

# SPi-Box Manual

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## Welcome

Congratulations on buying an SB Components SPI-Box. We hope you find it to be the perfect complement to your Raspberry Pi PIR and camera projects.



The case is designed to mount the Raspberry Pi 2 (or B+) along with a Raspberry Pi camera module and a PIR module; all the elements you need to set up a PIR-based security camera system.

As a starting point for your project the accompanying SPI-Box microSD card comes pre-loaded with some Python scripts for configuring and running a simple motion-capture security camera which will email the captured images to an email address of your choice.

## Safety Information

- To reduce the risk of damage make sure your Raspberry Pi is switched off when attaching components to the non-consumer ports (i.e. GPIO or camera connectors).
- Do not operate near water
- Do not block any case ventilation openings
- Do not install near any heat sources such as radiators
- Protect the power cord from damage
- Unplug during thunder storms or when switched off for extended periods

## What's in the box

Depending on the kit you purchased the contents will vary (check the label on the box for what is included in your kit). The standard starter kit includes:

- 1 x SPi-Box case
- 1 x PIR
- 3 x GPIO/PIR leads
- 1 x microSD card pre-loaded with SPi-Box scripts

## Putting the SPi-Box together

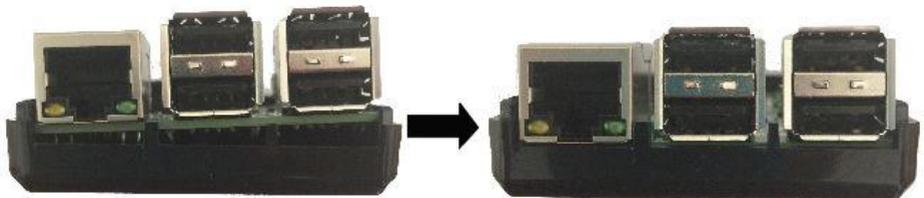
### Install your Raspberry Pi

Both B+ and Pi 2 Model B boards will fit the SPi-Box case. Please be aware that the bottom half of the case of the SPi-Box is shallower than other SB Components' cases making the mounting procedure slightly different:



1. Line up the hdmi side of the Pi with the lower half of the case and ease it into place at a slight angle pressing down gently but firmly until the mounting posts (highlighted in red) click into place in the Pi's screw-mounting holes.

2. Press the other side of the board down into place gently but firmly until the mounting posts on the GPIO side of the board click into place in the board's screw-mounting holes.



## Mounting the camera and PIR

1. Attach the camera module to the top half of the case using the screws provided to secure it into place (note: the camera ribbon cable should point toward the USB holes in the case).
2. Attach the PIR module to the top half of the case using the screws provided to secure it into place (note: the pins should be closest to the camera with the orange trimming controls aligned with the two holes in the side of the case).
3. Connect the camera module ribbon to the Pi. For the correct method of connection please see this guide from the [Raspberry Pi Foundation](#).
4. Connect the PIR to the Raspberry Pi using the included GPIO leads:
  - a. PIR VCC pin connects to Pi pin 2 (5v)
  - b. PIR OUT pin connects to Pi pin 7 (GPIO4)
  - c. PIR GND pin connects to Pi pin 6 (Ground)

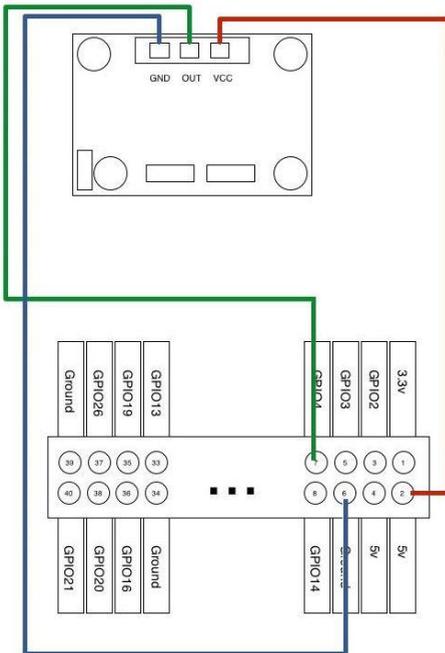


Illustration of the rear of the PIR module connected to the Pi GPI.

5. Snap the two case sections together.

## Getting the SPi-Box started

To get up and running with the SPi-Box scripts (pre-installed on the microSD card) you will first need to connect your Pi to a monitor, keyboard and mouse. Additionally you will need to connect the Pi to your local network.

### Things you need to know:

1. If the Pi does not boot to the desktop how to start the GUI  
startx
2. How to open a command window from the Raspbian desktop
3. How to edit files using nano (for a quick tutorial see: [How-To-Geek](#))
4. The default username and password for the basic Raspbian install:  
Login = pi  
Password = raspberry

**Note:** After the initial configuration you should be able to run the SPi-Box “headless” without connecting to a monitor, keyboard and mouse.

### SPi-Box software

The SPi-Box software has been installed under `/home/pi/spibox:`

Filename	Description
spibox.conf	This is a config file that stores: <ol style="list-style-type: none"><li>1. The subject line of your email alerts</li><li>2. The email address to which your email alerts should be sent</li><li>3. Whether the email routine should be sending emails or not (by default this is set to NO)</li></ol>
spibox.py	When executed, this python script will start waiting for the PIR to detect motion and then when motion is detected will take a picture with the camera. All images get saved to <code>/home/pi/spibox/capture</code>
spiboxmessenger.py	This python script runs at startup (via cron: enter crontab –l in a command prompt to see the details) and if the spibox.conf file has the send email flag set to YES it will attempt to email all jpg files sitting in the capture directory to the email address specified in the spibox.conf file (see above). It then moves those files to the capture/archive folder.
spiboxconfig.py	This python script will open a simple GUI allowing you to:

	<ol style="list-style-type: none"><li>1. Change the contents of the spibox.conf file without using a text editor.</li><li>2. Test that you have correctly configured your ssmtp settings (see below).</li></ol>
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Although the spiboxmessenger.py script will have started when the Pi boots up it will not by default email any captured images. Before you set the send email flag in the spibox.conf file to YES you should configure the ssmtp.conf file on the Raspberry Pi. More specifically you need to specify which mail server/user credentials you will be using for sending emails.

## SSMTP - Configuring your mail account

This assumes that you will be using a gmail account (other email services are available!):

1. Run spiboxmessenger.py by double-clicking the relevant icon on the desktop
2. Enter the email subject you would like to appear on your emails
3. Enter the email address to which you would like the emails sent
4. Press "Save and Quit"
5. Open the your ssmtp.conf file for editing (at the command prompt):

```
sudo nano /etc/ssmtp/ssmtp.conf
```

6. Change the lines:

```
mailhub=[your smtp server or smtp.gmail.com:587 if using a gmail account]  
FromLineOverride=YES  
AuthUser=[yourEmail@address]  
AuthPass=[your email address password]  
UseSTARTTLS=YES
```

7. Save your changes
8. Now run the spiboxmessenger.py again and click thr "Test Email" button

If you have configured your ssmtp.conf correctly an email will a dummy image file should be sent to the specified email address.

## Running the SPi-Box

If everything is set up correctly you should now be ready to start the spibox.py script which will start detecting movement in front of the PIR. When movement is detected it will start taking image captures via the camera and (if you have switched emailing on) emailing them to the specified email address.

To start SPi-Box simply double-click the desktop SPi-Box icon. The following lines should be output to a console window:

```
Turning on motion sensor...  
Sensor ready  
Waiting for movement
```

When motion is detected you should get:

```
Motion detected! Taking snapshot  
Waiting for movement
```

## Stopping the SPi-Box

If started from the desktop simply click on the command window which contains the output described above and press CTRL-C

## Next steps

Although the SPi-Box scripts preloaded onto the accompanying microSD card should get you up and running quickly with your own basic security camera they are really just a starting point for more sophisticated projects.

Some changes you might want to implement:

1. Add code to auto-delete the archived images after x days.
2. Change the code to record video rather than still images.
3. Setup the spibox.py script to run at startup

## Warranty

This SB Components product is warranted for the period of twelve (12) months from the original date of purchase, against defective materials and workmanship. In the event that warranty service is required you should return the product to the retailer from whom it was purchased.

## About us

SB Components is a specialist manufacturer of protective cases for single board computers and microcontroller boards. Our designers are experts in producing robust, functional and elegant cases that protect and augment technology platforms.

In addition to the standard products listed in this catalogue SB Components will undertake bespoke case projects. These can range from the addition of logos, or changes in colour/material of existing cases to the creation of completely bespoke engineered-from-scratch projects

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