In Room
Energy Management Systems (EMS)

By
Jim Schivley
Director, Business Development
North America
Schneider Electric USA
What is an In-room EMS?

- Wireless or wired occupancy based control (OBC) system that regulates the individual guest room temperature while the room is unrented or unoccupied to **reduce ENERGY** consumption by an average of 17-22%.*

---

Why install an EMS?

- Save Energy with out guest involvement
- Add Value to the Customer Experience
  - Determine adverse conditions prior to guest complaint
  - Remotely and quickly address guest HVAC or Lighting issues.
- Predictive Maintenance
  - Determine HVAC runtimes
  - Inefficient room conditions
Typical control devices for an EMS.

Zigbee Wireless Guest Room Devices and Coordinator

800W Dimmer / 1000W Switch
Zigbee Smart Thermostat
Floor Coordinator

Lamp/Appliance Door Contact Motion Sensor
Module
# TYPES OF EMS OPTIONS

<table>
<thead>
<tr>
<th><strong>OPTION 1</strong></th>
<th><strong>OPTION 2</strong></th>
<th><strong>OPTION 3</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Motion Only</td>
<td>Motion and Door</td>
<td>Fully Network Solution</td>
</tr>
</tbody>
</table>

**OPTION 1**
- Provides an individual room temperature set-back for energy savings based **only** on occupancy detection.
- A separate Zigbee wireless PIR occupancy sensor **NOT** embedded into the thermostat provides maximum coverage of 140 degree occupancy detection in the room.
- Upgradable to Plus

**OPTION 2**
- Provides an individual room temperature set-back for energy savings based on logic between a door event and occupancy detection.
- Eliminates inadvertent set-back while room is occupied.
- Upgradable to Networked

**OPTION 3**
- Provides temperature set backs for energy savings based on logic between door events and occupancy detection. Eliminates inadvertent set backs while room is occupied. EMS Software provides total remote monitoring, individual or group control of room parameters in addition to full energy management reporting capabilities, dashboards and scheduling.
- Upgradable to Building Automation
Wireless Zigbee Mesh Network

- Wireless Communication Protocol for low-power applications
- Self-Healing – Routing Path Auto Updates
- Low Duty Cycle – Optimal for Battery Powered Devices
- Long Battery Life

30'
EMS Options

- Stand Alone EMS
- Fully Networked EMS
EMS Manager Software for Networked Reporting, Control, Monitoring and Customization Software
EMS Manager Software

Reporting: By Floor level

Rented / Unoccupied - Rented / Occupied

Unrented / Unoccupied - Unrented / Occupied
EMS Manager **Software**

**Control:** By Individual Room - Setpoints, Limits & Mode
EMS Manager Software

Event History: Individual Events Types, Time & Data
EMS Manager **Software**

**Event History**: Performance Graphs, Charts

**Summary Reports**
EMS Manager **Software**

**Event History**: Room Performance, Student/Staff Interaction

Performance over time of Outside Temperature (Green Line) vs. Room Temperature

Hover over white and grey shaded areas to see pop up window showing occupancy & vacancy summary report.
EMS Manager **Software**

*Customization: Dashboards, Scheduler and Reports*

**Dashboards**

**Calendar Automates Global Events and System Changes**
EMS Manager **Software**

**Global Settings:** One/Group of Rooms or Entire Facility
EMS Manager **Software**

**REPORTS:** Customized Spreadsheet Data, Graphs & Charts
EMS Manager **Software**

**Reports:** HVAC runtime report

<table>
<thead>
<tr>
<th>Room</th>
<th>Runtime %</th>
<th>Avg Setpoint</th>
<th>Avg Temp</th>
<th>Cool</th>
<th>Heating (Hrs)</th>
<th>Idle (Hrs)</th>
<th>Occupied (Hrs)</th>
<th>Vacant (Hrs)</th>
<th>Difference (Hrs)</th>
<th>Saved (Hrs)</th>
<th>Saved Runtime %</th>
<th>Runtime Out</th>
</tr>
</thead>
<tbody>
<tr>
<td>303</td>
<td>90.0</td>
<td>60.1</td>
<td>60.1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>304</td>
<td>80.4</td>
<td>70.0</td>
<td>67.2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>302</td>
<td>79.4</td>
<td>70.0</td>
<td>70.5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>109</td>
<td>63.4</td>
<td>63.5</td>
<td>63.5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>307</td>
<td>58.2</td>
<td>68.8</td>
<td>66.6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Air Filters Clogged?**

**Hot Water Valve is Stuck?**
EMS Manager Software

Reports: Battery Status Report for each device
Daily Email Snapshot

Email Report: Communications, Status and Runtime Savings
EMS Manager **Software**

**Alerts:** Pre-determined Alarm Set Points
The research team calculated aggregate and location-specific energy savings across the four study periods; Table 1 summarizes the results. All OBC systems performed within the manufacturers’ savings claim range of 10% to 30%, as shown below, with an average savings of 18.4% observed.

<table>
<thead>
<tr>
<th>Property Name</th>
<th>Property Location</th>
<th>OBC System Vendor</th>
<th>OBC System Notes</th>
<th>Average Energy Savings Percent</th>
<th>Calculated Energy Savings (kWh/room/yr)</th>
</tr>
</thead>
</table>
| Courtyard Gaithersburg Washingtonian Center | Gaithersburg, MD         | Schneider Electric | • Occupancy-based thermostat
• Wireless remote sensor
• Wireless door switch | 26.5%                       | 525                     |
| Mayflower Renaissance                 | Washington, DC            | WiSuite            | • Occupancy-based thermostat
• Wireless remote sensor
• Wireless door switch | 18.3%                       | 589                     |
| Courtyard Los Angeles Torrance/South Bay | Torrance, CA              | Telkonet           | • Occupancy-based thermostat
• Wireless door switch | 17.8%                       | 167                     |
| TownePlace Suites Los Angeles LAX/Manhattan Beach | Manhattan Beach, CA | Onity              | • Occupancy-based thermostat
• Wireless door switch | 23.2%                       | 255                     |
| Courtyard Dallas Addison/Midway      | Addison, TX               | Schneider Electric | • Occupancy-based thermostat
• Wireless remote sensor
• Wireless door switch | 13.7%                       | 289                     |
| Courtyard Dallas Richardson at Spring Valley | Richardson, TX           | Inncom             | • Occupancy-based thermostat
• Wireless door switch | 10.8%                       | 228                     |
Why EMS Solution?

- **Guest Satisfaction**
  - User friendly Smart Thermostat – customizable programmable button configuration
  - High/Low limit actual display
  - Smart Thermostat does not reset to defaults or predetermined set back temperatures when guest leaves the room.
  - Solution minimizes inadvertent set backs – Separate wireless motion sensors from Smart Thermostat.
  - Entry door scene lighting upon guest entry.
  - Solution is invisible to guest.

- **Operating Advantages**
  - Advanced software capable of remotely changing guest HVAC parameters on a single room, group of rooms or entire hotel.
  - Reports generated allows engineering department to be more proactive and efficient.
  - Runtime reports allow for prioritizing room rent and maximize energy savings.

- **Solution Advantages**
  - Expandable – add additional devices in the future; door contacts, sliding door contacts, light switches, lamp modules, etc.
  - Upgradable – to a fully networked version
  - Integratable – into hotels Reservation Management System, TV set top boxes
  - Scalable – can be installed in stages over time, realize immediate savings.
Contact Information

Jim Schivley
Director Business Development

*Schneider Electric*

Mobile: 407-461-4271

Email: jim.schivley@schneider-electric.com