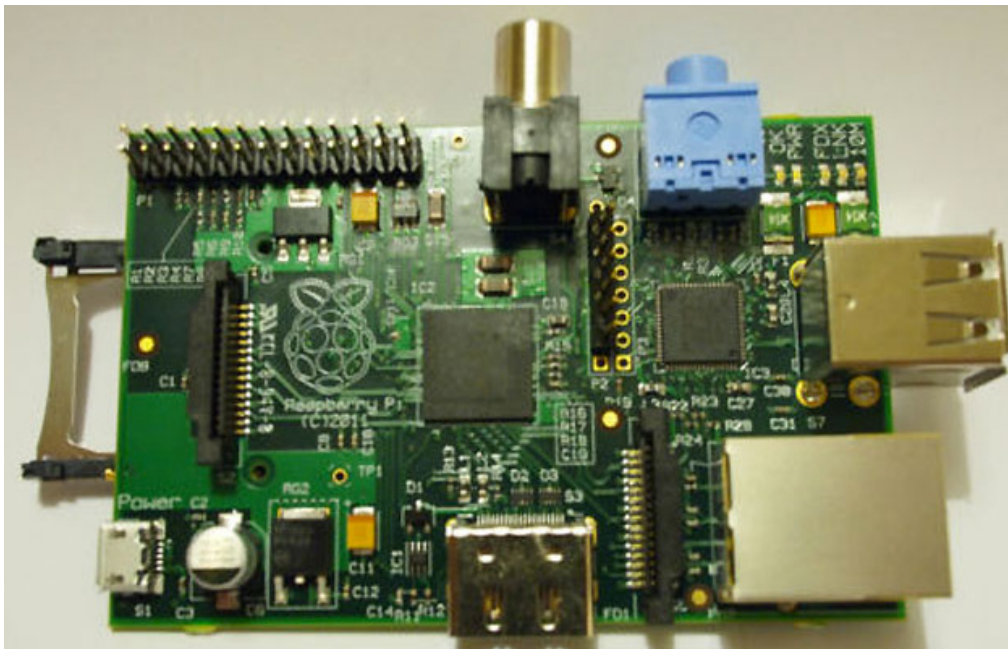
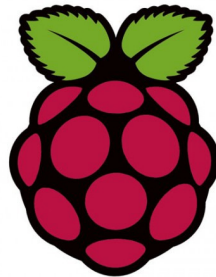


# Quick Start Guide

## The Raspberry Pi – Single Board Computer



Source: Raspberry Pi & Wiki

# Chapter 1: RPi Hardware Basic Setup

## Typical Hardware You Will Need

While the RPi can be used without any additional hardware (except perhaps a power supply of some kind), it won't be much use as a general computer. As with any normal PC, it is likely you will need some additional hardware.

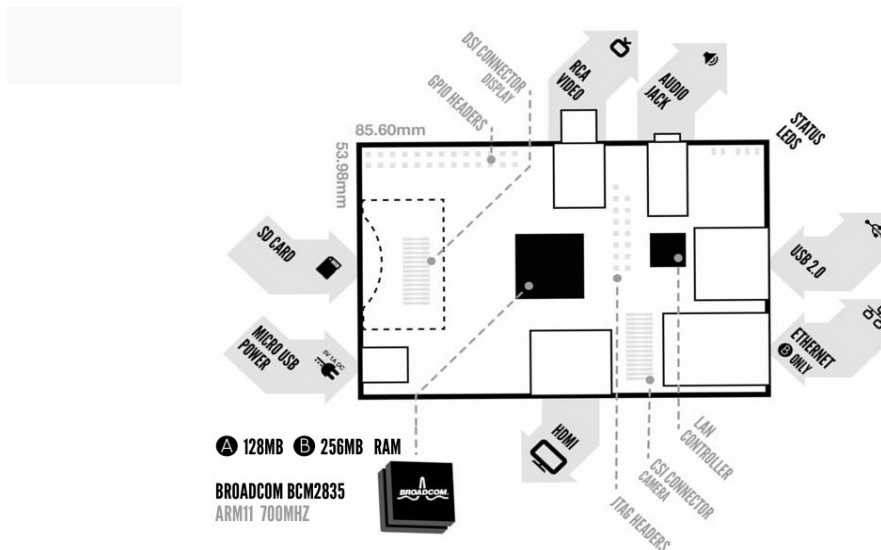
The following are more or less essential:

- Raspberry Pi board
- Prepared Operating System SD Card
- USB keyboard
- Display (with HDMI, DVI, Composite or SCART input)
- Power Supply
- Cables

Highly suggested extras include:

- USB mouse
- Internet connectivity - a USB WiFi adaptor (Model A/B) or a LAN cable (Model B)
- Powered USB Hub
- Case

## Connecting Together



You can use the diagram to connect everything together, or use the following instructions:

1. Plug the preloaded SD Card into the Pi.
2. Plug the USB keyboard and mouse into the Pi, perhaps via a USB Hub. Connect the Hub to power, if necessary.

3. Plug the video cable into the screen (TV) and into the Pi.
4. Plug your extras into the Pi (USB WiFi, Ethernet cable, hard drive etc.). This is where you may really need a USB Hub.
5. Ensure that your USB Hub (if any) and screen are working.
6. Plug the power source into the main socket.
7. With your screen on, plug the other end of the power source into the Pi.
8. The Pi should boot up and display messages on the screen.

It is always recommended to connect the MicroUSB Power to the unit last (while most connections can be made live, it is best practice to connect items such as displays/h/w pin connections with the power turned off).

The RPi may take a long time to boot when powered-on for the first time, so be patient!

## Prepared Operating System SD Card

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As the RPi has no internal storage or built-in operating system it requires an SD-Card that is set up to boot the RPi.

- You can create your own preloaded card using any suitable SD card you have. Be sure to backup any existing data on the card.
- Preloaded SD cards will be available from the RPi Shop.

This guide will assume you have a preloaded SD card.

## Keyboard & Mouse

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Most standard USB keyboards and mice will work with the RPi. Wireless keyboard/mice should also function, and only require a single USB port for an RF dongle. In order to use a Bluetooth keyboard or mouse you would need to use a Bluetooth dongle, which again uses a single port.

Remember that the Model A has a single USB port and the Model B only has two (typically a keyboard and mouse will use a USB port each).

## Display

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There are two main connection options for the RPi display, *HDMI* (high definition) and *Composite* (low definition).

- HD TVs and most LCD Monitors can be connected using a full-size 'male' HDMI cable, and with an inexpensive adaptor if DVI is used. HDMI versions 1.3 and 1.4 are supported, and a version 1.4 cable is recommended. The RPi outputs audio and video via HDMI, but does not support HDMI input.
- Older TVs can be connected using Composite (a yellow-to-yellow cable) or via SCART (using a Composite to SCART adaptor). PAL and NTSC TVs are supported. When using composite video, audio is available from a 3.5mm (1/8 inch) socket, and can be sent to your TV, to headphones, or to an amplifier. To send audio your TV,

you will need a cable which adapts from 3.5mm to double (red and white) RCA connectors.

**Note: There is no VGA output available, so older VGA monitors will require an expensive adaptor.**

Using an HDMI to DVI-D (digital) adaptor plus a DVI to VGA adaptor will not work. HDMI does not supply the DVI-A (analogue) needed to convert to VGA - converting an HDMI or DVI-D source to VGA (or component) needs an active converter. (It can work out cheaper to buy a new monitor.) The lack of VGA has been acknowledged as a priority issue.

## Power Supply

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The unit uses a Micro USB connection to power itself (only the power pins are connected - so it will not transfer data over this connection). A standard modern phone charger with a micro-USB connector will do, but needs to produce at least 700mA at 5 volts. Check your power supply's ratings carefully. Suitable mains adaptors will be available from the RPi Shop and are recommended if you are unsure what to use.

You can use a range of other power sources (assuming they are able to provide enough current ~700mA):

- Computer USB Port or powered USB hub (will depend on power output)
- Special wall warts with USB ports
- Mobile Phone Backup Battery (will depend on power output) (in theory - needs confirmation)

To use the above, you'll need a USB A 'male' to USB micro 'male' cable - these are often shipped as data cables with MP3 players.

## Cables

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You will probably need a number of cables in order to connect your RPi up.

1. Micro-B USB Power Cable
2. HDMI-A or Composite cable, plus DVI adaptor or SCART adaptor if required, to connect your RPi to the Display/Monitor/TV of your choice.
3. Audio cable, this is not needed if you use a HDMI TV/monitor.
4. Ethernet/LAN Cable

## Additional Peripherals

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You may decide you want to use various other devices with your RPi, such as Flash Drives/Portable Hard Drives, Speakers etc.

### **Internet Connectivity**

This may be an Ethernet/LAN cable (standard RJ45 connector) or a USB WiFi adaptor. The RPi ethernet port is auto-sensing which means that it may be connected to a router or directly to another computer (without the need for a crossover cable).

### **USB-Hub**

In order to connect additional devices to the RPi, you may want to obtain a USB Hub, which will allow multiple devices to be used.

It is recommended that a **powered** hub is used - this will provide any additional power to the devices without affecting the RPi itself.

USB version 2.0 is recommended. USB version 1.1 is fine for keyboards and mice, but may not be fast enough for other accessories.

### **Case**

Since the RPi is supplied without a case, it will be important to ensure that you do not use it in places where it will come into contact with conductive metal or liquids, unless suitably protected.

### **Expansion & Low Level Peripherals**

If you plan on making use of the low level interfaces available on the RPi, then ensure you have suitable header pins for the GPIO (and if required JTAG) suitable for your needs.

Also if you have a particular low-level project in mind, then ensure you design in suitable protection circuits to keep your RPi safe.

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