PC501 Protocol Converter Product Guide

Table of Contents

Overview and General Concepts

The PC501 protocol converter bridges Honeywell's INNCOM Integrated Room Automation System with 3rd-party interfaces to provide onscreen guestroom environmental control through TV, smartphone, or other digital devices. Using a USB cable both for power and for data transfer to a set-top box, the platform-independent PC501 can translate settings from the 3rd-party interface to standard P5 commands for heating, lighting, or other room equipment. In turn, the PC501 can forward information from INNCOM-controlled environmental systems back through the 3rd-party interface for display and adjustment onscreen. The PC501 features S5bus and RF communications.

Figure 1. PC501 Protocol Converter

Technical Information

Major components (see Figure 2) of the compact PC501 include

- S217IR logic board: provides infrared (IR5) and S5bus capabilities

- CC2430 RF: provides RF capabilities

- CC2430 radio programming header

- Mini-USB connector and cable: connection to set-top box

- Two S5bus headers

- 3 LEDs: Red indicates power, middle violet indicates transmission (Rx/Tx), outer violet indicates programming

Both the S217IR and the CC2430 must be loaded with application software that supports the FastPack Serial Protocol (see **Programming**). This software allows FastPack Control commands from the 3rd-party interface to be translated into P5 commands sent out by IR5, S5bus, or RF to the Room Automation System and for updates to flow back through the USB/Serial port as FastPack Controls.

> **Note:** The set-top box will differ according to the 3rd party collaborator (e.g., Enseo, Exceptional Innovation). Generally, it will be a video on demand (VoD) device with a dedicated USB port for communication with and power for the PC501. The vendor must develop the FastPack Serial Protocol for interaction with INNCOM devices as well as supporting FTDI Serial drivers for the USB connection.
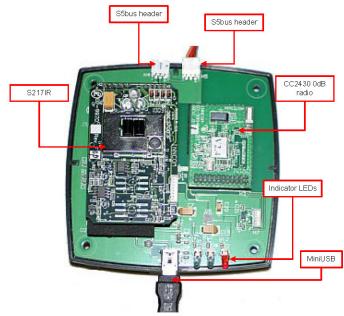
Mechanical Illustration

Figure 2. PC501 Illustration

Technical Specifications

Dimensions	95mm x 95mm x 25mm
USB connector	Mini USB 5-pin header
Communications	Infrared (IR5), S5bus, RF, 802.15.4
Power	See current consumption chart in table x.
Approvals	FCC Part 15
Dimensions	95mm x 95mm x 25mm
USB connector	Mini USB 5-pin header

Radio Specifications

The PC501 houses either a 0dB (P/N 02-9994) or 20dB (P/N 02-9894) radio, depending on the required application.

Performance	02-9994	02-9894
RF Data Rate	250kbps	SMT
Antenna Type	SMT	SMT
Indoor Range	70ft	100ft
Outdoor RF/Line-of-Sight	540ft	1000ft+
Transmit Power	1mW (+0dBm)	10mW (+18dBm)
Receive Sensitivity	-94.6dBm	-94.6dBm
Frequency Band	2.4Ghz	2.4Ghz
Encryption	AES-128	AES-128
Protocol	802.15.4	802.15.4
Frequency Channels	11-26	11-26
Dimensions	28mm x 38mm	28mm x 38mm

All Final Products containing the INNCOM TXR 02-9894 or TXR 02-9994 must contain the following statements on their label:

This device contains FCC ID: GTC029894TXR or GTC029994TXR.

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.

The followings statements are required in the final product user manuals:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

All Final Products containing the INNCOM TXR 02-9894 or TXR 02-9994 should be kept at a safe distance of at least 20cm from all persons. The final product cannot be co-located with any other antenna or transmitter.

Modifications not expressly approved by INNCOM International Inc. could void the user's authority to operate the equipment.

Power Consumption

The PC501 has multiple types of transmission mediums such as a 1mW radio, 20mW radio, IR transmitter, and hardwired S5bus communications. Peak values are based on current consumption measured while transmitting each medium.

Parameter	Nominal	Peak
PC501 logic board	20mA	20mA
S217 logic board	20mA	50mA
0dB (02-9994)	10mA	30mA
20dB (02-9894)	10mA	70mA

Peak current values are measured during IR, RF, or S5bus transmissions.

Example 1: 01-5001.PC.R3.S0.P configuration, the nominal current is 30mA, peak current is 50mA.

Example 2: 01-5001.PC.R1.S1.P configuration, the nominal current is 50mA, peak current is 110mA.

Programming

As indicated above, both the S217IR and the CC2430 must be programmed to support the FastPack Serial Protocol. To program the S217R

1. Use the INNCOM ST7 Flash Bash programmer as usual. (See INNCOM ST7 ICP User's Manual.

2. Load the latest available software package located in the T:\Library\INNCOM Products\Devices\S217_CBL\S217_FPS_IR5 directory.

To program the CC2430

1. Use the ELAB UPP-1 JTag programmer as usual. (See E-LAB Zigbee ICP User's Manual, found in T:\FTP\Eng_Data\Products\PC\E-LAB Zigbee ICP)

2. Load the latest available software package located in the T:\Library\INNCOM Products\Devices\CC2430 Radio\FPS directory.

Commissioning

The PC501 must be bound to the Integrated Room Automation System:

1. Enter the Service Mode on the e4 thermostat (press and hold the °F/°C button; press and release the OFF/AUTO button; press and release the DISPLAY button; release the °F/°C button)

2. Set parameter 14 on the thermostat to the specific I/O map if necessary

3. Set parameter 15 on the thermostat to the reserved P5 device address (234). Leave the thermostat parked in PAR 15 displaying the device address (VAL: 234). This puts the thermostat into bind ready mode for the PC501.

4. Power up the PC501 (either by connecting it to a power source through the 3-pin S5 bus or by plugging in the USB connector to the 3rd-party box or the USB connector on a laptop)

5. Upon power up, the PC501 sends a "bind offer" message that it is prepared for binding. The thermostat will confirm that it received the bind offer from the PC501 by scrolling its display

6. The PC501 confirms receipt of the device configuration data from the thermostat by sending a buzzer VFI back to the thermostat. Typically, the buzzer VFI will be sent approximately 10 seconds after the devices have been bound. This confirms a link has been established between the PC501 and the correct thermostat

7. The Enseo box only recognizes the PC501 on startup. Reboot the Enseo box to complete the networking of the devices (see Testing below)

Testing

1. The In-Room-3rd-party interface connection through the PC501 should be tested to ensure proper commissioning and communication.

2. Reboot the 3rd-Party set-top box to verify connection to the PC501

3. Use the remote to change environmental conditions (e.g., raise or lower temperature, change lighting) using the VoD screen. Verify that changes are made in the INNCOM devices.

4. Change conditions using the e4. Verify that changes are noted in the VoD screen.

Operation

The programmed PC501 connects by USB to the set-top box for both power and communication. The box in turn is connected to a VoD device, for example, to a TV by HDMI cable. The display shows the environmental status (temperature, fan, lights, door open/close, etc.) based on data transmitted (by IR, RF, or S5bus) from INNCOM thermostats, light controls, and the like through the PC501. Guests can use a remote control to make changes (lights on, temperature up) onscreen that can be translated through the PC501 to control INNCOM devices (the remote works with the VoD and the set-top box; it cannot control the PC501 directly). The actual method of interacting with the application through the VoD is dependent on the particular 3rd-party interface.

Document Revision History

Revision	Date Issued	Reason for Change
1.0	30-JUNE-10	Original Release
2.0	24-APRIL-17	Reformat to meet Honeywell Brand Specifications

Honeywell I 277 West Main Street I Niantic, CT 06357 I Phone: 1.860-739-4468 I www.INNCOM.com