

# User Manual

FW v3.1 and up

## AC<sup>2</sup>Meter



# Contents

---

Contents .....	2
Preliminary Information .....	5
Introduction.....	5
Applicable Models .....	6
Specifications.....	6
Electrical Ratings .....	6
Operating Environment.....	6
Dimensions .....	6
User Account Overview .....	7
Safety.....	8
Certifications .....	9
Compliance .....	9
Recycling.....	10
Servicing & Repair .....	10
Additional Documentation .....	10
Getting Started .....	11
Receiving Inspection.....	11
Inventory .....	11
Installation.....	12
Mounting the AC <sup>2</sup> Meter .....	12
Connecting the AC <sup>2</sup> Meter.....	12
Scheme .....	12
Installing Current Sensors.....	13
Specifications.....	13
Installation.....	13
Overview.....	15
Front .....	15
Status LEDs .....	15
Power LED (1) .....	15
Quick Configuration.....	16
Using the Display .....	16
Activating the Display .....	16
Controlling the Display .....	16
Hot Keys.....	16
Network Settings .....	17
Dynamic IP Address Assignment (DEFAULT) .....	17

Manual IP Address Assignment .....	18
Web Interface.....	19
Getting Started .....	19
Supported Web Browsers .....	19
Logging in.....	19
Layout .....	20
Tabs .....	21
Power.....	21
Environment .....	21
Logging .....	21
E <sup>2</sup> Sensors .....	22
Settings .....	22
Device Settings .....	22
Network Settings .....	23
SNMP Settings .....	23
Global .....	24
Authentication Profiles.....	24
Traps .....	25
Current Sensor Settings.....	25
LDAP Settings.....	26
LDAP Group Names .....	26
LDAP Filter settings.....	26
Thresholds .....	27
Resetting Measurements .....	28
Network Time Protocol (NTP) .....	28
CLI .....	29
Introduction.....	29
Connecting.....	29
Logging .....	30
Event.....	30
Management Information Base (MIB) .....	31
Frequently used OIDs .....	31
Upgrade Firmware.....	32
Obtaining Files.....	32
Troubleshooting .....	33
Resetting Login Credentials.....	33
Connecting to the Web Interface.....	33
Knowing your AC <sup>2</sup> Meter's IP address.....	33

Support.....	34
--------------	----

# Preliminary Information

---

## Introduction

The AC<sup>2</sup>Meter, Racktivity's newest addition to its data center power monitoring and management solution can be installed at the AC power distribution board or in distributed remote locations such as PoPs (Points Of Presence), base stations, and head ends. The unit features a DIN rail mountable design and Ethernet connectivity and supports 8 current sensors for current measurements.

### Main Features:

- Measure AC voltage
  - On 3 phases: L1, L2, L3
  - Input range: 100-240 VAC
  - Accuracy: +/- 2%
- Measure AC current
  - On 8 current sensors: each input can be manually assigned to the corresponding phase
  - Input range: up to 2000A (depends on the current sensor used)
  - Accuracy: +/- 2%
- Calculates power (W) and power consumption (kWh) per current sensor
- Power supply via L1 (phase 1)
- Current sensor grouping (3 phases)

# Applicable Models

Unless specified otherwise, all information in this document is applicable to the following Racktivity AC<sup>2</sup>Meter model(s):

- ACS08-03

## Specifications

### Electrical Ratings

Input:

Voltage	100-240 VAC
---------	-------------

### 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)	7.1 x 9 x 5.3
Dimensions inch (WxHxD)	2.8 x 3.54 x 2.1

# User Account Overview

The AC<sup>2</sup>Meter has 3 types (levels) of user accounts: **admin**, **restricted** and **guest**. The following table shows an overview of the functionalities 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
Edit thresholds	Yes	No	No
Edit port 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.

# Safety



## Save these instructions!

This Safety Information contains important instructions that should be followed during installation and maintenance of the AC<sup>2</sup>Meter. It is intended for Racktivity customers who set up, install, relocate or maintain Racktivity equipment. Changes and modifications to this unit not specifically approved by Racktivity could void the warranty.



## Electrical Hazard!

Read the following information before installing or operating your AC<sup>2</sup>Meter:

- 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 AC<sup>2</sup>Meter.
- To avoid possible electrical shock and equipment damage, use only the supplied hardware.
- The power connector serves as connection switch for the AC<sup>2</sup>Meter.
- Do not operate your AC<sup>2</sup>Meter with any covers removed or when damaged.
- There are no user serviceable parts inside the AC<sup>2</sup>Meter. All repairs and service should be performed by authorized service personnel only.
- The AC<sup>2</sup>Meter is designed for indoor use only in a controlled environment away from excess moisture, temperature extremes, conductive contaminants, dust, direct sunlight or magnetic sources.
- Do not attempt to mount the AC<sup>2</sup>Meter 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.
- **CAUTION:**  
The AC<sup>2</sup>Meter 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 61000-3-3  
EN 55024



This device is certified to comply with Part 15 of the FCC rules.

## Compliance

- **WEEE**

Waste Electrical and Electronic Equipment



- **RoHS**

Restriction of Hazardous Substances



# Recycling



The materials used for shipping the AC<sup>2</sup>Meter are recyclable, please save them for later use or dispose of them appropriately.

## Servicing & Repair

**There are no user serviceable parts inside the AC<sup>2</sup>Meter. All repairs and service should be performed by authorized service personnel only.**

Please refer to the Service Manual for more info on the RMA procedure.

## Additional Documentation

Additional documentation and support regarding the following subjects is available on the Racktivity website [www.racktivity.com/support](http://www.racktivity.com/support).

- API manual, overview & examples
- E<sup>2</sup>Sensor documentation
- Servicing (RMA) documentation

# Getting Started

## Receiving Inspection

Inspect the package (see **INVENTORY** chapter) 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
AC <sup>2</sup> Meter	1
Power connector (5 pins)	1
Quick Start Guide	1

# Installation

## Mounting the AC<sup>2</sup>Meter

Mount the AC<sup>2</sup>Meter to a horizontal DIN rail in your enclosure using the mounting slots at the back of the unit.

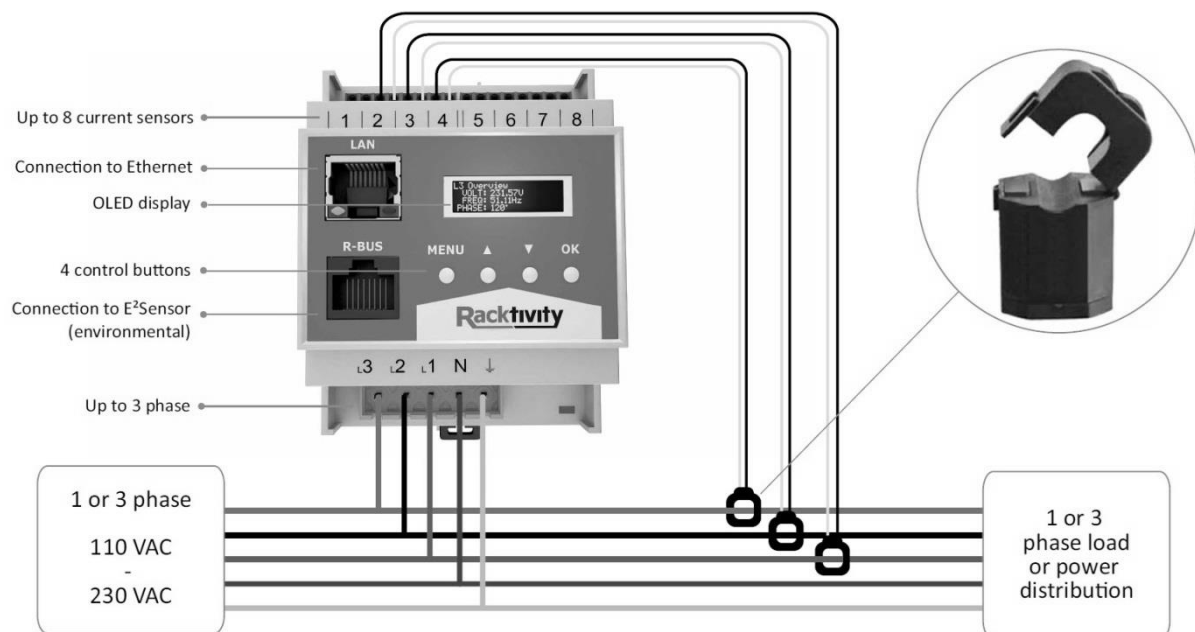
- Hold the unit with the top (white) slider over the DIN rail while slightly pulling the unit down.
- Place the bottom (black) slider over the bottom of the DIN rail.

To remove the AC<sup>2</sup>Meter use a flathead screwdriver to slightly pull the bottom (black) slider down. This will enable you to pull the bottom of the unit forward and release it from the DIN rail.

## Connecting the AC<sup>2</sup>Meter

1. The AC<sup>2</sup>Meter is powered through phase 1 (the L1 pin of the power connector).
2. Attach the supplied connector to an existing 100-240 VAC power cable by using the screws.  
**Note:** Check to make sure that the power is disconnected before performing this step.
3. The POWER LED (blue) adjacent to the connected connector will become active.

## Scheme



# Installing Current Sensors

## Specifications

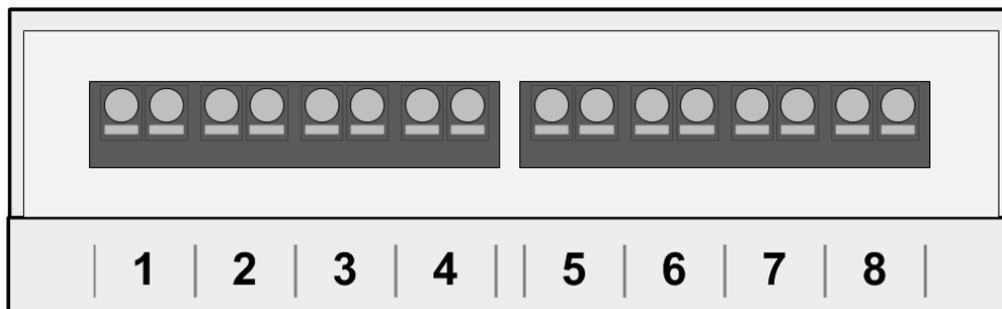
The AC<sup>2</sup>Meter has been designed to communicate with a wide range of current sensors as long as they meet the following criteria:

- Output voltage: 330mV AC

**Note:** The AC<sup>2</sup>Meter features a fixed list of predefined current sensor models with a wide variety of current ranges. If you are uncertain that your preferred sensor is available for, or compatible with the AC<sup>2</sup>Meter, please see the **CURRENT SENSOR SETTINGS** chapter or contact **SUPPORT** prior to purchase.

## Installation

The layout of the current sensor connections on the AC<sup>2</sup>Meter is as follows:



Each of the 8 available current sensor connections consists of 2 adjacent connection points (from left to right) that connect to the 2 wires of a current sensor:

Connection point	Labeled as	Current Sensor
1 + 2	1	1
3 + 4	2	2
5 + 6	3	3
7 + 8	4	4
9 + 10	5	5
11 + 12	6	6
13 + 14	7	7
15 + 16	8	8

To install a current sensor:

- Connect each of the 2 ends of the current sensor cable (typically black & white) to the correct 2 connection points for that current sensor by pressing the tinned wire into the spring cage.
  - For more info on which connection points to use see the **SPECIFICATIONS** chapter.
  - It doesn't matter how the 2 cables from the current sensor are connected to the 2 connection points of a current sensor connection (black cable in connection point 1, white cable in connection point 2, or vice versa) as this can be adjusted on the Web Interface.
- Mount the current sensor to the wire that needs to be monitored.

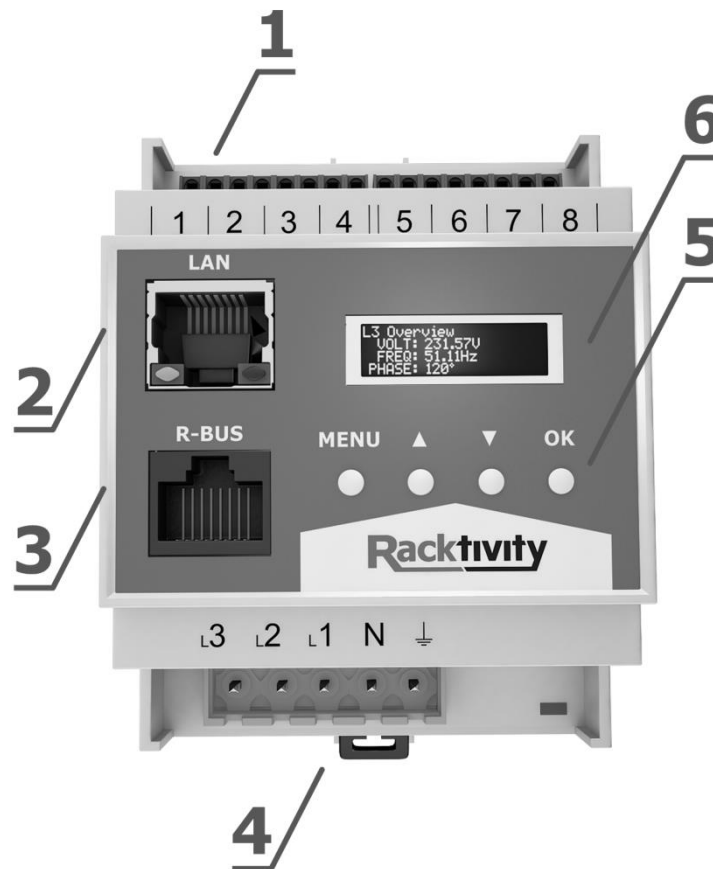
**Note:** To complete the next steps you'll need to be logged in to the Web Interface. Please refer to the **WEB INTERFACE** chapter before continuing.

- On the Web Interface: open the Settings > Sensors tab.
- Select the correct current sensor type, phase and optionally group for the installed sensor as described in the **CURRENT SENSOR SETTINGS** chapter.
- Press the Save button.
  - **Note:** If the metrics for the installed current sensor remain '0' it might be installed inverted to the phase wire. To resolve this select the 'inverted' option for your phase in the Selected Phase list.
- The AC<sup>2</sup>Meter display and Web Interface will now show the correct current values.

**Note:** The AC<sup>2</sup>Meter can be installed and operated by connecting and powering only phase 1 (N + L1); **if certain metrics are missing for a specific current sensor, please verify that there is an active phase for that sensor.**

# Overview

## Front



1	SENSOR	Current sensor connections 1 to 8
2	LAN	Ethernet connector (with connectivity indicator LEDs)
3	R-BUS	R-BUS which connects to E <sup>2</sup> Sensors
4	POWER	3 Phase mains input connector with power LED
5	NAV BUTTONS	Menu, Up, Down and OK navigation buttons
6	DISPLAY	Display

## Status LEDs

### Power LED (1)

ON	The device is powered
OFF	No power is provided to the device on phase 1 (L1)

# Quick Configuration

---

## Using the 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 display to activate it. The OLED standby delay can be set at the Settings page on the Web Interface (the default value is 10 minutes).

### Controlling the Display

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

### Hot Keys

Several Hot Key combinations are available by using the navigation buttons below to the display. To activate the functions, press the necessary buttons **simultaneously for 4 seconds** (until the notification is shown on screen).

Hot Key	Buttons	Action
Hot Reset	MENU + DOWN	Reboots the master/controller module, no settings changed
Credential Reset	UP + DOWN	Resets the login credentials to default values
Factory Reset	MENU + OK	Resets all <b>non-power</b> related settings to factory defaults (network, SNMP configuration, credentials, etc.). Use the <b>CLI</b> to reset the individual power modules (banks) instead.

**Note:** When the Display Lock setting is enabled these Hot Keys will not be triggered.



# 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:** Recent browser versions have started blocking the SSLv3 encryption protocol used by the device when HTTPS is enabled. For this reason HTTPS has been disabled by default. Please make sure your browser allows SSLv3 prior to updating the HTTP(S) setting.

## Dynamic IP Address Assignment (DEFAULT)

1. Press the **MENU** button until the MENU appears, select **Network Settings** using the **DOWN** button and press **OK**.
2. Within the **Network Settings** menu, select **DHCP** and press **OK**. When the value DHCP: ON is displayed, the device already has dynamic IP assignment enabled (skip to step 4).
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** and press **OK** to display the current IP address.
  - **Note:** The current IP address is also displayed on the starting screen
5. On a computer in the same network, use a browser to open the assigned IP address, for example <http://192.168.14.250>
6. When surfing to the Web Interface, 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 MENU appears, select **Network Settings** using the **DOWN** button and press **OK**.
3. Within the **Network Settings** menu, select **DHCP** and press **OK**. When the value 'DHCP: OFF' is displayed, the device already has manual IP assignment enabled. If not, use the **UP** or **DOWN** buttons to change the value to 'DHCP: OFF' and press **MENU** or **OK** to confirm.
4. Use the **UP** button to select **IP Address** and press **OK**.
5. 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, you can speed up the changing of the values. When ready press **MENU** to confirm and return to the **Network Settings** menu.
6. Repeat the last two steps for the **Subnet Mask**, **Standard Gateway** and **DNS Server** settings.
7. 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.
8. On a computer in the same network, use a browser to open the chosen IP address, for example <http://192.168.14.250>
  - **Note:** The current IP address is also displayed on the starting screen
9. When surfing to the Web Interface, a popup appears requesting a username and password. The default username is **admin** and the default password is **1234**

# Web Interface

---

## Getting Started

### Supported Web Browsers

The following browsers have been tested and work with the AC<sup>2</sup>Meter Web Interface (on most platforms):

- Internet Explorer 11 or higher
- Firefox 26.0 or higher
- Chrome 31.0 or higher

Other available web browsers may work with this device but have not been fully tested by Rackactivity.

**Note:** Recent browser versions have started blocking the SSLv3 encryption protocol used by the device when HTTPS is enabled. For this reason HTTPS has been disabled by default. Please make sure your browser allows SSLv3 prior to updating the HTTP(S) setting.

### 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.

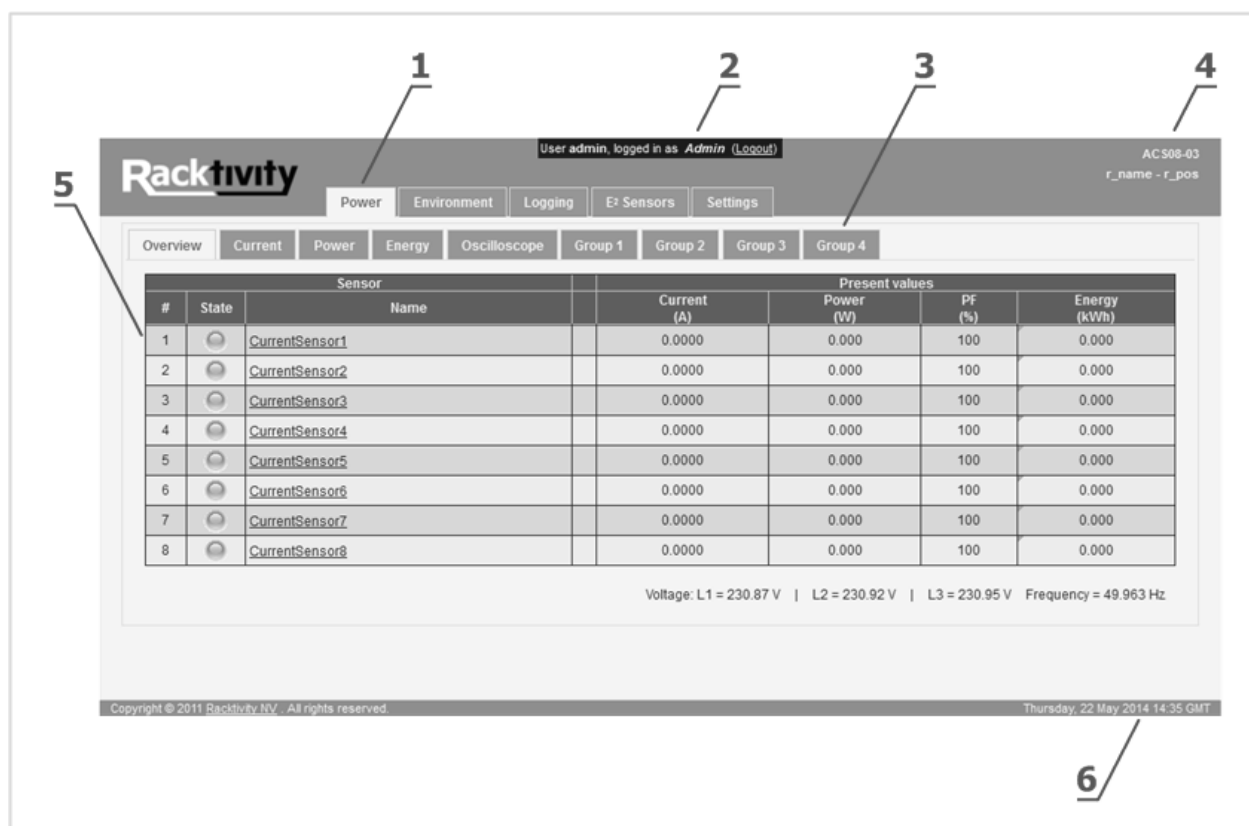
To recover from a lost password, please refer to the **TROUBLESHOOTING** chapter.

Use an internet browser to open the AC<sup>2</sup>Meter 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.

# Layout



1	<b>Main tabs</b>	Displays the different functional sections of the device
2	<b>User account</b>	Displays which type of User Account is currently logged in
3	<b>Sub tabs</b>	Displays the different sections of the selected main tab
4	<b>Device info</b>	Displays the device name, cabinet name & cabinet location Can be changed at the Settings tab
5	<b>Current Sensors</b>	Displays the available info for each of the 8 available current sensors
6	<b>Device time</b>	The time set on the Settings tab (either manual or through an NTP server)

# Tabs

## Power

Use the Power Tab for the following:

- See the load and general status of both the AC<sup>2</sup>Meter's individual current sensors and the totals:
  - Amps
  - Wattage (only when the corresponding phase connector is powered)
  - Real and Apparent Energy (kWh)
  - Voltage for each phase
- Monitor current sensor metrics
- Configure thresholds for current sensors and groups (as applicable)
- Resetting measurements
- Change SNMP notifications state
- Oscilloscope View
- View and configure Groups. A Group consists of a custom selection of one or more current sensors grouped together and features:
  - Total current: current value, historical min and max value
  - Total power: current value, historical min and max value
  - Warning thresholds on total current & power with SNMP notification toggles
  - Accumulated and resettable kWh

**Note:** All current sensors in a Group should have the same measurement capacity to ensure correct measurements.

## Environment

Use the Environment Tab to monitor and manage:

- Internal temperature sensor
  - Current value
  - Historical min and max
  - Thresholds & SNMP notifications
- Voltage
  - Current value
  - Historical min and max
  - Thresholds & SNMP notifications
- Phase shift
- Frequency

## Logging

The logging tab provides access to the **Event** 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.

# E<sup>2</sup>Sensors

Use this tab to manage and monitor your E<sup>2</sup>Sensors.

For more information regarding this tab, please see the E<sup>2</sup>Sensor documentation.

## Settings

Use this tab to configure the following settings:

- Device (see **DEVICE SETTINGS** chapter)
- Network (see **NETWORK SETTINGS** chapter)
- SNMP (see **SNMP SETTINGS** chapter)
- Current Sensors (see **CURRENT SENSOR SETTINGS** chapter)
- LDAP (see **LDAP SETTINGS** chapter)

## Device Settings

*Path: Settings > Device*

The Device Settings give access to:

- Device identification
  - **Device name:** the name of the device
  - **Rack name:** the name of the rack where the device is located
  - **Rack position:** the identifier of the position in the rack
- User account settings (see the **USER ACCOUNT OVERVIEW** chapter)
  - **Admin:** Name and password for the admin account
  - **Restricted user:** Name and password for the restricted account
  - **Guest:** Name and password for the guest account
- System reboot
  - **Reboot device:** Pressing this button will hot reset the device
- Display settings
  - **Display timeout:** the idle time in minutes after which the Display goes into standby
  - **Display lock:** when enabled the display (and buttons) cannot be used to change settings (display becomes read-only). All changes must be made through the other available interfaces
- Temperature
  - **Temperature unit:** degrees Celsius (°C) or Fahrenheit (°F)
- Web Interface
  - **Website auto logout:** The time in minutes after which the session expires
- 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 will clear all Logging!

- System info
  - **About this device:** Shows all relevant firmware and hardware info regarding your device. Please provide this info when communication with Racktivity Support

## Network Settings

*Path: Settings > Network*

The Network subtab contains the Network and other security settings. The following Network settings are available:

- **MAC Address**
  - The MAC address of the EnergySwitch
- **Enable DHCP**
  - Toggle DHCP (depending on this setting the fields below it will be enabled or disabled)
- **Device IP Address**
  - The IP address of the EnergySwitch
- **Subnet Mask**
  - The subnet mask of the EnergySwitch
- **Standard Gateway**
  - The IP address of the default node on the network
- **DNS Server**
  - The IP address of the Domain Name System (DNS) server
- **Test Connection**
  - Ping a device on the network to test network settings.  
**Note:** Save any changed settings before using this functionality.
- **Force secure web access (HTTPS)**
  - Check to force secure HTTPS web access using SSLv3
- **Force secure Telnet access (SSL)**
  - Check to force Telnet-SSL access

## SNMP Settings

*Path: Settings > SNMP*

The device offers **SNMPv2c** and **SNMPv3** communication (GETs, SETs and traps). Notifications (traps) can be enabled or disabled for many of the device's functions:

- Current sensor thresholds (current, power, ...)
- Totals thresholds (current, power, ...)
- Temperature thresholds
- Voltage thresholds
- ...

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.

The SNMP subtab is divided into 3 sections: **Global**, **Authentication Profiles** and **Traps**.

## Global

The Global section of the SNMP subtab contains the following settings:

- **Allow SNMPv2c GET & SET**
  - Toggles communication to and from the device using SNMPv2c  
**Note:** SNMPv2c Traps can still be used when this setting is disabled (see Traps chapter)
- **Allow SNMPv3 GET & SET**
  - Toggles communication to and from the device using SNMPv3  
**Note:** SNMPv3 Traps can still be used when this setting is disabled (see Traps chapter)
- **Write Protection (SNMP read-only)**
  - With this setting enabled the device will not accept changes and SET requests over SNMPv2c or SNMPv3. GET, Walk, etc. requests are still allowed
- **Enable SNMP Traps**
  - When enabled, no SNMP Traps will be sent (even when all other SNMP settings are configured correctly)
- **Heartbeat Interval**
  - Defines the interval (in seconds) at which Heartbeat SNMP Traps will be sent to the configured receivers. Set to 0 to disable this feature
- **Download MIB file**
  - The MIB files for your device, more info in the **MANAGEMENT INFORMATION BASE (MIB)** chapter

## Authentication Profiles

The authentication profiles section is used to configure the available SNMP profiles for GET & SET access. At this time the following profiles are available:

- **SNMPv2c**
  - 1 profile available
  - Requires community strings (read, write and trap)
- **SNMPv3**
  - 3 profiles available
  - The SNMPv3 profiles require **all** of the following parameters:
    - USM User
    - Authentication passphrase (auth): MD5
      - In text or hexadecimal format
    - Privacy passphrase (priv): AES
      - In text or hexadecimal format

**Note:** Some SNMP monitoring tools will require the **SNMPv3 Engine ID** displayed in this section.



# Traps

In the Traps section up to 3 SNMP Trap receivers can be configured. Each receiver contains the following:

- **Enable**
  - Enable or disable this receiver
- **IP Address**
  - The IP address of the receiver
- **Port**
  - The network port on the receiver to use
- **Authentication profile**
  - The authentication profile used to authenticate with the Trap receiver
- **Send test SNMP Trap**
  - Sends a Heartbeat Trap to all configured SNMP Trap receivers

**Note:** Save any changed settings before using the button

**Note:** This button is disabled when SNMP Traps are disabled in the Global section

## Current Sensor Settings

*Path: Settings > Sensors*

For each of the 8 current sensors the following options can be set:

- **Current Sensor:** The type of current sensor installed. Use the Generic option to enter a custom value or select the correct model number from the list.
- **Group (optional):** The group to which the current sensor belongs.
- **Selected Phase:** The phase to which the current sensor is installed. Select a phase manually or choose the phase suggested for that sensor by pressing the 'Select' button.

At the time of writing current sensors with the following Amp rating are available for purchase from Racktivity:

- |               |                |
|---------------|----------------|
| • <b>25A</b>  | • <b>600A</b>  |
| • <b>50A</b>  | • <b>800A</b>  |
| • <b>100A</b> | • <b>1500A</b> |
| • <b>200A</b> | • <b>2000A</b> |
| • <b>400A</b> | • <b>3000A</b> |

Please contact [sales@racktivity.com](mailto:sales@racktivity.com) for an updated list or more information.

# LDAP Settings

*Path: Settings > LDAP*

The LDAP (Lightweight Directory Access Protocol) functionality allows you to setup remote authentication to the device using one of the available user roles.

**Note:** If you are uncertain on how to configure the LDAP related settings please contact your LDAP administrator.

- **Enable LDAP (SSL):** Check this option to enable authentication through LDAP using SSL.  
**Note:** When locked out of the device due to misconfiguration a credential reset can be performed using the **HOT KEYS** that will also disable LDAP (default setting).
- **Enable local authentication:** When checked, authentication to the device remains possible using the local credentials when LDAP is enabled. This setting provides an easy recovery option when setting up your LDAP configuration.  
**Note:** When locked out of the device due to misconfiguration a credential reset can be performed using the **HOT KEYS** that will disable LDAP (default setting).
- **Authentication server and port:** The IP address and network port of the LDAP authentication server on the network.

## LDAP Group Names

- **Admin group name:** The group name in your LDAP directory that contains the users that can authenticate using the Admin user account.
- **Restricted group name:** The group name in your LDAP directory that contains the users that can authenticate using the Restricted user account.
- **Guest group name:** The group name in your LDAP directory that contains the users that can authenticate using the Guest user account.

More info on the available user roles/accounts and their permissions can be found in the **USER ACCOUNT OVERVIEW**.

## LDAP Filter settings

- **LDAP Login Wrapper:** The login wrapper used to create the correct login string on the LDAP server.  
**Example:** uid=[login],dc=rackactivity,dc=com
- **Path:** The relative path on the LDAP server necessary for authentication.
- **Advanced**
  - **Filter:** The LDAP filter query. Available variables are **[groupname]** and **[login]**.  
**Example:**  
(&(&(objectClass=posixGroup)(cn=**[groupname]**))(memberUid=**[login]**))
  - **Attribute:** LDAP attribute parameter.

# Thresholds

Thresholds can be configured and used so that you are notified through SNMP at certain events. Many of the AC<sup>2</sup>Meter's parameters have settable thresholds. To configure a specific threshold, open the tab where the appropriate parameter is shown.

Threshold (W)	
Warning	SNMP Warning
<input type="text" value="0.000"/>	<input checked="" type="checkbox"/>
<input type="text" value="0.000"/>	<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
- **Group totals**
  - Path: Power > Group X

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

- **Warning:** When the measurement crosses this value 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 that 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)			
#	Name	Min	Now	Max	Min/max Reset
1	<a href="#">CurrentSensor1</a>	0.0000	0.0000	0.0000	<a href="#">Reset</a>
2	<a href="#">CurrentSensor2</a>	0.0000	0.0000	0.0000	<a href="#">Reset</a>

The following parameters have resettable values:

- **Individual amperage**
  - *Path: Power > Current*
- **Individual wattage**
  - *Path: Power > Power*
- **Individual active (kWh) and apparent energy (kVAh)**
  - **Note:** The **Accumulated kWh** counter is not resettable!
  - *Path: Power > Energy*
- **Temperature**
  - *Path: Environment > Ambient*
- **Voltage**
  - *Path: Environment > Electrical*
- **Group totals**
  - *Path: Power > Group X*

**Note:** Clicking a Reset link in the column header will reset all values in that column.

## 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 AC<sup>2</sup>Meter 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 AC<sup>2</sup>Meter has a built in Command Line Interface that can be accessed through Telnet. Commands are typically sent to the separate modules. An AC<sup>2</sup>Meter consists of exactly 1 Master module, 1 Power module, and 1 optional E<sup>2</sup>Sensor module. Each module is of a specific type: 'M' for master module, 'P' for power module and 'A' for sensor module. The Master will always have address M1, Power - P1, sensor modules can have addresses A1, A2, A3...

## Connecting

Connect to the device IP on port 23. Please note that only Telnet over SSL is enabled by default and requires an SSL capable Telnet client. 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 AC<sup>2</sup>Meter's functions. Enter "HELP" for more information.

# Logging

---

The AC<sup>2</sup>Meter features an Event logging memory that 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 the Event log will be loaded from.
- **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: threshold violation, etc.
- **GUID**  
The GUID of the control. For more info regarding GUIDs please refer to the *API Manual*.
- **Value**  
The value that was returned by the event (voltage, temperature, etc.)

# Management Information Base (MIB)

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 AC<sup>2</sup>Meter features a built-in mib file which can be found at the following locations:

- By browsing to [http://\[DEVICE\\_IP\]/ES-RACKTIVITY-MIB.txt](http://[DEVICE_IP]/ES-RACKTIVITY-MIB.txt)
  - with [DEVICE\_IP] the IP of your AC<sup>2</sup>Meter
- By clicking the "Download MIB file" link on the Settings > Network Settings tab on the Web Interface.

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.

## Frequently used OIDs

The following table shows some frequently used OIDs for your device to allow for easy integration into your SNMP monitoring software.

Description	MIB Name	Type	OID	Unit
Actual Current CT1	pBigcurrent. 1.0	Integer	.1.3.6.1.4.1.34097.9.80.1.1.52.1.0	0.0001A
Actual Current CT2	pBigcurrent. 1.1	Integer	.1.3.6.1.4.1.34097.9.80.1.1.52.1.1	0.0001A
Actual Current CT3	pBigcurrent. 1.2	Integer	.1.3.6.1.4.1.34097.9.80.1.1.52.1.2	0.0001A
Actual Current CT4	pBigcurrent. 1.3	Integer	.1.3.6.1.4.1.34097.9.80.1.1.52.1.3	0.0001A
Actual Current CT5	pBigcurrent. 1.4	Integer	.1.3.6.1.4.1.34097.9.80.1.1.52.1.4	0.0001A
Actual Current CT6	pBigcurrent. 1.5	Integer	.1.3.6.1.4.1.34097.9.80.1.1.52.1.5	0.0001A
Actual Current CT7	pBigcurrent. 1.6	Integer	.1.3.6.1.4.1.34097.9.80.1.1.52.1.6	0.0001A
Actual Current CT8	pBigcurrent. 1.7	Integer	.1.3.6.1.4.1.34097.9.80.1.1.52.1.7	0.0001A
Actual Current Group1	pBigcurrent. 1.8	Integer	.1.3.6.1.4.1.34097.9.80.1.1.52.1.8	0.0001A
Actual Current Group2	pBigcurrent. 1.9	Integer	.1.3.6.1.4.1.34097.9.80.1.1.52.1.9	0.0001A
Actual Current Group3	pBigcurrent. 1.10	Integer	.1.3.6.1.4.1.34097.9.80.1.1.52.1.10	0.0001A
Actual Current Group4	pBigcurrent. 1.11	Integer	.1.3.6.1.4.1.34097.9.80.1.1.52.1.11	0.0001A
Actual Voltage L1	pVoltage. 1.0	Gauge	.1.3.6.1.4.1.34097.9.80.1.1.4.1.0	0.01V
Actual Voltage L2	pVoltage. 1.1	Gauge	.1.3.6.1.4.1.34097.9.80.1.1.4.1.1	0.01V
Actual Voltage L3	pVoltage. 1.2	Gauge	.1.3.6.1.4.1.34097.9.80.1.1.4.1.2	0.01V

# Upgrade Firmware

---

Rackactivity 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 AC<sup>2</sup>Meter - such as the website and telnet - **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.rackactivity.com/support> or contact Rackactivity Support (see **SUPPORT** chapter). If applicable the necessary files and instructions will be provided.



# Troubleshooting

---

## 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 AC<sup>2</sup>Meter is most likely not on the same network as your PC, or communication is blocked by a network device.
- Connect the AC<sup>2</sup>Meter 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 AC<sup>2</sup>Meter using a different computer.
- If possible, power cycle the AC<sup>2</sup>Meter.

## Knowing your AC<sup>2</sup>Meter's IP address

If you want to easily find out the IP address of your AC<sup>2</sup>Meter, use the navigation 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 Settings and press OK.
- Press the DOWN button, select IP Address and press OK.
- The IP address of your AC<sup>2</sup>Meter is displayed.

# Support

---

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

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

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

Phone 003293242095 (GMT+1)