<td>5</td>
</tr>
<tr>
<td>Low battery</td>
<td>no</td>
<td>yes</td>
<td>40</td>
<td>6</td>
</tr>
<tr>
<td>Operation on static switch</td>
<td>no</td>
<td>yes</td>
<td>40</td>
<td>7</td>
</tr>
<tr>
<td>Communication fault</td>
<td>absent</td>
<td>present</td>
<td>40</td>
<td>9</td>
</tr>
<tr>
<td>UPS overload</td>
<td>no</td>
<td>yes</td>
<td>40</td>
<td>A</td>
</tr>
<tr>
<td>Emergency stop</td>
<td>absent</td>
<td>present</td>
<td>40</td>
<td>B</td>
</tr>
<tr>
<td>Battery to be checked</td>
<td>no</td>
<td>yes</td>
<td>40</td>
<td>D</td>
</tr>
<tr>
<td>Device ventilation fault</td>
<td>no</td>
<td>yes</td>
<td>40</td>
<td>E</td>
</tr>
<tr>
<td>Manual bypass switch (Q3BP)</td>
<td>open</td>
<td>closed</td>
<td>41</td>
<td>6</td>
</tr>
<tr>
<td>Battery present</td>
<td>absent</td>
<td>present</td>
<td>42</td>
<td>0</td>
</tr>
<tr>
<td>Mains 1 voltage out of tolerance</td>
<td>no</td>
<td>yes</td>
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<td>Output on bypass</td>
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<td>46</td>
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<tr>
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<td>Phase M2 out of tolerance</td>
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<td>46</td>
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<td>Charger general fault</td>
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### 6.2.2 Measurements table

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<td>109</td>
<td>A</td>
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<td>U mains 2</td>
<td>11E</td>
<td>V</td>
</tr>
<tr>
<td>U output</td>
<td>124</td>
<td>V</td>
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<tr>
<td>U battery</td>
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<td>V</td>
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<td>W</td>
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<td>VA</td>
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<td>dHz</td>
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<td>Min</td>
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<td>%</td>
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# 6.3 Data for Pulsar MX 4000 / 5000 / 10000

## 6.3.1 Status table

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<tr>
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</tr>
<tr>
<td>Unit general alarm</td>
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<td>2</td>
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<tr>
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<td>yes</td>
<td>40</td>
<td>4</td>
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<tr>
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<td>5</td>
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<tr>
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<td>present</td>
<td>40</td>
<td>9</td>
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<td>present</td>
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<td>B</td>
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<tr>
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### 6.3.2 Measurements table

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<tr>
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<td>A</td>
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<tr>
<td>I battery</td>
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<td>U mains 2</td>
<td>11E</td>
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</tr>
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<td>U output</td>
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<td>V</td>
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<td>U battery</td>
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<td>V</td>
</tr>
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<td>W</td>
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<td>VA</td>
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<td>Battery charging level</td>
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### 6.4 Data for Pulsar MX frame 15 / 20

#### 6.4.1 Status table

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<tr>
<td>Operation on static switch</td>
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<td>yes</td>
<td>40</td>
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<td>present</td>
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<td>9</td>
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<tr>
<td>UPS overload</td>
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<td>yes</td>
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<tr>
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<td>absent</td>
<td>present</td>
<td>40</td>
<td>B</td>
</tr>
<tr>
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<tr>
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<td>E</td>
</tr>
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<td>Phase M2 out of tolerance</td>
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<td>Charger general fault</td>
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### 6.4.2 Modular fault table

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### 6.4.3 Measurements table

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6.5.2 Measurements table

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<th>Unit</th>
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<td>I1 (I phase 1) mains 1</td>
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</tr>
<tr>
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<td>1</td>
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<td>2</td>
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<td>4</td>
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<td>5</td>
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<td>A</td>
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<td>present</td>
<td>40</td>
<td>B</td>
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<tr>
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<td>40</td>
<td>D</td>
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<td>E</td>
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<tr>
<td>101 : on line – hot standby redundancy</td>
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<td>44</td>
<td>B</td>
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<td>49</td>
<td>1 &amp; 3</td>
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### 6.6.2 Measurements table

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<td>W of KW</td>
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<td>V</td>
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<td>V</td>
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<td>W</td>
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<td>%</td>
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### 6.7 Data for Eaton 9E

#### 6.7.1 Status table

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<td>B</td>
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<td>40</td>
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### 6.7.2 Measurements table

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6.8 Data for Eaton 9PX and Eaton 9SX Single phase

6.8.1 Status table

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<td>40</td>
<td>A</td>
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<td>Device ventilation fault</td>
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<td>Redundancy lost</td>
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<td>Maintenance position</td>
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<td>Output on bypass</td>
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<td>Charger general fault</td>
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<td>absent</td>
<td>present</td>
<td>4A</td>
<td>1</td>
</tr>
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<td>present</td>
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<td>Status to 1</td>
<td>Word (hex)</td>
<td>Bit</td>
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<td>-------------</td>
<td>-------------</td>
<td>------------</td>
<td>-----</td>
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<td>1</td>
</tr>
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<td>Inverter overload</td>
<td>no</td>
<td>yes</td>
<td>4C</td>
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6.8.2 Measurements table

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<tr>
<td>I output</td>
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<td>A</td>
</tr>
<tr>
<td>I battery</td>
<td>10E</td>
<td>A</td>
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<tr>
<td>Nominal value active power</td>
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<td>W of KW</td>
</tr>
<tr>
<td>U mains 2</td>
<td>11E</td>
<td>V</td>
</tr>
<tr>
<td>U output</td>
<td>124</td>
<td>V</td>
</tr>
<tr>
<td>U battery</td>
<td>12D</td>
<td>V</td>
</tr>
<tr>
<td>Output total active power</td>
<td>136</td>
<td>W</td>
</tr>
<tr>
<td>Output total apparent power</td>
<td>137</td>
<td>VA</td>
</tr>
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<td>% output load level</td>
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<td>%</td>
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<td>Output frequency</td>
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<td>%</td>
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<td>209</td>
<td>VA or KVA</td>
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### 6.9 Data for Eaton 9PX Three phase Input

#### 6.9.1 Status table

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<tr>
<td>UPS coupled</td>
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<tr>
<td>Unit general alarm</td>
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<td>40</td>
<td>2</td>
</tr>
<tr>
<td>Configuration firmware fault</td>
<td>no</td>
<td>yes</td>
<td>40</td>
<td>3</td>
</tr>
<tr>
<td>UPS in backup</td>
<td>no</td>
<td>yes</td>
<td>40</td>
<td>4</td>
</tr>
<tr>
<td>Battery low warning</td>
<td>no</td>
<td>yes</td>
<td>40</td>
<td>5</td>
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<td>Low battery</td>
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<td>yes</td>
<td>40</td>
<td>6</td>
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<td>Operation on static switch</td>
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<td>40</td>
<td>7</td>
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<td>Communication fault</td>
<td>absent</td>
<td>present</td>
<td>40</td>
<td>9</td>
</tr>
<tr>
<td>UPS overload</td>
<td>no</td>
<td>yes</td>
<td>40</td>
<td>A</td>
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<tr>
<td>Emergency stop</td>
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<td>present</td>
<td>40</td>
<td>B</td>
</tr>
<tr>
<td>Battery to be checked</td>
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<td>yes</td>
<td>40</td>
<td>D</td>
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<tr>
<td>Device ventilation fault</td>
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<td>yes</td>
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<td>E</td>
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<td>011: on line - unitary/parallel</td>
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<tr>
<td></td>
<td>100: on line – parallel with NS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>101: on line – hot standby redundancy</td>
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<td>present</td>
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<td>present</td>
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<td>Timer expired</td>
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<tr>
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<td>1 &amp; 3</td>
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<tr>
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### Status description

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<th>Status to 1</th>
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<td>4C</td>
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### 6.9.2 Measurements table

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<th>Unit</th>
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<td>I2 (I phase 2) mains 1</td>
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</tr>
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<td>I3 (I phase 3) mains 1</td>
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<td>I mains 2</td>
<td>106</td>
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<tr>
<td>I output</td>
<td>109</td>
<td>A</td>
</tr>
<tr>
<td>I battery</td>
<td>10E</td>
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<td>W of KW</td>
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<td>V</td>
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### 6.10 Data for Eaton 9PX Split phase

#### 6.10.1 Status table

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<tr>
<td>UPS coupled</td>
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<td>Unit general alarm</td>
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<tr>
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<td>40</td>
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<tr>
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</tr>
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<td>D</td>
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<tr>
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</tr>
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### Status description

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<th>Status to 1</th>
<th>Word (hex)</th>
<th>Bit</th>
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<tbody>
<tr>
<td>Inverter thermal overload</td>
<td>no</td>
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<td>4C</td>
<td>3</td>
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<td>Electronic power supply fault</td>
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### 6.10.2 Measurements table

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<tr>
<th>Description of the physical quantity</th>
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</tr>
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<tr>
<td>I mains 2</td>
<td>106</td>
<td>A</td>
</tr>
<tr>
<td>I1 (I phase 1) output</td>
<td>109</td>
<td>A</td>
</tr>
<tr>
<td>I2 (I phase 2) output</td>
<td>10A</td>
<td>A</td>
</tr>
<tr>
<td>I battery</td>
<td>10E</td>
<td>A</td>
</tr>
<tr>
<td>Nominal value active power</td>
<td>111</td>
<td>W of KW</td>
</tr>
<tr>
<td>U12 mains 1</td>
<td>115</td>
<td>V</td>
</tr>
<tr>
<td>U mains 2 (phase 1)</td>
<td>11E</td>
<td>V</td>
</tr>
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<td>U mains 2 (phase 2)</td>
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<td>V</td>
</tr>
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<td>U12 mains 2</td>
<td>121</td>
<td>V</td>
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<td>U1N output</td>
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<td>V</td>
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<tr>
<td>U2N output</td>
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<td>V</td>
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<tr>
<td>U12 output</td>
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<td>V</td>
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<tr>
<td>U battery</td>
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<td>V</td>
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<td>W</td>
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<td>VA</td>
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<td>VA</td>
</tr>
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<td>Output total active power</td>
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<td>W</td>
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<tr>
<td>Output total apparent power</td>
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<td>VA</td>
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<td>%</td>
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<td>Hz</td>
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<td>Mains 2 frequency</td>
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<td>Hz</td>
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<td>Output frequency</td>
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<td>Min</td>
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<td>Battery charging level</td>
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## 6.11 Generic UPS

### 6.11.1 Status table

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<th>Word (hex)</th>
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<td>Load protected</td>
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<tr>
<td>UPS coupled</td>
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<tr>
<td>Unit general alarm</td>
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<tr>
<td>Configuration firmware fault</td>
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<td>UPS in backup</td>
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<td>Operation on static switch</td>
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<td>Communication fault</td>
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<td>present</td>
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<td>UPS overload</td>
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<td>40</td>
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<td>Emergency stop</td>
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<td>D</td>
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<td>Device ventilation fault</td>
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<td>Classe d’UPS</td>
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<td>001 : off line / line interactive</td>
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<td>011 : on line - unitary/parallel</td>
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<td>100 : on line – parallel with NS</td>
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<td>present</td>
<td>42</td>
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</table>
### 6.11.2 Measurements table

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<thead>
<tr>
<th>Description of the physical quantity</th>
<th>Word (hex)</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>I1 (I phase 1) mains 1</td>
<td>100</td>
<td>A</td>
</tr>
<tr>
<td>I2 (I phase 2) mains 1</td>
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<td>A</td>
</tr>
<tr>
<td>I3 (I phase 3) mains 1</td>
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<td>A</td>
</tr>
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<td>I1 (I phase 1) mains 2</td>
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</tr>
<tr>
<td>I2 (I phase 2) mains 2</td>
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</tr>
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<td>I3 (I phase 3) mains 2</td>
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</tr>
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<td>W of KW</td>
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<td>V</td>
</tr>
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<td>U23 mains 1</td>
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<td>V</td>
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<td>VA</td>
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<td>% output load level</td>
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<td>%</td>
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<td>Peak factor phase 1 x 100</td>
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<td>Peak factor phase 2 x 100</td>
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<td>Peak factor phase 3 x 100</td>
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<td>Description of the physical quantity</td>
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<td>Unit</td>
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<td>Battery charging level</td>
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<td>V</td>
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<td>U mains 1 (phase 2)</td>
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<td>U mains 1 (phase 3)</td>
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<td>VA or KVA</td>
</tr>
<tr>
<td>Nominal voltage of battery element</td>
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<td>V</td>
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## 6.12 Sensor data

### 6.12.1 Status table

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<th>Word (hex)</th>
<th>Bit</th>
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</tr>
<tr>
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<td>4</td>
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<td>Input 2</td>
<td>open</td>
<td>close</td>
<td>48</td>
<td>1</td>
</tr>
</tbody>
</table>
### 6.12.2 Measurements table

<table>
<thead>
<tr>
<th>Description of the physical quantity</th>
<th>Word (hex)</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature measure</td>
<td>180</td>
<td>°C / °F</td>
</tr>
<tr>
<td>Maximum temperature</td>
<td>181</td>
<td>°C / °F</td>
</tr>
<tr>
<td>Maximum temperature date (MSB) in Unix timestamp</td>
<td>182</td>
<td></td>
</tr>
<tr>
<td>Maximum temperature date (LSB) in Unix timestamp</td>
<td>183</td>
<td></td>
</tr>
<tr>
<td>Minimum temperature</td>
<td>184</td>
<td>°C / °F</td>
</tr>
<tr>
<td>Minimum temperature date (MSB) in Unix timestamp</td>
<td>185</td>
<td></td>
</tr>
<tr>
<td>Minimum temperature date (LSB) in Unix timestamp</td>
<td>186</td>
<td></td>
</tr>
<tr>
<td>Humidity measure</td>
<td>187</td>
<td>%</td>
</tr>
<tr>
<td>Maximum humidity</td>
<td>188</td>
<td>%</td>
</tr>
<tr>
<td>Maximum humidity date (MSB) in Unix timestamp</td>
<td>189</td>
<td></td>
</tr>
<tr>
<td>Maximum humidity date (LSB) in Unix timestamp</td>
<td>18A</td>
<td></td>
</tr>
<tr>
<td>Minimum humidity</td>
<td>18B</td>
<td>%</td>
</tr>
<tr>
<td>Minimum humidity date (MSB) in Unix timestamp</td>
<td>18C</td>
<td></td>
</tr>
<tr>
<td>Minimum humidity date (LSB) in Unix timestamp</td>
<td>18D</td>
<td></td>
</tr>
<tr>
<td>Input 1 changing date (MSB) in Unix timestamp</td>
<td>194</td>
<td></td>
</tr>
<tr>
<td>Input 1 changing date (LSB) in Unix timestamp</td>
<td>195</td>
<td></td>
</tr>
<tr>
<td>Input 2 changing date (MSB) in Unix timestamp</td>
<td>196</td>
<td></td>
</tr>
<tr>
<td>Input 2 changing date (LSB) in Unix timestamp</td>
<td>197</td>
<td></td>
</tr>
</tbody>
</table>
### 6.12.3 Read of the personalization table

<table>
<thead>
<tr>
<th>Description</th>
<th>Word (hex)</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>High threshold temperature (°C)</td>
<td>32C</td>
<td>0</td>
</tr>
<tr>
<td>Low threshold temperature (°C)</td>
<td>32D</td>
<td>0</td>
</tr>
<tr>
<td>Temperature hysteresis (°C)</td>
<td>32E</td>
<td>0</td>
</tr>
<tr>
<td>Offset temperature (deci °C)</td>
<td>32F</td>
<td>0</td>
</tr>
<tr>
<td>High threshold humidity (%)</td>
<td>330</td>
<td>0</td>
</tr>
<tr>
<td>Low threshold humidity (%)</td>
<td>331</td>
<td>0</td>
</tr>
<tr>
<td>Humidity hysteresis (%)</td>
<td>332</td>
<td>0</td>
</tr>
<tr>
<td>Humidity offset (%)</td>
<td>333</td>
<td>0</td>
</tr>
<tr>
<td>Inputs call mask – input 1 close notification</td>
<td>334</td>
<td>0</td>
</tr>
<tr>
<td>Inputs call mask – input 1 open notification</td>
<td>334</td>
<td>1</td>
</tr>
<tr>
<td>Inputs call mask – input 2 close notification</td>
<td>334</td>
<td>2</td>
</tr>
<tr>
<td>Inputs call mask – input 2 open notification</td>
<td>334</td>
<td>3</td>
</tr>
<tr>
<td>Inputs call mask – high temperature notification</td>
<td>334</td>
<td>4</td>
</tr>
<tr>
<td>Inputs call mask – low temperature notification</td>
<td>334</td>
<td>5</td>
</tr>
<tr>
<td>Inputs call mask – high temperature shutdown</td>
<td>334</td>
<td>6</td>
</tr>
<tr>
<td>Inputs call mask – low temperature shutdown</td>
<td>334</td>
<td>7</td>
</tr>
<tr>
<td>Inputs call mask – high humidity notification</td>
<td>334</td>
<td>8</td>
</tr>
<tr>
<td>Inputs call mask – low humidity notification</td>
<td>334</td>
<td>9</td>
</tr>
<tr>
<td>Inputs call mask – high humidity shutdown</td>
<td>334</td>
<td>A</td>
</tr>
<tr>
<td>Inputs call mask – low humidity shutdown</td>
<td>334</td>
<td>B</td>
</tr>
<tr>
<td>Inputs call mask – input 1 close shutdown</td>
<td>334</td>
<td>C</td>
</tr>
<tr>
<td>Inputs call mask – input 1 open shutdown</td>
<td>334</td>
<td>D</td>
</tr>
<tr>
<td>Inputs call mask – input 2 close shutdown</td>
<td>334</td>
<td>E</td>
</tr>
<tr>
<td>Inputs call mask – input 2 open shutdown</td>
<td>334</td>
<td>F</td>
</tr>
<tr>
<td>Input 1 identification</td>
<td>336 - 343</td>
<td></td>
</tr>
<tr>
<td>Input 2 identification</td>
<td>344 - 351</td>
<td></td>
</tr>
</tbody>
</table>
### 6.13 Other data

<table>
<thead>
<tr>
<th>Information description</th>
<th>Word (hex)</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer name</td>
<td>1A0 – 1A7</td>
<td>“Eaton”</td>
</tr>
<tr>
<td>Product name</td>
<td>1A8 – 1AF</td>
<td>“Pulsar”</td>
</tr>
<tr>
<td>UPS model</td>
<td>1B0 – 1B7</td>
<td>“700”</td>
</tr>
<tr>
<td>Serial number</td>
<td>1B8 – 1BF</td>
<td>“AN2E49008”</td>
</tr>
<tr>
<td>Part number</td>
<td>1C0 – 1C7</td>
<td></td>
</tr>
<tr>
<td>Reference number</td>
<td>1C8 – 1CF</td>
<td></td>
</tr>
</tbody>
</table>
7 Glossary