The Cassia™ Energy Management System (EMS)

Return on Investment (ROI)

INTRODUCTION

In the current economic climate, businesses of all shapes and sizes are searching for innovative ways to reduce operating costs and reintroduce dollars into their cash flow statements. Nowhere is this more evident than in the hospitality and multi-unit renter industry, where owners and management companies continually face major energy expenditures in areas such as lighting, heating, ventilation and air conditioning (HVAC) systems . Since guests or renters are not directly accountable for a facility's overall utility bill, they often have little incentive to adopt energy-efficient habits. This contributes to the plight of the industry.

With the Cassia™ Energy Management System (EMS) from Schneider Electric, the industry can now save energy easily and enjoy a rapid return on investment with an intuitive, in-room energy management solution.

HOW THE CASSIA™ EMS SYSTEM WORKS

Installation is as simple as replacing a thermostat or installing a new light switch, since all components deploy ZigBee® wireless technology. This simple retrofit technology does not restrict a building's daily operation or require the shut down of individual floors or occupied rooms for installation, so owners can enjoy a continued revenue stream in addition to a rapid Return on Investment (ROI).

Figure 1: The Cassia™ EMS System Components

The Cassia EMS tackles two of the largest culprits of energy waste in hospitality, HVAC and lighting. This is accomplished through the use of room automation, reporting, lighting and HVAC controls. The web-based central control software provides hotel operators and maintenance personnel the additional convenience of customized software and real-time monitoring to enhance their energy saving capabilities. Based on conservative estimates, a 25% - 44% energy savings per room can be achieved in virtually any hotel, dorm, or multi-unit dwelling.

Schneider Electric

Heating and Cooling (HVAC) Management

The Cassia EMS uses the concept of “Target” temperature settings to manage activation of heating and cooling systems in guest rooms. These settings allow the room temperature to fluctuate up or down a pre-determined temperature range. Customer-selected Variances, Setbacks and Deep Setback settings determine the desired temperature range.

The purpose of these variable fluctuations is to ensure that the target temperature is maintained for guest comfort, while eliminating unnecessary “vacant energy expense” while guests are out of the room. When a guest reenters, temperatures return the guest’s preferred settings and offers manual adjustments.

Lighting Management

When the Cassia system determines a room is unoccupied, it sends a signal to each light switch and turns off any light that is left on. Similar to the heating and cooling settings, the time delay can be programmed to preference. As soon as the door opens again, guests can be greeted by warm courtesy lighting. Rules can also be set to not activate courtesy lighting during daylight hours when natural light is sufficient, thus maximizing the energy savings potential.

DETERMINING ROI

When making an investment in energy management, business owners expect detailed reporting and information to support their financial decisions. Through the extensive amount of data points captured by the Cassia EMS, reports can be customized to meet a customer's unique goals, whether that is a clear display of the facility's ROI or detailed summary of monthly energy usage. Although every property will experience fixed financial expenditures, understanding how the Cassia system can impact your facility's energy efficiency through the following eight drivers can lead to dramatic improvements and rapid payback periods. See the figure below.

Figure 2: Return on Investment Drivers

(1) Installed Costs

The Cassia EMS wireless technology provides a fast and non-invasive way to save money and increase facility up-time by reducing energy usage and installation costs.

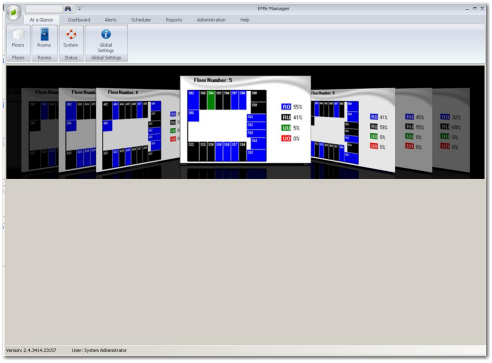
There are multiple ways in which customers can offset the installed costs of the Cassia EMS. For example, much of the labor expense can also be offset through on-site installer training. This offers customers the opportunity to utilize their own maintenance team to service the majority of installation activity required. This becomes especially important in regions where trade labor is held at a premium, such as high density areas.

Since the Cassia EMS is a scalable solution, customers have the flexibility to start the installation process with an entire building, a single floor, a full product solution or a phased installation to manage installed costs. It can be easily phased in to large properties over multiple fiscal quarters to accommodate a customer's budgetary schedule.

Together with Schneider Electric, customers can determine the most efficient implementation strategy to meet their payback period goal. While labor does vary by property, these design elements are the key to helping lower the threshold of implementation, and the required labor for a retrofit or new multi-unit application.

(2) Management Strategy

Figure 3: Floor Layout Screen



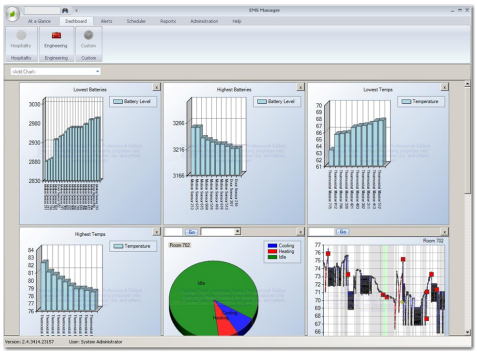
With the Cassia EMS, customers will enjoy the convenience of customized reporting and real-time energy monitoring software. These robust reporting features ensure that customers are always well informed to make accurate business decisions relating to their overall management strategy or energy usage. To accomplish this, the Cassia EMS tracks millions of key data points that directly impact a facility's profitability and operating performance. Some key areas where the Cassia system that can positively impact operations, maintenance, and sales include:

Programming – Degrees of Drift, Deep Setback, Room Shut Down

A customer's choice of settings and other programming decisions for the Cassia EMS can significantly impact ROI during the initial payback period. For example, if a room is rented but unoccupied, the Cassia thermostat can be programmed to allow "drift" from the last set point attained before the occupant left the room. By utilizing this drift feature, the customer eliminates the energy wasted to heat or cool a vacant room. The degree of drift is programmed based on customer preference, however the recovery time of the HVAC system often influences this decision. For example, if the facility's air conditioning unit is known to cool a room rapidly, the customer can confidently expand the drift range for a maximum ROI. If a room is unrented and unoccupied, the deep-set back mode can also be utilized or, in some cases, the room may temporarily shut down to eliminate unnecessary expense.

Troubleshooting, Training and Monitoring

Figure 4: Reports Dashboard



Through the comprehensive software offered by the Cassia EMS, building management can enjoy increased task automation that once drained significant amounts of time and resource. Continuous monitoring and convenient electronic alerts will result in higher guest satisfaction and improved maintenance response time if problems arise. For troubleshooting or manual adjustments, staff are able to access system controls by room or floor through a secure IP address. Thus, HVAC inefficiencies will no longer go unresolved and in-room energy usage can be managed to peak performance. Additional data captured by the Cassia software, such as number of manual setback overrides, will also provide management visibility of their employee's "green performance."

Tracking Unauthorized Room Entry

The Cassia EMS is able to link easily with a facility's Property Management System, allowing the system to collect data relating to the rented or unrented status of a room. Coupled with the occupancy and vacancy detection of the Cassia EMS, the system is able to alert personnel if a room is occupied during unrented periods. This safeguards company property inside a room, and assures management that only authorized personnel are entering guest rooms during vacant periods.

(3) Room Efficiency

Every property will experience rooms or apartments that run more efficiently than others. This is often due to factors such as aging HVAC equipment, a room's orientation to the sun, or poor insulation and thermal leakage. Once the Cassia EMS is installed and has had sufficient time to collect a facility's energy usage statistics, more efficient rooms can be easily identified. This offers valuable information for off-peak seasons, where management could choose to rent the most efficient rooms first to improve profitability.

(4) Property Size

When investing in the Cassia EMS, all properties will experience a one-time purchase of an on-site or remote facility server and comprehensive software installation. Since this fixed expense is spread over the number of available rooms in a multi-unit dwelling, larger properties with a high number of units will experience a faster Return on Investment. The federal government also provides incentives for energy efficient investments based on property size.

The Energy Policy Act (EPAct) of 2005 provides a Federal Tax incentive that allows accelerated depreciation during a property's first year based on a property's square footage. EPAct offers a tax deduction up to $0.60 cents per square foot for lighting and $0.60 cents for HVAC improvements. For example, a property operating under a 40% tax bracket with 80,000 sq. ft. (7,432 sq. m) under roof would net $38,400 in one year (80K X $1.2 X 40%).

Additionally, by addressing periodic low fill rates in large properties, customers will experience a greater impact on payback when they choose to set back or turn off large blocks of rooms during slow periods.

(5) Location

Climate

One can assume that the local climate and location of a facility can dramatically impact energy usage and the ROI of an energy management system. Locations that experience strong winter conditions, for example, will consistently rely upon their heating units and incur higher utility costs to ensure guest comfort. Climates with extreme heat, on the other hand, will require a more regular use of

air conditioning units. Although the energy cost that a customer experiences will vary by location and climatic conditions, the Cassia EMS will ensure that a facility is performing as efficiently as possible in every season.

Average Cost Per Kilowatt Hour (in cents)

In order to accurately determine a facility's energy savings potential and possible ROI, it is important to note the varying energy costs and how they are calculated by location. Energy cost is referred to in terms Average Cost per Kilowatt Hour, and often varies by city, state or region. Refer to Table 1 below to see the Environmental Protection Agency's 2008 average cost per hour of electricity by state.

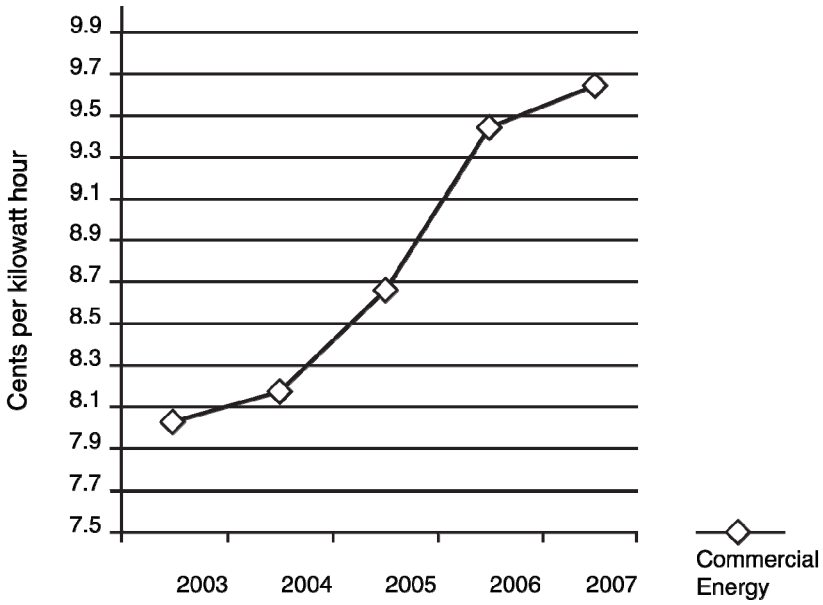
Energy Trends

With the anticipation of rising energy costs, market conditions demand greater efficiencies. Table 1 below references EPA statistics that detail the year-on-year rising energy costs experienced by state. In 2008, 18 states faced double-digit increases in energy costs while 32 states experienced increases of 5% or more. The aggregate U.S. electric energy costs rose 20% from 2003 – 2007. Based on these indications, businesses everywhere will need to establish new and innovative ways such as the Cassia EMS to reduce their energy usage.

Table 1: Published EPA Year-Over-Year Trends – Increases (2007-2008) by State

State	% Change	State	%Change	State	%Change
Hawaii	36%	Oklahoma	10%	Nebraska	4%
Rhode Island	22%	Alaska	9%	Wash.	4%
Virginia	16%	Texas	8%	W. Virginia	4%
Georgia	14%	Michigan	8%	Conn.	4%
Dist. of Col.	14%	Delaware	7%	N. Dakota	3%
New Jersey	13%	Kentucky	7%	New York	3%
Alabama	13%	Wyoming	7%	S. Dakota	3%
Colorado	12%	Arizona	7%	N.Carolina	3%
Arkansas	12%	Indiana	7%	Utah	3%
Mississippi	12%	Ohio	7%	New Hamp.	3%
New Mexico	12%	Wisconsin	7%	Penn.	2%
Tennessee	11%	Mass.	6%	Iowa	2%
Idaho	11%	Montana	5%	California	2%
Maryland	11%	Oregon	5%	Vermont	2%
Louisiana	11%	Minnesota	5%	Nevada	1%
Kansas	11%	Florida	5%	Maine	0%
S. Carolina	10%	Missouri	4%	Illinois	0%

Figure 5: 2003-2007 Commercial Kilowatt Trends



(6) Demographics

Determining the average number of "rented unoccupied" hours of a facility is virtually impossible without the help of a central management system to capture these real-time events. However, it is often useful to consider the guest demographic of a facility as an indication of guest occupancy habits. This can provide basic guidance toward the programming and system settings of the Cassia EMS. For example, leisure and business travelers will utilize their time differently due to the purpose of their trip. Vacationers are likely to spend more time in their room during the morning and afternoon hours to take advantage of the guest amenities or the opportunity to catch up on sleep. By contrast, business travelers are known to have regular working hours spent away from their room, departing early for meetings, followed by dinners and evening entertainment.

By assessing the demographic patterns and behavior of the property clientele, customers will have a better understanding of the energy savings that can be achieved with the Cassia EMS during rented unoccupied periods. Since the Cassia system reverts to an energy-saving Setback mode when a guest room is unoccupied, properties whose guests spend the majority of their time away from the room will experience greater energy savings potential.

Demographic assessment data categories may include:

- Business traveler
- Vacationing family
- Retired couple
- One night stays
- Multiple night stays
- Other

(7) Incentives and (8) Funding

To achieve the greatest ROI on the Cassia EMS, it is important to determine whether there are any local, state or federal incentives available. To encourage property owners to reduce their carbon footprint and dependence on fossil fuels, many local, state, and federal governments are offering incentive programs and funding packages for the installation of renewable and energy-efficient technologies such as the Cassia EMS.

Additionally, a multitude of incentive plans are available from local utility companies for sustainable installations. This often comes in the form of product rebates on a per-unit basis or preferential low-interest loans.

The following pages display some of the numerous incentive programs available by state. Further information on state, local, utility and federal incentives and policies can be found at www.DsireUSA.org.

Table 2: Summary of Available Incentives by State

F = Federal S = State/Territory L = Local U = Utility
Numeric values indicate the number of available incentives by state.

State	Corp. Tax	Sales Tax	Prop. Tax	Rebates	Grants	Loans
Federal	4-F				1-F	4-F
Alabama				10-U		1-S 10-U
Alaska				1-S 2-U		4-S
Arizona				9-U		1-U
Arkansas						1-S 4-U
California				65-U	1-S 5-U	1-S 10-U
Colorado				20-U	1-U	2-U
Connecticut		1-S		2-S 14-U	1-U	2-S 4-U
Delaware				1-S	2-S	
Florida				16-U	1-S 2-U	4-U
Georgia	1-S	1-S		14-U		10-U
Hawaii				5-U		
Idaho				18-U		1-S 2-U
Illinois				2-S 11-U	2-S	
Indiana	1-S			30-U	1-U	1-U
Iowa				20-U	1-S	1-S 3-U
Kansas				1-S 7-U		1-S 1-U
Kentucky	1-S	1-S		15-U		6-U
Louisiana				1-S 1-U		1-S
Maine				2-S 2-U		2-S
Maryland	1-S		2-S	1-U	1-S	2-S
Massachusetts	1-S			28-U		6-U
Michigan				1-U	1-S	
Minnesota				74-U	5-U	4-S 4-U
Mississippi				6-U		1-S 4-U
Missouri		1-S		22-U		1-S 2-U
Montana	1-S			8-U	1-U	1-S
Nebraska				7-U		1-S
Nevada			1-S	3-U		
New Hampshire				16-U	2-U	1-S 2-U
New Jersey				8-S		1-S
New Mexico	1-S			5-U		
New York	1-S		1-S	3-S 6-U	2-S	2-S
North Carolina		1-S		1-S 6-U	1-S	1-S 9-U

(Table continued on next page)

North Dakota				1-U	1-S	3-U
Ohio				6-U	1-S	1-U
Oklahoma				1-U		3-S 1-U
Oregon	1-S			8-S 41-U	2-U	1-S 15-U
Pennsylvania				1-S 1-U	6-S 1-U	2-S 1-U
Rhode Island				5-U		1-U
South Carolina		1-S		1-U		1-S 5-U
South Dakota				4-U		2-U
Tennessee				20-U		2-S 24-U
Texas		1-S		39-U		1-S 5-U
Utah				9-U		2-S
Vermont				9-S 3-U		1-S 1-U
Virginia		1-S	1-S	1-U		
Washington				71-U	1-S 4-U	12-U
West Virginia		1-S				
Wisconsin				4-S 13-U	1-U	3-U
Wyoming				4-U	1-S	1-S 2-U
District of Columbia						
Palau						
Guam						
Puerto Rico						
Virgin Islands				1-S	1-S	
N. Mariana Islands						
American Samoa						
Totals	13	9	5	707	50	209

F = Federal S = State/Territory L = Local U = Utility

Numeric values indicate the number of available incentives by state.

EMS Savings Estimator and Cash Flow Analysis

Table 3: EMS Savings Estimator

Property Information		**CEM HVAC System**	
Number of Rooms	300	Cost per room (components)	$750
Average Energy Cost per room per year	$675	Total System Cost	$225,000
Estimated Annual Savings per Room	$256.50	Estimated annual savings (Typical average)	38%
Annual Savings Total Property	$76,950.00	ROI Timeframe (months)	35.1

Table 4: Cash Flow Analysis

Year	**Annual Savings**	**Accumulated Cash Flow**
1	$76,950.00	-$148,050.00
2	$76,950.00	-$71,100.00
3	$76,950.00	$5,850.00
4	$76,950.00	$82,800.00
5	$76,950.00	$159,750.00
Total	**$384,750.00**	**$159,750.00**

CONCLUSION

There are numerous elements within these eight drivers that offer customers the opportunity to take control of their energy cost through installing the Cassia Energy Management System.

Schneider Electric can provide an online or in-person demonstration of the Cassia Energy Management System as well as assist in evaluating and calculating the potential payback and ROI of a facility for customers.

COMPONENTS

Figure 6: Cassia™ Door Sensor

Figure 7: EMS Thermostat

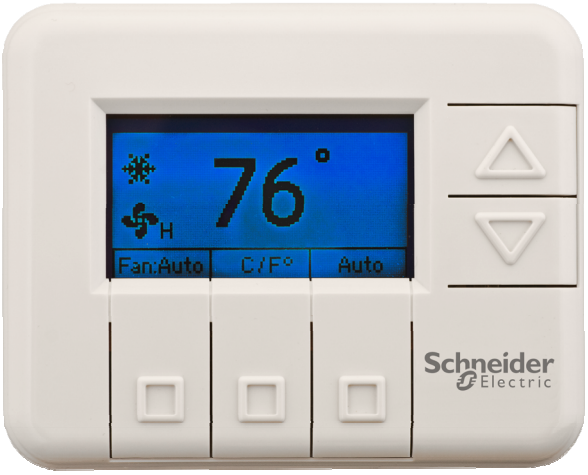


Figure 8: Cassia™ EMS Motion Sensor

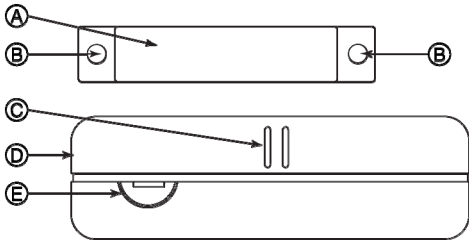
Figure 9: EMS Group Coordinator

Dimensions

Component	Dimensions
Magnet	2.5 x 0.32 x 0.39 in. (63.5 x 8.1 x 9.9 mm)
Door Sensor	2.5 x 0.81 x 0.86 in. (63.5 x 20.5 x 21.8 mm)

Figure 10: Door Sensor

KEY:
A. Magnet (Top view)
B. Mounting holes
C. Alignment markers
D. Door sensor (Side view)
E. Access release (press)



Cassia Motion Sensor Dimensions

Component	Dimensions
Motion Sensor	1.9 x 1.9 x 1.2 in. (48.3 x 48.3 x 28.4 mm)

Figure 11: Motion Sensor (Interior view)

KEY:
A. LED
B. Programming button
C. Sensor
D. Battery location

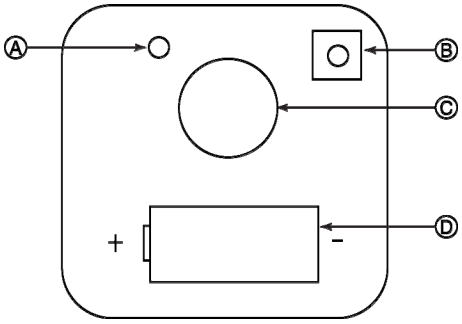


Figure 12: Dimensions

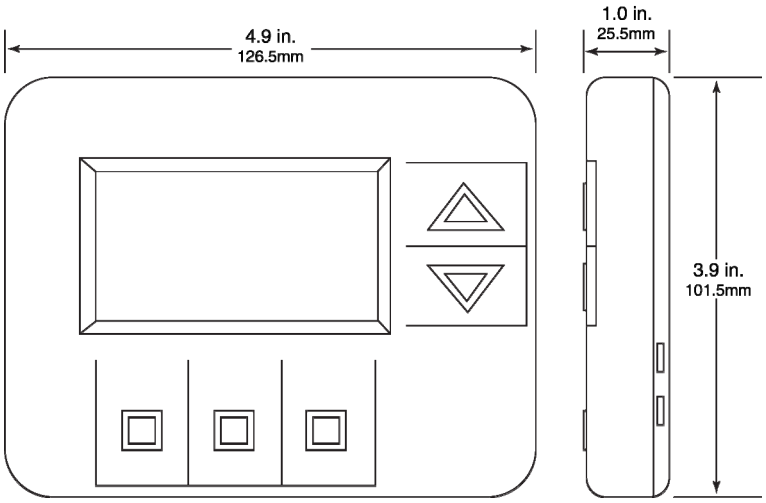
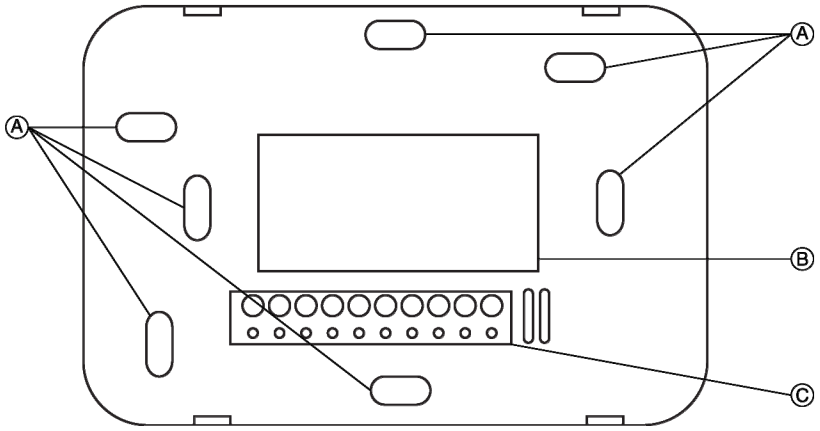


Figure13: Back Plate Diagram (Interior View)

KEY:
A. Mounting holes
B. Wiring hole
C. Wiring terminal



ORDER INFORMATION

Description	Catalog Number
EMS Group Coordinator	CSEC01
EMS Group Coordinator (Advanced)	CSEC02
EMS Door Sensor	CSDC1
EMS Motion Sensor	CSMS1
EMS Thermostat	CSSTAT1

Contact the Customer Information Center for technical support by phone at 1-888-778-2733 or e-mail at lightingcontrol.support@us.schneider-electric.com.

You may also find helpful information on our web site at www.Schneider-Electric.us.

Schneider Electric, USA
320 Tech Park Drive, Suite 100
La Vergne, TN 37086
1-888-778-2733
www.schneider-electric.us

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