SS5000 Energy Management Thermostat, Model 4.5

Telkonet SmartEnergy™

Energy Management Solutions

Overview

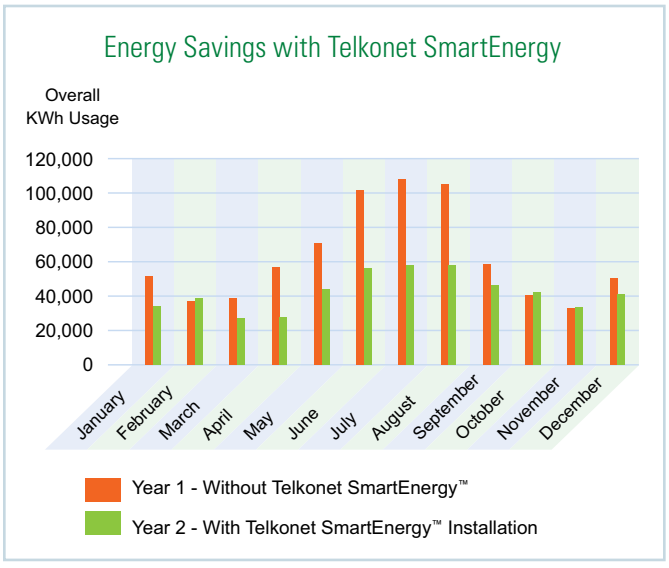
The Telkonet SS5000 Energy Management Thermostat (EMT) Model 4.5 controls HVAC systems with a common thermostat interface. It uses a wireless radio link or hard-wired connection to communicate with the SS2000 Energy Management Occupancy Sensor. Using these occupancy sensors, the SS5000 determines whether or not a space is occupied. When people are present, the SS5000 maintains comfort and ventilation at occupant-selected levels. When vacant, the SS5000 automatically reduces the energy consumption by the HVAC and adjusts the settings as needed by allowing the temperature to drift to energy saving levels.

The SS5000 EMT Model 4.5 is an innovative digital computerized intelligent thermostat that incorporates a range of significant technology advancements, including increased HVAC system interoperability with a wide range of third party HVAC equipment, customization and flexibility, as well as improvements to make installation easier.

Powerful Technology Advancements

The fundamental benefit of Telkonet's SS5000 Model 4.5 is the extensive degree of field-customization that it offers, greatly enhancing the speed and ease of installation. The thermostat can be fine-tuned for direct control over relays for customized heating, cooling, and multi-speed fan control without having to rewrite internal code. It enables the installer the flexibility to determine what relays to engage or disengage for different speed modes, as well as speed mode timing to match equipment needs and savings goals. Being able to redefine the code in the field allows for greatly increased compatibility for virtually any HAVC system (single or multi-speed) and any desired method of operation.

Settings can be field customized on screen or in more detail with the Telkonet SmartView software. For example, irrespective of whether the SS5000 Model 4.5 is being interfaced to a 1- or 2-speed heat pump, or a fan coil system, it can be quickly re-programmed to match the installation requirements exactly. Changes can be made directly from the unit's front panel, including the selection of various air-conditioning systems, or through the use of software designed to facilitate this process.



This shows the energy usage for a midsize hotel in Las Vegas, Nevada, where the rooms were cooled from April to Sept and heated in Dec and January. Usage varied in February, October, and November due to increased loads and yearly temperature fluctuations.

Patented Recovery Time™ Technology

Utilizing Telkonet's patented Recovery Time™ technology, the SS5000 constantly calculates how far each room's temperature can drift from the occupant's preferred setting (setpoint) to maximize energy savings and still return within the preset recovery time. Every room is constantly evaluated independently to determine its energy efficient temperature based on its environmental characteristics. Factors considered include if the drapes are open or closed, the window placement in the room, if the climate is dry or humid, the varying weather conditions, and the functional condition of the HVAC unit.

Through the constant monitoring of the HVAC unit's ability to drive the temperature and real-time adjustment of setback temperature, rooms are never excessively hot or cold when an occupant returns to the room. The room will always be just minutes away from an occupant's desired comfort setting. Unlike fixed setback systems where the temperature is forced to one setpoint in all rooms, Recovery Time technology delivers room-by-room, occupant-by-occupant savings, while maximizing occupant comfort.

The SS5000 can optionally learn the day-to-day occupancy patterns of the room and recover in advance of the expected arrival, as well as setback more deeply after a typical departure. This provides optimal savings and comfort, and is ideal for use in offices and schools with set schedules.

Management Reports

In addition to calculating how far the temperature can drift out to a recovery time setpoint and drive back to the guest setpoint, the SS5000 also records detailed occupancy and HVAC usage data which can be captured in management reports. These reports assist in determining room occupancy patterns/percentages, HVAC system efficiency, runtime hours saved, and return on investment calculations. Data that is stored on the SS5000 can be downloaded onto a PC using the built-in interface and is stored in non-volatile memory to prevent loss in case of a power failure.

Features and Benefits

Increased HVAC compatibility with a wide range of PTAC and fan coil systems

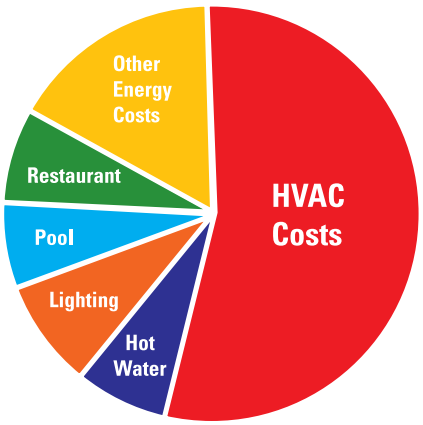
- Eliminates the need for external equipment or adapter boards; can simply wire in any power source to the relay, accommodating even older models
- Operates across wider AC and DC power voltage ranges: 10V – 35V AC; 8V – 40V DC, further enhancing compatibility with third party equipment
- Interfaces with virtually all HVAC models including fan coil, PTAC, PTHP, split system, multi-stage heating and cooling systems
- Interfaces with HVAC sharing environments
- Accommodates 3 fan speeds for HVAC systems
- Allows for automatic or manual 2 speed fan control for heat pumps, including support for mode-based fan control (cool on high, heat on low)

Field upgradeable and customizable to meet the control requirements of diverse systems

- Flash-based CPU enables field-adjustable HVAC operation to instantly to match customer's requirements; ensures future-proofing, while guaranteeing ease of integration with new product designs as they emerge, including wireless mesh technologies
- Microprocessor can be upgraded via the serial port or the high-speed wireless ZigBee network

Customized programming options for property management

- Custom programming can be set for humid vs. dry environments, extreme temperatures that require guest setpoint limits, measured emphasis on comfort versus savings goals, etc.



Energy costs associated with heating, ventilation and air conditioning (HVAC) add up to one of the largest operating expense for property owners.

- Preprogrammed temperature set point limits
- Selectable recovery time at time of installation; can be altered at any time
- Deeper temperature setbacks during extended periods of non-occupancy (long periods of non-rented guest rooms, vacant meeting rooms, ballrooms, vacations, etc.)

Fast operating speed with high data rate

- Serial speed is 100 times faster than previous SS5000 model 4.0
- Supports BAUD rates of 1,200, 9,600, 57,600 and 115,200, enabling quicker download of statistical data
- Dedicated for both the wireless occupancy sensor and any serial or network devices attached

Dry contacts enable door/window monitoring and support load shedding on demand

- 2 dry contact switch inputs detect if connection is made or broken, turning HVAC off when doors/windows are opened, for greater energy savings
- Second dry contact switch input allows for a second door/window to be monitored; allows for a hard-wired load-shedding input
- Door contacts can assist in determining room occupancy state (optional)

Maximize energy efficiency and occupant comfort with room-by-room energy savings

- Patented Recovery Time technology continuously learns temperature variances and drive characteristics; continuously maximizes temperature drift (and energy savings) when vacant
- Guaranteed comfort recovery time setting, selectable by management, from 2 to 255 minutes
- Ensures the room temperature will recover to the occupant's setpoint within minutes upon their return to the room
- Adapts in real time to changing weather and environmental conditions
- Maintains temperature to within less than one degree of occupant's setpoint while the room is occupied
- Special settings for sleep mode when rooms are dark to ensure occupant comfort
- Automatically adjusts for altered operation while occupant is sleeping
- Refresh cycle keeps the room air fresh

User-friendly temperature adjustments

- Large, easy-to-understand colored icons and temperature display digits with selectable Fahrenheit or Celsius display
- Internationally known icons: flashing flames or snowflakes to indicate heating or cooling
- Simple temperature adjustments by pressing the temperature up or down arrow
- Manual 2 and 3 speed fan control allows the user to change the fan speed
- Optional animated icons to indicate fan and heating/cooling speeds

Monitoring, management and statistics logging

- Ability to monitor and report HVAC health and efficiency
- Supports monitoring (wired and /or wireless) of lanai doors and windows
- Accurately records/reports real time HVAC runtime savings information
- Useful occupancy statistics recorded by internal computer chip

- PC downloadable data to generate savings analysis
- Accumulates data across 39 variables to analyze system performance, savings and communications
- Provides detailed information on all sensor messages to enable a user to observe precise time stamps of all occupancy arrivals and departures and monitor signal strength for all nearby sensors

Simplified, quick installation

- Wireless communication enables simple, non-disruptive installation
- Unobtrusive design
- Terminals on the back plate enable hard-wire sensors to be added effortlessly without any product modifications
- Supports both hard-wired and wireless occupancy sensors for all types of applications
- Supports on-screen defaults for many common PTAC manufacturers
- Instant response times when writing codes into memory
- Comes preprogrammed
- Cover and buttons can be locked down to ensure simple operation and security

Interfaces and serial communication support

- Separate, dedicated serial connections for a computer or external communications, eliminating potential contention issues, such as when a PC and sensors are running simultaneously, dramatically improving communications
- Optional high-speed wireless data port for communication via ZigBee network
- Improved serial port communication to support extended transmission for data logs
- Stereo and 1x5 SIP data jacks available for external communication

Operation

- Multi-stage HVAC operation optimizes the use of varying heating and cooling stages
- Supports peak demand load shedding
- Advanced SmartFan operation evacuates conditioned air from ductwork after the compressor has turned off, conserving compressor usage
- System can switch either the supplied power source or an external source, with optional external relay power switching (low voltage)
- Feature rich: 132 programmable features, including vacation mode, setpoint limiting, humidity refresh cycling, fan optimization
- Up to eight sensors can be linked with each SS5000
- 24 volt thermostat replacement for all HVAC systems, including heat pumps, dual staged, (heat and cool), fan coil, and hybrids
- For systems that use line voltage (120, 240, or 277 volts), the SS5050 voltage converter is used
- Humidity protection and mildew suppression; refresh cycle protects soft goods (optional)

The SS2000 Energy Management Occupancy Sensor constantly monitors a room and sends data back to the SS5000 Energy Management Thermostat. This data is used to calculate occupancy patterns to optimize energy savings.

- Can be reprogrammed, operationally verified, and performance analyzed using the Telkonet SmartView program
- Dynamic relay configuration allows configuration of relays for non-HVAC functions based on occupancy or time of day, such as lighting

Reliability and maintenance

- All PCM assembly is 100% quality tested before shipped
- Replacement of damaged or broken components; no need to replace the entire system
- Reduced wear and tear on HVAC units, ensuring longer life and reduced maintenance

Options

- Programmable timed refresh cycle to ensure humidity control
- Auto changeover mode for heating or cooling as needed
- Wireless/wired door switch monitoring
- Wireless door sensors to turn off HVAC when a patio door is left open

Other

- One year standard warranty
- ENERGY STAR certified
- UL and FCC approved
- ZigBee compatible

ENERGY STAR ZigBee® Alliance FC

Note: Features for the energy management products listed above vary by model number.

Related Products: SS2000 Energy Management Occupancy Sensor, SS5050 Energy Management Voltage Converter, SS5060 Energy Management Multiplexor

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