

# INDOOR SECURITY SYSTEM

## User Manual



Group 5 CC3501

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## 1. Security System Contents

### 1.1. Main Hub

The main hub of the security system contains the following items:

- 1 x Raspberry Pi Model B
- 1 x Raspberry Pi Camera Module + Stand
- 1 x WiPi Dongle
- 1 x USB Microphone
- 1 x Speakers with 3.5mm Audio Jack Connectivity
- 1 x Power Adapter
- 1 x XBee Pro

### 1.2. Wireless Motion Detector Module

The lightweight motion sensing module kit contains the following items:

- 1 x Sensor Board
- 1 x XBee Pro
- 1 x Coin Cell Battery
- 1 x Power Adapter



Figure 1: Sensor board with peripherals

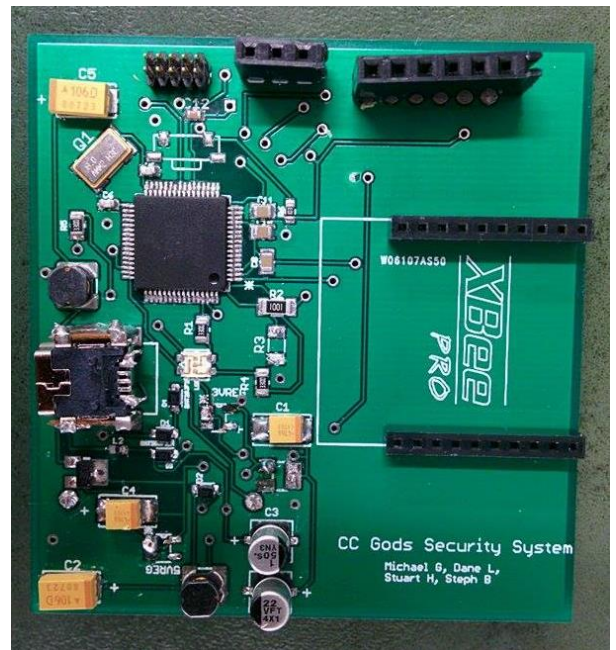


Figure 2: Sensor board

## 2. Physical Installation

### 2.1. Main Hub

The following steps outline how to set up your main hub:

1. Remove camera from anti-static bag and connect it to the camera slot. The camera slot is located behind the Ethernet port. Lift the corners of the camera slot up carefully, until it unclicks. Slide the camera ribbon into the camera slot with the small metal contacts facing away from the Ethernet port. Gently lock the camera slot back into place by pressing the corners until it clicks.
2. Stabilize the camera by affixing it to a wall or other unmoving surface.
3. Connect the WiPi dongle to one of the available USB slots and configure it to your home network as per the instructions provided with the WiPi.
4. Connect the USB microphone to the remaining available USB slot.
5. Connect the speakers to the blue 3.5mm audio jack.
6. Connect the XBee via USB
7. Connect the mini USB end of the power adapter to the board, and then plug it into a power socket and turn on.
8. The program will run on power up.

### 2.2. Wireless Motion Detector Module

The following steps outline how to set up your wireless motion detector module:

1. Connect the XBee, aligning it with the image printed on the board.
2. Insert one coin cell battery.
3. Affix the board to any surface, ensuring the large sensor faces outwards so that it is able to detect motion.
4. Connect the mini USB end of the power adapter to the board, and then plug it into a power socket and turn on.

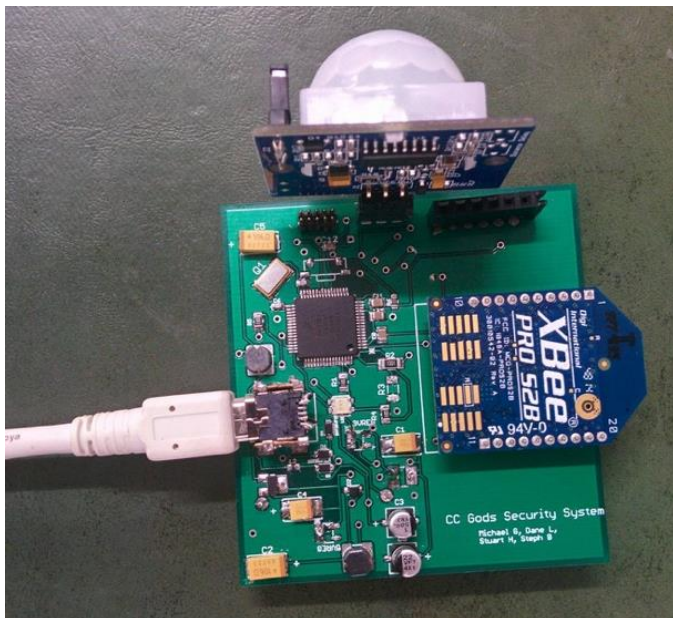


Figure 3: Powered by USB

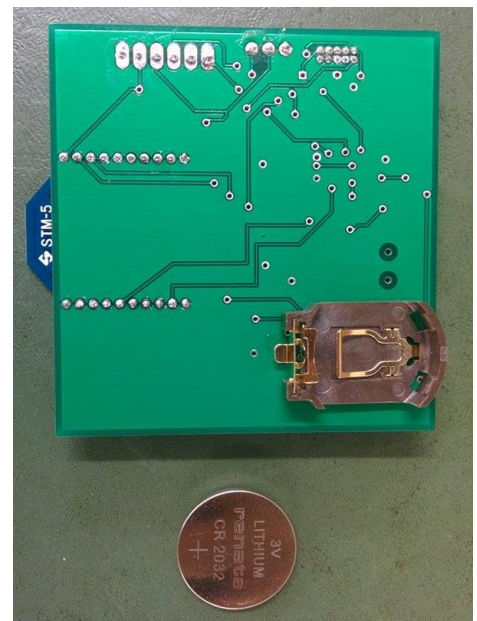


Figure 4: Powered by coin cell

### 3. Web-application

This security system hosts a webserver for the user to control the settings and view a live stream from the camera. The website is accessible from any web browser on devices including computers, tablets and phones by simply typing the IP address “192.168.35.196:5000” into the address bar.



Figure 5 - Webserver homepage

If the website is working as it should be, you should be presented with the homepage seen in **Figure 5**. There will be an active video stream with 6 buttons offering the following features:

- “Arm” – puts the system into “watching” mode, where it is actively watching for motion and will send you email alerts should motion be detected. The stream remains accessible at all times.
- “Disarm” – puts the system into “sleep” mode, where it does not look for motion. The stream will still be accessible at all times.
- “Save Snapshot” – captures and saves a snapshot of the video stream. Snapshots can be viewed by navigating to the “View Snapshots” tab.
- “Email Snapshot” – captures an image and emails it to the email address specified by the user.
- “Enable Voice” – turns on voice control configuration mode. Use voice control as per the instructions in section 4.
- “Disable Voice” – turns off voice control configuration mode.

From the homepage there are also two other pages accessible from the navigation bar on the left. These are:

- **View Snapshots** – this page will display the 16 most recent snapshots captured by the “Save Snapshot” function on the dashboard.
- **Email Setup** – this page allows the user to configure which email address they would like images to be emailed to them at by the system. Simply enter your email and press ‘save’.

### 4. Voice Control

This indoor security system implements voice control to make configuration of the system hands-free:

- “ARM” – puts the system into “watching” mode, where it is actively watching for motion and will send you email alerts should motion be detected. The stream remains accessible at all times.
- “DISARM” – puts the system into “sleep” mode, where it does not look for motion. The stream will still be accessible and voice commands can still be used.

- “TAKE PHOTO” – allows you to test motion detection. Saying “TAKE PHOTO” will prompt the system to take three photos and check them for motion.
  - If motion is detected, the system will verbally inform you that motion occurred as well as emailing you images of the motion.
  - If motion is not detected, the system will inform you that the coast is clear.
  - NB: it is recommended that you test motion detection by using the “TAKE PHOTO” command on a still room, and using it again whilst you or another person moves in front of the camera.
- “GOODBYE” – exits configuration mode. Commands will not be accessible until voice control is turned on again via web application.

## 5. Troubleshooting

### **The program isn’t running when I turn on my Raspberry Pi.**

The software on the Raspberry Pi will not run unless both the camera and the USB microphone are connected correctly. Please ensure that the camera is connected gently but firmly into the camera slot, and that the USB microphone has been correctly inserted into a USB slot.

### **The camera isn’t detecting motion correctly.**

The motion detection software has been optimized for indoor usage only. Please ensure that the camera is facing a still background and is securely fastened on a stable surface. Additionally, ensure that the camera is in a well-lit room.

### **Voice control isn’t hearing me well.**

Voice control works best when there is no background noise so it can focus on what you’re saying. It has been optimized for both American and Australian accents, and may struggle with variations from these. Try to speak clearly, in a quiet room, and repeat commands if prompted.

### **Voice command isn’t executing my commands and isn’t responding.**

Ensure that you have said “HELLO” and voice control has responded to you. If this has not occurred, then voice control is not in configuration mode. Say “HELLO” to enter configuration mode. Voice control will greet you and inform you that it is in configuration mode.

### **The video stream appears frozen.**

Ensure that voice control is not in configuration mode. If voice control is in configuration mode, the stream will not update regularly. If voice control is not in configuration mode, check your internet connection.

### **Motion is not being automatically detected by the wireless sensor module.**

Communications between your wireless sensor module and your main hub may have been disrupted. Please check that XBees are firmly connected to their respective boards. Also ensure that the PIR sensor has a clear view of the room.

### **The website isn’t loading.**

Check that your home network is working correctly, and ensure that the WiPi has been configured correctly for your home network. If needed, restart the Raspberry Pi.

### **I’m not receiving emails.**

Ensure that you have configured the system to send to your email address via the website, referring to instructions in Section 3. Also ensure that your home network is working correctly, and that the WiPi has been configured for your home network.