E527 Smart Digital Thermostat Product Guide

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Overview and General Concepts

INNCOM's e527 Smart Digital Thermostat is a powerful, multi-purpose Direct Digital Control (DDC) device. It is designed to control virtually any HVAC system found in hotel guestrooms.

The e527 is a sleek, low-profile device that has been designed specifically on a smaller scale to meet the needs of properties using a British single-gang electrical box. The e527 has an optional mounting plate that is used for American double-gang box assembly.

In its standard form, the e527 does not have infrared (IR) transmission capability; however, this can easily be added in a number of configurations if required for the application.

Figure 1. E527 Digital Thermostat

Application

In its most basic form, the e527 functions as a programmable DDC thermostat, automatically adjusting fan speeds and valves to achieve set temperature (**Note:** guests can manually select heat or cool by pressing the OFF/AUTO button and cycling through OFF, AUTO, HEAT and COOL). The e527 is also an “intelligent” device capable of linking ancillary sensors and performing information gateway functions. For example, in an Energy Management System (EMS) application, the e527 monitors door switches and motion detectors and communicates with central servers to fill EMS information requirements. It can be equipped with a humidity sensor and/or a sleek, low-profile Passive Infrared (PIR) motion detector. Coupled with a magnetic door switch (wired or wireless), the e527 becomes the brain of a highly effective EMS. Because the e527 can be equipped with an optional IR transmission device, installation is feasible and affordable in retrofit applications.

When combined with INNCOM's X05/X06 Controller, the e527 can interface with all common HVAC unit voltage configurations (24-277-volt). With the X05/X06, the e527 can support the following functions:

- Remote HVAC control
- Guestroom HVAC diagnostics
- Remote room occupancy indication
- Automatic lighting control
- Remote mini-bar access reporting
- Remote smoke detector annunciation
- Central Electronic Lock control
- Humidity control
- Remote drape control
- Outside temperature display
- Peak demand load shedding
- Property/Building Management System (PMS/BMS) interface
- Room gateway to INNCOM System 5 Floor Level Network (Central Interface Network) backbone

A centrally controlled EMS package is created when the e527 is connected to the property's Central Interface Network (CINET) via X05b (X485 TTL to RS485 converter required) or via the property's high-speed TCP/IP network with the addition of a TCT (Ethernet gateway device). The e527 is readily expandable to include functionality such as humidity control, mini-bar access reporting, occupancy reporting to Housekeeping, and much more. Adding the X05/X06 with IR or low-voltage wiring enables remote control of lights and other functions.

The e527 features a guest-friendly graphic interface with intuitive controls

Headers

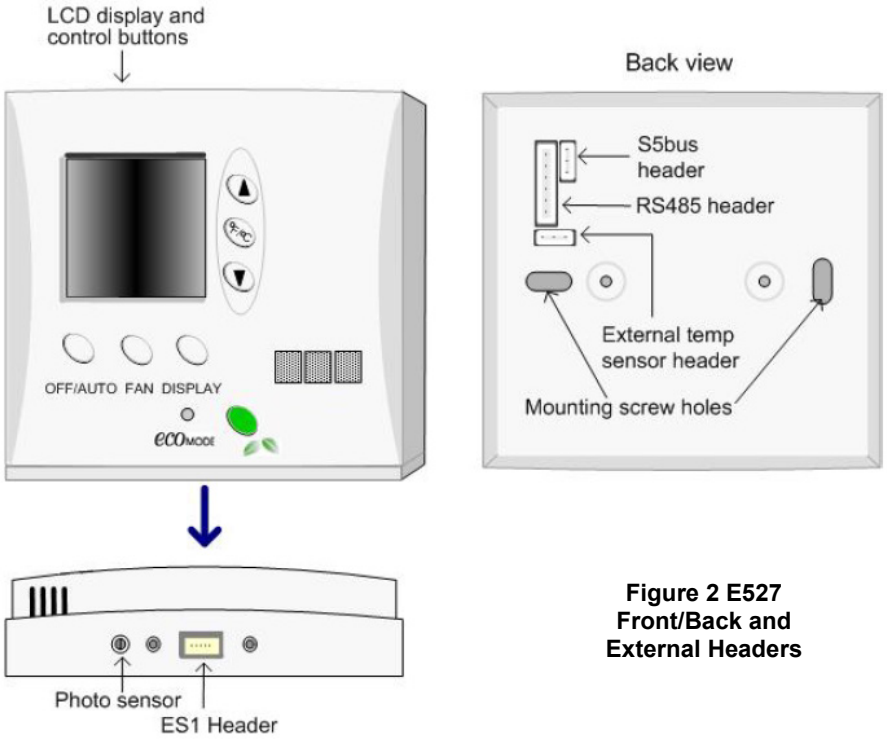


Figure 2 E527 Front/Back and External Headers

H1 ICP microprocessor programming

H2 Humidity sensor

H3 System interconnect

H4 PIR sensor

H5 ES1

H6 RS485 network header (see pinout on next page)

H7 System 5 header (see pinout on next page)

H8 System interconnect

H9 External temperature control sensor

H6 Pinout

Pin	Function	Comment
1	Common	GND
2	12VDC	Min 10V Nom 12V Max 14V
3	S5bus	Communication bus
4	Dry Input	Input
5	RS485B	RS485 Twisted Pair
6	RS485A	RS485 Twisted Pair

H7 Pinout

Pin	Function	Comment
1	Common	GND
2	12VDC	Min 10V Nom 12V Max 14V
3	S5bus	Communication bus

H9 Pinout

Pin	Function	Comment
1	Common	GND
2	Common	GND
3	External Temp Sensor	

Motion Detection

The optional motion detector available on the e527 works in conjunction with the electronic door lock to determine room occupancy. If the door lock reports that the door has opened and closed and no motion is detected in the room for a set number of minutes, the e527 engages energy conservation setbacks. When motion is detected, the e527 returns to its occupied state. Also, the e527 reports occupancy changes to the central server.

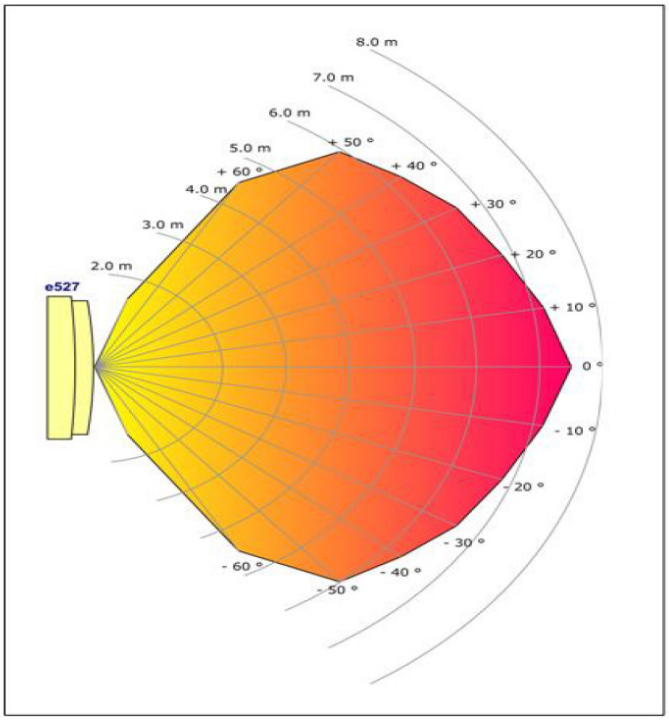


Figure 3 Motion Sensor Sensitivity

Features

In an EMS, the e527 controls room heating and cooling using occupancy data collected from motion detectors and door switches and can be networked to the property's central management system. As an IRAS device, the e527 can communicate with devices within a room and function as a room gateway device towards the mesh network.

- British gang mounting (American gang mounting with optional frame)
- Accurate temperature measurement +/- 1 degree F
- External temperature sensor support
- Motion sensor for occupancy detection
- RF transceiver (onboard 802.15.4, 2.4GHz radio) for wireless guestroom and backhaul network communications
- RS485 for wired backhaul network communications
- Photo sensor for light level detection

Network Communication

INNCOM employs a Deep Mesh system to connect guestroom IRAS components to management and monitoring servers. Because networking infrastructure is embedded in the IRAS devices, command and reporting information packets can follow multiple network pathways, increasing communication efficiency and reliability at lower cost. Typically, a Deep Mesh network integrates 50–200 rooms per network segment*. INNCOM generally uses a wireless radio network, but a Deep Mesh system may be constructed using RS485 networks (topologies that merge RF and RS485 networks are also possible).

2.4GHz Wireless RF

In a typical RF Deep Mesh network, an 802.15.4-based 2.4GHz radio equipped IRAS device (most often a thermostat, such as the e527) acts as a room gateway for communication with the network. Data are propagated among the network nodes until terminated at edge routers that bridge traffic onto IP (Ethernet) networks towards the servers. The radio specifications are given in the table to the right:

* The network segment size depends on the facility's layout, expected network traffic, and other environmental considerations.

Performance	0dB
RF Data Rate	250kbps
Antenna Type	SMT
Indoor Range	70ft
Outdoor/RF line-of-site range	540ft
Transmit Power	1mW
Receive Sensitivity	-94.6dBm
Frequency Band	2.4GHz
Encryption	AES-128
Protocol	802.15.4
Frequency Channels	11-26

FCC ID: GTC202151TXR:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

** The network segment size depends on the facility's layout, expected network traffic, and other environmental considerations.*

IC: 1609A-201527TXR:

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

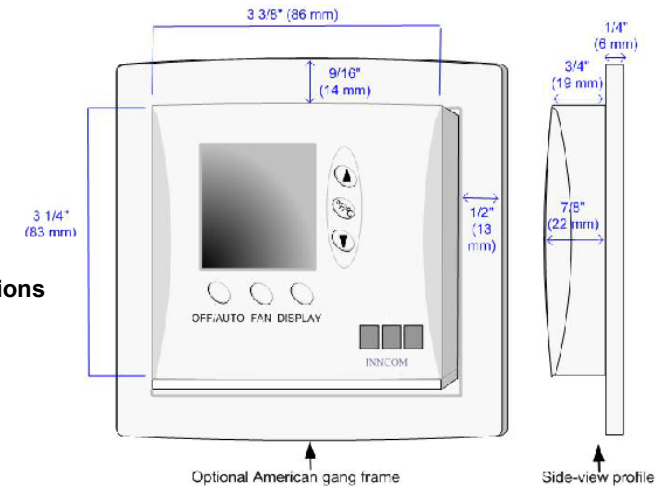
RS485

A Deep Mesh RS485 (DM485) network typically uses a CAT5-type wiring wired as a home-run or daisy-chain. The DM485 network is routed to a dedicated device in each guestroom. This device becomes the room gateway, which transfers information packets between the DM485 backbone and the in-room network. The in-room network can be either S5Bus or a local mesh formed with RF. Each DM485 network is operated by a B575 hardware running DM485 software. Refer to the H6 pinout table above for wiring instructions.

Technical Specifications

Power Requirements	12VDC, 50mA
Thermostat Measurement Range	33 to 99 degrees F (1 to 37 degrees C)
Outdoor Air Temperature Display	0 to 99 degrees F (-18 to 37 degrees C)
Display Resolution	Whole degree F, 0.5 degree C (0.1 degree F in test mode)
Standard Deadband	2 degrees F (1 degree C) between heating and cooling
Degrees C/Degrees F Display	Toggle Button located on front display
Ambient Operating	41 to 149 degrees F (5 to 65 degrees C), 0-95% RH noncondensing
Ambient Storage	33 to 149 degrees F (1 to 65 degrees C)
Dimensions	3.5” W x 3.5” H x 0.9” D (89 mm x 89 mm x 23 mm)
Approvals	FCC, CE Mark

Figure 4
E527 Dimensions



Installation Requirements

The e527 must be located on a partitioning interior wall, approximately 5' (1.5 m) above the floor, in a site of average temperature. It is important to ensure that the thermostat is located away from direct sunlight or radiant heat, air discharge grilles, stairwells, outside doors, steam or water pipes, warm air stacks, unheated/uncooled areas, or sources of electrical interference. The unit should not be placed on an outside wall or behind a door.

The e527 is designed to be mounted on a standard British-style single-gang electrical box. For use with an American box, the e527 can be installed in an optional frame by means of two screws. Screws for attaching the optional frame and mounting the e527 are included. The device is shipped with a clear clamshell dust cover.

Ordering Configurations

The following configurations are available on the E527. The standard ordered using the Pantone Coated Color Guide or the RAL Color Guide.

They are typically sold with the Honeywell logo, but you may request it have it omitted.

6 Button Standard

5 Button Standard

6 Button with PIR

6 Button with ecoMODE

6 Button with PIR and ecoMODE button

ecoMODE®

The patented, award-winning ecoMODE system, the Green Button will trigger an energy savings setback, as well as illuminate a green LED to indicate the guest's participation to hotel staff. In a centrally controlled system, notification is also sent to the central server, instantly alerting the property to the guest's participation and collecting useful data regarding the Hotel's green program involvement.

Document Revision History	DATE ISSUED	REASON FOR CHANGE
V1.0	11-Jun-2007	First Release
V2.0	20-Mar-2010	Specification updates
V2.1	21-Sep-2011	Reformatted
V3.0	05-Jan-2012	Added manual heat/cool control
V4.0	14-Dec-2016	Rebranded HON & Standard color updates

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