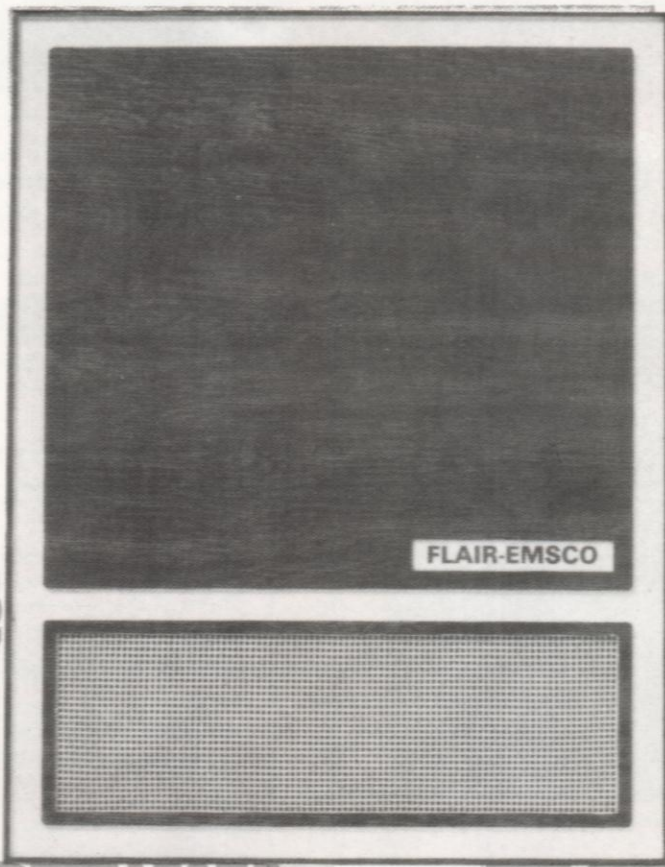


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ENERGY

**Energy
management
in the
guest room**



**The stand alone electronic intelligence that controls
room energy waste without the occupant's knowledge.**

AMERICA'S BUSINESS ADDRESS™

CASE HISTORY

Controlled tests prove room energy waste can be saved.

Occupancy-sensing technology is the fastest growing aspect of Energy Management Systems (EMS). The many units on the market utilize several types of electronic sensing devices to seek out occupancy and turn the electricity in a room on and off as needed. The common three types of sensing devices normally used are infrared heat sensors, sound activated sensors, and ultrasonic movement sensors. Such systems can be installed in new or existing buildings without altering wiring or HVAC systems. Of the three common systems the ultrasonic motion sensor working in conjunction with a normally closed door switch appears to be the most dependable. Infrared heat sensors are subject to triggering by random hot spots caused by sun infiltration or air circulation and are too expensive. Sound activated sensors can be triggered by a TV or radio left on in the room.

chilled water supply, thus saving electricity and reducing the load accordingly on the boiler/chiller reducing energy use at that point.

The proper application of the system to the equipment is the main determining factor that makes a guest room controller a success. Installing this system with adequate engineering for the type of equipment could result in paybacks ranging anywhere from one to three years at today's energy costs*.

The advantage of the occupancy-sensing system over the check-out/check-in system is that it turns the room off (or performs temperature setback) anytime it is vacant and not only when it is not rented.

A controlled test of four different guest room energy management systems was conducted at a motel in San Antonio, Texas. The test involved control of only through-

TEST DATA

Data from AH&MA/DOE Demonstration Projects Summary Report of Energy usage/consumption analysis for six hotel/motels.

Results of controlled tests

4 Guest Rooms each	Percent Occupancy	Total Kwh used	Kwh per Room/Day	Percent of Decrease
Uncontrolled	97.2	4,354	9.5	--
Product A	88.8	2,886	6.9	27.4
EMSCO CRC	96.6	3,056	6.7	29.4
Product C	94.7	3,160	7.1	25.5
Product D	87.1	3,310	8.1	15.2

The occupancy-sensing system is based on the potential disturbance of field ultrasonic waves that fill the monitored area. When motion such as the entrance of a guest into a room is detected, the room is activated. When the room is vacated (if movement is not sensed in that predetermined time) the room is deactivated. The ultrasonic system working in conjunction with a normally closed door switch seems to also solve the problem of a door propped open (heating or cooling uncontrolled areas) and occupancy of the room by more than one person.

The potential savings for some properties using occupancy-sensing systems can be substantial, depending mostly on the type of HVAC system in use. For example, a property using through-the-wall units with electrical resistance heating and using an average of 18 Kwh per day, would show considerable savings. The identical unit with a heat pump instead of resistance heating would show somewhat less savings because of its higher efficiency. A central fan coil guest room unit would control fan operation in conjunction with valving on the

the-wall air conditioning units during a 118 day period from May 3rd to August 29th. Three of the systems tested were of ultrasonic movement type, while one was an infra-red heat sensor type. Total cooling degree days (CDD) during the test was 2,033.

Four guest rooms were uncontrolled, while four guest rooms were controlled by each of the four different energy management systems. During the test period, detailed records were kept on each group of four guest rooms, including number of guests, number of rooms occupied and daily electric meter readings for each group of air conditioning units. High occupancy rates were purposely maintained. The illustration above shows the statistics for each of the four units.

Results of the test indicated decreases in the use of electricity for air conditioning in the rooms using energy management systems, when compared to the uncontrolled rooms, of from 15.2% to 29.4% per occupied room.

During the test period guest acceptance was very good, resulting in few complaints.

*1984

CASE HISTORY

Sheraton retrieves six months of energy waste with Emsco CRC



The Sheraton Crest Hotel released a report detailing the recovery of energy waste totaling \$26,459. in a six month period. The analysis submitted by the hotel's management documented the KWH use and Cooling Degree Days (CDD). The KWH consumption was detailed by A P & L while the CDD was supplied by the Bureau of the National Weather Service. Because the facility heats with gas the annual energy savings were estimated by management to be \$61,462.

CASE HISTORY

Holiday Inn trims room energy use by 57%.



Temple, Holiday Inn. During a controlled test of the Emsco CRC (Computerized Room Control) documented savings of "run-time" reached a high of 57%. The tests included ten rooms. Five rooms had Emsco units installed and five were without any devices. All rooms were carefully monitored and were uniformly occupied. At the end of the test period the fan coil units in the five Emsco equipped rooms had run for a total of 1086.7 hours (an average of 217 hours per room). In the other five rooms the fan coil units ran for a total of 2560.8 hours (an average of 512 hours). The lessor run time (295 hours per room) multiplied by the 134 rooms and .048 Kwh generates a projected savings of \$1897.44 during this two month period.

Henderson, Holiday Inn. A four week test in four random rooms monitored by Dupont Electric KWH meters documented savings of 340 KWH (31.7%). It is noted that this test took place during the generally mild time of the year and that annual energy savings were estimated to be higher.

Richardson, Holiday Inn. The 221 rooms averaged 446 KWH per room in the uncontrolled rooms versus 246 KWH per room the Emsco controlled rooms. A 44.8% reduction in energy waste. When converted to dollars the savings would generate a 12 month payback period.

CASE HISTORY

HYATT MACAU selects Computerized Room Control

Management stated "Since the installation of the CRC (Computer Room Controller) in June we have been able to document the savings by monitoring the KWH use in comparison to the same period last year."

Month	Last year without CRC	This year with CRC
June	914,984	615,636
July	900,101	605,620
August	916,700	661,384
September	780,600	544,204
October	673,000	486,300
November	522,144	397,964
Totals	4,707,529	3,311,108

"Although many actions resulted in energy savings, it was the Computerized Room Controller that helped the most to conserve energy. To date, this equipment has brought us, on the average, 37% dollar savings on our guest room energy bill."



REPRINT

Energy management in the guest room

Reprinted from Lodging Technology News

A major advance was made in sensory unit technology when the EMSCO CRC (Computerized Room Control) was introduced. The system was "triggered" by a switch installed in the door jamb of the guest room. An internal logic circuit could then combine the motion scanning process with a **time-since-entry** routine to determine if the guest was entering or leaving the room. Why? The idea was to avoid any setback in the room when occupied, even when the guest was asleep.

The system developed by EMSCO succeeded. Each time the door switch was triggered, the unit would scan for a period of time. If a single motion was detected the room system determined that the room had not been vacated and it would go into a passive mode, leaving total control to the guest, asleep or not. It was a simple and effective method. EMSCO also introduced electronic temperature sensing for determining room setback, permitting management to set the maximum and minimum "drift" temperature range for each room when in the setback mode.

CASE HISTORY

Energy is hotel's third largest expense.

Over 50% of this energy is used in unoccupied rooms.

Since the installation of 350 CRC (Computerized Room Control) units in the Best Western in Philadelphia energy waste has decreased in excess of 30%. During one period savings of 58% were noted. Management stated that they had considered other energy systems and chose Emsco's CRC because of "its ease of operation, plus

our guests are not even aware of the presence of the units. Since a hotel's third largest expense is energy related, a savings of 38 to 58% is quite impressive. We pre-set our units on two levels: a 'comfort' level for when the room is occupied; and a set-back, energy saving level for when the room is unoccupied. The stand-alone Emsco takes over and senses and monitors the activity within the room."

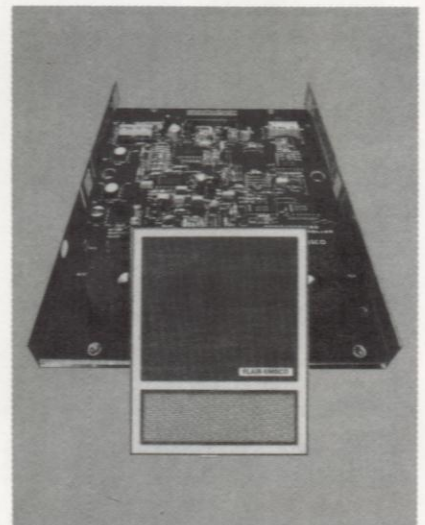
TEST DATA

Average room uses \$490. energy a year CRC (Computerized Room Control) generates enough savings for a 8 to 16 month payback.

Location	Space Heating	Space Cooling	Lighting Outlets	Annual Costs*
Atlanta, GA	1,789Kwh	3,467Kwh	401Kwh	\$508.29
Hubbing, MN	245Cef	2,154Kwh	803Kwh	456.90
San Antonio, TX	2,665Kwh	1,643Kwh	876Kwh	479.97
Woodstock, VT	157 gal	1,643Kwh	548Kwh	515.72
Total 827 rooms				\$494.87

The above data is based on AH&MA/DOE Demonstration Project's "Summary Report of Energy Usage/Consumption Analysis for Six Hotels/Motels", **Data for guest rooms only; does not include energy use in public and service areas, or building exterior.**

*Adjusted to .075¢ Kwh.



Today, virtually every sensory controller is built around the technology introduced with the CRC. These systems have consistently produced 25 to 40% reductions in the energy required for room HVAC units, and provide paybacks of less than 2 years.

Chilled water fan coil units have benefited from the system, too. Although electricity saved by reducing the run time of the room blower motors is not significant, the reduced demand on the chilled water loop is directly proportional to the percentage of rooms in the setback mode at a given time, provided the chiller unit used reduces the load based on return water temperature.

(Continued on page four)

(Continued from page three):

Energy management in the guest room

Imagine a 300 room property in the South with a chilled water system. It is 3:00 p.m. and the temperature is approximately 100 degrees. Although 85% of the rooms are rented, less than 50 rooms are actually occupied. The vacant rooms are in setback, operating only infrequently to maintain a temperature of 82 degrees. The result is a reduction of close to 90% on the demand for chilled water, and the chiller is implemented only for the few occupied rooms and public areas.

Carefully metered tests have shown consistent reductions in run time for fan coil systems to be in the 40% range. The energy management vendors offer a range of financial packages including sales, renting and leasing. Yet, estimates indicate that only about 5% of the total lodging rooms currently have in-room energy management equipment installed. It is incomprehensible that the lodging industry has not embraced this proven, financially lucrative technology.

CASE HISTORY

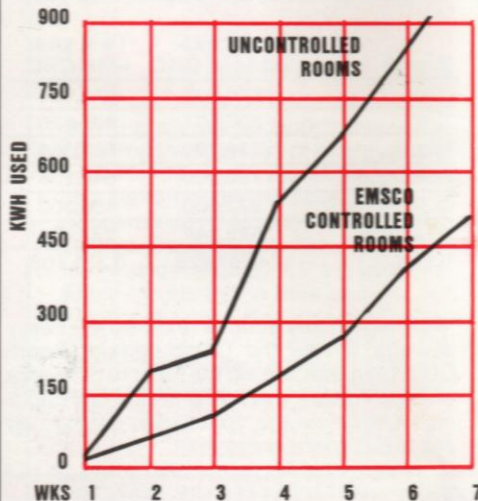
Controlled rooms generate 55% energy savings.

Smuggler's Inn, Fresno, CA. An agreement was made with Smuggler's Inn of Fresno, California to install CRC units on an experimental basis. Pacific Gas & Electric Company's Energy Conservation and Services Department assisted in the evaluation of the system by monitoring and recording the necessary data. The following parameters were used:

1. Two CRCs were installed in two rooms adjacent to two uncontrolled rooms. All rooms were approximately 448 square feet and were using fan/coil units operating off a central unit.
2. All four rooms were equipped with clocks to monitor the operational hours of the fan/coil units.

At the conclusion of the tests the following facts were documented: The uncontrolled rooms fan/coil units used 188 KWH, while the controlled rooms used 95 KWH. Equating the KWH with the related costs the controlled room's generated in excess of 55% energy savings. Add to this, the often

ignored, lesser time that the HVAC equipment has to operate. This represents a substantial savings in equipment costs and maintenance.



Come up to my room and we'll waste energy!

Actually, room energy waste is a very serious problem. Emsco can show you a cost effective way to reduce this cost by 30-50%. This self-contained system is easily installed and virtually maintenance-free. It can control any type of heating/cooling system as well as lighting. The Emsco CRC (Computerized Room Control) is so automatic and passive that once it is installed, you will forget it is there...until you review your energy bills. Call or write for further details.

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Other case histories...

E-Z Travel, "...with the first month's savings of over \$1,500.00, I am quite confident that the system will pay for itself in a period of time less than what was projected. I think another important point is the fact that we had no guest complaints."

Hilton Inn, Management predicts after testing, the CRC used in conjunction with a computer system will save approximately \$28,600. a year.

Summit Hotel, After testing the CRC at the 380 room hotel the results revealed that in the uncontrolled rooms electrical usage averaged 18.57 KWH per day. "At this rate," management stated, "we could save \$39,000.00 per year using sensors."

Sonesta Hotel, At the end of the first year of operation of the CRC energy savings of 57% have been confirmed, without guest discomfort.

Best Western Inn, "We are delighted with the EMSCO CRC installed 4 years ago and plan to use it in our new expansion."

This brochure is a collection of tests, articles and quotations taken from various sources and edited for presentation purposes. All trademarks are the property of the respective companies. Flair, Emsco and CRC are trademarks of Flair-Emsco Corporation. Bulletin #091285

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