User Manual

E²Sensor

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Preliminary Information

Applicable Models

Unless specified otherwise, all information in this document is applicable to the following Racktivity E²Sensor models:

- **ESN100-11**

Usage

The Racktivity E²Sensors are intended to be used in conjunction with Racktivity devices that are equipped with one or more Racktivity R-BUS connectors.

Specifications

Electrical Ratings

Input:

	E²Sensor
Voltage	5V DC

The E²Sensor receives input power through the R-BUS connection with another Racktivity device. A standard Cat. 5e LAN cable (straight through) is used to establish this connection.

Measurement Specifications

The following tolerances & ranges apply to the humidity and temperature sensors of the E²Sensor:

	Tolerance		Range	
Relative humidity (internal)	+/- 3.1%RH		20%RH - 80%RH	
Temperature (internal)	+/- 0.4°C	+/- 0.72°F	5°C-60°C	41°F-140°F
Temperature (external)	+/- 1.1°C	+/- 2°F	0°C-70°C	32°F-158°F

Note: To ensure the most accurate readings from the E²Sensor' internal temperature sensor, please install the unit in a well-ventilated area. Failure to do so may cause a slight deviation of the temperature sensor reading due to heat emitted from its components. Using external temperature probes - connected to the TEMP connectors - are not affected by this behavior.

Using multiple E²Sensors

The following table shows the amount of E²Sensors each Racktivity device series supports on its R-BUS connection(s):

EnergySwitch 0U	8
EnergySwitch 1U	8
AC²Meter	1
DC²Meter	1
ACL Series	N/A
PowerManager	N/A

Note: The double R-BUS connector on most EnergySwitch 0U models functions as 1 R-BUS connector. In this case 8 E²Sensors can be connected in total over the double R-BUS connector.

Cable Length Restrictions

Amount of E²Sensors*	Point to point length	Max total cable length
1	50m (164ft)	50m (164ft)
2	21.3 (69.8ft)	42.5m (ft)
3	12m (39.3ft)	36.1m (ft)
4	7.7m (25.2ft)	30.7m (ft)
5	5.2m (17ft)	26.1m (ft)
6	3.7m (12.1ft)	22.2m (ft)
7	2.7m (8.8ft)	18.9m (ft)
8	2m (6.5ft)	16m (ft)

* Amount of E²Sensors per connector. Having 8 E²Sensors split equally over the RBUS A and B connectors (as available on the 0U EnergySwitches) means that you can have 30.7m + 30.7m = 61.4m cable in total

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)	5.77 x 7.00 x 2.38
Dimensions inch (WxHxD)	2.27 x 2.76 x 0.94

Compliance

- **WEEE**

Waste Electrical and Electronic Equipment

- **RoHS**

Restriction of Hazardous Substances

RŏHS

Safety Information

Save these instructions!

This documentation contains important instructions that should be followed during installation and maintenance of the E²Sensor. 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.

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.

Recycling

The materials used for shipping the E²Sensor are recyclable, please save them for later use or dispose of them appropriately.

Servicing & Repair

There are no user serviceable parts inside the E²Sensor**. All repairs and service should be performed by authorized service personnel only.**
Please refer to the Service Manual for RMA procedure.

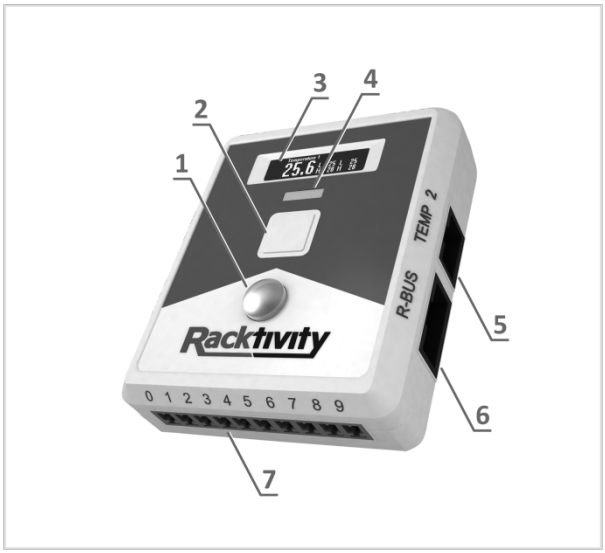
Inventory

Please verify the contents of the box:

Standard Package

Item	Quantity
E²Sensor	1
Cat. 5e LAN cable (straight)	1
Accessory set (ESN-ACC-SET)	1

Overview



1	**DOME**	Motion detection dome (if applicable)
2	**BUTTON**	Operation button
3	**DISPLAY**	OLED display
4	**LED**	RGB status LED (see **STATUS LED** chapter)
5	**TEMP (2x)**	Connector for external temperature probes (both sides)
6	**R-BUS (2x)**	R-BUS connector (both sides)
7	**I/O CONN**	Input & output connector (see **I/O CONNECTOR** chapter)

Status LED

BLUE	The sensor is powered on (no motion detected (if applicable))
RED	The sensor is powered on and has detected motion. Intensity is based on the amount of motion detected
GREEN	The button has been pressed

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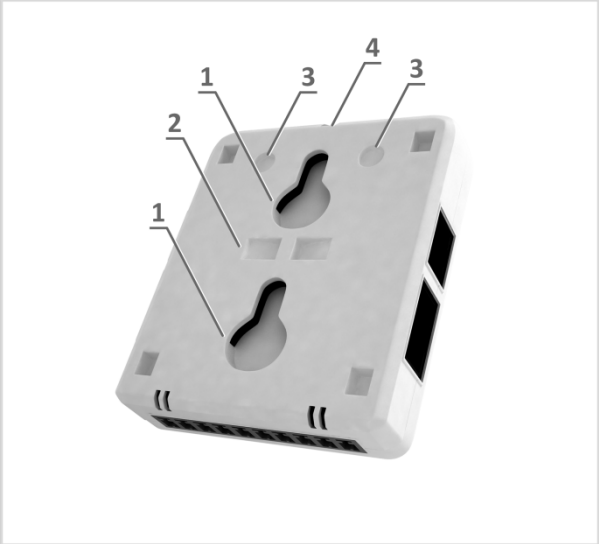
Installation

Mounting Options

The back panel features several mounting options to ensure proper installation in almost every situation.



1	**SCREW HEADS**	Lock to screw heads of a (vertical) rail in a rack
2	**CABLE TIE (H)**	Cable tie slot for horizontal mounting
3	**MAGNETS**	Circular notches for 5 x 3mm (0.2 x 0.12”) neodymium magnets
4	**CABLE TIE (V)**	Cable tie slot for vertical mounting

Note: The mounting options mentioned above are not included in the E²Sensor package.

Connecting the E²Sensor

1. Connect one end of the supplied Cat. 5e LAN cable (standard straight through) to the R-BUS connector on your Racktivity device.

2. Connect the other end of this cable to one of the two R-BUS connectors on the E²Sensor. Either one of the R-BUS connectors on the E²Sensor can be used as connection to a Racktivity device or as link to the following E²Sensor.

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Managing the E²Sensor

When an E²Sensor is connected to the R-BUS of a Racktivity device it receives input power and is fully functional on itself. At this point the E²Sensor is not yet "managed" by the Racktivity device, meaning that there is no data link between the two.

Managing can be done in 2 ways, through the Command Line Interface and via the website. The following chapters only cover specific actions regarding the managing of an E²Sensor. For more general information about these topics please see the User Manual of your Racktivity device.

Website

1. Connect the E²Sensor to an available R-BUS connector on your Racktivity device.
2. Log in to the Web Portal as administrator.
3. Open the E²Sensor > Management tab (on some devices this will be called the Management tab)
4. Press the Scan button below the table to scan for modules.
5. When successfully completed the E²Sensor multiple subtabs will become visible under the E²Sensor tab.

Note: In some previous versions of the Web Portal the managing of an E²Sensor will require additional steps:

6. Select "Manage" in the Action column of the module row and press the Save button.
7. If the managing is successful a new tab named "Modules" appears at the top of the Web Portal where the E²Sensor can be operated and monitored.

CLI

1. Log in to the Command Line Interface as administrator.
2. Enter command: **`get m1 modinfo 1-4`**
   to see the number of used slots (replace "1-4" with "5-8" if there are no free slots).
3. Enter command: **`set m1 modscan 1`**
   to initiate a new module scan.
4. Enter command **`get m1 modscan`**
   to get the result of the module scan (should return "2").

5. Enter command **`get m1 modinfo 1-4`** (or “5-8”)
   to get the updated list of modules. Every not yet managed E²Sensor has now been added to the list as an A1 module (ref. step 1). The list number equals the number of the module (shown as [X] in the following commands).

6. Enter command **`set m1 modmgmt [X] 1`**
   to manage the module in slot [X] (as defined above). Do this for every E²Sensor you wish to manage.

7. Enter command **`get m1 modmgmt [X]`**
   to get the management status of the module in slot [X] (should return “1”).

8. Your E²Sensor is now managed by the Racktivity device. For more information on how to get measurements from the E²Sensor please see the API documentation or use the “HELP” command in the Command Line Interface.

Connecting I/O

External temperature probe

Up to two external temperature probes can be connected to each E²Sensor. To connect an external temperature sensor plug it in an available TEMP connector. The read-outs will be available instantly.

I/O Connector

The E²Sensor features an Input/Output (I/O) connector to which external devices can be connected. The following is an overview of the I/O Connectors pins per model.

ESN100-11

PIN	FUNCTION	MAXIMUM VALUE
0	Ground	-
1	5V out - switched	40mA
2	Analog IN 2	3.3V
3	-	-
4	Isolated Input Common *	-
5	Analog IN 1	3.3V
6	Isolated Input B *	-
7	Isolated Input A *	-
8	Relay 1 - contact B	2A - 60W - 60V DC
9	Relay 1 - contact A	

* An external dry door contact can be connected between both:

- Isolated Input Common (PIN 4) and Isolated Input A (PIN 7)
- Isolated Input Common (PIN 4) and Isolated Input B (PIN 6)

ESN100-10 (obsolete)

PIN	FUNCTION	MAXIMUM VALUE
0	Ground	-
1	5V out - switched *	40mA
2	Analog IN 2 *	3.3V
3	-	-
4	-	-
5	Analog IN 1 *	3.3V
6	-	-
7	-	-
8	Relay 1 - contact B	2A - 60W - 60V DC
9	Relay 1 - contact A	

* An external dry door contact can be connected between both:

- 5V out (PIN 1) and Analog IN 1 (PIN 5)
- 5V out (PIN 1) and Analog IN 2 (PIN 2)

Quick Configuration

Using the OLED Panel Display

Activating the display

When the Status LED is lit or blinking and the screen is black, push the button below the OLED display to activate it. On some models, the display is activated when motion is detected.

Controlling the display

The button on the E^2Sensor has 2 main functions: switching display screens and resetting values.

- Switching screens: press the button once.
- Resetting values (on a value screen): keep the button pressed until the status LED changes color (1 sec).
- Other functions: follow the instructions on-screen.

Troubleshooting

Known Issues

- ***No communication between the E²Sensor and Racktivity device.***
  When the E²Sensor and Racktivity device are not booted at the same time, communication between the two may fail. This issue can be resolved by booting the 2 devices when they are connected. After connecting the E²Sensor *give the Racktivity device a Hot Reset through an API call or by pressing the MENU and DOWN button simultaneously for 3 seconds.*

Support

Feel free to contact us if you need any support:

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