User Manual

ACL Series

Contents

Introduction

Features

The ACL Series, Racktivity's newest addition to its power monitoring and management solution can be installed at the AC power distribution board or in distributed remote locations such as PoPs, base stations, and head ends. The design is based on a Master - Slave principle that allows you to have one access point (the ACL Master) for many measuring points (the ACL Slaves) with direct monitoring capabilities (the ACL Display). The ACL Masters and ACL Slaves are DIN rail mounted; the ACL Displays are typically mounted in cabinet door panels.

Main Features:
- Measure AC voltage (using the Slave unit)
    - On 3 phases: L1, L2, L3
    - Input range: 100-240 VAC
    - Accuracy: +/- 2%
- Measure AC current (using the Slave unit)
    - On 4 transducers: L1, L2, L3 and N
    - Transducer range: up to 1500A (depends on the current transducer used)
    - Accuracy: +/- 2%
    - Calculates power (W) and power consumption (kWh) per transducer
- Power supply via R-BUS^{24V} or mains on phase 1 (L1)
- Monitor the measured metrics (using the Display unit)

Applicable Models

Unless specified otherwise, all information in this document is applicable to the following Racktivity ACL Series model(s):

- **ACLM24-01**
    - o The **Master** unit of the ACL Series
- **ACLS04-03**
    - o The **Slave** unit of the ACL Series
- **ACLD24-02**
    - o The **Display** unit of the ACL Series

Specifications

Electrical Ratings

ACLM24-01 Input:

Voltage	24VDC

ACLS04-03 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

ACLM24-01

Dimensions cm (WxHxD)	7.1 x 9 x 5.8
Dimensions inch (WxHxD)	2.8 x 3.54 x 2.3

ACLS04-03

Dimensions cm (WxHxD)	8.8 x 9 x 5.8
Dimensions inch (WxHxD)	3.5 x 3.54 x 2.3

ACLD24-02

Dimensions cm (WxHxD)	9 x 9 x 5.9
Dimensions inch (WxHxD)	3.54 x 3.54 x 2.32

User Account Overview

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

	admin	restricted	guest
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 labels	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 User Account Overview chapter.

Safety

 Save these instructions!

This Safety Information contains important instructions that should be followed during installation and maintenance of the ACL Series equipment. 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 ACL Series equipment:
- 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 ACL Series equipment.
- To avoid possible electrical shock and equipment damage, use only the supplied hardware.
- Do not operate your ACL Series equipment with any covers removed or when damaged.
- There are no user serviceable parts inside the ACL Series equipment. All repairs and service should be performed by authorized service personnel only.
- The ACL Series equipment 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 ACL Series equipment 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 ACL Master contains a lithium battery and should not be disposed of with general refuge. 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 ACL Series equipment are recyclable, please save them for later use or dispose of them appropriately.

Servicing & Repair

There are no user serviceable parts inside the ACL Series equipment. 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 and support regarding the following subjects is available on the Racktivity website www.racktivity.com/support.

- API manual, overview & examples
- 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 ACL Master Package

Item	Quantity
ACLM24-01	1
24V power connector (2 pins)	1

Standard ACL Slave Package

Item	Quantity
ACLS04-03	1
Power connector (5 pins)	1
Transducer connector (8 pins)	1
Dry contact connector (8 pins)	1

Standard ACL Display Package

Item	Quantity
ACLD24-02	1

Installation

Mounting the ACL Hardware

ACL Master and Slave

Mount the ACL Master and/or Slave 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 and while slightly pulling the unit down.
- Place the bottom (black) slider over the bottom of the DIN rail.

To remove the ACL Master and/or Slave 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.

ACL Display

The ACL Display is typically mounted in cabinet door panels to provide an easy overview of the measured parameters.
- The door panel cutout required should measure 9.0 x 9.0 cm (3.543 x 3.543 inch).
- Mount the Display unit by sliding the device into the door panel cutout until it clicks into place.

To remove the ACL Display, gently press the device from the back through the door panel cutout until the snap mechanism holding it in place releases.

Connecting the ACL Hardware

The ACL Master is powered by the 2 pin 24V feed connector, the polarity of the connector is marked on the label on the unit. The ACL Slave & Display units are powered through their respective R-BUS^{24V} connectors. Additionally the ACL Slaves can also be powered through the incoming mains power on phase 1 (L1).

Note: The maximum amount of Slaves allowed on the R-BUS^{24V} bus of 1 Master: **32**

The maximum amount of Displays allowed on the R-BUS^{24V} bus of 1 Master: **7**

The power supply in the ACL Master is capable of powering the amount of devices mentioned above. However, the actual amount of devices that can be powered is determined by the type, wire gauge and length of the RJ45 cables used to connect the R-BUS^{24V} connectors of the devices on the bus. To increase the amount of devices that an ACL Master can power on its bus, either upgrade the cables used, or provide power on its Slaves phase 1 (L1) connection.

For example, a typical setup using standard low-cost 2 meter cat5e patch cables will only be able to power 16 ACL Slave modules.

- **ACL Master**
    1. Attach the supplied 2 pins 24V connector to an existing 24VDC power cable by using the screws.
    2. Plug the power connector into the designated socket on the ACL Master.
    3. The POWER LED (blue) adjacent to the connector will become active.

- **ACL Slave**
    1. Attach the supplied 5 pins connector to an existing 100-240 VAC power cable by using the screws.
       AND/OR
       Plug the RJ45 cable coming from an R-BUS^{24V} connector of a powered ACL Master, ACL Slave or ACL Display into either of the R-BUS^{24V} connectors.
    2. The POWER LED (blue) on the front panel will become active.

- **ACL Display**
    1. Plug the RJ45 cable coming from an R-BUS^{24V} connector of a powered ACL Master, ACL Slave or ACL Display into either of the R-BUS^{24V} connectors.
    2. The screen will light up.

For more info on how to manage the devices on the bus see the Managing Slaves & Displays chapter.

Installing Transducers

Specifications

The ACL Slave has been designed to communicate with a wide range of transducers as long as they meet the following criteria:

- Output voltage: 330mV AC

Note: The ACL Slave features a fixed list of predefined transducer models with a wide variety of current ranges. If you are uncertain that your preferred transducer is compatible with the ACL Slave, please contact Support prior to purchase.

Note: As seen on the diagram on the front panel of the ACL Slave the intended transducer setup is as follows:

- The transducer connected to **T1** measures **L3**
- The transducer connected to **T2** measures **L2**
- The transducer connected to **T3** measures **L1**
- The transducer connected to **T4** measures **N**

Since the device assumes all wiring to be as described above, any other wiring schemes will return unexpected results.

Installation

To receive all available read-outs and metrics both the transducer and its corresponding phase need to be connected and powered correctly. **If certain metrics are missing for a specific transducer, please verify that there is an active phase for that transducer.**

To install a current transducer:

- Connect the 2 ends of the current transducer cable to the correct 2 pins of the 8 pins transducer connector (male) using a flathead screwdriver. The correct pin layout for the transducer connector is as follows (from left to right):
    - Pin 1 & 2: **T1** (measuring L3)
    - Pin 3 & 4: **T2** (measuring L2)
    - Pin 5 & 6: **T3** (measuring L1)
    - Pin 7 & 8: **T4** (measuring N)
- Connect the transducer connector (male) to the transducer connector on the ACL Slave (female).
- Open the core of the transducer; enclose the power cable that needs to be monitored and close the core again.

Note: To complete the next steps you'll need to be logged in to the Web Interface and have managed your ACL Slaves through an ACL Master. Please refer to the Web Interface and Managing Slaves & Displays chapters before continuing.

- Open the Web Interface of the ACL Master to which the ACL Slave is connected for the dry contacts you wish to configure.
- The ACL Slaves > Contacts tab lists the 4 Contacts:
    - **Status**: Whether or not the Current State matches the Active State
    - **Current State**: The current state of the connected Dry Contact
    - **Active State**: Select which state (HIGH or LOW) is the intended active state
    - **SNMP**: When checked an SNMP trap will be sent when the Current State changes
- Press the Save button after performing changes

Installing Dry Contacts

Any potential free dry contacts can be used to connect to the Contact connector on the ACL Slaves.

To install a Dry Contact:

- Connect the 2 ends of the dry contact cable to the correct 2 pins of the 8 pins dry contact connector (male) using a flathead screwdriver. The correct pin layout for the dry contact connector is as follows (from left to right):
    - Pin 1 & 2: **C1**
    - Pin 3 & 4: **C2**
    - Pin 5 & 6: **C3**
    - Pin 7 & 8: **C4**
- Connect the dry contact connector (male) to the dry contact connector on the ACL Slave (female).

Note: To complete the next steps you'll need to be logged in to the Web Interface and have managed your ACL Slaves through an ACL Master. Please refer to the Web Interface and Managing Slaves & Displays chapters before continuing.

- Open the Web Interface of the ACL Master to which the ACL Slave is connected for the transducers you wish to set.
- On the Settings > Power tab select the ACL Slave from the device dropdown list
- Select the correct transducer type from the corresponding dropdown list in the Transducer Settings section and press the Save button.
- The measured metrics for that transducer are now available.

Overview

ACL Master
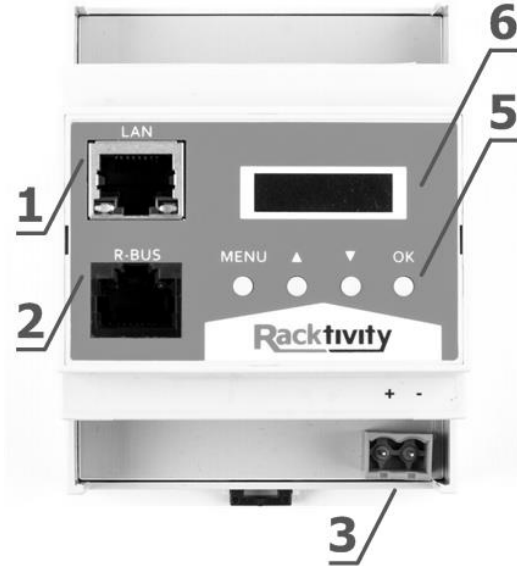
1	LAN	Ethernet connector (with connectivity indicator LEDs)
2	R-BUS 24V	24V R-BUS which connects to the ACL Slaves and ACL Displays
3	POWER	Input 24V connector with power LED
4	NAV BUTTONS	Menu, Up, Down and OK navigation buttons
5	DISPLAY	Display

LEDs

Power LED	ON	The device is powered
	OFF	No power is provided to the device

ACL Slave
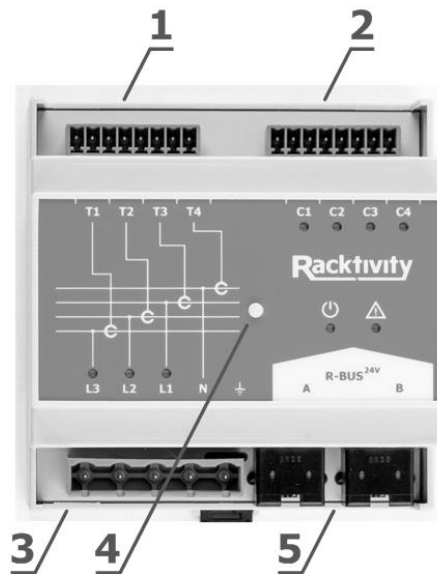
1	**TRANSDUCER**	Transducer connector (requires male connector adapter)
2	**DRY CONTACT**	Dry contact connector (requires male connector adapter)
3	**POWER**	Input voltage connector (requires male connector adapter)
4	**BUTTON**	Diagnostics & reboot button
5	**R-BUS 24V**	24V R-BUS which connects to the other ACL devices on the bus

LEDs

Power	ON	The device is powered
	OFF	No power is provided to the device
Alarm	ON	One or more alarms are currently active
		OR the button is pressed
	OFF	There are currently no severe alarms active
L3, L2, L1	ON	Input voltage detected
	OFF	No input voltage detected
C1, C2, C3 ,C4	ON	The current state equals the set active state
	OFF	The current state equals the set active state

ACL Display
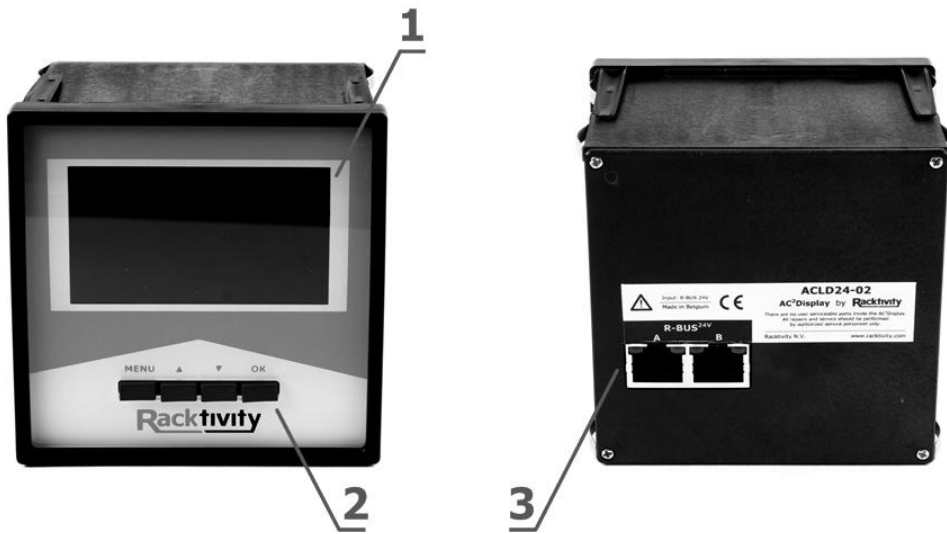
1	DISPLAY	Display
2	NAV BUTTONS	Menu, Up, Down and OK navigation buttons
3	R-BUS 24V	24V R-BUS which connects to the other ACL devices on the bus

Quick Configuration

Using the Onboard Display

Activating the Display

Note: The ACL Display' onboard display doesn't have an inactive state. Whenever the device is powered the display will show the intended content.

When the Power LED on the ACL Master is lit and the display is black, push any of the 4 navigation buttons next to the display to activate it. The 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.

Network Settings

Note: Only the ACL Master provides network access to the devices on the bus. The ACL Slave and ACL Display cannot be managed without an ACL Master connected.

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 currently active IP address is also shown on the main overview 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 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 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

9. 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

Getting Started

Supported Web Browsers

The following browsers have been tested and certified to work with the ACL Master 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 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 device' IP address. You will be asked for login credentials, the default values for the **administrator** account are:

User name	admin
Password	1234

To find out everything about the different types of user accounts see the User Account Overview chapter.

Layout
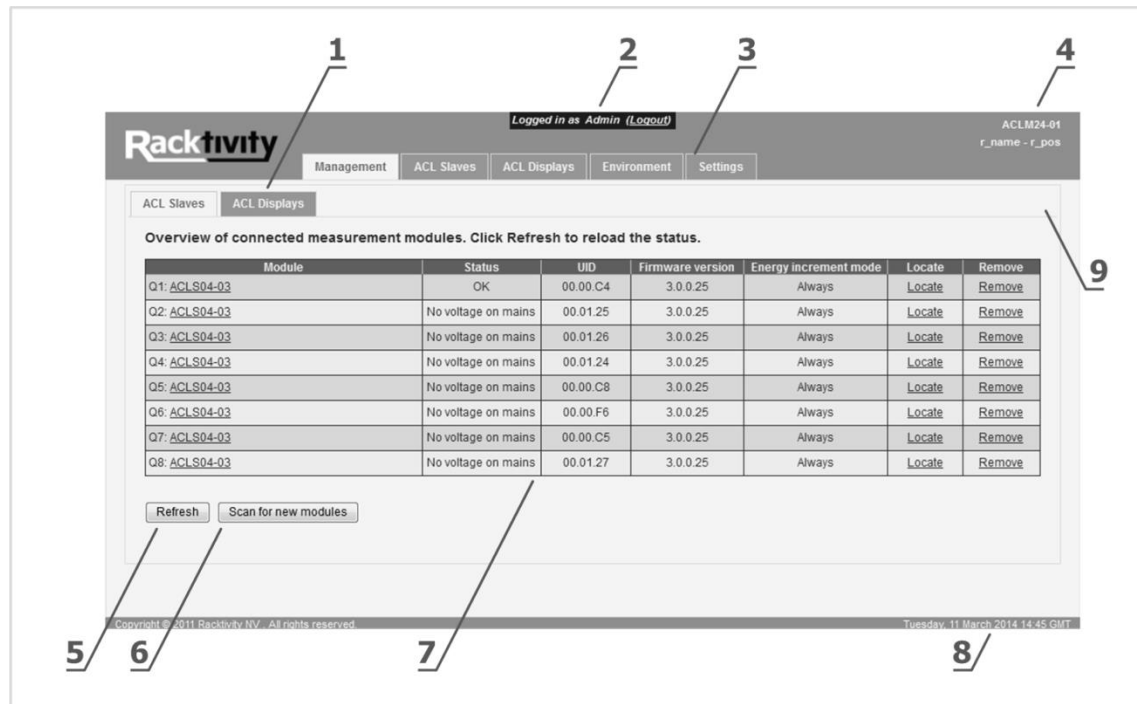
1	**Sub tabs**	Displays the different sections of the selected main tab
2	**User account**	Displays which type of User Account is currently logged in
3	**Main tabs**	Displays the different functional sections of the device
4	**Device info**	Displays the device name, cabinet name & cabinet location Can be changed at the Settings tab
5	**Refresh/Reset**	Refresh or Reset button to refresh the page contents or reset all input fields
6	**Scan/Save**	Scan or Save button to scan and manage new devices or save any changes on the active page
7	**Content**	Available content for the selected main or sub tab
8	**Device time**	The time set on the Settings tab (either manual or through an NTP server)
9	**Device select**	Device selection dropdown list (only visible when appropriate)

Tabs

Management

The management tab is used to manage the ACL Slaves and ACL Displays.
Each of the subtabs provides an overview of the managed devices and their current status, UID (unique identifier) and firmware version.

Pressing the Locate link next to a device in the list will enhance the visibility of that device:
- ACL Slaves: the Dry Contact LEDs will start blinking
- ACL Displays: the display will start blinking (as of FW v3.1)

To stop locating the device press the End Locate link or press any button on that device's front panel.

Whenever a managed device is no longer detected by the ACL Master it will be shown as *Disconnected*.

For more info on managing devices please refer to the Managing Slaves & Displays chapter.

ACL Slaves

The ACL Slave tab allows you to select every managed Slave device to monitor and manage the following parameters:

- Voltage
  - Current value, historical min & max, thresholds (low & high), phase shift & frequency
- Current
  - Current value, historical min & max, thresholds (low & high), THD (Total Harmonic Distortion)
- Power
  - Current value, historical min & max, high threshold, VA (apparent power) & power factor
- Energy
  - kWh (real energy) & kVAh (apparent energy)
    Note: The values in the Accumulated columns cannot be reset to zero by pressing the Reset links, only the values in the Resettable columns.
- Contacts
  - Current state & active state

The Status LED image displays the following statuses:
- **Grey**
  - Voltage, current, power: There is no incoming voltage on this phase
- **Orange**
  - Voltage, current, power: One or more metrics on this phase is outside its threshold boundaries.

- o   Contacts: The Current State does not match the Active State for this contact.
- **Green**
  - o   Voltage, current, power: The status for this metric is OK.
  - o   Contacts: The Current State matches the Active State for this contact.

ACL Displays

When one or more ACL Displays are managed by the ALC Master this tab allows you to set each Display as 'Display All' or 'Display Selected'

- **Display All**
  When the Display All checkbox is checked all managed ACL Slaves will be available on the selected ACL Display.

- **Display Selected**
  With the Display All checkbox unchecked it is possible to select which managed ACL Slaves to be available on the selected ACL Display.

Environment

The Environment tab shows the values - and settable thresholds - for the ACL Master's internal temperature sensor:

- Current value
- Historical minimum & maximum
- Thresholds: low & high
- SNMP Traps for temperature

Note: The temperature unit (Celsius or Fahrenheit) can be set on the Settings > Device subtab.

Settings

Use this tab to configure the following settings:
- Device (see Device Settings chapter)
- Network (see Network Settings chapter)
- SNMP (see SNMP Settings chapter)
- Power (see Power 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/cabinet where the device is located
  - **Rack position**: the identifier of the position in the rack/cabinet
- 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 ACL Master's onboard 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 and its managed modules. 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 device
- **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 device
- **Subnet Mask**
    - The subnet mask of the device
- **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 ACL Master offers **SNMPv2c** and **SNMPv3** communication (GETs, SETs and traps). Notifications (traps) can be enabled or disabled for many of the device's functions.

For more info on setting SNMP notifications for specific thresholds see the Thresholds chapter.

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 **Error! Reference source not ound.** 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**
  - o   Enable or disable this receiver
- **IP Address**
  - o   The IP address of the receiver
- **Port**
  - o   The network port on the receiver to use
- **Authentication profile**
  - o   The authentication profile used to authenticate with the Trap receiver
- **Send test SNMP Trap**
  - o   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

Power Settings

Path: Settings > Power

Note: Use the module selection dropdown list to select the correct ACL Slave.

The Power tab allows you to set the following for each managed ACL Slave:

- **Energy Increment Mode**
  The energy increment mode determines how the values on the ACL Slave > Energy tab are calculated
  - o   **Always**: All values will be incremented to calculate the energy
  - o   **Only Positive**: Only positive values will be incremented to calculate the energy
  - o   **Only Negative**: Only negative values will be incremented to calculate the energy

- **Transducer Settings**
  Select the correct transducer type from the dropdown list for each of the connected transducers (T1, T2, T3 and T4). The transducer type is printed on the model label of each transducer.
  Note: Selecting an incorrect type of transducer will return incorrect values on the ACL Slave tab.

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

  - **25A**
  - **50A**
  - **100A**
  - **200A**
  - **400A**
  - **600A**
  - **800A**
  - **1500A**
  - **2000A**
  - **3000A**

  Please contact sales@racktivity.com for an updated list or more information.

Managing Slaves & Displays

In order to fully use the ACL Slaves and ACL Displays they need to be managed by the ACL Master.

1. Make sure the ACL Slaves and ACL Displays are connected and powered correctly. Please refer to the Mounting the ACL Hardware chapter for more info.

2. On the ACL Master Web Interface, open the Management > ACL Slaves or ACL Displays tab.

3. Press the Scan for New Modules button.

4. After scanning has completed verify that the connected devices are listed in the table.

5. The management table shows basic info on each device allows you to locate and/or remove certain units.

6. All devices listed (for both ACL Slaves and ACL Displays) are now available on the Web Interface of this ACL Master, use the device selection dropdown list on the relevant tabs to switch devices (see the Layout chapter).

Principles

Whenever Slaves or Displays are added to the R-BUS^{24V} and managed by the Master the addressing of that module will follow the rules below:

1. New modules will get the next available (unused) module address.

2. As long as a **managed** module is not explicitly removed (by pressing the corresponding Remove link on its management tab, or by performing a factory reset) that address will remain reserved for that module.

Let's say you start with the following setup:
- **Q1**: managed & connected
- **Q2**: managed & **disconnected**
- **D3**: managed & connected
- **Q4**: managed & connected

Based on the 1st Principle, any new module that is connected and managed will be assigned **address 5** (either Q5 or D5, depending on the type of module).

Based on the 2nd Principle, if you however remove the disconnected module (Q2) first, and then connect and manage a new module it will be assigned **address 2** (either Q2 or D2, depending on the type of module).

Note that a module does not need to be disconnected before it can be removed.

Thresholds

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

Threshold (W)	
Warning	SNMP Warning
0.000	☑
0.000	☑

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

- **Voltage**
  - *Path: ACL Slaves > Voltage*
- **Current**
  - *Path: ACL Slaves > Current*
- **Power**
  - *Path: ACL Slaves > Power*
- **Dry Contacts**
  - An SNMP notification will be sent whenever the Current State for that Contact changes.
  - *Path: ACL Slaves > Contacts*
- **Ambient**
  - *Path: Environment > Ambient*

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

- **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.

	Status	Current (A)			
		Min	Now	Max	Reset
L1	○	19.6007	19.6034	19.6040	Reset
L2	○	18.0751	18.0779	18.0785	Reset
L3	○	16.6249	16.6270	16.6277	Reset
N	○	15.1504	15.1534	15.1540	Reset

The following parameters have resettable values:

- **Voltage**
  - *Path: ACL Slaves > Voltage*
- **Current**
  - *Path: ACL Slaves > Current*
- **Power**
  - *Path: ACL Slaves > Power*
- **Energy**
  - **Note**: The values in the Accumulated columns cannot be reset to 0.
  - *Path: ACL Slaves > Energy*
- **Ambient**
  - *Path: Environment > Ambient*

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

Network Time Protocol (NTP)

Path: Settings > Device

The Network Time Protocol (NTP) is a protocol for synchronizing the clocks of computer systems over networks. The ACL Master 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.

CLI

Introduction

The ACL Master has a built in Command Line Interface that can be accessed through Telnet or secure Telnet (Telnet-SSL). Commands are typically sent to the separate modules. An ACL Series setup consists of 1 Master module, up to 32 ACL Slaves, and up to 7 ACL Displays.

Each device is designated as a specific type:

- **M** for the ACL Master
- **Q** for the ACL Slaves
- **D** for the ACL Displays

The Master will always have address M1 while the Slaves will have address Q1 to Q32 (same for the Displays)

Connecting

- **Telnet**
  Connect to the device IP on port 23 over Telnet using a 3rd party tool (i.e. Putty). Please note that only Telnet over SSL is enabled by default. This can be changed on the Settings > Network subtab on the Web Interface of the ACL Master.

- **Telnet-SSL**
  Connecting to Telnet over SSL can be achieved through several 3rd party tools.
  For example using stunnel (cross platform):

  Create a config file for stunnel called stunnel.conf containing the following:
  ```
  fips = no
  cert = stunnel .pem

  client = yes
  [pdu]
  accept = 127.0.0.1:23
  connect = [DEVICE_IP]:992
  sslVersion = SSLv3
  ```

  (with [DEVICE_IP] being the IP address of the PDU)
  Start stunnel with this config:
  ```
  # stunnel stunnel.conf
  ```

  If you now Telnet to 127.0.0.1 on port 23, stunnel will tunnel the traffic over SSL to the specified IP.

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 devices's functions.
Execute the **HELP** command for more information.

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 ACL Master features a built-in mib file which can be found at the following locations:

- By browsing to http://[DEVICE_IP]/RACKTIVITY-MIB.txt
    - with [DEVICE_IP] the IP of your ACL Master
- By clicking the "Download MIB file" link on the Settings > SNMP tab on the web portal.

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

Racktivity 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 ACL Master - such as the web interface 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.racktivity.com/support or contact Racktivity 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 through the navigation buttons on the ACL Master front panel:

- 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 ACL Master is most likely not on the same network as your PC, or communication is blocked by a network device.
- Connect the ACL Master 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 ACL Master using a different computer.
- Power cycle the ACL Master (if possible).

Knowing your device's IP address

The IP address of your ACL Master is displayed on the main screen of its onboard display. Press any of the navigation buttons to activate the screen.

Support

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

Online	www.racktivity.com/support
E-mail	support@racktivity.com
Phone	003293242095 (GMT+1)