

LevNet RF™ HVAC Applications

Product: LevNet RF Wireless Solutions

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Summary: This article describes the EnOcean-enabled components, available from Leviton, which can be used to control HVAC systems. It also describes how to best use these components.

Information: Components:

The **Transmitters** that are commonly used with HVAC systems are:

- **Key Card Switch** – This is learned to receivers in learn mode 2. When a key card is inserted, the receiver is activated. When the key card is removed, the receiver is deactivated.
- **Door/Window Sensor** – This is learned to receivers in learn mode 1. When the sensor detects the door/window to be closed, the receiver is activated. When the sensor detects the door/window to be open, the receiver is deactivated.
- **Occupancy Sensors** – The occupancy sensors can be learned in mode 1 for Manual On/Auto Off behavior, mode 2 for Auto On/Auto Off behavior, and mode 3 for Walk-through behavior.

The **Receivers** that are commonly used with HVAC systems are:

- **24VAC Thermostat** – When activated, the thermostat set point are set for occupant comfort in the space. When deactivated, the thermostat goes to a “unoccupied mode”. In this mode, the set points are widened so that energy is saved.
- **24VAC 5-Wire Relay** – When activated, the 5-wire relay is in the N.O. state. When deactivated, the 5-wire relay is in the N.C. state.

Explanation:

- The **Key-Card Switch** is used to determine occupancy of a space, in particular hotel rooms. When an occupant is in the space, a key card is inserted into the switch and the HVAC system is activated. When the occupant leaves, the key card is removed and the HVAC system is deactivated. An alternative method of detecting motion is to use occupancy sensors.
- The **Door/Window sensor** is used to deactivate the HVAC system when an outside door or window is open.

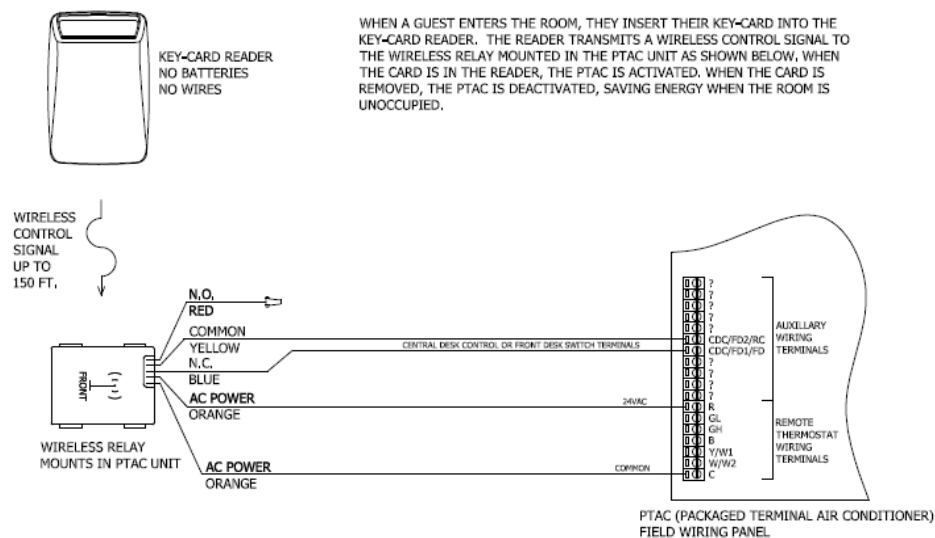
- The **24VAC Thermostat** is used to replace old or existing thermostats with one that is EnOcean enabled and can respond to EnOcean enabled transmitters. The 24VAC 5-Wire Relay is used in conjunction with PTAC units. Often a PTAC unit will have a wiring terminal with an option for a “front desk switch” when the wire-in relay is connected to this terminal it will deactivate the PTAC unit per the radio packets received from the transmitter.
- A **Wire-In Relay or a Plug-In Relay** should not be used to disconnect power from a HVAC system. There are two reasons for this.
 - 1) Disconnecting power to an HVAC system may cause it to “short cycle”. Short cycling is when the system turns on or off quickly. This can cause damage to motors and other components of the system, reducing the life of the HVAC system.
 - 2) Disconnecting power may allow temperatures in the space to drop below freezing. If this happens, water pipes can burst, causing damage to the building.

Wiring Diagrams

The wiring diagram for the 24VAC Thermostat is in its installation guide. The wiring diagram for the 24VAC 5-Wire Relay is shown below.

BATTERY-FREE, WIRELESS, KEY-CARD SWITCH ACTIVATES AND DEACTIVATES PTAC UNIT IN A HOTEL ROOM.

ALWAYS FOLLOW LOCAL ELECTRICAL CODES.



THE FIELD WIRING TERMINAL BLOCK FOUND IN MOST PTAC UNITS WILL LOOK SOMETHING LIKE THE ONE SHOWN IN THE DIAGRAM, TERMINAL NAMES MAY DIFFER FROM THOSE SHOWN, BUT THE CONCEPT IS UNIVERSAL. THE WIRELESS RELAY NEEDS 24VAC POWER FROM THE PTAC UNIT, WHICH IS AVAILABLE FROM THE REMOTE THERMOSTAT WIRING TERMINALS, THE WIRELESS RELAY ALSO CONNECTS TO THE CENTRAL DESK CONTROL OR FRONT DESK TERMINALS. WHEN THE WIRELESS RELAY RECEIVES THE SIGNAL FROM THE KEY-CARD SWITCH, IT DISCONNECTS THE FRONT DESK TERMINALS, CAUSING THE PTAC TO ACTIVATE.

Contact: If you have any questions or concerns, please call LES technical support at (800) 959-6004.