

# User Manual

## ES1000 Series Energy Switch



Racktivity

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# Introduction

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## Features

The EnergySwitch PDU Family, EnergyOS and its included EnergyDNA deliver power within the data center along with the energy utilization and capacity optimization features you demand. These next-generation PDUs are a step into the future of data center energy management, leveraging leading-edge EnergyDNA for highly granular visibility into rack-based energy quality and consumption.

### Main Features:

- Real-Time, True RMS measurements
- Metered and Switched per outlet
- Serial out-of-band management ports
- Role-based Authentication
- Usage and Access Event Logging
- Instant-On technology
- Physical and Logical current protection
- Sequential Outlet startup
- Programmable Thresholds and alarms
- Support for Racktivity's EnergySensor family
- Flash Upgradable
- Ultra-Low power consumption

# Applicable Models

Unless specified otherwise, all information in this document is applicable to the following Racktivity Energy Switch ES1000 models:

- ES1008-16

## Specifications

### Electrical Ratings

#### Input:

Voltage	100V - 240V
Frequency	50/60Hz
Current	16A

#### Output:

Connection	8x C13
Voltage	100V - 240V
Current total	16A
Current per C13	8A

The model number, input and output ratings and certification information for the Energy Switch are also shown on the label found on the case of the unit.

### Operating Environment

Operating temperature	0°C to 50°C	32°F to 122°F
Storage temperature	-10°C to 60°C	14°F to 140°F
Humidity	5% to 85% RH	non-condensing

### Dimensions

Dimensions cm (WxHxD)	48.55 x 4.45 x 14.20
Dimensions inch (WxHxD)	19.00 x 1.75 x 5.59

## User Account Overview

The Energy Switch has 3 types (levels) of user accounts: **admin**, **restricted** and **guest**. The following table shows an overview of the functionality of each type:

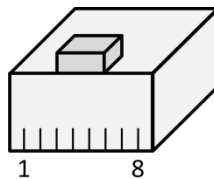
	<b>admin</b>	<b>restricted</b>	<b>guest</b>
Open website	Yes	Yes	Yes
Open CLI session	Yes	Yes	Yes
View current status (states, data & values)	Yes	Yes	Yes
Toggle outlets	Yes	Yes	No
Edit thresholds	Yes	No	No
Edit outlet names	Yes	No	No
Change SNMP notification settings	Yes	No	No
Edit device settings	Yes	No	No
View & download logs	Yes	No	No
Default user name	admin	restricted	guest
Default password	1234	1234	1234

The same features and options apply to both the website and the Command Line Interface (CLI). To change the login credentials for the users please refer to the Device Settings chapter.

## RS232 Specifications

The RS232 ports on the Energy Switch have the following pin lay-out:

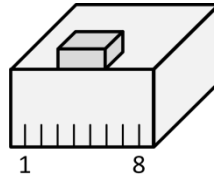
<b>Pin</b>	<b>Function</b>
1	-
2	-
3	RxD
4	GND
5	GND
6	TxD
7	-
8	-



# CLI Specifications

The CLI port on the Energy Switch has the following pin lay-out:

Pin	Function
1	-
2	-
3	TxD
4	GND
5	GND
6	RxD
7	-
8	-



# Safety



## Save these instructions!

This Safety Information contains important instructions that should be followed during installation and maintenance of the Energy Switch. It is intended for Racktivity customers who set up, install, relocate, or maintain Racktivity equipment. Changes and modifications to this unit not expressly approved by Racktivity could void the warranty.



## Electrical Hazard!

Read the following information before installing or operating your Energy Switch:

- Do not work alone under hazardous conditions.
- High current through conductive materials could cause severe burns.
- Follow all local and national codes when installing the Energy Switch.
- To avoid possible electrical shock and equipment damage, use only the supplied hardware.
- The Energy Switch should be connected to a single-outlet dedicated circuit, protected by a circuit breaker with the same current rating as the Energy Switch.
- The plug serves as the disconnect for the Energy Switch. Make sure the utility power outlet for the Energy Switch will be close to the Energy Switch and readily accessible.
- Make sure the utility power outlet and the Energy Switch power cord and plug are in good condition.
- Do not connect the Energy Switch to an ungrounded utility power outlet.
- Do not operate your Energy Switch with any covers removed or when it is damaged.
- This Energy Switch contains potentially hazardous voltages. There are no user serviceable parts inside the Energy Switch. All repairs and service should be performed by authorized service personnel only.
- The power requirement for each piece of equipment connected to the Energy Switch must not exceed the individual outlet's load rating.
- The Energy Switch provides convenient multiple power outlets, but it does not provide surge or line noise protection for connected equipment.
- The Energy Switch is designed for indoor use only in a controlled environment away from excess moisture, temperature extremes, conductive contaminants, dust, direct sunlight or magnetic sources.
- The total power requirement for equipment connected to the Energy Switch must NOT exceed the maximum load rating for the Energy Switch.
- Do not attempt to mount the Energy Switch to an insecure or unstable surface.
- Never attempt to install electrical equipment during a thunderstorm.
- Use of this equipment in life support applications or any medical applications is strictly prohibited since failure of this equipment can reasonably be expected to cause the failure of the life support equipment or to significantly affect its safety.
- Putting several Energy Switch units in cascade is NOT allowed.

- **CAUTION:**

The Rack Controller contains a lithium battery and should not be disposed of with general refuse. Dispose of the lithium battery in accordance with all local codes and regulations for products containing lithium batteries. Contact your local environmental control or disposal agency for further details. The battery is not intended to be user replaceable.

## Certifications

**Not all certifications are applicable to every model. Please check the label on your device.**

- **CE / FCC**

This device is designed in compliance with the requirements of the 4 following regulations: EN 55022: Class B, EN 61000-3-2, EN 6100-3-3 and EN 55024. This device is certified to comply with Part 15 of the FCC rules.



- **UL (US & Canada)**

This device is in the certification process to comply with rule UL /CSA 60950-1 (2<sup>nd</sup> Edition) safety of Information Technology Equipment (ITE) Part 1.



## Compliance

- **WEEE**

Waste Electrical and Electronic Equipment



- **RoHS**

Restriction of Hazardous Substances



# Recycling



The materials used for shipping the Energy Switch are recyclable, please save them for later use or dispose of them appropriately.

## Servicing & Repair

**There are no user serviceable parts inside the Energy Switch. All repairs and service should be performed by authorized service personnel only.**

Please refer to the Service manual for RMA procedure.

## Additional Documentation

Additional documentation regarding the following subjects is available on the Racktivity Support Website <http://www.racktivity.com/support/>.

- API
  - Manual
  - GUID Overview
  - (python) examples
- Energy Sensor User Manual
- Servicing (RMA)

# Getting Started

## Receiving Inspection

Inspect the package (see INVENTORY section) and contents for shipping damage and make sure that all parts were received. Report any damage immediately to the shipping agent and report missing contents, damage, or other problems immediately to your reseller.

## Inventory

Please verify the contents of the box:

### Standard Package

Item	Quantity
Energy Switch	1
Power cable	1
Installation Manual	1

# Installation

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## Rack Mounting Instructions

- Elevated Operating Ambient  
When installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (T<sub>ma</sub>) of 50 °C.
- Reduced Air Flow  
Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised. It is recommended that 2.5cm (1 inch) of clearance be supplied around the sides of the unit.
- Mechanical Loading  
Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading. The unit should be mounted with screws suitable for up to 10kg (22lbs).
- Circuit Overloading  
Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- Reliable Earthing  
Reliable earthing of the unit should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

# Mounting the Energy Switch

Attach the Energy Switch to a vertical rail in your rack. Position the Energy Switch, align the buttons with the rack mounting slots and fix the Energy Switch with the required screws (not included in the package).

## Connecting the Energy Switch

1. The Energy Switch has a detachable power cord. Attach the included power cord to the Energy Switch by inserting the input cable in to the power inlet.

*Note: Optionally, a user-supplied power cord can be attached to the Energy Switch by connecting it to the IEC inlet. The cord-set should be a UL Listed type SJT or better rated minimum 14 AWG (1.5mm<sup>2</sup>) rated 125V or 250V.*

2. Connect the input plug to a compatible AC power outlet.

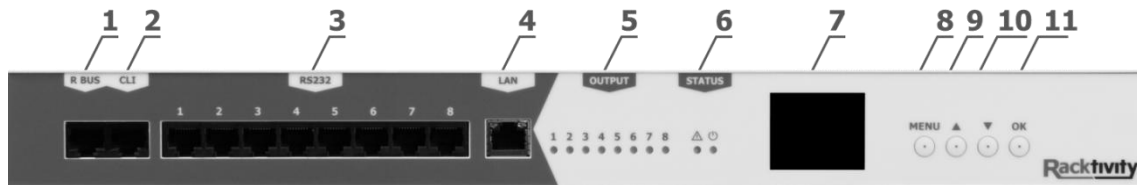
*Note: The AC power source should not share a circuit with a heavy electrical load.*

3. When using the device for the first time all OUTPUT LEDs will light up consecutively indicating that the outlets are being activated.
4. The POWER LED (blue) will become active

Connect your equipment's input plugs to the outlet plugs of the Energy Switch.

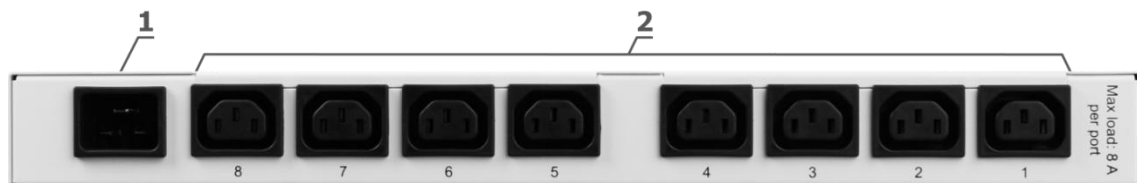
# Overview

## Front Panel



1	R BUS	RS485 peripheral bus connector (for external modules)
2	CLI	RS232 Command Line Interface connector
3	RS232	8 x RS232 Out-of-Band management connectors
4	LAN	Ethernet connector (with connectivity indicator LEDs)
5	OUTPUT LEDs	8 blue outlet status LEDs
6	STATUS LEDs	Alarm and power LEDs
7	TFT	Color graphics TFT display
8	MENU	Access menu function or return to the previous screen
9	UP	Move to the previous page or to browse upwards in a list
10	DOWN	Move to the next page or to browse downwards in a list
11	OK	Enter or validate

## Rear Panel



1	INLET	Power inlet
2	OUTLET	8 Power outlets

# Status LEDs

## Output LEDs (1-8)

ON	The corresponding outlet is turned on
OFF	The corresponding outlet is turned off and the connected device is not receiving input power

## Alarm LED

ON	Warning, at least one alarm: visit the Web Interface for more info
OFF	OK, no alarms triggered

## Power LED

ON	The Energy Switch is receiving input power
OFF	The Energy Switch is unpowered

# Quick Configuration

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## Using the TFT Panel Display

### Activating the Display

When the Power LED is lit and the screen is black, push any of the 4 navigation buttons next to the TFT Display to activate it. The TFT Panel standby delay can be set at the Settings page on the Web Interface (the default value is 10 minutes).

### Controlling the Display

The TFT Panel is controlled using the **UP**, **DOWN**, **MENU** and **OK** buttons next to the screen. Use the **UP** and **DOWN** buttons to navigate through the reporting screens or through a selection list in the menus. Press **OK** to select the highlighted item and **MENU** to go back.

When in a menu, the ">" symbol indicates that clicking this item will open a submenu. The "●" symbol indicates that this menu item leads directly to a setting.

# Network Settings

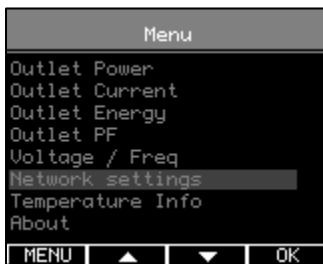
There are two methods for setting up the IP address: Dynamic IP address assignment and Manual Assignment. If you are uncertain which method to use, contact your network administrator for assistance before continuing the installation process.

**Note:** As of firmware version v1.2 the Energy Switch has secure HTTP (**HTTPS**) enabled by default. Use 'https://' instead of 'http://' in your browser to access the web portal.

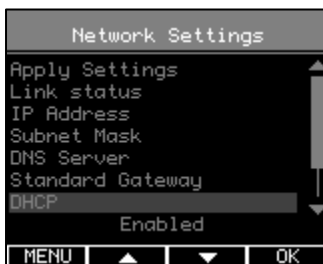
## Firmware version 1.2 or higher

### Dynamic IP Address Assignment (DEFAULT)

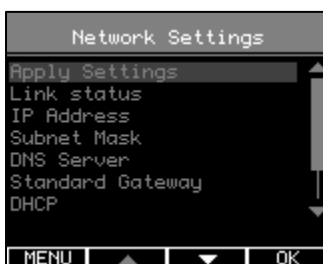
1. Press the **MENU** button until the **MAIN** menu appears, select **Network Settings** using the **DOWN** button and press **OK**.



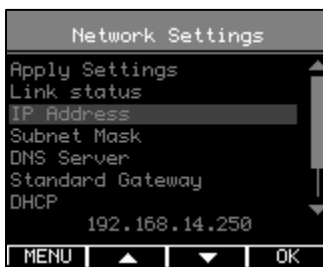
2. Within the **Network Settings** menu, select **DHCP**. When the value at the bottom of the screen shows **Enabled**, the device already has dynamic IP assignment enabled (skip to step 4). If not, press **OK** and verify that **Enabled** is displayed at the bottom of the screen.



3. Use the **UP** button to select **Apply Settings** and press **OK**. Press the **MENU** button to cancel or the **OK** button to apply the settings.



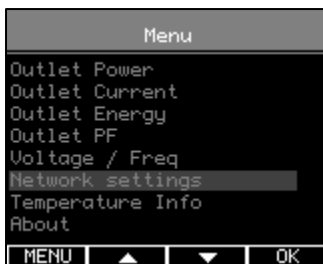
4. Press **DOWN** to select **IP Address**. The assigned IP-address is shown at the bottom of the TFT.



5. On a computer in the same network, use a browser to open the assigned IP-address, for example <https://192.168.14.250>
6. When surfing to the web portal, a login screen appears. The default user name is **admin** and the default password is **1234**

## Manual IP Address Assignment

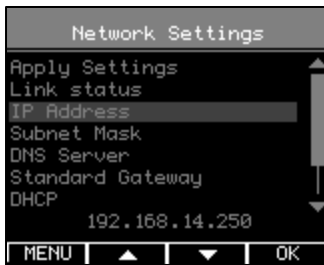
1. Obtain the correct IP address, standard gateway, DNS Server IP and subnet mask from your network administrator.
2. Press the **MENU** button until the **MAIN** menu appears, select **Network Settings** using the **DOWN** button and press **OK**.



3. Within the **Network Settings** menu, select **DHCP**. When the value at the bottom of the screen shows **Disabled**, the device already has manual IP assignment enabled (skip to the next step to enter a different IP). If not, press **OK** and verify that **Disabled** is displayed at the bottom of the screen.



4. Use the **UP** button to select **IP Address** and press **OK**.



- Use the **UP** and **DOWN** buttons to change the currently selected value and press **OK** to select the next value. When holding the **UP** and **DOWN** buttons changing the values speeds up. When ready press **MENU** to confirm and return to the **Network Settings** menu.



- Repeat the last two steps for the **Subnet Mask**, **Standard Gateway** and **DNS Server** settings.
- Use the **UP** button to select **Apply Settings** and press **OK**. Press the **MENU** button to cancel or the **OK** button to apply the settings.
- On a computer in the same network, use a browser to open the chosen IP-address, for example <https://192.168.14.250>

When surfing to the web portal, a popup appears requesting a username and password. The default username is **admin** and the default password is **1234**

## Firmware version 1.1 or lower

### Dynamic IP Address Assignment (DEFAULT)

- Press the **MENU** button until the **MAIN** menu appears, select **NETWORK** using the **UP** and **DOWN** buttons and press **OK**.



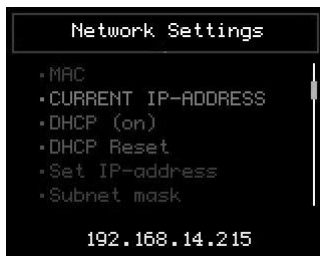
- Within the **NETWORK** menu, select **Use DHCP**. When the value in yellow at the bottom of the screen shows **yes**, the device already has dynamic IP assignment enabled; if not, press **OK**.



9. Use the **UP** and **DOWN** buttons to change the setting. Select **yes** and press **MENU** to confirm and return to the **NETWORK** menu.
10. Use the **UP** and **DOWN** buttons to select **Save IP Settings** and press **OK**. Use the **UP** and **DOWN** buttons to change the setting. Select **yes** and press **MENU** to save and return to the **NETWORK** menu.



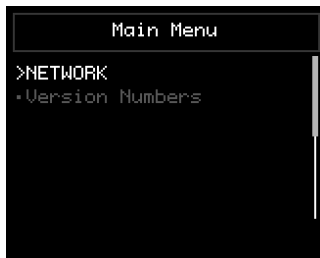
11. Press **UP** to select **CURRENT IP-ADDRESS**. The assigned IP-address is shown in yellow at the bottom of the TFT.



12. On a computer in the same network, use a browser to open the assigned IP-address, for example <http://192.168.14.250>
13. When surfing to the web portal, a login screen appears. The default user name is **admin** and the default password is **1234**

## Manual IP Address Assignment

9. Obtain the correct IP address, standard gateway, DNS Server IP and subnet mask from your network administrator.
10. Press the **MENU** button until the **MAIN** menu appears, select **NETWORK** using the **UP** and **DOWN** buttons and press **OK**.



11. Within the **NETWORK** menu, select **Use DHCP**. When the value in yellow at the bottom of the screen shows **no**, the device already has a fixed IP; if not, press **OK**.

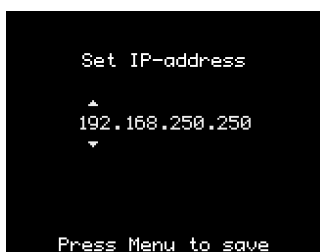


12. Use the **UP** and **DOWN** buttons to change the setting. Select **no** and press **MENU** to confirm and return to the **NETWORK** menu.

13. Use the **UP** and **DOWN** buttons to select **SET IP-ADDRESS** and press **OK**.



14. Use the **UP** and **DOWN** buttons to change the currently selected value and press **OK** to select the next value. When holding the **UP** and **DOWN** buttons changing the values speeds up. When ready press **MENU** to confirm and return to the **NETWORK** menu.



15. Repeat the last two steps for the **Subnet mask**, **StdGateway** and **DNS Server** settings.

16. Use the **UP** and **DOWN** buttons to select **Save IP Settings** and press **OK**. Use the **UP** and **DOWN** buttons to change the setting. Select **yes** and press **MENU** to save and return to the **NETWORK** menu.

17. On a computer in the same network, use a browser to open the chosen IP-address, for example <http://192.168.14.250>

When surfing to the web portal, a popup appears requesting a username and password. The default username is **admin** and the default password is **1234**

# Web Interface

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## Getting Started

### Supported Web Browsers

The following browsers have been tested and certified to work with the Energy Switch Web Interface (on all platforms):

- Internet Explorer 8 or higher
- Firefox 3.6.16 or higher
- Chrome 11.0.696.71 or higher
- Opera 11.11 or higher
- Safari 5.0.5

Other available web browsers may work with the Energy Switch but have not been fully tested by Racktivity.

### Logging in

For instructions on how to set up the TCP/IP settings to connect to the Web Interface, please see the Network Settings chapter.

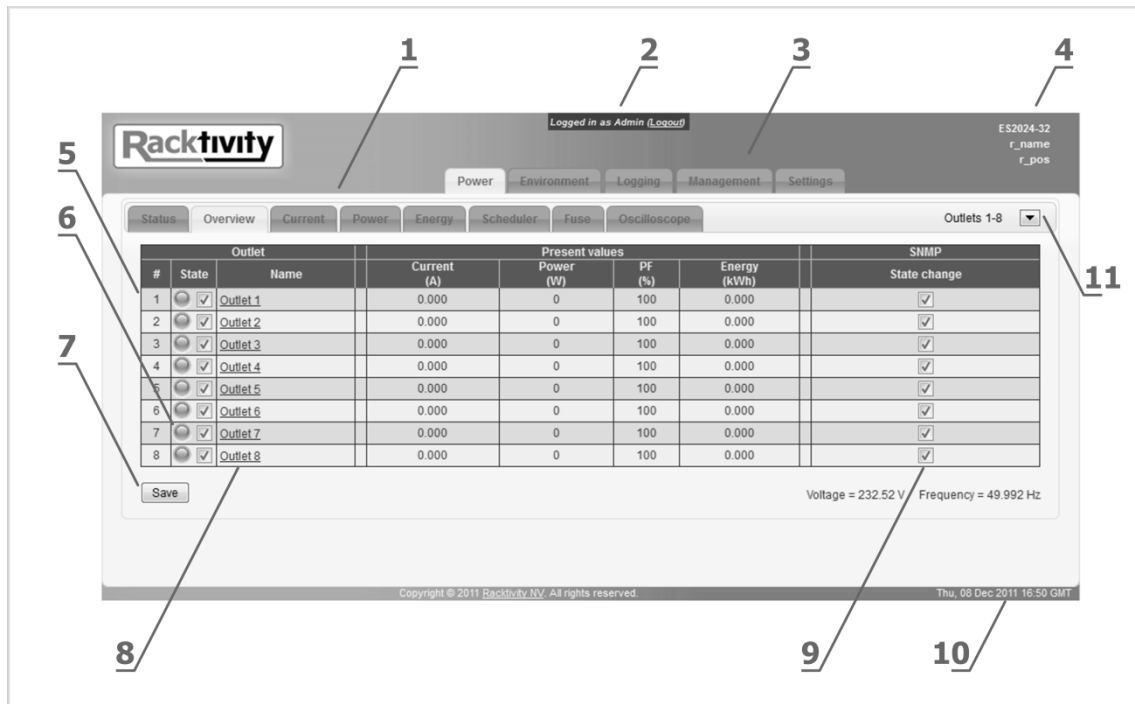
To recover from a lost password, please refer to the Troubleshooting chapter.

Use an internet browser to open the Energy Switch IP address. You will be asked for login credentials, the default values for the **administrator** account are:

<b>User name</b>	admin
<b>Password</b>	1234

To find out everything about the different types of user accounts see the User Account Overview chapter. If you are presented with a warning about the connection being untrusted (self-signed certificate) it can be ignored.

# Layout



1	<b>Sub tabs</b>	Displays the different sections of the selected main tab
2	<b>User account</b>	Displays which type of User Account is currently logged in
3	<b>Main tabs</b>	Displays the different functions of the Energy Switch
4	<b>Device info</b>	Displays the device name, rack name & rack location. Can be changed at the settings tab
5	<b>Outlet status</b>	Displays the current status of each outlet: <b>GREY:</b> the outlet is turned off <b>GREEN:</b> the outlet is on and working normally <b>ORANGE:</b> a warning threshold has been crossed, but the port state has not yet changed (only visible on the Overview tab and the affected parameter's tab) <b>RED:</b> an off threshold has been crossed, port state has changed <b>BLUE:</b> the outlet will be toggled after the set delay has expired (during boot and whilst power cycling)
6	<b>Outlet toggle</b>	Toggle the outlet state (ON/OFF/CYCLE)
7	<b>Save</b>	Save any changes made on this page
8	<b>Outlet name</b>	Change the outlet's name
9	<b>SNMP</b>	Toggle a specific SNMP notification for that outlet
10	<b>Device time</b>	The time set on the Settings tab (either manual or through an NTP server)
11	<b>Banks</b>	Power bank/module selection (only on 0U models)

# Tabs

## Power

Use the Power Tab for the following:

- See the load and general status of both the Energy Switch's individual outlets and the totals:
  - Amps
  - Wattage
  - Power Factor
  - Energy (kWh)
  - Apparent Energy (kVAh)
  - Voltage
- Control and manage outlets
- Configure thresholds for connected loads, banks (as applicable)
- Resetting measurements
- Change SNMP notifications for power related parameters (outlet toggle, amps, wattage)
- Manage outlet scheduling
- Control fuse and/or line currents
- Oscilloscope view for an outlet

## Environment

Use the Environment Tab to monitor and manage:

- Internal sensors (as applicable)
- Voltage: status, history and management

## Logging

The logging tab provides access to both the **Event** and the **Detailed** logging. After selecting the desired module and time-range the log can be downloaded or viewed inside the browser.

For more information regarding this subject, please refer to the Logging chapter.

## Modules

Use this tab to control connected Energy Sensors.

For more information regarding the modules tab, please see the Energy Sensor documentation.

**Note:** This tab is available as of firmware version 1.2 and above; and with a managed Energy Sensor.

# Management

The management tab is used to manage the modules in an Energy Switch setup, including Energy Sensors.

For more information regarding the managing of Energy Sensors, please see the Energy Sensor documentation.

Available as of firmware version 1.2

# Settings

Use this tab to configure the following settings:

- Network
- SNMP
- Telnet
- Device and User Accounts
- NTP (Network Time Protocol)
- Startup delay and priority
- Overheat protection
- Energy Cloud Sentinel

# Network Configuration

path: Settings > Network Settings

The Network Settings contains both the Network and the SNMP related settings. The SNMP related settings can be found in the SNMP Configuration chapter. The following Network settings are editable:

- **Device IP Address**
  - The IP address of the Energy Switch\*
- **Subnet Mask**
  - The subnet mask of the Energy Switch
- **Standard Gateway**
  - The IP address of the default node on the network
- **DNS Server**
  - The IP address of the Domain Name System (DNS) server
- **Enable DHCP**
  - Check to enable DHCP
- **Force secure web access (HTTPS)**
  - Check to force secure HTTP web access
- **Force secure telnet access (SSL)**
  - Check to force SSL telnet access

\* **Note:** When DHCP is enabled, the Network Settings are not necessarily the ones shown here, since they are provided by the DHCP server. Disabling DHCP will force the Energy Switch to use the provided Network Settings.

# SNMP Configuration

The Energy Switch offers SNMPv2 communication (GETs, SETs and traps). Notifications (traps) can be enabled or disabled for many of the device's functions:

- Outlet state change
- Outlet thresholds (current, power, ...)
- Totals thresholds (current, power, ...)
- Temperature thresholds
- Voltage thresholds
- Overheat protection
- ...

To toggle SNMP for a specific parameter or function, (un)check that parameter's checkbox and press the Save button. The SNMP checkboxes can be found next to most measurements.

## SNMP Settings

path: Settings > Network Settings

The Network Settings contains both the Network and the SNMP related settings. The network related settings can be found in the Network Configuration chapter. The following SNMP settings are editable:

- **SNMP Community read**  
The community read string for GET requests
- **SNMP Community write**  
The community write string for SET requests
- **SNMP Trap Community string**  
Community string used when sending SNMP traps
- **SNMP Trap Receiver port**  
The port (1 - 65535) on which traps will be sent
- **SNMP Trap Receiver IP**  
IP address of the trap receiver
- **Enable SNMP write protection**  
Check this box to disable SNMP write (SET) access to the Energy Switch completely
- **Enable SNMP Traps for device**  
The Energy Switch will not send any traps when unchecked, regardless of individual settings
- **Use ECS authentication**  
Toggles the use of an external authentication server
- **ECS Authentication server IP**  
The IP address of the authentication server
- **ECS Authentication server port**  
The port (1 - 65535) of the authentication server on which the connection will be made

# Device Settings

The Device Settings give access to

- Energy Switch identification
  - **Device name:** the name of the Energy Switch
  - **Rack name:** the name of the rack where the Energy Switch is located
  - **Rack position:** the identifier of the position in the rack
- User account settings (see the User Account Overview chapter)
  - **Admin**
  - **Restricted user**
  - **Guest**
- TFT settings
  - **TFT timeout:** the idle time in minutes after which the TFT goes into standby
  - **TFT display lock:** when checked the TFT (and buttons) cannot be used to change settings. All changes must be made through the website.
- Temperature
  - **Temperature unit:** degrees Celsius (°C) or Fahrenheit (°F)
- Clock settings (see the Network Time Protocol (NTP) chapter)
  - **Date & Time Settings:** The real-time clock dialog features several options. Uncheck the *Use NTP* checkbox to be able to set a custom date & time. Uncheck the *Use default NTP* checkbox to not use an NTP server from pool.ntp.org and enter the custom IP address into the *NTP address* field.  
**Note:** Making changes to the date/time settings might clear all logged data!

## Thresholds

Thresholds can be configured and used so that you are notified through SNMP at certain events. Many of the Energy Switch's parameters have settable thresholds. To configure a specific threshold, open the tab where the appropriate parameter is shown.

Threshold (A)		
Warning	Switch off	SNMP Warning/switch off
<input type="text" value="6.000"/>	<input type="text" value="8.000"/>	<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>
<input type="text" value="6.000"/>	<input type="text" value="8.000"/>	<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>

At least the following parameters have one or more settable thresholds:

- **Amperage**
  - path: Power > Current
- **Wattage**
  - path: Power > Power
- **Voltage**
  - path: Environment > Voltage
- **Ambient**
  - path: Environment > Ambient
- **External modules**
  - path: Environment > External Modules

- **Overheat Protection**
  - path: Settings > Overheat Protection

Depending on the parameter one or more of the following types of thresholds will be available:

- **Warning:** The outlet state is not changed, only an SNMP notification is sent
- **Switch Off:** The designated outlet is toggled off and an SNMP notification is sent
- **Low:** When the measurement goes below this value an SNMP notification is sent
- **High:** When the measurement goes above this value an SNMP notification is sent

To change a threshold enter the desired value into the appropriate input area and press the Save button. If the background of the input area turns red an incorrect value has been entered.

**Note:** Most thresholds have corresponding SNMP checkboxes that enable/disable the notification. Please ensure both the threshold **and** the appropriate SNMP notifications are set correctly.

# Resetting Measurements

For many parameters the minimum, maximum and/or total is saved to give an easy overview of load activity. These values can be easily reset by pressing the Reset link for that value.

Outlet			Current (A)			
#	State	Name	Min	Now	Max	Min/max Reset
1	<input checked="" type="checkbox"/>	Outlet 1	0.000	0.000	0.000	<a href="#">Reset</a>
2	<input checked="" type="checkbox"/>	Outlet 2	0.000	0.000	0.000	<a href="#">Reset</a>

The following parameters have resettable values:

- **Individual & total amperage**
  - path: Power > Current
- **Individual & total wattage**
  - path: Power > Power
- **Individual & total power factor**
  - path: Power > Power
- **Individual & total real energy (kWh)**
  - **Note:** The **Accumulated kWh** counter is not resettable!
  - path: Power > Energy
- **Individual & total Apparent Energy (kVAh)**
  - **Note:** The **Accumulated kVAh** counter is not resettable!
  - path: Power > Energy
- **Temperature**
  - path: Environment > Ambient
- **Voltage**
  - path: Environment > Electrical

**Note:** Clicking a Reset link in the column header will reset all values in that column, except for the value in the Total row.

# Startup Delay

path: Settings > Startup Delay & Outlet Importance

The **startup delay** shown in the table is the time in seconds at which the designated outlet will switch on after boot. By default the delay is set incrementally over the outlets to reduce the overall power peaks of booting loads.

Outlets 1-8	Startup delay (sec)	Importance (1=high)
Outlet 1	0	4 ▼
Outlet 2	1	4 ▼

**Note:** An outlet will only switch on at boot if it was on before the Energy Switch was powered down.

# Priority

path: Settings > Startup Delay & Outlet Importance

The **Importance** column gives a rating from 1 to 8 to each outlet. A rating of 1 indicates the highest importance, whilst 8 is the lowest.

When the Total (device) off threshold for the amperage and/or wattage is crossed (but none of the individual off thresholds) the Energy Switch will use the importance rating to determine which outlet to switch off first.

If two or more outlets have the same rating, the outlet with the last peak load will be switched off first.

# Overheat Protection

path: Settings > Overheat Protection

The Energy Switch has built in temperature sensors that can help prevent overheating. For more information regarding the thresholds and event notifications please refer to the Thresholds and SNMP Configuration chapters.

**Note:** The Energy Switch has a built-in safety that switches off all ports when the temperature hits 60°C (140°F) **regardless** of the settings in the Overheat Protection section.

# Network Time Protocol (NTP)

path: Settings > Device Settings

The Network Time Protocol (NTP) is a protocol for synchronizing the clocks of computer systems over networks. The Energy Switch is equipped with an onboard clock that can be setup to sync with:

- pool.ntp.org (default)
- a custom NTP server
- date & time picker

For more information regarding the configuration of the onboard clock please refer to the Device Settings chapter.

## Introduction

The Energy Switch has a built in Command Line Interface that can be accessed through both the CLI connector on the front or via Telnet.

Commands are typically sent to the separate modules. An Energy Switch consists of exactly 1 Master module and 1 or more Power modules, controlled by the Master. Each module is of a specific type: 'M' for master module, 'P' for power module, 'A' for sensor module. The Master will always have address M1, power modules can have addresses P1, P2, P3, ....

## Connecting

- **CLI connector**

Connect a standard cat. 5e patch cable to both the CLI connector and your pc (i.e. by using an RS232 to USB adapter). For the CLI Specification, see the CLI Specifications chapter.

Connection settings: 115200/8-N-1 (115200Bd, 8 data bits, no parity, 1 stop bit)

- **Telnet**

Connect to the device IP on port 23. Please note that only Telnet over SSL is enabled by default. This can be changed at the Settings tab

Once connected, you will be presented with a log-in screen. Use the admin credentials to gain full access. From here it is possible to access the majority of the Energy Switch's functions. Type "help" for more information.

**Note:** The complete CLI interface is available as from firmware version 1.1.x.x Version 1.0.x.x and below only have a reduced interface (or less). For more information regarding a firmware upgrade see the Upgrade Firmware chapter.

# RS232

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The RS232 ports on your Energy Switch can be used to connect to the RS232 connectors of external devices (CONSOLE port on a switch, ...). Depending on your firmware version the means of establishing a connection will vary. The firmware version is shown on the Web Interface or TFT display.

**Please note that only 1 RS232 port can be used/active at a time. Opening a second RS232 port on the Energy Switch will close the first connection.**

## **Firmware version 1.0.1.3 or lower**

- Connect to the CLI Interface (see the CLI chapter)
- The “OPENCOM” command can now be used to open a specific RS232 port
- Use the HELP command for more detailed info (to open RS232 port 4 at 19200 Baud the command would be “OPENCOM -c4 -b19200”)
- Open a new telnet session to the Energy Switch on port 2000 and login
- You are now connected to the desired RS232 port

## **Firmware version 1.0.1.11**

- Connect to the CLI Interface (see the CLI chapter)
- Use the command “SET M1 UARTMUXBAUD X” (with ‘X’ being the baud rate (max 115200Bd))
- Use the command “SET M1 UARTMUXPORT X” (with ‘X’ being the port number (from 1 to 8))
- Open a new telnet session to the Energy Switch on port 2000 and login
- You are now connected to the desired RS232 port

## **Firmware version 1.2**

- Please follow the instructions from firmware version 1.0.1.11
- After setting up the RS232 port open a new telnet session to the Energy Switch on port 200X (with ‘X’ being the port number (from 1 to 8) that was used in the previous steps). From this firmware version on the CLI port numbers are fixed values ranging from 2001 for CLI port 1 to 2008 for CLI port 8.

# Logging

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There are currently 2 types of logging available. Both can be downloaded from the Web Interface or through the API for your convenience.

## Event

path: Logging > Event

The Event log is used to keep a history of all important events. Fill in the available fields and view the log in your browser or download it for offline use.

- **Module**  
The module for which to request the Event log.
- **Start time**  
The starting date & time for the log.
- **End time**  
The ending date & time for the log.
- **Download**  
Download the log as a text file.
- **Show**  
View the log in your browser.

The Log is displayed as a table with the following columns (from left to right):

- **Timestamp**  
The timestamp of the event.
- **Event type**  
The type of event: outlet toggle, threshold violation, ...
- **GUID**  
The GUID of the control. For more info regarding GUIDs please refer to the *ES Series - API Manual*.
- **Value**  
The value that was returned by the event (voltage, temperature, etc)

## Measurement

path: Logging > Measurement

The Measurement log returns a binary file with monitoring data of the selected module. For interpretation of the data in this file, refer to the manual of the selected device.

It's possible to select a specific Measurement log file by configuring the following options:

- **Type**  
The type of Measurement log

- **Module**  
The module for which to request the log.
- **Start time**  
The starting date & time.
- **End time**  
The ending date & time.
- **Download**  
Download the log as a text file.

# Management Information Base (MIB)

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A **management information base (MIB)** is a virtual database used for managing the entities in a communications network and is most often associated with the Simple Network Management Protocol (SNMP). The Energy Switch features a built-in mib file which can be found at the following location:

- For firmware version **v1.2.x.x and above**: [https://\[DEVICE\\_IP\]/ES-RACKTIVITY-MIB.txt](https://[DEVICE_IP]/ES-RACKTIVITY-MIB.txt)
- For firmware version **v1.1.x.x and above**: [http://\[DEVICE\\_IP\]/ES-RACKTIVITY-MIB.txt](http://[DEVICE_IP]/ES-RACKTIVITY-MIB.txt)
- For firmware version **v1.0.1.x and below**: [http://\[DEVICE\\_IP\]/ES100816-MIB.txt](http://[DEVICE_IP]/ES100816-MIB.txt)

Where [DEVICE\_IP] is the IP of your Energy Switch (i.e.: 192.168.14.250).

Use this file to translate the OIDs (Object IDentifiers) to a more human-readable state. For more information on how to use the MIB file, please refer to the documentation of your network monitoring software.

# Upgrade Firmware

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Rackivity is always working on improving and fine-tuning its products. It is possible that a new firmware is available for your device. During a firmware update the device continues working as normal.

**Note:** Make sure all active connections to the Energy Switch - such as the website, telnet and SNMP - **are closed before updating**. Open connections might result in a failed update!

## Obtaining Files

If you are unsure whether a firmware update is available for your device, have a look at <http://www.rackivity.com/support> or contact Rackivity Support (see Support chapter). If applicable the necessary files and instructions will be provided.

# Troubleshooting

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## Resetting Login Credentials

In case of lost login credentials, resetting them can be done on the device itself:

- Press and hold the **UP** and **DOWN** buttons simultaneously for 3 seconds until a notification is shown on the display.  
The credentials will now be reset to their default settings:

Default login credentials	
User name	admin
Password	1234

## Connecting to the Web Interface

If you are unable to connect to the Web Interface please try one or more of the following options:

- Ping the device on its IP address. When unsuccessful, the Energy Switch is most likely not on the same network as your PC, or communication is blocked by a network device.
- Connect the Energy Switch directly to your computer (please note that for this both devices need to have a valid fixed IP).
- Try opening the Web Interface with another browser.
- Connect to the Energy Switch using a different computer.
- If possible, power cycle the Energy Switch.

## Knowing your Energy Switch' IP address

If you want to easily find out the IP address of your Energy Switch, use the navigational buttons next to the TFT on the front.

- If the TFT is black, press any button once to activate it.
- Press MENU to enter the Menu.
- Select *Network* or *Network Settings* (v1.2) and press OK.
- Press the DOWN button and select *Current IP address* or *IP Address* (v1.2).
- The IP of your Energy Switch is displayed in yellow at the bottom of the TFT.

# Support

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Feel free to contact us if you need any support or have any other questions or remarks:

Online [www.rackivity.com/support](http://www.rackivity.com/support)

E-mail [support@rackivity.com](mailto:support@rackivity.com)

Phone 003293242095 (GMT+1)