EDS ENERGY EFFICIENCY MANAGER

EDS (Efficiency Data Server) is an energy efficiency manager. The device has an RS-485 communications bus, as well as 8 digital inputs and 6 digital outputs via relay, which allow it to communicate with external field devices, representing and storing the information via its Ethernet connection and integrated web server. EDS also has a standard XML server, through which other external applications can integrate information from the device easily and intuitively.

1.- Buttons

The front panel of the EDS device has an alphanumeric LCD display, along with four function buttons, allowing the user to navigate through the setup screens of the device.

The buttons have two operating methods:

SHORT KEYS/WORD: when the user presses the function button for less than two seconds.

LONG KEYS/WORD: when the user presses the function button for more than two seconds.

The buttons have the following functions:

- SCROLL LEFT: edit button, scroll the cursor to the left to modify the numerical or alphanumeric digit.
- SCROLL RIGHT: edit button, scroll the cursor to the right to modify the numerical or alphanumeric digit.
- SCROLL UP: the function of this button is to modify the digit where the edit cursor is located. If there is no cursor on the screen, move up to the next step of the previous setup option.
- SCROLL DOWN: the function of this button is to modify the digit where the edit cursor is located. If there is no cursor on the screen, move down to the next step of the previous setup option.

2.- Setup

The device has two clear setup routes: the first one is related to the setup of the internal application and the technical or alphanumeric digit. The second one is related to the setup of the internal application and the technical or alphanumeric digit.

2.1.- Network addressing

After entering the setup menu, the device displays the DHCP (Dynamic Host Configuration Protocol), and shows the by default NO option. To modify the option displayed on the screen, press the Scroll DOWN key until the YES option appears. Do this twice and the device cyclically displays both options until one of them is validated.

When the DHCP server is activated via the YES option, press the SCROLL DOWN key to go to the next option.

2.2.2.- Client ID - ( DHCP YES )

After entering the DHCP authentication and the subsequent validation, the device displays the Client ID parameter setup on the screen, which makes reference to the DHCP name of the device to be logged into the Ethernet network.

The edit cursor in the first digit is activated via the SCROLL RIGHT key. This key and the SCROLL UP and SCROLL DOWN buttons can be used to parameterise an alphanumeric data entry of up to 20 digits.

When the data is entered, press the SCROLL RIGHT key twice until the edit key disappears, and then validate the data with the SCROLL DOWN key, by going to the next screen.

2.2.2.- Assigned values - ( DHCP YES )

After entering the Client ID name in the device for the first time, the device displays the parameters assigned by the DHCP server on the screen. Given that the parameters that are being edited will not be fixed until the device is configured, the device displays the following fields on the screen, which cannot be edited (asterisk in upper left hand corner):

- 2.8.1.- Netmask
- 2.8.2.- Gateway
- 2.8.4.- Primary DNP
- 2.8.5.- Secondary DNS

2.2.3.- Primary NTP

The device can be synchronised with a time and date NTP server (Network Time Protocol) server in the UTC time system. The time selection does not display a value by default, indicating that the synchronisation is completed via DHCP, if the network server allows this to be done. In this case, it is the main servicer.

To configure an NTP server that is different from the DHCP (0.0.0.0), press the SCROLL RIGHT key, enabling the editor cursor in the first digit. Set parameters for an alphanumeric data entry with the SCROLL UP and SCROLL DOWN buttons up to a maximum of 20 digits, indicating an http address or internal or external IP (if the device has Internet access). After establishing the parameters, press the SCROLL RIGHT key twice until the edit key disappears, and then validate the data with the SCROLL DOWN key, by going to the next screen.

Servers available on the Internet:

- es.pool.ntp.org
- pool.ntp.org

2.2.1.- Secondary NTP

configuration of the secondary NTP server, carry out the same procedure as with the Primary NTP.

2.2.4.- Time Zone

To configure the time zone, press the SCROLL RIGHT key to select the time zone where the EDS device is located.

After selecting the zone, press the SCROLL DOWN key, and go to the next screen.

2.2.5.- AMB® - Active Mode Bridge

The AMB system reverses the connection process of remote devices. In this case, it is the equipment that starts the communication process with the connections server located in a central computer, by creating a transparent communications tunnel between the equipment and connection server.

Therefore, the user has to set up and maintain a fixed IP system or DynDNS in its remote control locations.

2.2.1.- Active mode

To configure an access route, press the SCROLL RIGHT key, until the YES option appears. When the ACTIVE MODE is activated via the YES option, press the SCROLL DOWN key to go to the next option.

2.2.5.- Act. Mode Port - ( ACTIVE MODE YES )

The “Act. Mode Port” option is the access port of the central server, where the AMB connections software has been installed. This computer must have an access port for connecting all remote devices, in order to establish a transparent communication process.

In this case, access to the Internet connection from the central location will require the use of a connection router, which will establish a NAT access rule to activate a TCP connection port in the connection server (connection path).

An access port must be activated in the Internet access router, which will internally transfer the public communication frames to the AMB internal connection server and to a port specified by the user and the device.

The port activated in the communication router must be configured in the “Port” section.

2.2.6.- Enable Security

A user and edition password can be activated in the device, thus avoiding modification of the configuration parameters. The device displays YES by default. It should be noted out that if the password is activated, it will be present in all the device’s setup and display accesses (keyboard, Web setup and maintenance application).

To modify the option displayed on screen, SCROLL RIGHT until the YES option appears. Do this twice and the device cyclically displays both options until one of them is validated. Establish the parameters for the alphanumeric data entry with the SCROLL UP and SCROLL DOWN buttons, up to 20 digits corresponding to the YES, and when the data is validated, repeat the operation with the PRESS/SEND. Validate the data (SCROLL RIGHT and SCROLL DOWN).

2.2.7.- Change NTP - ( DHCP YES )

The information must be validated to save the setup. The device displays YES by default. When the completed configuration is validated, press the SCROLL DOWN key and the device saves the data and leaves configuration.

If the setup is not saved, SCROLL RIGHT until the NO option appears. Do this twice and the device cyclically displays both options until one of them is validated with the SCROLL DOWN key.

2.2.8.- Client ID - ( DHCP NO )

If the DHCP server is not activated, shown in section 2.2.2.- DHCP assignment, validate the NO option using the SCROLL DOWN key and go to the next screen.

2.2.8.- IP - ( DHCP NO )

The user configures an IP address for the EDS device using the configuration option. To do this, press the SCROLL RIGHT key to activate the edition cursor in the first digit. Press the SCROLL UP and SCROLL DOWN buttons to establish the parameters of a 0.0.0.0 type numeric data entry. After establishing the parameters, press the SCROLL RIGHT key twice until the edition key disappears, and then validate the data with the SCROLL DOWN key, by going to the next screen.

2.2.8.- NetMask - ( DHCP NO )

To configure the (NetMask) setup, press the SCROLL RIGHT key, activating the edition cursor in the first digit. Press the SCROLL UP and SCROLL DOWN buttons to establish the parameters of a 0.0.0.0 type numeric data entry. After establishing the parameters, press the SCROLL RIGHT key twice until the edition key disappears, and then validate the data with the SCROLL DOWN key, by going to the next screen.

2.2.8.- Gateway - ( DHCP NO )

To configure the Gateway setup, press the SCROLL RIGHT key, activating the edition cursor in the first digit. Press the SCROLL UP and SCROLL DOWN buttons to parameterise a 0.0.0.0 type numeric data entry. After establishing the parameters, press the SCROLL RIGHT key twice until the edition key disappears, and then validate the data with the SCROLL DOWN key, by going to the next screen.

2.2.8.- Primary DNS - ( DHCP NO )

To configure the Primary DNS configuration, press the SCROLL RIGHT key, activating the edition cursor in the first digit. Press the SCROLL UP and SCROLL DOWN buttons to establish the parameters of a 0.0.0.0 type numeric data entry. After establishing the parameters, press the SCROLL RIGHT key twice until the edition key disappears, and then validate the data with the SCROLL DOWN key, by going to the next screen.
2.2.8.7- Manual Date and Time setup

If there is no authentication configuration by the DHCPP system, and no DHCP server is available, EDS allows the time and date to be configured manually when validating the changes by displaying the configuration menu. The date and time are displayed on the screen with the following format: dd/mm/yyyy HH:MM:SS.

To configure them, press the SCROLL RIGHT key, activating the edit cursor in the first digit. Use the SCROLL UP and SCROLL DOWN buttons to establish the parameters of the numerical data entry. After establishing the parameters, press the SCROLL RIGHT key twice until the edition key disappears, and then validate the data with the SCROLL DOWN key, leaving setup and validating the configuration.

When the setup is validated, the O/TDE caption appears, returning to the main screen.

2.2.9- Display of setup parameters

To display the setup parameters, the user must enter the setup menu by simultaneously pressing the SCROLL RIGHT, SCROLL UP and SCROLL DOWN keys. THE USER MUST Press the SCROLL DOWN key twice for complete visualisation of the device configuration.

If a user and password are available even when the user does not have one, all the setup parameters can be visualised without being able to change them (asterisk in top left hand corner).

2.2.9.1- Ping system

To confirm IP connectivity via a Local Area Network (LAN) or the Internet using a DSL or 3G router, the user sometimes has to know if the EDS device has this IP access or if the unit has particular access to a certain host.

To do this, EDS has a ping section, from which the user can carry out an online ping test with an IP address or name, emulating the ping command of a conventional operating system.

The device displays the physical address within the setup menu, as shown in section 2.2.1- MAC address. Press the SCROLL RIGHT key to go to the on-screen caption HOST PING. To enter the name or IP address to carry out the ping test, press the SCROLL RIGHT key to activate the edit cursor in the first digit. Press this key and the SCROLL UP and SCROLL DOWN buttons to establish the parameters of an alphanumeric data entry of up to 20 digits. After the data is entered, press the SCROLL RIGHT key twice until the edit key disappears, and then validate the data with the SCROLL DOWN key, by going to the next screen.

When the data is validated, the screen displays the PING CAPTION (Afterwards the results:

- **PING RESULT** ON - a response was obtained from the host
- **PING RESULT** OFF - no response was obtained from the host

When a result is obtained by the device, press the SCROLL DOWN key and the device goes back to the by default display screen.

2.2.10- Internal setup web site

After establishing the parameters with the keyboard and connecting to the Ethernet, the device has a web setup where the user can independently modify the data entered with the keyboard. The setup web site is at the http address below:


Where xxx.xxx.xxx is the IP address assigned by the user.

Where name_dhcp is the name assigned and authenticated by the name server of the local area network (LAN).

2.3- Network parameters setup (Software)

Configuration of addressing can be done in the same way as using the keyboard via the IPSetup.exe file, available on a CD supplied with the device.

2.3.1- Fixed IP assignment

To assign a fixed IP address, enter the MAC address displayed on the device screen as shown in section 2.2.1- MAC address address, the format of which is 00:26:45:XX:XX:XX.

In the Address field, enter the IP address being configured; do the same with the (Netmask) and the (Gateway) port if necessary. After entering the device setup, press “Setup” to send the setup to the equipment.

2.3.2- DHCP IP assignment

To assign the DHCP name, activate the option using the upper right hand arrow and select On. Once the setup fields have been enabled, enter the MAC address.

In the Address field, enter an unused, temporary IP address, which is within the working range of your computer. In the Host Name field, enter the DHCP name to be assigned to the equipment. Optionally, the user can configure the parameters of the Client ID field. The default Vendor ID of the device is CIRCUTOR.

2.3.3- Setup web site

Once connection to the Local Area Network (LAN) is established and the IP address or DHCP name is configured, the device has an internal web site where the user can independently modify all the parameters concerning network configuration (2.2.10- Internal setup web site), and even the time and date data.

Once the Ethernet addressing is configured and integrated into the Ethernet network, the device variables are visible to the user via a conventional Internet Explorer, or through a Java plug-in installed on the computer (http://www.java.com/es/download/).

Another access interface is the Universal Scada Client.

To see the Web display interface, the user must access it via the http address below:

- http://xxx.xxx.xxx
- http://idhp.name

Where xxx.xxx.xxx is the IP address assigned by the user.

Where name_dhcp is the name assigned and authenticated by the name server of the local area network (LAN).

2.3.2- XML server

The XML server is an excellent integration tool for external applications. EDS has a server available whose access requests are identified in this manual (see XXX).

3.3- Digital inputs

The device has a total of 8 digital inputs, whose function is to count energy impulses coming from external sensors or for detection of the logical status of the input. The contacts associated to the digital inputs of the device must be voltage-free dry contacts.

3.3.1- Impulse meter function

The electronic meters have an impulse output that is proportional to the recorded power. With its inputs, EDS is a centralising unit with 8 digital inputs (opto-coupled) for reading impulses from electricity, water, gas, etc. meters. The value of these impulses is associated to 8 memory records, stored in a non-volatile memory.

Each registry is 32 bits (4 bytes), so it counts a maximum of up to 4,294,967,295 impulses. When a memory record reaches this value, the meter is reset back to zero.

The minimum duration of the impulse or status change of the digital input must be 50 ms. The minimum time between two successive impulses must also have a minimum duration of 50 ms. This represents a maximum sampling frequency of 10 Hz.

Its Web server and internal memory enable the user to extract graphics and tables of impulses received during a certain period (table and graphic function).

3.3.2- Input logical status function (0/1)

The 8 digital inputs in the device are voltage-free and have an input logical status detection function. This means that when a voltage is set between the common and one of the digital inputs, the device detects that the input has closed, and displays the status via both communications servers.

3.4- Digital outputs

The device has 6 relay digital outputs. The user can use remote control to carry out actions on the outputs (open, close, create an impulse).

These actions can be manual, or via programming in the events section of the device (see PowerStudio Scada manual).

3.5- RS-485 expansion bus

The device has an RS-485 communications bus that allows it to communicate with external peripheral acting as a communications master and store data recorded in its 200Mb cyclic memory.

Its Web accessibility and memory enable the user to view data coming from devices connected to the bus in real time, and easily and simply view graphics and tables of the parameters registered by the device.

As well as linking communications with devices connected to its RS-485 communications bus, the device also has the capacity to make connections via IP connectivity (local or remote), and access throughout the IP via addressing or DHCP name.

To add devices to the EDS energy device setup, the user must install the PowerStudio or PowerStudio Scada application, so as to export a new setup of the device, adding new analyzers or slaves connected to the unit.

EDS allows configuration of up to 5 slave devices connected to its network.

3.6- Additional PS/SS features

To configure the other system features, read the PowerStudio / Scada Editor manual. It has all the information the user needs.

EDS

M98237501-03-13A
4. - XML instructions

Not only does EDS function as an excellent energy efficiency manager for local and multi-point networks, it also has a default XML requests server that enables it to be easily integrated into a SCADA or remote monitoring system. The device, via its IP address, addresses to GET and PUT requests that can carry out different functions on the device.

4.1. - Type of variables

The device has a list of available variables, in accordance with the device features. The basic code is made up of the device name and the variables separated by a dot:

<device>
  <name_variable>
</device>

This way the software knows which variable it is and what device must be asked to find out the value of the variable.

When an incremental variable is discriminated (energy, impulse meter or similar), the information about the parameterised discriminator is added to the basic code:

<device>
  name_discriminator@type_time:variable
</device>

The discriminable variables are shown in the list with an asterisk.

4.2. - EDS variables list

If slave devices are provided, the frames sent to EDS are configured in the same way by name and variable, as shown in section 4.1.

The following table defines the variables available in EDS:

<table>
<thead>
<tr>
<th>Digital Inputs</th>
<th>XML - Status Value</th>
<th>XML - Metric Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital Input 1</td>
<td>D1</td>
<td>C1</td>
</tr>
<tr>
<td>Digital Input 2</td>
<td>D2</td>
<td>C2</td>
</tr>
<tr>
<td>Digital Input 3</td>
<td>D3</td>
<td>C3</td>
</tr>
<tr>
<td>Digital Input 4</td>
<td>D4</td>
<td>C4</td>
</tr>
<tr>
<td>Digital Input 5</td>
<td>D5</td>
<td>C5</td>
</tr>
<tr>
<td>Digital Input 6</td>
<td>D6</td>
<td>C6</td>
</tr>
<tr>
<td>Digital Input 7</td>
<td>D7</td>
<td>C7</td>
</tr>
<tr>
<td>Digital Input 8</td>
<td>D8</td>
<td>C8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Digital Output Status</th>
<th>XML - Force Output</th>
<th>Forced Output/Closed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital Output 1</td>
<td>DO1</td>
<td>P5</td>
</tr>
<tr>
<td>Digital Output 2</td>
<td>DO2</td>
<td>P5</td>
</tr>
<tr>
<td>Digital Output 3</td>
<td>DO3</td>
<td>P5</td>
</tr>
<tr>
<td>Digital Output 4</td>
<td>DO4</td>
<td>P5</td>
</tr>
<tr>
<td>Digital Output 5</td>
<td>DO5</td>
<td>P5</td>
</tr>
<tr>
<td>Digital Output 6</td>
<td>DO6</td>
<td>P5</td>
</tr>
<tr>
<td>Digital Output 7</td>
<td>DO7</td>
<td>P5</td>
</tr>
<tr>
<td>Digital Output 8</td>
<td>DO8</td>
<td>P5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date and Time</th>
<th>XML - Value Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use and Time</td>
<td>UTIM Last Server Communicates</td>
</tr>
<tr>
<td>Device status</td>
<td>STATUS 1 Communication OK</td>
</tr>
<tr>
<td></td>
<td>2 Not available</td>
</tr>
<tr>
<td></td>
<td>3E Preambles</td>
</tr>
<tr>
<td></td>
<td>4E Error</td>
</tr>
<tr>
<td></td>
<td>5E Device Error</td>
</tr>
</tbody>
</table>

4.3. - XML Services

The requests must follow the URI standard (RFC 2396), and the user of these requests should take this detail into account when making such calls (especially in cases where the name of any device contains non-ASCII characters). Take into account that the length of the request must not under any circumstance exceed 4000 characters.

4.3.1.- Configured devices request

With this request the XML service returns the list of connected devices to the EDS energy efficiency manager. http://x.x.x.x/services/user/devices.xml

http://name_dhp/services/user/devices.xml

<devices>
  ...<id>...</id>
  ...</device>
</devices>

4.3.2.- Information about the device

Request for detailed information about the devices. Each of you devices want more information, should be included in the XML sentence ?id=device?

http://x.x.x.x/services/user/deviceInfo.xml?id=device?

<devices>
  <device>
    <id>...</id>
    <description>...</description>
    <typeDescription>...</typeDescription>
    <var>...</var>
    ...</device>
</devices>

4.3.3.- Information about the variable

The user can request detailed information about one or more variables from a device and even make single request for the information about all the variables available in the device.

4.3.3.1.- Information about one or more variables

Request for detailed information about one or more variables of the device (if information is needed about more variables, link the other requests below with ?var=device:variable?).

http://x.x.x.x/services/user/varInfo.xml?v=var=device:variable?

<variable>
  <id>...</id>
  <title>...</title>
  <hasValue> ... </hasValue>
  <hasLogger> ... </hasLogger>
  <sampleMode> ... </sampleMode>
  <unitsFactor> ... </unitsFactor>
  <decimals> ... </decimals>
  ...</variable>

4.3.3.2.- Information about all the variables

Request for detailed information about all the variables of the device (if information is needed about more devices, link the other requests below with ?id=device?):

http://x.x.x.x/services/user/varInfo.xml?id=device?

<devices>
  <device>
    <id>...</id>
    <description>...</description>
    <typeDescription>...</typeDescription>
    <var>...</var>
    ...</device>
</devices>

4.3.4.- Instantaneous variable

The user can request the instantaneous values of one or more variables, and can even request the information about all the instantaneous values of a device (if information is needed about more devices, link the other requests below with ?var=device:variable?):

http://x.x.x.x/services/user/values.xml?v=var=device:variable?

4.3.4.1.- Instantaneous value of one or more variables

Request for the instantaneous value one or more variables of the device (if information is needed about more variables, link the other requests below with ?var=device:variable?):

http://x.x.x.x/services/user/values.xml?var=device:variable?

4.3.4.2.- Instantaneous value of all variables

Request for the instantaneous values of all the variables of the device (if information is needed about more devices, link the other requests below with ?id=device?):

http://x.x.x.x/services/user/values.xml?id=device?

<values>
  <variable>...</variable>
  ...</value>
</values>

4.3.5.- Historical data

Request for historical data registry of an incremental variable. Returns information on one or more variables between the "begin" and "end" dates. Each variable for which information is required must be included in the request as ?var=device:variable?

When only the date is required, the format is DDMMYYYY;

When the date and time are required, the format is DDMMMYYYYHHMMSS.

Both the date and the time must be expressed in UTC (Universal Coordinated Time).

The grouping period can be defined by different criteria:

- value in seconds (for example 900): value in seconds in which the data is grouped
- ALL: the data is grouped into a single value
- AUTO: grouping is automatic with predefined intervals according to "begin" and "end"
- FILE: data not grouped. the information as registered in the database
- if the period parameter does not appear in the request, it is considered as value 0 and the data is not grouped

http://x.x.x.x/services/user/records.xml?begin=010320110000&end=0103201100000000&var=device:variable?

<periodGroup>
  <period>...</period>
</periodGroup>

4.3.6.- Historical events file

As this user manual describes, the PowerStudio / Scada Editor makes it possible to configure events or alarms within the EDS device and record them in the internal memory.

With the following request, the user can request the historical events file between the dates defined. Every event that is requested with a historical events file is defined as

?eventName

When only the date is required, the format is DDMMMYYYY;

When the date and time are required, the format is DDMMY YYYYHHMMSS.

Both the date and the time must be expressed in Universal Coordinated Time.

http://x.x.x.x/services/user/records.xml?begin=010320110000&end=3103201100000000&var=device:variable&period=900

<recordGroup>
  <period>...</period>
</recordGroup>

- recordGroup: field identifying the XML as a response to the variable register request
- period: recording period; time between recordings
- record: identifies each recording (date:time: date and time read)
- field: standard recording value (for others consult PS manual)
- value: value of variable at the time of the request.
4.3.8.1. - Test commands

Before initiating implementation of the active events system, there are a number of PUT type test requests between the listener and the producer (remote engine) and vice versa, the aim of which is to test and ensure connectivity between both systems.

The listener can send the request with the following message body to check connectivity with the remote search engine (producer):

```
http://ip_producer:port/services/user/testListener.xml
```

This request must contain the following body in the message, in which the listener and the type of data to be received are defined:

```
<listener>
  <ip>ip_listener</ip>
  <port>80</port>
  <whyFired>ACTIVATION</whyFired>
</listener>
```

The request contains the following information in XML format in the body of the message: information about the events produced:

```
<producer>
  <id>Tf</id>
  <name>Event 1</name>
  <description>Description 1</description>
  <annotation>Annotation 1</annotation>
  <dateTime>25112010201034</dateTime>
  <whyFired>ACTIVATION</whyFired>
</producer>
```

```
<producer>
  <id>Tf</id>
  <name>Event 2</name>
  <description>Description 2</description>
  <annotation>Annotation 2</annotation>
  <dateTime>25112010201034</dateTime>
  <whyFired>DEACTIVATION</whyFired>
</producer>
```

Notes referring to the active events:

- **Note:** If the producer has implemented http authentication by user and password, it must be implemented in the listener by the user.

4.3.9. - Forcing of variables

This request is used to send the variable forcing order (or writing) to the system. The request should include the name of the device that wants to make the request. It is important to incorporate the authentication data when this is necessary.

```
<forceVariables>
  <forceVar>
    <forceName>...</forceName>
    <forceValue>...</forceValue>
    <record/>
  </forceVar>
  ...
</forceVariables>
```

```
<forceVariables>
  <forceVar>
    <forceName>...</forceName>
    <forceValue>...</forceValue>
    <record/>
  </forceVar>
  ...
</forceVariables>
```

When there is any change in the events, the request that the producer creates against the listeners’ distribution list giving information about the events is PUT type with the following Syntax:

```
http://ip_producer:port/services/user/producer.xml
```

The request contains the following information in XML format in the body of the message: information about the events produced:

```
<producer>
  <id>Tf</id>
  <name>Event 1</name>
  <description>Description 1</description>
  <annotation>Annotation 1</annotation>
  <dateTime>25112010201034</dateTime>
  <whyFired>ACTIVATION</whyFired>
</producer>
```

```
<producer>
  <id>Tf</id>
  <name>Event 2</name>
  <description>Description 2</description>
  <annotation>Annotation 2</annotation>
  <dateTime>25112010201034</dateTime>
  <whyFired>DEACTIVATION</whyFired>
</producer>
```
5.- Technical specifications

### Power circuit
- Single-phase (phase – neutral) A1 – A2:
  - Frequency: 47...63 Hz
  - Maximum consumption: 5...8 VA
  - Working temperature: -10...+ 60 °C
  - Water content (non-condensing):

<table>
<thead>
<tr>
<th>Standard version</th>
<th>Relay</th>
</tr>
</thead>
<tbody>
<tr>
<td>85...264 Vac / 120...300 Vac</td>
<td>750 VA</td>
</tr>
<tr>
<td>47...63 Hz</td>
<td>250 Vac</td>
</tr>
<tr>
<td>5... 95 %</td>
<td>5 A with resistive load</td>
</tr>
</tbody>
</table>

### Output Features:
- Type: Relay
- Maximum switching power: 750 VA
- Maximum switching voltage: 250 Vac
- Maximum switching intensity: 5 A with resistive load
- Electrical life (250 Vac / 5 A):
- Mechanical working life: 2 x 107 operations

### Mechanical features:
- Case material: UL94 - V0 self-extinguishing plastic
- Equipment protection degree: IP 20
- Dimensions (mm):
  - 106 x 70 x 90 mm (6 modules)
  - 250 g
- Maximum operating height: 2,000 m
- Water content (non-condensing):
  - 5... 95 %

### Inputs features:
- Type: Voltage-free opto-insulated (dry contact)
- Maximum activation current:
  - 50 mA
  - 1200 V

### Network interface:
- Type: Ethernet 10BaseT / 100BaseTX self-detectable
- Connector:
- Network protocols:
  - RJ45
  - HTTP / Modbus/RTU in RS-485 bus

### Serial interface:
- Type: Three-wire RS-485 (A/B/S)
- Transmission speed (configurable):
  - 4800, 9600, 19,200, 34,800, 57,600, 115,200 bps
- Data bits:
  - 8
- Parity:
  - No parity, odd, even
- Stop bit:
  - 1 / 2

### LED symbols:
- Equipment power supply and CPU activity
- Communicating slave devices shutdown
- Green: Full duplex / Yellow: Half duplex / Activity
- Green: 100 Mbits / Yellow: 10 Mbits / Link

### Display:
- Type:
- Characters: 20
- Back lighting: Yes

### Mechanical features:
- Case material: UL94 - V0 self-extinguishing plastic
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- Type: Three-wire RS-485 (A/B/S)
- Transmission speed (configurable):
  - 4800, 9600, 19,200, 34,800, 57,600, 115,200 bps
- Data bits:
  - 8
- Parity:
  - No parity, odd, even
- Stop bit:
  - 1 / 2

6.- Connections

### DETAILS OF THE POWER SUPPLY AND RS-485 COMMUNICATION (SLAVE EQUIPMENT) CONNECTIONS

### DETAILS OF DIGITAL INPUT 4 ACTIVATION

7.- Technical Service

If you have any doubts about the operation of the unit or suspect any malfunction, contact our service staff at CIRCUTOR, SA

**CIRCUTOR, SA - Technical Assistance Service**

Vial Sant Jordi, s/n
08232 – Viladecavalls (Barcelona), SPAIN

Tel.: 902 449 459 (Spain)
Tel.: +34 937 452 900 (outside Spain)
e-mail: sat@circutor.es