Hotels & dorms

Wireless room control with HVAC setback, no new wire

Design guide



Photo: Wes Hicks / Unsplash

Guest rooms and dorm rooms spend most of the day empty with the lights and HVAC running. ILLUMRA's battery-free devices tell the room when someone is in, then turn off lights and switched outlets and set the HVAC back when they leave, all over 902 MHz wireless with no new wiring through finished walls.

0
batteries to replace

902 MHz
EnOcean wireless

2
solutions in this guide

Design goals

- Lights and switched receptacles off when the room is vacated
- HVAC setback when unoccupied and when a balcony door is open
- Battery-free devices: nothing for housekeeping to replace
- Installed in occupied buildings with minimal disruption

Solutions in this guide

A Key card room control
Hotels · battery-free

B Occupancy-based room control
Dorms & student housing · battery-free

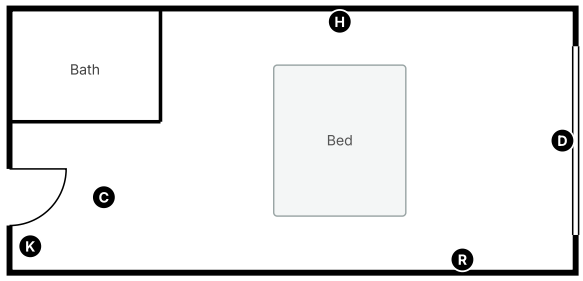
Code checklist

Requirement	Typical code target	How the solutions meet it
Guest room lighting & receptacles	Off within 20 minutes of the room being vacated (ASHRAE 90.1)	Lights and E9X-ERNR switched outlets turn off on vacancy
Guest room HVAC	Setback when unoccupied (ASHRAE 90.1, hotels over 50 guest rooms)	E9X-HSM-2 sets back the HVAC
Window / door interlock	HVAC off or setback when balcony doors are open (where required)	E9T-MCS contact to the HVAC module
Exceptions	One lighting outlet may stay on; check bath and entry requirements	Leave the entry or bath light on its own switch as needed

Typical requirements of ASHRAE 90.1-2019 and the 2021 IECC. Local amendments and other code editions differ; the adopted code for the project governs.

A Solution A: Key card room control

Hotels · battery-free



K Key card switch C Lighting controller
H HVAC setback module R Switched receptacle
D Door contact

The guest's key card enables the room. Removing it turns off lights and switched outlets and sets the HVAC back; a balcony contact sets back the HVAC while the door is open.

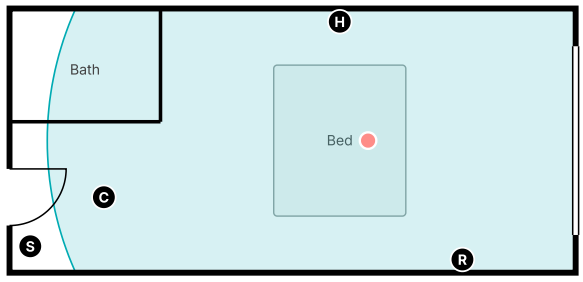
- Key card switch inside the entry door at switch height
- HVAC module at the thermostat or fan coil; switched receptacle where lamps plug in
- Optional E9T-OSC so a room with a spare card left in still times out

Qty	Model	Description
1	**E9T-C2AWH**	Key card switch
1	**E9X-RUV-4IBTP**	Room lighting controller
1	**E9X-ERNR**	Switched receptacle
1	**E9X-HSM-2**	HVAC setback module
1	**E9T-MCS**	Balcony door contact
2	**E9T-S1A**	Bedside and desk rockers

Tech sheet: ES-TS-105 / 106 / 107

B Solution B: Occupancy-based room control

Dorms & student housing · battery-free



Ceiling sensor and pattern · C Lighting controller · H HVAC setback module · R Switched receptacle · S Battery-free rocker

No card needed: a self-powered ceiling sensor drives lights, switched outlets and HVAC setback from actual occupancy, with rockers for manual control.

- Center the E9T-OSC over the main room (34 ft Ø)
- Link the sensor to the lighting controller, receptacle and HVAC module
- Use a longer time-out for sleeping areas, or vacancy mode

Qty	Model	Description
1	**E9T-OSC**	Self-powered ceiling occupancy sensor
1	**E9X-RUV-4IBTP**	Room lighting controller
1	**E9X-ERNR**	Switched receptacle
1	**E9X-HSM-2**	HVAC setback module
2	**E9T-S1A**	Rocker switches

Tech sheet: ES-TS-105 / 106 / 107

Design tips

- Link devices by pressing the controller's learn button, then the switch three times; label each room's set.
- Check controller locations against the 50–150 ft typical radio range.
- Corridors and stairs: WAVE or MINI sensors with partial-off (see ES-DG-02 for zoning).

Related tech sheets

ES-TS-105 Self-powered wireless sensors · **ES-TS-106** Wireless switches & keypads · **ES-TS-107** Wireless load controllers

Starting points only: check every project against its adopted energy code, the reflected ceiling plan and current manufacturer data. Diagrams are illustrative. Send plans to info@energiocontrols.com for a project layout. Products by B.E.G., DANLERS and ILLUMRA. Photo: Unsplash License.