PC502 Module Installation Instructions

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Introduction

The INNCOM PC-502 wall mounted module can be used to expand the range of an RF network or to provide the protocol gateway from INNCOM S5bus to RF protocol.

The PC-502 can be combined with the B485 (01-9489) to provide RS485 to Deep Mesh RF protocol conversion. This application is ideal for INNCOM Central Electronic Lock System (CELS) integrations and for applications where signal conversion between an RS485 and RF networks are required for backhauling guestroom data towards the network backbone.

In an in-room RF network, the PC502 provides S5bus to RF protocol conversion, giving any INNCOM product participating in the INNCOM Integrated Room Automation System (IRAS) an RF transceiver for control of wireless products in the guestroom.



Figure 1 PC-502 Wall Mounted Module

In the Deep Mesh 802.15.4 network, the PC-502 is designed to patch areas within the network where signal strength is lost due to distance limitations or interference. It also serves to create multiple pathways, increasing the redundancy of the mesh communications to ensure maximum network reliability.

Features

- Small wall mountable form
- 2.4Ghz IEEE 802.15.4 compliant RF transceiver
- Medium and long range variants available
- Industrial temperature ratings 0–65 degrees C
- FCC Part 15b listed

Specifications

Parameter	PC-502.1	PC-502.2
RF Data Rate	250kbps	250kbps
Antenna Type	SMT	SMT
Indoor Range	70ft	100ft
Outdoor RF line-of-sight range	540ft	1000ft
Transmit Power	3mW (+5dBm)	50mW (+17dBm)
Receive Sensitivity	-98dBm	-98dBm
Frequency Band	2.4Ghz	2.4Ghz
Encryption	AES-128	AES-128
Protocol	802.15.4	802.15.4
Frequency Channels	11–26	11–26
Input Voltage	12VDC	12VDC
Current Consumption	50mA (Peak)	100mA (Peak)
Operating Ambient Temperature	0°C	40°C
LED /Switch	Reset indication, blinks when unit is connected to an RF network. Rapid blink during binding association.	Reset indication, blinks when unit is connected to an RF network. Rapid blink during binding association.

Ranges are determined by performing an RF link quality test using e528 thermostats as the transmitter and the PC-502 as the receiver. The maximum distance threshold is based on a 95% overall link quality. Outdoor ranges

were conducted in a low noise, free air environment. Indoor ranges are for reference. Indoor ranges are affected by the ambient environmental noise floor and building construction materials.

Dimensions

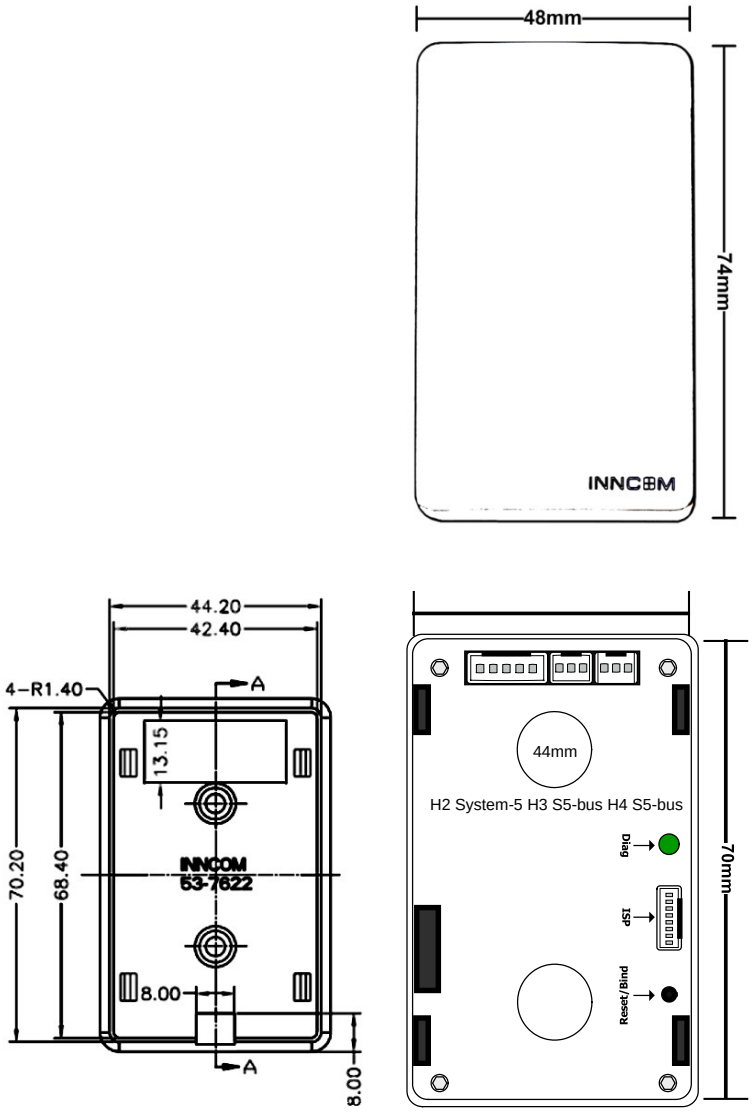


Figure 2 PC-502 front, back, and dimensions

Input/Output

H1 (In System Programming)

Pin	Function	Type	Max
1-8 Programming	-	-	-

H2 (System 5)

Pin	Function	Type	Max
1-GND	Common	-	-
2012VDC	Input Voltage	In	11.75/12.25
3-S5bus Multi Drop	In/Out	-	4
InOut 1	TTL	In/Out	-
5-InOut2	TTL	In/Out	-

H3 / H4 (S5bus In/Out)

Pin	Function	Type	Max
1-GND	Common	-	-
2012VDC	Input Voltage	In	11.75/12.25
3-S5bus Multi Drop	In/Out	-	4

Application

Network Typology

In an in-room application (Appendix 1, Figure 4), the PC-502.1 is providing S5bus to RF protocol conversion, giving any INNCOM product participating in the INNCOM Integrated Room Automation System (IRAS) an RF transceiver for control of wireless products in the guestroom.

The PC-502 can function as a gateway in an RS485 network as well. Figure 5 in Appendix 1 shows a typical RS485 application.

The PC-502, in participation with the e528, may also provide the in-room to Deep Mesh RF bridge where both wireless in-room and wireless backend networking are required. The PC-502 can also patch areas within the Deep Mesh network where signal strength is lost due to distance limitations or interference. Figure 6 in Appendix 1 illustrates a typical PC-502 Deep Mesh application.

Binding

The PC-502 uses reverse binding to acquire the information necessary to participate in a network application. The device must signal that it's prepared to accept the networking information from the thermostat.

Binding with e528.4G

1. Enter the Service Mode on the e4 thermostat
   a. Press and hold the °F/°C button
   b. Press and release the OFF/AUTO button
   c. Press and release the DISPLAY button
   d. Release the °F/°C button)

2. **Set Room ID (rId) in the e528**
   a. Press DISPLAY; the current rId will scroll across the screen. Note: If a value other than rId appears, use the UP/DOWN buttons to scroll through the values.
   b. The upper digit ("HI") of the Room ID should appear. Use UP/DOWN to change the value (0–6). Press OFF/AUTO to set.
   c. Middle 2 Room ID digits ("MED") should appear. Use UP/DOWN to change the value; use OFF/AUTO to set.
   d. Last 2 Room ID digits ("LO") should appear. Use UP/DOWN to change value; use OFF/AUTO to set.
   e. Press DISPLAY to store values. New Room ID should scroll across LCD.

3. **Set PAN ID (PAn) in the e528.**
   a. In Service Mode, scroll to PAn. Press DISPLAY. Current PAn should appear on the LCD.
   b. Use UP/DOWN to change the PAN ID value (in decimal notation).
   c. Press DISPLAY to store the new value. A buzzer will sound on the e528 to signal that the PAN ID has been set.

4. **Set the RF Channel (rF) in the e528**
   a. In Service Mode, scroll to rf; press DISPLAY. The current channel should appear on the LCD.
   b. Use UP/DOWN to change the rF value.
   c. Press DISPLAY to store the new value. A buzzer will sound on the e528 to signal that the RF Channel has been set.

Binding with e529.RF

1. **Enter the Service Parameter mode as described above for the e528.4G.**
   a. Set Room ID (rId) in the e529

b. Press OFF/AUTO; the current rId will scroll across the screen. Note: If a value other than rId appears, use the UP/DOWN buttons to scroll through the values.

c. The upper digit ("HI") of the Room ID should appear. Use UP/DOWN to change the value (0–6). Press DISPLAY to set.

d. Middle 2 Room ID digits ("MED") should appear. Use UP/DOWN to change the value; use DISPLAY to set.

e. Last 2 Room ID digits ("LO") should appear. Use UP/DOWN to change value; use DISPLAY to set.

f. The new Room ID should scroll across LCD.

2**. Set PAN ID (PAn) in the e529.**

a. In Service Mode, scroll to PAn. Press OFF/AUTO. Current PAn should scroll across LCD.

b. Use UP/DOWN to change the PAN

ID value (in decimal notation).

c. Press DISPLAY to store the new value. A buzzer will sound on the e529 to signal that the PAN ID has been set.

d. Set the RF Channel (rF) in the e529

e. In Service Mode, scroll to rf; press OFF/AUTO. The current channel value will scroll across the LCD.

f. Use UP/DOWN to change the rF value.

g. Press DISPLAY to store the new value. A buzzer will sound on the e529 to signal that the RF Channel has been set.

Binding the Device

1. The PC-502.4G uses a "reverse binding" procedure to acquire network information from the thermostat, meaning that the device will signal the thermostat that it wants the information. Besides the information set in the thermostat in the steps above, the PC502 requires a map of network components, complete with unique address. This information is typically carried in the I/O Map.
2. Place the thermostat in Service Parameter mode as above. Go to the Io (I/O Map Teach) parameter and press the DISPLAY button (for e528.4G) or OFF/AUTO (e529.RF) to view the value. Set the Io value to the desired I/O Map number. Do NOT press the thermostat's DISPLAY or OFF/AUTO button. See I/O Map tables below.
3. For the e528.4G, press OFF/AUTO and the LCD will display bnd. For the e529, do nothing.

4. Using a small point (e.g., the end of a straightened paper clip), press the recessed Reset/Bind switch on the PC502 once.
5. The thermostat sends a bind offer to the PC-502. If accepted, the thermostat will buzz loudly. The PC-502 will reset.
6. Test the PC-502 functionality.

PC-502 I/O Maps

Default PC-502 I/O Maps Deep Mesh Gateway

Deep Mesh Room Gateway - Default I/O Map - 0 or 227

Rental/Room Gateway/CELS/Network ID servers enabled

Default PC-502 I/O Maps S5bus converter

RF to S5bus converter only. No 1 or 216 servers enabled

Regulatory Approvals

Parameter	Condition	Status
FCC	Part 15b	02-9994, 02-9894 and 029927 are FCC listed.

FCC ID: GTC202124TXR (PC-502.1)

FCC ID: GTC202125TXR (PC-502.2)

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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.

IC: 1609A-202124TXR (PC-502.1)
IC: 1609A-202125TXR (PC-502.2)

This Class B Digital Apparatus complies with Canadian ICES-0003. 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.

Appendix

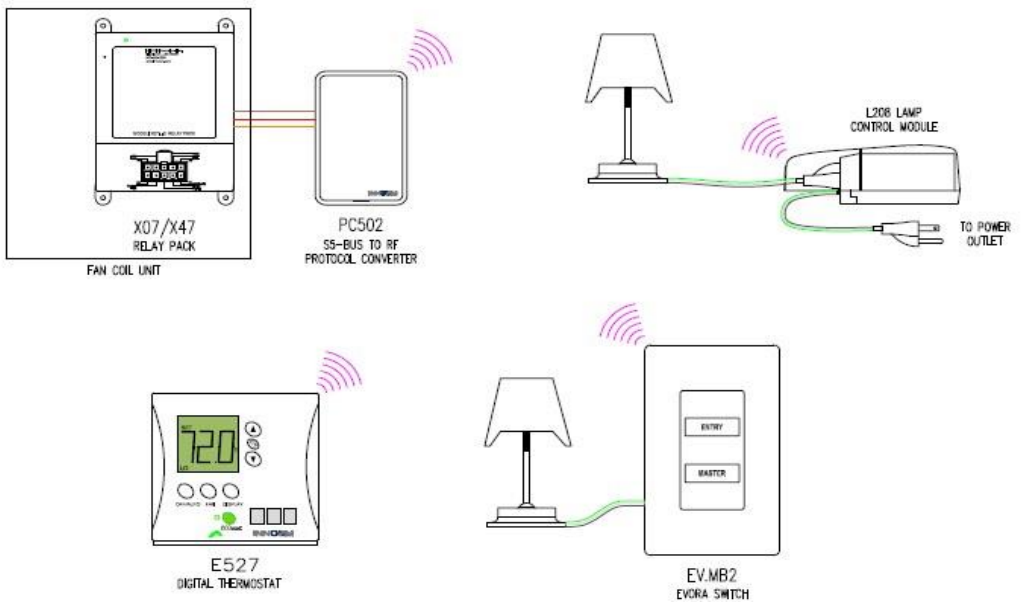


Figure 4 PC-502 In-Room Network

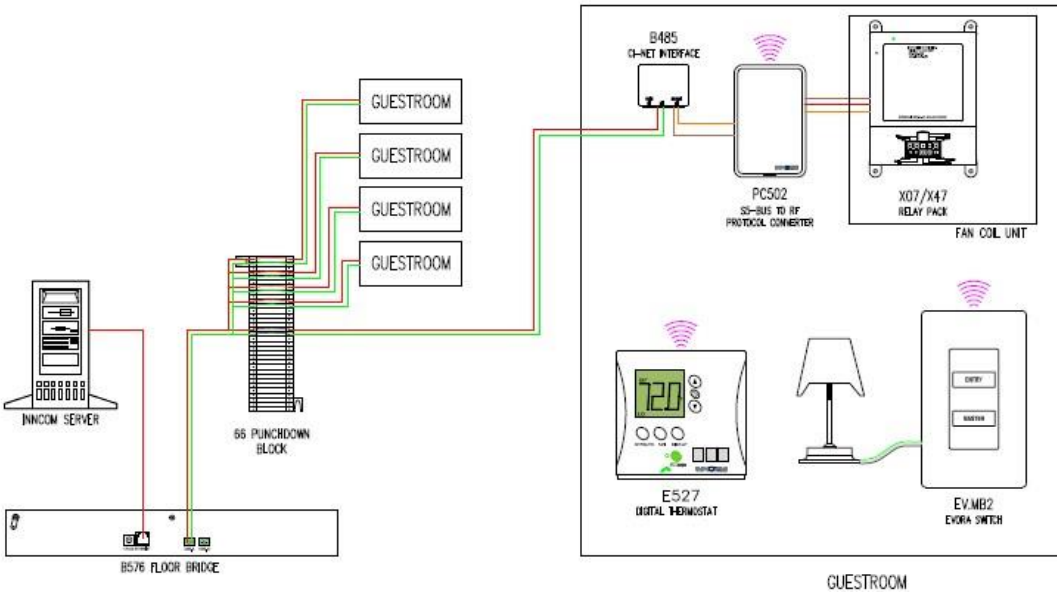


Figure 5 PC-502 RS-485 Network

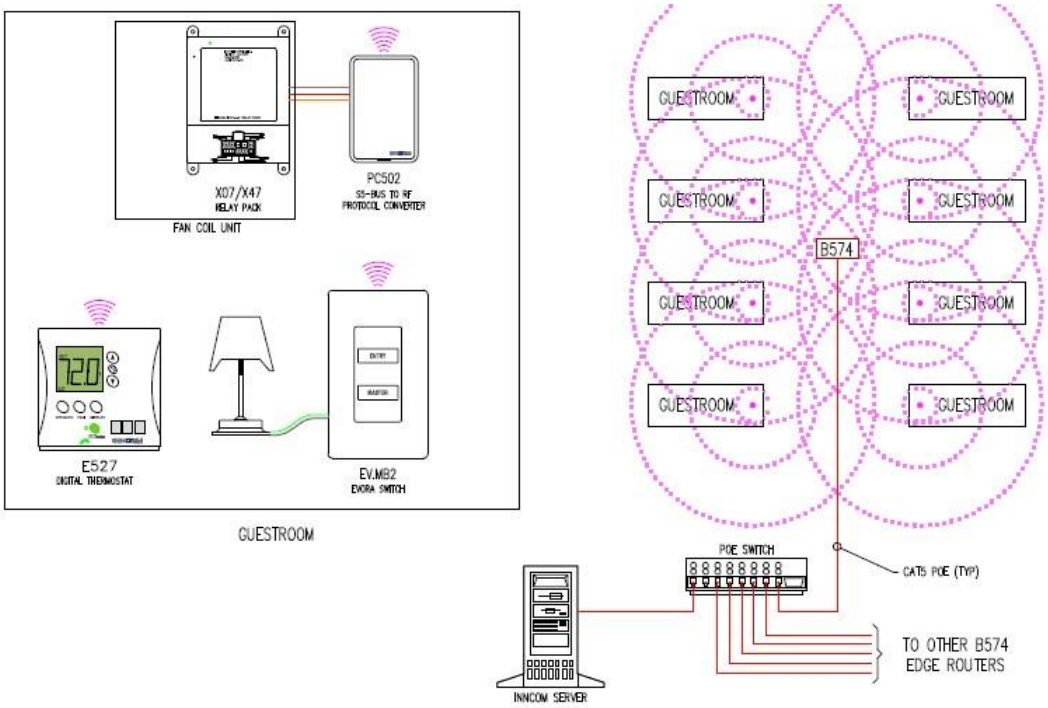


Figure 6 PC-502 Deep Mesh Network

Models & Part Numbers

Model #	Description
201-502.1.WH.P	Protocol Converter PC502: 0dB radio; White housing
201-502.1.BK.P	Protocol Converter PC502: 0dB radio; Black housing
201-502.2.WH.P	Protocol Converter PC502: 20dB radio; White housing
201-502.2.BK.P	Protocol Converter PC502: 20dB radio; Black housing

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