Programming

Full range of Programming products available at:

www.rapidonline.com

BBC micro:bit

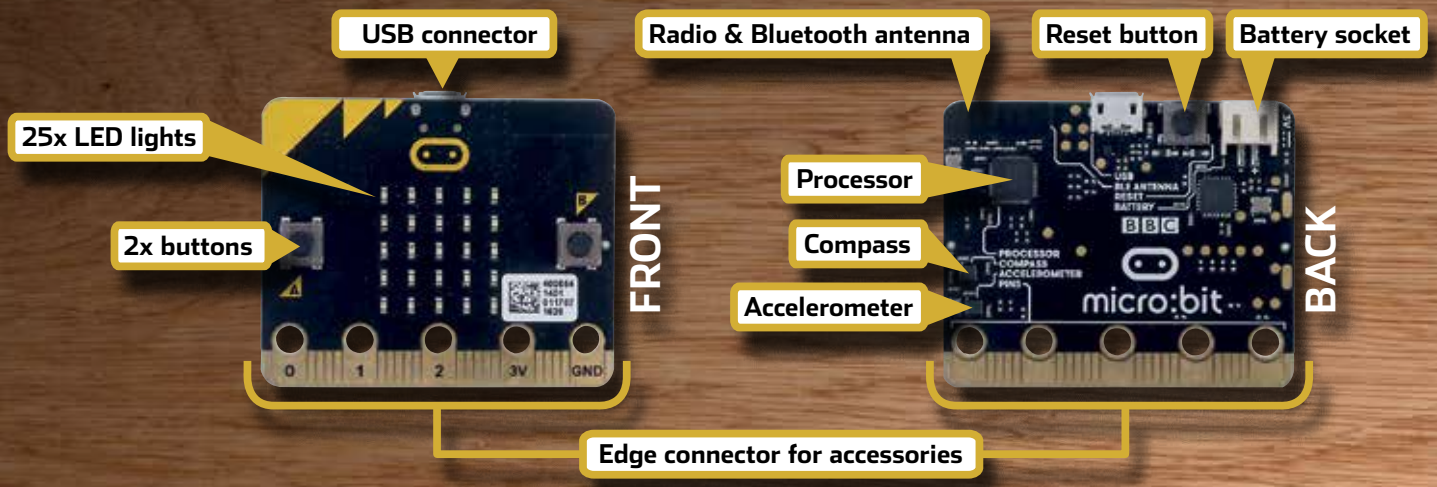
micro:bit barely needs any introduction. Since its launch in 2016 when 1 million devices were delivered to students across the UK, micro:bit's popularity has continued to grow and the device has been used by students all over the world to learn coding and basic electronics.

What is micro:bit?

micro:bit is a small, handheld programmable computer that can be used for making all sorts of fun projects from robots and remote controls to wearable electronic devices.

It has an LED matrix on the front for displaying messages and shapes, two push-button inputs, a 3-axis accelerometer to detect movement in all directions and a compass to detect heading. It can also transmit to and receive data from another micro:bit which means it can be used to send messages or act as a remote control.

* Starter kit contains micro:bit, USB cable, switched battery box and 2x AAA batteries.



Programming the micro:bit

The easiest way to write code for your micro:bit is by using the MakeCode editor. It runs in your browser window and allows your students to create programs in a graphical block editor or by using the text-based JavaScript editor. When you build a block program, the equivalent JavaScript is automatically created so your can start to understand the syntax.

Visit **www.microbit.org/code** to get programming

Bit:Bot Robot for BBC micro:bit/Ultrasonic Sensors/Pen Holders/Grabber

The **Bit:Bot** Robot is a feature-packed little robot that is almost ready to go, requiring no soldering, no wires and nothing more than a screwdriver to complete it.

The Bit:Bot turns your micro:bit from a stand-alone programmable computer to an awesome mobile robot allowing you to explore and code the **BBC micro:bit** using any of the languages available.

The Bit:Bot is powered by 3x AA batteries which are also used to power your micro:bit so the original micro:bit battery holder is not needed. The micro:bit itself is easily plugged in and removed using the edge connector on the top of the robot.

Two versions of the optional Ultrasonic Distance Sensor are available. The removable version unplugs easily from its socket to aid access to the micro:bit download port. The soldered version is more stable and robust, but you may need a right-angled USB download cable to download a program with the sensor in situ.

Batteries and micro:bit sold separately. Also available are a range of accessories designed to complement the Bit:Bot.

There is a **pen holder** available that is designed for use with either the Bit:Bot or CrumbleBot. The nifty little, and extremely thin PCB allows you to connect a pin to the back of your robot, and because the PCB is so thin it is very flexible, ensuring that it can exert downward pressure on the pen without lifting the robot off the ground. A rubber grommet with a 10mm internal diameter accepts Sharpie-type pens and the pen holder is easily fitted onto the battery support pillar of the robot. There are two versions, with or without a ring of 8x bright white LEDs that enhance the looks and shine light onto where the pen is writing.

The **Talon Grabber** has a jaw that you can control the opening of using standard servo code, as well as the specific code added to the Bit:Bot package.

- 2x micro-metal gear motors which can be controlled with both speed and direction
- Wheels with rubber tyres for maximum grip
- Super-smooth metal ball front caster
- 12x neopixel LEDs - select any colour for any pixel to produce stunning lighting effects as your Bit:Bot moves around
- 2x line following sensors - code your own line-following robots and race them to see which programmer can produce the fastest lap!
- 2x analogue light sensors so your Bit:Bot can be programmed to follow a light source such as a torch or hide in the darkest place it can find
- Sounder for making beeps wherever you go!
- Extension port for adding more neopixel LEDs
- Expansion connections at the front for adding the optional Ultrasonic Distance Sensor
- Pen holder and talon grabber also available

Type	Order code	1+
Bit:Bot Robot	**75-0117**	29.75
Socketed ultrasonic	**75-0121**	3.71
Soldered ultrasonic	**75-0119**	3.30
Pen holder	**75-5005**	2.50
Pen holder with LED	**75-5006**	4.50
Talon/grabber	**75-5007**	10.00

565004

Robo:Bit for BBC micro:bit and Accessories

If you have a **BBC micro:bit** then you should get the Robo:Bit buggy. Using the basic kit, you can learn about controlling motors and use the accelerometers or compass on the micro:bit to aid navigation and collision detection. You can also make a very cool remote control robot by using another micro:bit and the radio function.

The **Robo:Bit buggy** can be assembled very quickly using only a screwdriver. No soldering is required making it a great beginners kit and the chunky wheels and powerful motors mean it works well on any surface.

There are also available a number of optional accessories to make the Robo:Bit buggy even more versatile:

The **Ultrasonic Distance Sensor** lets the robot detect objects before it collides with them allowing you to program it to avoid them. It can also be used to create a 'follow me' program where the robot tries to stay a certain distance from the object in front of it.

The **Line Follower Sensor Pack** uses two line sensors to follow a black line and keep the buggy on track. You can write more complex programs that behave as required when you meet a T-junction or crossroads.

We all like adding blinky LEDs to our electronic creations, whether it is a robot, weather station or something that reads and displays sensor data. Now with **McRoboFace** you can add emotions to everything at the same time as adding blinkies. It also comes in grey or white.

All the 17 RGB LEDs are fully addressable and can be controlled by most processors in the field using standard 'neopixel' code. This includes Raspberry Pi, Crumble, Arduino, ESP8266, micro:bit and Codebug.

The **Robo:Bit** robotics controller is a ready-assembled robotics controller board that's ready to be used with your **BBC micro:bit**, just add battery power (3 or 4 AA is ideal, but not included) and motors of your choice to make your own DIY robot. Use a small box, ice-cream carton or similar to house everything and you can build a really affordable robot for your school, coding club or home.

Robo:Bit has been cleverly designed so that with a few hexagonal pillars and screws, you can fit the motors, battery box, front casters, line following sensors and even ultrasonic distance sensors and have a very neat and simple robot!

Robo:Bit uses the ever popular DRV8833 motor driver which allows you to use most small motors that operate in the 3 to 6V range.

Connections are provided for lots of the BBC micro:bit pins, and all have immediate 3-pin access to power (3.3V) and ground. There are three separate pins for 5V if you need the extra voltage (but don't feed back 5V to the micro:bit as it won't like it!). This is the GVS (Ground, Volts, Signal) system for sensors and servos etc.

On the left side of the board (the 'front' of the robot) is a set of 4 offset holes into which you can simply poke an HC-SR04 ultrasonic distance sensor. The offset holes and gold plating ensure a good connection, but you can also solder it in permanently for added robustness.

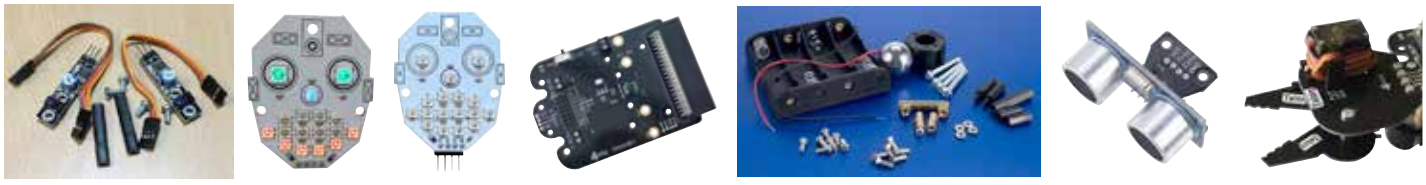
The Robo:Bit fixings pack contains screws, hexagonal pillars and a Pololu caster. This allows you to fit standard yellow motors (not included) and immediately get a robot working.

Also available is the **Talon Grabber** (75-5008) that has a jaw that can be controlled using standard servo code, as well as the specific code added to the Bit:Bot package.

- Have fun and learn robotics at the same time
- Quick to assemble with just a screwdriver
- Chunky wheels and powerful motor
- Ideal for many projects
- Batteries and micro:bit sold separately

Type	Order code	1+
Robo:Bit Buggy	**75-0123**	22.00
Line sensor	**75-0127**	5.00
McRoboFace grey	**75-0139**	7.00
McRoboFace white	**75-0147**	7.00
Controller board	**75-0133**	10.00
Robo:bit fixings pack	**75-0136**	4.00
HC-SR04 ultrasonic distance sensor v2	**75-0146**	3.50
Talon/grabber	**75-5008**	10.00

565005



RVFM

BBC micro:bit Switched Battery Box Upgrade

This battery box upgrade has a built-in on/off switch and has the same connector as used on the BBC micro:bit. Using this box makes it much easier to switch your micro:bit on and off and will help to protect the fragile connector on your micro:bit.

- Battery holder upgrade
- Built-in on/off switch
- Avoids repeated plugging and unplugging
- Holds 2x AAA batteries
- Connector fully compatible with the BBC micro:bit

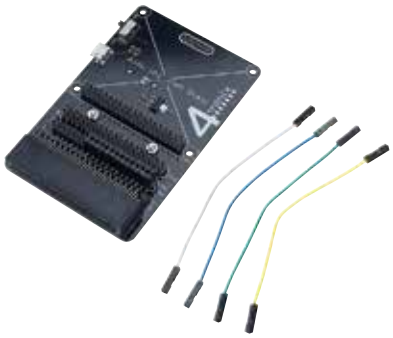
Batteries not included.

Type	Order code	1+	2+
micro:bit battery box	**18-2899**	0.83	0.848

562968

4tronix

Bit:2:Pi BBC micro:bit Raspberry Pi HAT Adaptor - Fully Assembled



The **Bit:2:Pi** adaptor allows the BBC micro:bit to connect to, and re-use all those hundreds of Raspberry Pi addon boards and HATs.

Simply plug your **micro:bit** into the edge connector and the required Raspberry Pi Hat onto the GPIO connector, then program your micro:bit to control the new board. Most Raspberry Pi boards are very simple to program as they are controlled by simple On/Off signals on the GPIO connector which are easily copied in the micro:bit. We have also used Neopixel hats (eg. Unicorn from Pimoroni) with great success and are happily communicating via I2C as well.

Selecting which micro:bit pin is connected to which GPIO pin, is via a set of configurable jumpers. There is a default set of connections that works for the most common boards, including I2C and SPI connections, but it is a simple matter to unplug a jumper or two, and replace it with a longer wire jumper (4 included) to connect your preferred pins.

Of course, the original code for the Raspberry Pi won't run directly on the micro:bit but with support from our community we will get more and more boards working and with example micro:bit code.

Current boards tested are:

4tronix: PlayHat, Picon Zero, PiStop, motor controllers

Pimoroni: Pibrella, Unicorn pHat/HAT. Explorer, Enviro pHat

Power is supplied to the board and the micro:bit via the micro-USB connector on the side, but there is also an option to add a battery holder (not supplied) to allow completely wire-free operation.

- Fully assembled and ready to go

Note: *BBC micro:bit is not included.*

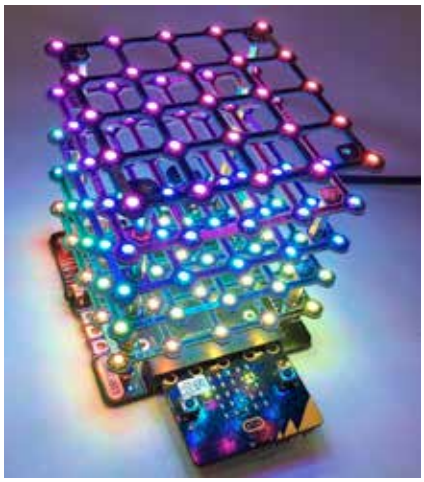
Type	Order code	1+
Bit:2:Pi Adaptor	**75-0131**	11.29

565006

Rapid education — We bring STEM to life

4tronix

Cube Bit Addressable RGB LEDs



Awesome is the best way to describe these magical RGB LED cube kits. The **Cube:Bit** can be assembled using just a screwdriver and within a few minutes you'll have created some stunning lighting and visual effects that you can use for a whole host of things, such as learning about coordinates in 2D and 3D, indications for sensory events from your SBC, decorative lighting, the possibilities are endless.

The Cube:Bits are made out of pre-assembled slices that have neopixel LEDs on both sides, giving an all-round effect to the lighting. There are three configurations available, 3x3x3, 4x4x4 and 5x5x5. Once assembly is done you have to use the Cube:Bit Base (available separately) to provide power and to connect a controller or to directly connect to a **BBC Micro:Bit** or **Raspberry Pi Zero** (full size Raspberry Pi work fine of course, but don't fit directly without using an extension GPIO cable, or simply 3 female-female jumper cables for 5V, Gnd and GPIO18).

- Available in 3, 4 or 5 LED square configuration
- Let your imagination roam free
- No soldering involved
- You can stack them, to make a tower as high as you like!
- Full RGB - contains every visible colour ever known (black not included)

Note. *Base not included with Cube:Bits.*

Type	Order code	1+
3x3x3 addressable RGB LEDs	**75-5009**	18.00
4x4x4 addressable RGB LEDs	**75-5010**	40.00
5x5x5 addressable RGB LEDs	**75-5011**	75.00
Cube:Bit base	**75-5012**	10.00

567658

BINARYBOTS

Raspberry Pi to BBC micro:bit Adaptors

This range of **adaptors** allows you to use both a **Raspberry Pi** and a **BBC micro:bit** together.

- Choice of vertical, horizontal or pi-top mounting

Vertical adaptor

Order code **75-0830**: Vertical mounting

Horizontal adaptor

Order code **75-0831**: Vertical mounting

pi-top adaptor

Order code **75-0832:** pi-top mounting

Note: *The Raspberry Pi has to be programmed with Python, whereas the BBC micro:bit can be programmed with either Python or Microsoft Block Editor.*

Type	Order code	1+
Vertical adaptor	**75-0830**	10.42
Horizontal adaptor	**75-0831**	10.42
pi-top adaptor	**75-0832**	12.92

566688

Pack of Ten Crocodile Leads

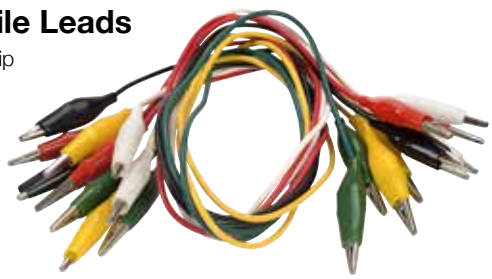
Pack of 460mm long crocodile clip leads supplied in a **pack of 10** leads in 5 colours.

Only

£2.44

Order code 17-0350

www.rapidonline.com



BINARYBOTS

DIMM Programmable Robot

DIMM is the incredible new smart robot that is revolutionising the way we learn how to code! From basics through to more advanced levels, use this kit to introduce S.T.E.M. to construct the smart card robot and then the even more fun bit - learn to code and build your own projects.

The kit comes jam packed with goodies, including DIMM the robot, some fun and interesting sensors, stickers to customise your robot, and full instruction. There are two versions of the kit, with one kit also including a BBC micro:bit pocket-sized computer.

These robots are easy to construct and final connections are easy and straightforward. Pretty soon you'll be designing projects, coding computers, and making DIMM do fun and exciting things. Create anything from a motion detecting security robot to a temperature or light sensing science experiment - the possibilities are endless!

- Build and code your own robot
- So easy and fun to learn to code, with lots of activities included
- No complicated software needed - just write code on a web page using Block Editor
- Includes free online lessons and courses
- Built out of strong durable card

For further fun activities please see the activities page – ***www.binarybots.co.uk/activities***

DIMM Robot with Microbit and Sensors
Order code 75-0823
£33.20

DIMM Robot with Sensors
Order code 75-0825
£20.82

UFO Programmable Saucer Robot

Binary's UFO is a smart and super saucer that uses lights and sounds to teach you how to code. Using S.T.E.M. to build the saucer and assemble the sensors, then create your own designs, learn how to code, and do exciting things!

You get tons of stuff with the UFO. As well as the easy-to-build UFO Saucer Robot the kit includes various fun sensors, stickers for customising your robot, connecting wires, instructions, etc. There are two versions of the kit, with one kit also including a BBC micro:bit pocket-sized computer.

UFO Robot with Microbit and Sensors
Order code 75-0824
£33.20

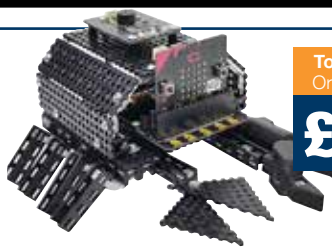
UFO Robot with Sensors
Order code 75-0826
£20.82

For full details on all of these products visit **www.rapidonline.com**

Totem Spider Robot
Order code 75-0827
£49.99

Totem Spider Programmable Robot with Sensors

The Totem Spider is an alien robot from the Planet Totem. The robot comes with a brand new BinaryBots sensor board and an awesome web, allowing you to easily bring the spider alive with code. You'll be able to build your very own robot, setup the powerful motorised web, hook up the sensor board, and bring it all to life with a BBC micro:bit (not supplied).



Totem Crab Robot
Order code 75-0828
£49.99

Totem Crab Programmable Robot with Sensors

The Totem Crab can normally be found scuttling merrily along the beaches on Planet Totem. This alien robot has a brand new BinaryBots sensor board and an awesome pincer, bring the crab alive with coding! You'll be able to build your very own robot, add the unique crab pincer, hook up the sensor board, and bring it all to life with a BBC micro:bit (not supplied).

Totem Tortoise Robot
Order code 75-0829
£49.99

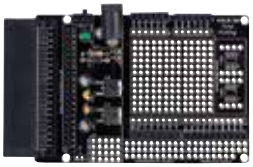
Totem Tortoise Programmable Robot with Sensors

The Totem Tortoise robot has plodded its way from Planet Totem. This alien robot has a brand new BinaryBots sensor board and an awesome hide in shell ability. Just waiting for you to code to life. You'll be able to build your very own robot, hook up the sensor board, and bring it all to life with a BBC micro:bit (not supplied).

- Makes sturdy structures
- Tailor made for combining electronics and mechanics
- Includes the powerful BinaryBots sensor board
- Included screwdriver with super strong magnetic grip
- Nuts stay in structure and don't fall out before fastening
- Extra grab bags allow for any innovation

RK Education

RKUB SB Shield Base for BBC micro:bit and Arduino



The RKUB SB is a shield base edge connector powered **breakout board** with headers that allow **Arduino** shields to be mounted onto the PCB, as well as breaking out the **BBC micro:bit** to provide a prototyping area for testing and development. The self-build kit is very easy to build, with surface mount voltage regulators that are easy to solder. The board uses a professional standard, double sided PCB with high quality plated through holes in the prototyping area.

There is a power switch and a 2.1mm DC power socket (12V DC recommended) that powers the board (therefore powering the micro:bit and the shield).

- Self-build kit
- Very easy to use
- Power circuitry with a 3.3V and 5V voltage regulators
- Designed and manufactured in the UK

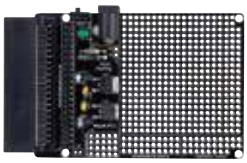
Note: *Neither Arduino nor BBC micro:bit are included.*

Type	Order code	1+
Shield base	**75-0261**	4.75

565685

RK Education

RKUB PT2 Prototyping Board for BBC micro:bit



The RKub PT2 is a powered prototype edge connector breakout board for the BBC micro:bit. Supplied as a self-build kit that is easy to assemble, with surface mount voltage regulators that are easy to solder. The professional standard, double sided PCB features a large prototyping area that has high quality, plated through holes. The assembly has a power switch and a 2.1mm DC power socket (12V DC recommended), powering the board and the micro:bit.

- Self-build kit
- Very easy to use
- Power circuitry with a 3.3V and 5V voltage regulator
- Designed and manufactured in the UK

Note: *The BBC micro:bit is not included.*

Type	Order code	1+
Prototyping board	**75-0262**	4.75

565686

RK Education

RKUB2 Powered Breakout Board for BBC micro:bit

The RKub2 is a powered edge connector **breakout board** solder kit for the **BBC micro:bit**. Supplied as a self-build kit that is easy to assemble, with surface mount voltage regulators that are easy to solder. The assembly has a power switch and a 2.1mm DC power socket (12V DC recommended), powering the board and the micro:bit.

- Self-build kit
- Allows you to breakout the BBC micro:bit
- Very easy to use
- Power circuitry with a 3.3V and 5V voltage regulator
- Designed and manufactured in the UK

Note: *The BBC micro:bit is not included.*

Type	Order code	1+
Breakout board	**75-0263**	3.75

565687

RK Education

RKUB1 Breakout Board for BBC micro:bit

The RKub1 is an edge connector **breakout board** solder kit designed for use with the BBC micro:bit. Supplied as a self-build kit that is easy to construct and very easy to use.

- Self-build kit
- Allows you to breakout the BBC micro:bit
- Includes a 2mm JST header for power pack
- Onboard power switch
- Designed and manufactured in the UK

Note: *The BBC micro:bit is not included.*

Type	Order code	1+
Breakout board	**75-0264**	2.50

565688

4tronix

Music Box Base and Neopixel Santa for BBC micro:bit

If you're looking for some extra twinkly fun this festive season look no further than this bundle of goodies from **4tronix**.

75-0149 - Music Box Base:Bit for BBC micro:bit

This clever little unit works as a standalone music box for your micro:bit (not included) or can be used to drive any **Neopixel** shape. The unit provides battery power, voltage regulation, On/Off switch with indicator and mounting for the micro:bit and up to two Neopixel plugins. There is also a mini speaker with powered driver so you can make music using the music modules in micro:bit programming languages.

75-0150 - Neopixel Santa Claus for Music Box Base:Bit

You may only see him once a year, but he's always welcome. The big fella is designed to plug into one of the two positions on the Music Box Base, and has 10 Neopixels all about him that are all RGB and can be individually programmed.

As examples of coding exercises why not try:

Flashing each pixel with random colours

Sweep a single colour from bottom to top

Make the LEDs on his belt and hat flash alternately

Make Santa walk by changing the colours on his legs

- Bundle includes 1 Music Box and 1 Santa
- Neopixel Santa is protected from incorrect insertion
- Great for learning how to code simple patterns of light
- Simple screw mounting for Micro:Bit (Micro:Bit not included)
- Music Box has:
- 3 x AAA battery holder (batteries not included)
- Robust on/off switch
- Blue LED power indicator
- Connectors for up to 2 plug in neopixel shapes

Type	Order code	1+
Neopixel Santa	**75-0150**	6.50
Music box base	**75-0149**	7.50

565865

Raspberry Pi

Unfamiliar with Raspberry Pi?

It is a credit-card sized computer with USB ports for devices such as a mouse and keyboard and an HDMI output for HDTVs. Millions have been sold worldwide into education, to home users and even into industry. This gives the Raspberry Pi the backing of a very active community which is constantly producing tutorials, software examples and programs you can download from the Internet for free. There's also a huge range of add-on hardware available, from cameras to robotics and more, making it a fantastic base for electronic projects. The Raspberry Pi is also a capable computer that will perform many of the functions that a desktop PC will, like spreadsheets, word processing and games, it will also play high definition video.

RaspberryPi

Raspberry Pi RPI3-MODAP Pi 3 Model A+ 512MB Quad Core WiFi & Bluetooth

Introducing the latest flavour of Raspberry Pi - the **Raspberry Pi 3 Model A+**.

This latest model is quite a bit smaller than its sibling, the 3 Model B+, but retains the 1.4GHz clock speed, 5GHz wireless networking and improved thermals, in a smaller form factor. With the Bluetooth wireless networking, fast processor, large memory Improved USB mass-storage booting and thermal management, the 3 Model A+ is ideal for where a smaller form factor is wanted, such as embedded applications.

The dual-band wireless LAN comes with modular compliance certification. This allows the board to be designed into end product with significantly reduced wireless LAN compliance testing, improving both cost and time to market.

For full details of software installation please follow the link on the product page at **www.rapidonline.com**, where you can learn about the **NOOBS** (New Out Of Box Software) operating system installation manager, which is recommended for beginners.

- Phenomenal cosmic powers! Itty-bitty living space
- Same mechanical format and footprint as the Raspberry Pi 1 Model A+
- A 1.4GHz 64-bit quad-core ARM Cortex-A53 CPU
- 512MB LPDDR2 SDRAM
- Dual-band 802.11ac wireless LAN and Bluetooth 4.2/BLE
- Improved USB mass-storage booting
- Improved thermal management
- Certified as a radio module under FCC rules

Technical specification

Broadcom BCM2837B0, Cortex-A53 (ARMv8) 64-bit SoC @ 1.4GHz
512MB LPDDR2 SDRAM
2.4GHz and 5GHz IEEE 802.11.b/g/n/ac wireless LAN, Bluetooth 4.2/BLE
Extended 40-pin GPIO header
Full-size HDMI
Single USB 2.0 ports
CSI camera port for connecting a Raspberry Pi Camera Module
DSI display port for connecting a Raspberry Pi Touch Display
4-pole stereo output and composite video port
Micro SD port for loading your operating system and storing data
5V/2.5A DC power input

Type	Order code	1+
Pi 3 model A+	**75-1006**	22.29

567730

Raspberry Pi Zero Wireless WH (Pre-Soldered Header)

If you're hungry for some Pi, but don't want to solder huge great headers then why not get the Raspberry Pi Zero Wireless board with a pre-soldered 40-pin male GPIO header!

The Raspberry Pi Zero Wireless features both wireless LAN and Bluetooth connectivity. It's compact design and low current consumption makes it ideally suited to embedded applications, wearables, prototyping, etc. The heart of the board is a BCM2835 chipset, overclocked to 1GHz with 512MB RAM.

The pre-soldered header has 40 pins in a 2 x 20 format with a 0.1" (2.54mm) pitch. Gold plated contacts prevent oxidisation and ensure excellent conductivity.

- Pre-soldered 40-pin header
- No fiddly soldering required
- Only uses 140mA at 5V
- On-Board WiFi and Bluetooth
- Fully HAT compatible
- Stream and watch high definition video output at 1080P
- Connectors for video, data, power and camera
- Micro SD Slot for OS
- Dimensions 65 x 30 x 5mm

Type	Order code	1+
Raspberry Pi Zero WH	**75-1030**	12.98

566895

Raspberry Pi 3 Model B+ 1 Quad Core 1.4GHz 1GB RAM WiFi & Bluetooth

The **Raspberry Pi 3 Model B** has been given a makeover. It's time to meet the **3B+.**

This addition to the Raspberry Pi range has a 64-bit quad-core processor which runs at a more powerful **1.4GHz**. It also offers dual-band wireless LAN, Bluetooth 4.2/BLE and a Gigabit ethernet port.

It's definitely a more powerful beast, but it retains the easy connectivity and software of the Raspberry Pi 3.In short, if you love the Raspberry Pi 3, you'll love the 3 Model B+ even more.

- Broadcom BCM2837B0, Cortex-A53 (ARMv8) 64-bit SoC @ 1.4GHz
- 1GB LPDDR2 SDRAM
- 2.4GHz and 5GHz IEEE 802.11.b/g/n/ac wireless LAN, Bluetooth 4.2, BLE
- Gigabit Ethernet over USB 2.0 (maximum throughput 300 Mbps)
- Extended 40-pin GPIO header
- Full-size HDMI
- 4 x USB 2.0 ports
- CSI camera port for connecting a Raspberry Pi camera
- DSI display port for connecting a Raspberry Pi touchscreen display
- 4-pole stereo output and composite video port
- Micro SD port for loading your operating system and storing data
- 5V/2.5A DC power input
- Power-over-Ethernet (PoE) support (requires separate PoE HAT)

Type	Order code	1+
Pi 3 model B+	**75-1005**	28.39

566563

Transcend 16GB microSD Card Preloaded with NOOBS for Raspberry Pi

With **Raspberry Pi** users there are some people who like to roll their sleeves up and get stuck in straight away, and there are others, especially new users, who like some assistance when starting out on the Raspberry Pi experience.

To provide help to the Raspberry Pi beginner, **Transcend** have produced a 16GB microSD card pre-installed with the **New Out Of Box Software** (NOOBS) for Raspberry Pi. **NOOBS** is software that makes it much, much easier to set up a Raspberry Pi. You just use the microSD card to boot your Pi for the first time and follow the menu instructions to quickly and simply install the operating system of your choice onto the card. Once your operating system of choice is installed, the Raspberry Pi will boot as normal.

- Provides a choice of operating systems
- Class 10 microSD card
- Capacity 16GB

Type	Order code	1+
NOOBS microSD card	**75-0755**	13.37

564949

Pi Kits

Raspberry Pi3 B+ Basic Student Kit

The **Raspberry Pi 3 Model B** has been given a makeover. The latest addition to the Raspberry Pi range, the **3B+** has a 64-bit quad-core processor which runs at a more powerful 1.4GHz. It also offers dual-band wireless LAN, Bluetooth 4.2/BLE and a Gigabit ethernet port. It's definitely a more powerful beast, but it retains the easy connectivity and software of the Raspberry Pi 3.

To help users get started Rapid has produced a basic student kit that contains a Raspberry Pi 3 model B+ plus a new Pibow 3 case, MicroSDHC card, cables, keyboard and mouse.

For programming, the latest version of the operating system for the Raspberry Pi can be downloaded for free*, and can be loaded onto the microSDHC card for use on the Pi.

- Kit contains everything you need to get started
- Easy to use
- Large online community of users

Click the link on the product page at* **www.rapidonline.com.

Kit contents:

75-1005	Raspberry Pi 3 Model B+ 1 Quad Core 1.4GHz 1GB RAM WiFi & Bluetooth
75-0532	Stontronics T5875DV Official Raspberry Pi International PSU (5.2V, 2.5A) with UK, Euro, Aus & US Plugs
73-5433	Pimoroni Pibow 3 Coupé; Case for Raspberry Pi
19-9222	Kingston SDC10G2/8GB microSDHC UHS-I Card (Class 10) - 8GB
19-4921	TruConnect URT-601G 1m Green Cat5e Utp Moulded Lead
16-1361	RVFM CDLHD-303 Hdmi Lead Gold Plated 3m
19-4042	Trust 20623 ClassicLine Keyboard
19-4114	Trust 16591 USB Optical Mouse - Black

Type	Order code	1+
Basic student kit	**75-0813**	58.81

566636

Raspberry Pi B+ Intermediate Student Kit

The **Raspberry Pi 3 Model B** has been given a makeover. The latest addition to the Raspberry Pi range, the **3B+** has a 64-bit quad-core processor which runs at a more powerful 1.4GHz. It also offers dual-band wireless LAN, Bluetooth 4.2/BLE and a Gigabit ethernet port. It's definitely a more powerful beast, but it retains the easy connectivity and software of the Raspberry Pi 3.

To help users get started Rapid has produced this intermediate student kit that contains a Raspberry Pi 3 model B+ plus all the accessories you need to start programming.

For programming, the latest version of the operating system for the Raspberry Pi can be downloaded for free* and can be loaded onto the microSDHC card for use on the Pi.

- Kit contains everything you need to get started
- Easy to use
- Large online community of users

Click the link on the product page at* **www.rapidonline.com.

Type	Order code	1+
Intermediate student kit	**75-0814**	67.91

566637

Raspberry Pi 3 B+ Advanced Student Kit

The **Raspberry Pi 3 Model B** has been given a makeover. The latest addition to the Raspberry Pi range, the **3B+** has a 64-bit quad-core processor which runs at a more powerful 1.4GHz. It also offers dual-band wireless LAN, Bluetooth 4.2/BLE and a Gigabit ethernet port. It's definitely a more powerful beast, but it retains the easy connectivity and software of the Raspberry Pi 3.

Rapid have produced the advanced student kit to enable students to really get into the Raspberry Pi experience. The kit contains everything required to carry out advanced projects including a Raspberry Pi 3 model B+ plus a case, power supply, and microSDHC.

For programming, the latest version of the operating system for the Raspberry Pi can be downloaded for free*, and can be loaded onto the microSDHC card for use on the Pi.

- Comprehensive kit
- Easy to use
- Large online community of users

Click the link on the product page at* **www.rapidonline.com.

Type	Order code	1+
Advanced student kit	**75-0815**	81.30

566638

pi-top

Transform the Computer Science experience through learning by making

pi-top

Modular laptop powered by Raspberry Pi with Inventor's Kit

Your DIY Raspberry Pi powered laptop

- The easiest way to start using your Raspberry Pi
- Takes Computer Science across the Curriculum
- Affordable modular computer kits
- Unique physical computing components
- Free flexible STEAM curriculum content for learning by making
- Pre-loaded SD card included
- Support community and unlimited lifetime warranty
- All-in-one package as a one-stop solution

Includes:
1x pi-topPROTO+, LED lights, Buttons, Buzzers and more!

£215.00

Order code 75-1000

RASPBERRY PI NOT INCLUDED

See page 17 for Raspberry Pi

pi-top CEED

Raspberry Pi Modular Desktop Computer

Your modular plug-and-play desktop

- Gives everyone the opportunity to be inspired by STEAM
- Full pi-topOS software bundle
- Slimmer form factor
- Adjustable viewing angles
- 14" HD screen
- Modular components
- Plug and Play Ready
- Pre-loaded SD card included
- Forward-facing access to your hardware
- Built in stand adjustable up to 180°

£109.00

Order code 75-1001

RASPBERRY PI NOT INCLUDED

See page 17 for Raspberry Pi

Software tools for the classroom

pi-top's unique ecosystem of physical computing, coding, and project-based learning provides the ultimate learning by making platform:

- pi-topDASHBOARD
- pi-topCODER
- CEEDuniverse
- Python IDE
- Scratch
- Wolfram Mathematica
- Minecraft Pi Edition
- Sonic Pi
- Microsoft Compatible software suite
- Chromium with YouTube support
- More native apps preinstalled

How does pi-top fit into the CS classroom?

pi-top takes learning beyond the textbook with a learning by making approach to STEAM education while building the skills students need to take on the future.

Software included

pi-topOS

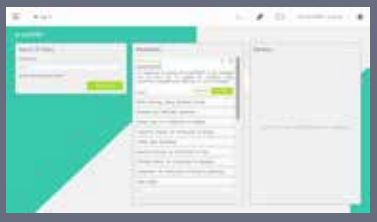
The **pi-top**OS platform lets you do everything that you would expect from a modern laptop or desktop computer, as well as having Google and Microsoft Office compatibility.

pi-topCLASSROOM

pi-topCLASSROOM is the teacher's classroom management suite for the pi-top curriculum. Link your pi-topCLASSROOM account to each student in your class in order to share worksheets and track student progress.

pi-topCODER

Using the Python programming language, prepare your students to be career ready through a variety of inspiring projects in pi-topCODER.

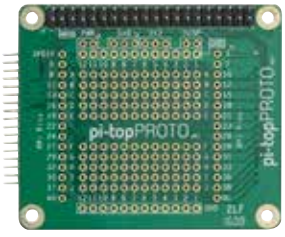


Learners can discover coding through project led, physical computing lesson plans. Create a circuit with pictures and step-by-step instructions provided, add code to bring your creation to life. With pi-top learning core Computer Science skills is more fun and engaging than ever!

CEEDUniverse

A revolutionary educational game where students learn basic computational thinking skills by solving fun, challenging puzzles. CEEDuniverse is pre-installed with every copy of pi-topOS and it is seamlessly integrated into pi-topCODER. Students will be able to jump between worksheets and CEEDuniverse to enhance their learning experience.

pi-top Proto for pi-top or CEED Prototype Your Project or Design



Using this supercharged breadboard you'll be able to design, build, test and tweak your physical computing projects. Just slide onto the modular rail and start connecting up your electronic devices, using the 40x GPIO pins. The pins provide the power required and allow you to write code to your connected devices, operating them remotely.

£4.50
Order code 75-1003

pi-top Pulse Amazon Alexa Integrated Smart Speaker for pi-top and CEED

The pi-topPULSE is a sleek, smart speaker that is designed for use as an add-on for the pi-top and pi-topCEED, and as a HAT for the Raspberry Pi 3. Makers, students and educators alike will be able to design and build many different projects, ranging from functioning as a high-end Raspberry Pi 3 speaker, a LED matrix for sound-based light shows, or even a customisable cloud-based voice service, with Amazon Alexa integration!

£39.00
Order code 75-1004

pi-top Speaker V2 for pi-top or CEED

The speaker slides onto the modular rail and allows you to play sounds, listen to videos, code music and create your own audio projects.

The speaker can be set to mono or stereo (left and right) output using a switch on the bottom side. As with all pi-top add-ons, speakers can be daisy-chained together (up to three) on the modular rail.

£14.90
Order code 75-1002

PIMORONI

PIM337 Raspberry Pi 3 B+ Starter Kit

If you want to get started with the whole **Raspberry Pi** experience you should get yourself one of these Raspberry Pi 3 B+ starter kits.

The kit comes with everything you need (just add a monitor or TV as a display) to get started with the Raspberry Pi 3 B+, plus there's a friendly **Getting Started Guide** to help you along the way. You'll easily learn how to get everything quickly set up, how to use the **Pibow** case to protect your Pi, how to add the heat sink to the board, as well as the microSD card and the **Blinkt!** rainbow light.

We'll also show you how to boot up your Pi for the first time, connect to WiFi, browse the web, play Minecraft, even how to use the terminal. Coding examples are also given, so you can code your twinkly Blinkt! using Python, and even make a (SQUEE!) rainbow animation with it.

The **Raspberry Pi 3 Model B** has a 64-bit quad-core processor which runs at a more powerful **1.4GHz**. It also offers dual-band wireless LAN, Bluetooth 4.2/BLE and a Gigabit ethernet port, retaining the easy connectivity and software of the Raspberry Pi 3. For further details of the Raspberry Pi Model B+ see 75-1005.

- Fun and educational
- Excellent getting started guide
- Only requires a display for full functionality
- Includes **Minecraft**
- Sheet of 11 fun and colourful peel-off stickers

Kit includes:
Raspberry Pi 3 B+
Keyboard and mouse
Pibow case
OS with Minecraft and Scratch (on an 16GB microSD card)
Blinkt! with 8 rainbow lights
HDMI Display cable
Heat sink
Worldwide power supply
Getting started guide
Sticker sheet with 11 stickers

Specification
1.4GHz 64-bit quad-core
ARM Cortex-A53 CPU (BCM2837)
1GB RAM (LPDDR2 SDRAM)
On-board wireless LAN - dual-band 802.11 b/g/n/ac (CYW43455)
On-board Bluetooth 4.2 HS low-energy (BLE) (CYW43455)
4x USB 2.0 ports
300Mbit/s ethernet
40x GPIO pins
Full-size HDMI 1.3a port
Combined 3.5mm analog audio and composite video jack
Camera interface (CSI)
Display interface (DSI)
microSD slot
VideoCore IV multimedia/3D graphics core @ 400MHz/300MHz

Type	Order code	1+
Pi 3 B+ starter kit	**75-0812**	69.00

566582

PIMORONI

PIM262 Raspberry Pi Zero W Starter Kit

The **Raspberry Pi Zero W** takes the awesome Pi Zero and adds wireless LAN and Bluetooth, making it perfect for embedded Internet of Things projects. This starter kit is the whole caboodle of things that you'll need to get up and running. The kit includes an SD card with operating system pre-loaded, a smart and colourful Pibow Zero W case, and even one of those lovely Blinkt! multicolour LED strips to take your first steps with coding in Python!

To protect your beloved from knocks, bumps and drop-testing, a **Pibow** case is included. The beautiful case has a clear top layer, with frosted red, purple and blue layers. The clever design of the case leaves the GPIO pins free, letting you attach any add-on boards - such as the Blinkt! - while your Pi is safely tucked away in its case.

Kit contents:
Raspberry Pi Zero W
Pibow case
8GB micro-SD card with operating system pre-loaded
Blinkt! multicolour LED strip
Male 2 x 20 pin header
50cm USB A to micro-B cable
USB A (female) to micro B (male) adaptor
Mini to full-size HDMI adaptor
Sticker sheet (personalise your Pibow!)
Comes in a reusable kit box

- Pi Zero W with single core CPU and built-in wireless LAN and Bluetooth
- Blinkt! with 8x APA102 RGB LEDs
- Pibow Zero W acrylic case
- 8GB micro-SD card with NOOBS 2.2 pre-loaded
- Take around 30 minutes to assemble (female and male headers require soldering)
- Adaptor kit
- 50cm USB A to micro-B cable
- Python library

Type	Order code	1+
Pi Zero W starter kit	**75-0787**	29.17

565815

PIMORONI

PIM286 Raspberry Pi Zero W OctoCam Project Kit

You're going to love this! From the ocean deep comes a cute cephalopod camera that can stick on the window or sit on a shelf.

The **OctoCam** kit contains practically everything required for the project, including a Pi Zero W, 5MP camera, an octopus acrylic mount with four suction cups, and a desk stand. The kit takes advantage of the built-in wireless LAN and Bluetooth on the Pi Zero W, meaning that there's no longer any need for a USB Wi-Fi dongle.

The motionEyeOS software makes it simple to set up your OctoCam as a remote camera that you can monitor through any connected web browser. It has all sorts of bells and whistles to trigger photos and videos to be captured when motion is detected, build time lapses, send notifications or tweets, and automatically sync. images to Dropbox or Google Drive.

Kit contents (also requires microSD card - not supplied):
Raspberry Pi Zero W
5MP camera with built-in cable and circuitry
OctoCam acrylic mount, suction cups, desk stand
50cm USB A to micro-B cable
USB A (female) to micro B (male) adaptor
Mini to full-size HDMI adaptor
Male 2 x 20 pin header
Sticker sheet
Comes in a reusable kit box

- Comes with a Raspberry Pi Zero W
- Take around 30 minutes to assemble (headers require soldering)
- Requires microSD card (not supplied)
- Personalise with included sticker sheet
- HDMI Adaptor
- USB Adaptor
- 50cm USB A to micro-B cable

Type	Order code	1+
Octo cam kit	**75-0788**	33.33

565816

PIMORONI

PIM261 Raspberry Pi Zero W Pirate Radio Project Kit

Ahoy, mateys! If ye be becalmed on a sea of silence why not build you very own Pirate Radio kit! This internet-connected radio is loaded to the gunwales with everything you need, including a Raspberry Pi Zero W, a flash new pHAT BEAT DAC and stereo amp, a 5W speaker, and a beautifully retro acrylic enclosure to make it look ship-shape. It'll take you around 30 minutes to assemble.

The nifty Pimoroni one-line installer will get your pHAT BEAT configured and install the VU meter plugin for ALSA that uses the RGB LEDs on pHAT BEAT to display sound levels. There is also a Python library to allow you to control the LEDs independently, if you wish, and to program the buttons to do whatever you wish.

Kit contents (also requires microSD card - not supplied):
Raspberry Pi Zero W
pHAT BEAT DAC and stereo amp, with VU meter and six buttons
Male and female 2 x 20 pin headers
Single 5W 4Ω speaker
Blue acrylic enclosure
50cm USB A to micro-B cable
USB A (female) to micro B (male) adaptor
Mini to full-size HDMI adaptor
Sticker sheet (personalise your Pirate Radio!)
Comes in a reusable kit box

- Pi Zero W with single core CPU and built-in wireless LAN and Bluetooth
- Take around 30 mins to assemble (female and male headers require soldering)
- Dual I2S DAC/amplifiers
- 3W per channel
- 2x Push fit speaker terminals
- DIP Switch to select blended mono or stereo modes
- 16x RGB LED pixels
- 6x Edge-mounted push buttons
- Software installer and ALSA VU meter plugin
- 5W 4Ω speaker with pre-soldered wires
- Blue acrylic enclosure
- Adaptor kit
- 50cm USB A to micro-B cable
- Python library

Type	Order code	1+
Pirate Radio	**75-0786**	33.33

565814

PIMORONI

PIM260 Raspberry Pi Zero W Scroll Bot Project Kit

Have a robot friend sitting on your desk - Scroll Bot can be your eyes on the world! Use the built-in wireless LAN to make your Scroll Bot internet-connected and be kept up to date with

the latest news, weather, Twitter feeds, hashtags, and a whole lot more.

The kit features the **Raspberry Pi Zero W** that adds wireless LAN and Bluetooth to the brilliant Pi Zero. Practically everything required is included (requires a microSD card - not supplied) and the kit takes about 30 minutes to assemble.

Our handy one-line installer will install the Scroll pHAT HS Python library for you.

Kit contents (also requires microSD card - not supplied):
Raspberry Pi Zero W
Scroll pHAT HD with 17 x 7 individually dimmable white LEDs
Male and female 2 x 20 pin headers
Orange robot stand and diffuser
50cm USB A to micro-B cable
USB A (female) to micro B (male) adaptor
Mini to full-size HDMI adaptor
Sticker sheet (personalise your Scroll Bot!)
Comes in a reusable kit box

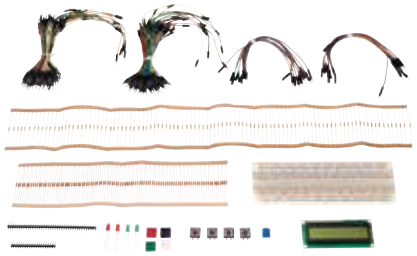
- Masquerades as a friendly orange robot
- Take around 30 minutes to assemble (female and male headers require soldering)
- Individual PWM brightness control of each pixel
- Uses the IS31FL3731 LED matrix driver chip
- 3-Layer orange robot stand and diffuser
- Pi Zero W with single core CPU and built-in wireless LAN and Bluetooth
- Adaptor kit
- 50cm USB A to micro-B cable
- Handy 1-line installer installs the Unicorn pHAT Python library

Type	Order code	1+
Scroll bot kit	**75-0785**	29.16

565813

Rapid

Adventures in Raspberry Pi Component Companion Kit



This kit contains a host of components suitable for prototyping work. Includes a solderless breadboard, headers, pots, switches, LEDs, buttons, resistors and cables. The kit is an ideal companion to the book 'Adventures In Raspberry Pi' by Carrie Anne Philbin.

- Suitable for any prototyping project

Technical specification

Adventures in Raspberry Pi Component Companion Kit		Qty
50-5441	Solderless Breadboard EIC-102 830 Point 165 x 55 x 8.5mm	1
57-2224	Compatible 16x2 3V3 LCD Display (pre-soldered header)	1
50-8082	1 x 20 Pin Header 2.54mm Pitch 3A Gold Plated	1
68-0242	10K 3/8 1-turn Finger Adjust Pot	1
78-0640	7.3mm Square 12x12 Tact.switch	4
78-1186	Green Button 12x12mm Square	1
78-1185	Black Button 12x12mm Square	1
78-1184	Ivory Button 12x12mm Square	1
78-1182	Blue Button 12x12mm Square	1
55-0868	Kingbright L-53GD 5mm Green LED Diffused 30mcd	2
55-0864	Kingbright L-53ID 5mm Red LED Diffused 50mcd	2
62-0358	330r Cr25 0.25w Cf Resistor - Pack of 100	1
62-0394	10k Cr25 0.25w Cf Resistor - Pack of 100	1
34-0679	Jumper Wires Dupont Cable M-F 26AWG 1 Pin 2.54mm Pitch - 15cm - Pack Of 10	2
34-0677	Jumper Wires Dupont Cable M-M 26AWG 1 Pin 2.54mm Pitch - 15cm - Pack Of 10	2

Type	Order code	1+
Companion kit	**75-0037**	12.88

559345

WILEY

Adventures In Raspberry Pi by Carrie Anne Philbin

Adventures In Raspberry Pi, Third Edition
Carrie Anne Philbin
ISBN: 9781119269069
288 pages
June, 2017

An elementary guide to the Raspberry Pi that is written for 11 to 15-year olds with **no prior computing knowledge**.
The book uses the extremely popular and successful, low-cost, credit card-sized **Raspberry Pi** to explain fundamental computing concepts. There are nine fun projects that teach basic programming and system administration skills - from the very basics of how to plug in the board and turn it on through to more advanced adventures such as coding music and building a jukebox. Each adventure includes a video that adds a lively reinforcement to the lesson, making it perfect for young self-learners as well as class-based teaching.

- Written by Carrie Anne Philbin
- Ideal for 11- to 15-year-olds
- Features 9 fun projects accompanied by lively and helpful videos
- Helps children have fun and learn computing skills

Technical specification

Type	Order code	1+
Adventures In Pi	**97-2140**	17.99

559343

Pi Breakout & Proto Boards

seeed studio

Raspberry Pi Relay Board

The **Raspberry Pi Relay Board from Seeed Studio** gives you 4 relays that will switch 15A at 30V DC/250V AC each, easily enough for most applications. The board uses the older 26-pin GPIO connector so it's compatible with every Pi from the old A to the new Zero. Screw terminals are provided for the connections to the device being switched and an LED indicator shows the status of each relay's normally open (NO) contacts. Your Pi can control the board via I2C and each board has a programmable address making it possible to drive multiple boards. PCBs with high voltages including mains electricity can be dangerous, please take precautions to prevent shocks and short circuits.

- 4 x relays with 1 x NO and 1 x NC contacts each
- 3-bit I2C address selection (8 addresses)
- LED indicators on each relay
- Screw terminals for switched devices

Type	Order code	1+
Relay board	**75-0396**	19.16

560356

adafruit

Pi T-Cobbler Plus Kit Breakout GPIO to Breadboard for RasPi A+ B+ or 2

The **T-Cobbler Plus + cable** is a fully assembled add-on **prototyping board** kit that is specifically designed for use with the Raspberry Pi B+ and Pi 2 and is also compatible with the A+ model. The breakout board is T-shaped, making it easier to read the labels and a 40-pin ribbon cable is supplied that connects between the Pi and the T-Cobbler, giving access to the power, GPIO, I²C and SPI pins on the Pi.

- Designed for use with Raspberry Pi Model A+/ B+/Pi 2/Pi 3
- Makes 'cobbling together' prototypes with the Pi very easy
- Comes with a 40-pin ribbon cable
- Can plug into any solderless breadboard or prototyping board
- All the pins conveniently labelled
- No soldering required

Type	Order code	1+
T-Cobbler kit	**75-0507**	7.14

559290

adafruit

PiGRRL 2.0 Custom Gamepad PCB Only

The **Adafruit PiGRRL 2.0 Custom Gamepad PCB** powers up your PiGRRL build by removing the need for point to point wiring for the buttons and switches. The board needs a 40-pin header cable to connect all the GPIO signals, 2 x wires for the power and 4 x wires for the left and right shoulder buttons. That's all the wiring you need to connect 12 x switches! As you'll see from the tutorial there's still quite a bit to do, but the Gamepad PCB takes away a lot of tedious soldering.

New to the PiGRRL? The Raspberry Pi is a tiny Linux computer which can run a number of emulators of classic game systems such as the 8-bit NES and MAME. These have proved so popular that there's a complete distribution aimed at retro gaming, and that's the RetroPie project. If you can think of an 8-bit game, the chances are that it will run on the Raspberry Pi. The PiGRRL project brings these great old games, with their blocky graphics and plinky 8-bit 'music' into a small, hand-held, battery powered, full colour console. Retro games are always a big hit with kids and adults so bring some more retro into your life and build a PiGRRL.

Supplied as a bare PCB, you will need to source the rest of the components required to build a working PiGRRL. Adafruit supply a free and very detailed tutorial to guide you through the whole process of building your very own hand-held retro gaming console.

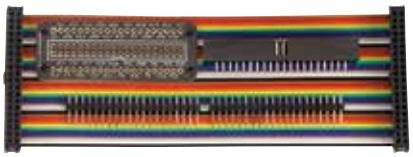
- Mounts 10 x tact switches
- Get a head start on your PiGRRL game console build
- Dimensions 85 x 48 x 1.6mm (3.35 x 1.9 x 0.06in.)
- Adafruit part no.: 3015

Type	Order code	1+
Gamepad PCB only	**73-5249**	4.45

563226

CYNTECH COMPONENTS
ELECTROMECHANICAL SPECIALISTS

Raspberry Pi B+ & Pi 2 GPIO Breakout Boards, Cobbler, Split and Paddle



The Raspberry Pi B+ has 40 GPIO pins compared to the Pi B's 26. Take advantage of the increased number of pins using a **Cyntech Raspberry Pi breakout board**. Each board carries the GPIO signals from the Pi to either a breadboard or spring loaded terminal blocks for prototyping. The Split+ and SplitMini+ are supplied as a kit of parts and require soldering before use. The Paddle+ is supplied fully assembled and ready to go.

- Split+ T shaped pcb for breakout boards (**73-6008**)
- Split Mini+ I shaped PCB for breakout boards (**73-6009**)
- Paddle+ with spring loaded terminal blocks for tool free connections (**73-6010**)

Technical specification

Order code	Name	Description
73-6008	Split+	T shaped PCB for breakout boards
75-0045	Split+	T shaped PCB for breakout boards assembled
73-6009	Split Mini+	I shaped PCB for breakout boards
73-6010	Paddle+	with spring loaded terminal blocks for tool free connections

Type	Order code	1+
T-cobbler breakout	**73-6008**	4.53
Cobbler breakout	**73-6009**	3.61
Paddle+ breakout	**73-6010**	8.35
Split mini assembled	**75-0044**	3.47
Split assembled	**75-0045**	4.43

547707

adafruit

Perma-Proto HAT for Raspberry Pi A+, B+ or 2

The **Adafruit Perma-Proto HAT** is a plug-in daughterboard that is compatible with the Raspberry Pi A+, B+ and Pi 2. The board has a grid of 0.1" prototyping solder holes for attaching chips, resistors, LEDs, potentiometers, etc. to create a versatile and easy to use protoyping area. The holes are connected underneath with traces to mimic solderless breadboards and there are long power strips for +3V, +5V and earth connections. There is also an area where there is broken out nearly every pin on the Raspberry Pi.

- Design a Pi HAT, attach custom circuitry
- Comes with a PCB and a single 2 x 20 GPIO header for Raspberry Pi
- Light soldering is required to attach the header to the PCB

Type	Order code	1+
Perma-Proto HAT	**75-0511**	4.65

559293

Pi Camera Modules

Raspberry Pi

Raspberry Pi Camera Board v2 8MP 3280 x 2464

This camera module add-on board version 2 features a high quality 8 megapixel Sony IMX219 image sensor that is custom designed for the **Raspberry Pi**. The camera sensor has a fixed focus lens and the sensor is capable of producing images of 3280 x 2464 and capturing video at resolutions of 1080p30, 720p60 and 640 x 480p90. Connection between the module and board is via the dedicated Camera Serial Interface (CSI) which is specifically designed for interfacing to cameras, with attachment via a short ribbon cable.

The small size and light weight of this add-on board make it perfect for mobile or other applications where size and weight are important. Suitable applications include CCTV security camera, motion detection, time lapse photography, etc.

- Turn a Raspberry Pi into a high quality still and video camera
- Software supported within the Raspbian Operating System
- Tiny board is just 25 x 23 x 9mm
- Weighs just over 3g

Type	Order code	1+
Camera board	**75-0530**	19.75

563384

Raspberry Pi

Raspberry Pi NOIR Camera Board v2 8MP 3280 x 2464

A camera module add-on board version 2 that features a HD 8 megapixel Sony IMX219 image sensor that is custom designed for use with the Raspberry Pi. The NOIR (no infrared) module omits the infrared filter from the lens, increasing sensitivity to the infrared band for IR and low light photography. A fixed focus lens and sensitive sensor gives the capability of taking still images of 3280 x 2464 pixels as well as capturing HD videos of 1080p30, 720p60 and 640x480p60/90.

The module connects to the Pi using the dedicated Camera Serial Interface (CSI) with attachment via a short ribbon cable from a socket on the upper surface of the camera module. The small size and light weight of this module make it perfect for mobile applications and for IR photography, low light photography, monitoring plant growth, CCTV security camera, etc.

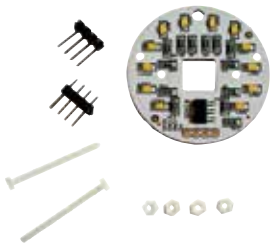
- Turn a Raspberry Pi into an IR and low light HD still and video camera
- Software supported within the Raspbian Operating System
- Ideal for twilight conditions
- Tiny board is just 25 x 23 x 9mm
- Weighs just over 3g

Type	Order code	1+
NOIR Camera board	**75-0531**	20.49

563385

CYNTECH COMPONENTS
ELECTROMECHANICAL SPECIALISTS

LISIPAROI LED Ring/Flash for Raspberry Pi Cameras



The **LISIPAROI light ring/flashes from Cyntech** gives your **Raspberry Pi** camera the extra light it needs to capture better images or capture images in interesting new situations. Choose the right light for your camera; the standard camera needs the white light ring while the Noir can use either but really comes into it's own when used with the IR ring. They can be used either as a fixed light source or like a traditional flash unit. You can control the duration of the flash, or the brightness of the light.
A pair of holes is provided for attaching the Pi camera, and these can also be used to mount the light to other hardware. The IR LED ring allows your Pi Noir to capture images in low light conditions, or even total darkness. Try your hand at time lapse photography, build a security system, or a perhaps a baby monitor.

- Choose between cool white LEDs and IR
- Operating voltage 5V DC
- Only uses 1 x GPIO pin

Type	Order code	1+
White LEDs	**75-0042**	10.28
IR Leds	**75-0043**	10.28

560444

Raspberry Pi Robotics

4tronix

Bit:2:Pi BBC micro:bit Raspberry Pi HAT Adaptor - Fully Assembled

The **Bit:2:Pi** adaptor allows the BBC micro:bit to connect to, and re-use all those hundreds of Raspberry Pi addon boards and HATs.

Simply plug your **micro:bit** into the edge connector and the required Raspberry Pi Hat onto the GPIO connector, then program your micro:bit to control the new board. Most Raspberry Pi boards are very simple to program as they are controlled by simple On/Off signals on the GPIO connector which are easily copied in the micro:bit. We have also used Neopixel hats (eg. Unicorn from Pimoroni) with great success and are happily communicating via I2C as well.

Selecting which micro:bit pin is connected to which GPIO pin, is via a set of configurable jumpers. There is a default set of connections that works for the most common boards, including I2C and SPI connections, but it is a simple matter to unplug a jumper or two, and replace it with a longer wire jumper (4 included) to connect your preferred pins.

Of course, the original code for the Raspberry Pi won't run directly on the micro:bit but with support from our

community we will get more and more boards working and with example micro:bit code.

Current boards tested are:
4tronix: PlayHat, Picon Zero, PiStop, motor controllers
Pimoroni: Pibrella, Unicorn pHat/HAT. Explorer, Enviro pHat
Power is supplied to the board and the micro:bit via the micro-USB connector on the side, but there is also an option to add a battery holder (not supplied) to allow completely wire-free operation.

- Fully assembled and ready to go

Note: *BBC micro:bit is not included.*

Type	Order code	1+
Bit:2:Pi Adaptor	**75-0131**	11.29

565006

RPI-Stop Educational Traffic Light for Raspberry Pi

The **Pi-Stop** is an educational traffic light project for **Raspberry Pi**. The low cost hardware module is designed to allow you to use your Raspberry Pi to take the first steps into interfacing with the real world. You'll be on the first rung of the Internet of Things ladder as soon as the lights change to green. The brilliant thing about the Pi-Stop is the familiarity of the elements, everyone knows what they are and how they can be used.

The beauty of this kit is that it removes the uncertainty that people face when asked to use hardware with a Raspberry Pi, what components to use, how to connect them, etc. The Pi-Stop makes it easy by plugging directly onto pre-set positions on the Raspberry GPIO connector. This removes the need for bundles of extra cables or wires and because the Pi-Stop does not block unused GPIO pins, keeping them available for other uses. The Pi-Stop can be fitted in four standard locations, allowing up to four Pi-Stops to be controlled independently or combined with other hardware.

The Pi-Stop provides a flexible and non-restrictive way to building understanding through experimentation, providing a simple stepping stone between pure screen-based programming and actually using hardware to interact with the real world. The programming of hardware can first be introduced to students and, at a later stage, the electronics can be introduced - allowing students to understand the control of hardware and then to be able to construct and control their own circuits.

Documentation, guides, tutorials and workshop material are openly available for educational use, and it is encouraged that similar materials can be submitted back for others also to share and make use of.

- Real world hardware makes understanding easier
- Low cost
- Designed for teaching both programming and hardware
- Fully supported with many resources

Note: *Raspberry Pi not included.*

Type	Order code	1+
Traffic light RasPi	**75-0287**	2.95

565330

RoboHAT Robotics Controller Board for Raspberry Pi

The **RoboHAT** is the complete robotics controller for your **Raspberry Pi** based mobile robot. The board supports all models of Raspberry Pi that have the 40-pin connector (Model A+/B+, as well as Pi 2 and 3 Model B).

The controller board comes fully assembled, no soldering or gluing is required. There are 2x mounting pillars and fixings supplied so it can be easily and securely mounted to your Raspberry Pi.

Amongst the many features of this board are:

5V Switching regulator to safely power the robot and the Pi from 7V to 10V batteries (not supplied)

LED Indication of 5V power status

High efficiency, dual H-Bridge driver that drives 2 DC motors (or 2 sets of 2 if using paired motors on each side of the robot)

6, 5V level shifted GPIO inputs with GVS 3-pin connectors (ground, volts, signal)

4, 5V level shifted GPIO outputs with GVS 3-pin connectors

4-pin Male header to directly plug in an ultrasonic distance sensor (not supplied)

I2C Breakout connector (standard 4tronix I2C port)

Output connectors can be used directly to drive servos

See the Blog entry on the **4tronix** website for more information, software and examples.

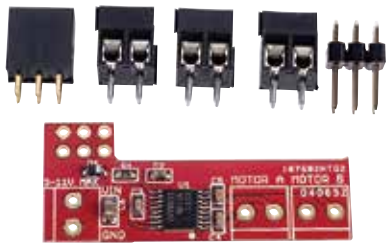
- Fully HAT specification compliant
- Replacement for the Pirocon
- Programming is fully supported in both Python and Scratch GPIO
- Python library module and examples freely available

Note: *Raspberry Pi and Batteries not included.*

Type	Order code	1+
RoboHAT control board	**75-0284**	19.95

565327

PZM Motor Controller Shim for Raspberry Pi Zero



The **PZM Pi Zero Motor Shim** is a brilliant way to adding motor control to (almost) any Raspberry Pi project. Although specifically designed for use with the Raspberry Pi Zero, the board can be used with any other Pi. When fitted, the board provides dual H-Bridge control of two DC motors. The board is so small (38 x 16 x 0.8mm) that it can be soldered onto the bottom of the connector (assuming you have added one to your Pi Zero), or you can solder on the female or male headers included in the kit so you can connect and remove it, however you have configured your Pi Zero.

Included in the kit are the ready assembled PZM Shim, 3x screw terminals, 3 x 2 male header, 3 x 2 female header. The board can be powered from an external 3 to 11V supply or, if you are using low power motors, you can use 5V from the Pi. The pzm.py library module provides basic functions for forward, reverse, spin left, spin right, turn left/right forward, turn left/right reverse. Download library and examples from the **4tronix** website.

- PZM Shim supplied ready assembled
- Mount with supplied headers
- OR solder directly to bottom of Pi header
- Reverse polarity protection

Note: *Raspberry Pi not included.*

Type	Order code	1+
PZM Motor controller	**75-0286**	4.50

565329

PiStep2 Dual/Quad Stepper Motor Controllers for Raspberry Pi

These **stepper motor** control boards are designed for use with all versions of the Raspberry Pi with the 40-pin GPIO connector. The boards are available in **dual** (2 steppers) or **quad** (4 steppers) versions. This neat little board plugs directly into the Raspberry Pi GPIO header and provides 2 or 4 connectors for stepper motors. There are various power options - powered from the Raspberry Pi 5V, micro-USB 5V, from the 2-pin terminal (voltage dependent on motor requirements).

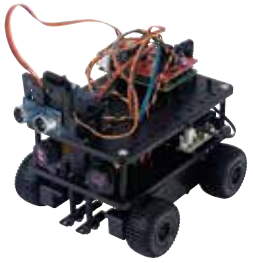
- Fully assembled - no soldering required
- Raspberry Pi Zero form factor
- Each pin has an associated LED to see stepper signals

Note: *Stepper motors and Raspberry Pi not included.*

Type	Order code	1+
DualStepper cont.	**75-0288**	6.05
Quad Stepper cont.	**75-0289**	10.50

565331

Ultimate Initio 4WD Robot Platform for Raspberry Pi with RoboHAT



The **Ultimate Initio** is a 4WD robot platform that is ideal for use with **Raspberry Pi** single board computer. The platform is a doddle to assemble and easy to use and comes with the RoboHAT robotics board and an assembled 2DOF pan-tilt servo assembly, as well as a number of other sensors that make this platform extremely flexible and perfect for a wide range of projects.

The main chassis comes pre-built, with the wheels, motors, gearboxes, battery box, wheel sensors all in place. The powerful 170-size motor is is coupled to a high-quality gearbox and there are built-in speed encoders on each side. Each wheel can be individually decoupled from the gearbox so you can run the robot in 1WD, 2WD or 3WD modes if you want.

Kit contents:
Main Initio chassis (with wheels, motors, gearboxes, battery box, wheel sensors, screws and all mountings)
RoboHAT Robotics Controller Board **75-0824**
Pan-Tilt 2DOF assembly with servos (ready assembled)
2x IR Obstacle sensors
2x IR Line sensors
1x Ultrasonic sensor
All connecting cables as required for above items

Build instructions and example code can be found on the **4tronix** website.

- Ideal for line following projects
- 6-cell battery box with switch (batteries not supplied)
- No soldering or gluing required
- Wiring already assembled
- Fixings for replacement stepper motors (not included)
- Injection moulded from tough ABS
- Includes mountings for additional boards and sensors
- Wheel size ø55 x 28mm
- Chassis size 180 x 120 x 93mm
- Height of top plate with wheels attached 110mm

Note: *Raspberry Pi and Batteries not included.*

Type	Order code	1+
Ultimate Initio	**75-0282**	97.02

565325

Mime Industries

MeAm Pi Raspberry Pi Robot Arm in Blue

The **MeArm Pi** is a brilliant new robot arm for all ages, that is easy to make and control, and can be built by anyone. The arm is powered and controlled with a Raspberry Pi (not included) and will teach you about technology, engineering and programming.

The MeArm has been deliberately designed so it is easy to build and use, it is recommended for 11+ age range but is so well designed that even younger engineers should have no problems. The only tool required is a Hex key, and it's included in the box.

The `heart` of the arm is the Raspberry Pi, a low cost computer that has been developed to make learning about computing accessible and fun. The MeArm can be controlled directly via the neat on-board joysticks, or you can try your hand at learning to code, making the arm move using one of the many programming languages that the Raspberry Pi runs. All the software is free and is suitable for all skill levels from absolute beginner to experienced programmer.

You'll find it simple to start programming and using the MeArm as soon as it's built. You can choose which way you program the MeArm, on-board programming and in-browser programming. The icing on the cake for the MeArm is that it can all be controlled straight from your web browser, so you don't need to have a monitor, keyboard or mouse.

Here's what you get in the box:
Arm structure parts
Socket head screws for easy assembling
Hex key so you don't need your own tools
4x Metal gear servos
Raspberry Pi HAT with two on-board joysticks

What else you'll need:
If you don't already have one, we can supply you with the phenomenal Raspberry Pi 3 (**75-0650**)

- Build the future with MeArm and Raspberry Pi
- 100% Open source in both hardware and software
- Joysticks for live control
- Simple on-board or in-browser programming
- The MeArm comes in blue

Type	Order code	1+
MeArm Pi robot arm	**75-0725**	38.00

565031

Pi Light, Sound & Display Add-on Boards

RaspberryPi

7in LCD Touch Screen and Clear Touch Screen Case

One of the most eagerly awaited accessories for the **Raspberry Pi** has finally arrived. The Raspberry Pi Official **7in LCD Touch Screen** gives you the ability to create all-in-one, integrated projects like tablets, infotainment systems, IoT devices, etc.

The display has a 800 x 480 pixel resolution and connects via an adaptor board that handles power and signal interfaces. Everything required for setting up the unit are supplied, just secure the adaptor board and Raspberry Pi to the back of the LCD, connect the signal ribbon cable, connect the power and you're ready to start. There is a choice of ways to power the display - using GPIO jumpers to access power from the attached Pi, using an external power supply such as the official Raspberry Pi power supply, or a separate micro USB 500mA supply.

- Truly Interactive
- Multi-touch capacitive touch screen – supports up to 10 finger touches
- 7 inch Display
- 800 x 480 pixel resolution at 60 frames per second (fps)
- 24-bit RGB colour
- 70° Viewing angle
- Only two connections required
- Flexible power supply
- No electronic interference
- Touch screen includes adaptor board, DSI ribbon cable, 4x jumper wires, mounting hardware
- Kivy touch screen development software available
- Case dimensions 197 x 47 x 116mm

Type	Order code	1+
LCD Touch screen	**75-0756**	48.99
Touch screen case	**75-0759**	12.99

564950

Pi Supply

Bright Pi White & IR LED Light for the Raspberry Pi Camera

If you need to shed light on your Raspberry Pi projects you should use the Bright Pi - a breakout/ add-on board that adds both visible bright white light and infrared illumination to your Raspberry Pi or other I2C device. Use the lights for your Raspberry Pi camera module, Pi NoIR module, or any other project that requires illumination.

The unit has M2 mounting holes, the same as the camera module and Pi NoIR and can be mounted directly to the camera module using the screws and spacers provided.

- Verified to work with the camera mount kit from Pimoroni
- Perfect accessory for any project that needs a bit more light
- Self assembly kit requires some soldering
- You can substitute the provided LEDs with the colourful LEDs of your choice

Note: *The Raspberry Pi Camera and Pimoroni Camera mount kit are not included with the Bright Pi.*

Type	Order code	1+
Light for Pi camera	**75-0871**	12.50

567109

Pi Supply

PaPiRus ePaper/eInk Screen pHAT/ HAT for Raspberry Pi/Pi Zero

These PaPiRus modules are a range of ePaper/eInk HATs and pHATs that are designed for the Raspberry Pi.

ePaper/eInk is a display technology that mimics the appearance of ink on normal paper. Unlike conventional displays, ePaper reflects light just like ordinary paper and is capable of holding text and images without power. Because of this, ePaper displays and single board computers or microcontrollers are a match made in heaven as together they use a very small amount of power whilst still bringing a display to your project.

The ePaper/eInk displays have the advantage that they don't need any power to keep the image on the screen. Just like a Kindle, you can read whatever is on your screen in daylight without any reflection. More information including wiring diagrams, datasheets & and links to example code are available at rePaper .

- Available in various sizes for Pi and Pi Zero/Zero W
- Multi screen versions available
- True low power displays
- Capable of driving ePaper displays of various sizes
- All signals are broken out to a 40-pin female header
- Daylight readable and very high contrast

Used with	Size	Order code	1+
Display pHAT			
Pi Zero	1.44in	**75-0863**	22.50
Pi Zero	2.00in	**75-0864**	24.99
Pi Zero	1.44in & 2.0in	**75-0865**	37.50
Display HAT			
Pi	1.44in	**75-0858**	29.99
Pi	2.00in	**75-0859**	32.49
Pi	2.70in	**75-0860**	34.16
Pi	1.44in, 2.0in & 2.7in	**75-0861**	58.33

567111

adafruit

PiTFT+ 3.5" 480x320 TFT Touchscreen Display Raspberry Pi A+, B+ or 2

The **PiTFT Plus** is a 480 x 320 3.5in touchscreen TFT that has been designed for use with the Raspberry Pi 2 and models A+ and B+. The 16-bit colour pixels and resistive touch overlay make this display a valuable addition to any **Raspberry Pi** project, where it can be used as a console, X window port, displaying images or video etc.

A custom kernel package based on Notro's awesome framebuffer work has been created, so that it can be installed over existing Raspbian (or derivative) images using just a few commands.

- High speed SPI interface
- Comes fully assembled and ready to plug into a Pi
- Backlight may be dimmed by PWM
- 2 x 16 'classic Pi' connection GPIO header on bottom
- Use as a display for running the X interface, or pygame

Type	Order code	1+
Touchscreen	**75-0493**	37.56

559276

adafruit

PiTFT+ 2.8" 320x240 TFT Touchscreen Display Raspberry Pi A+, B+ or 2

The **PiTFT Plus** is a 320 x 240 2.8in touchscreen TFT that has been designed for use with the Raspberry Pi 2 and models A+ and B+. The 16-bit colour pixels and resistive touch overlay make this display a valuable addition to any **Raspberry Pi** project, where it can be used as a console, X window port, displaying images or video etc.

A custom kernel package based of off Notro's awesome framebuffer work has been created, so that it can be installed over existing Raspbian (or derivative) images using just a few commands.

- Comes fully assembled and ready to plug into a Pi
- Includes 4 tactile switches soldered on
- High speed SPI interface
- Backlight may be dimmed by PWM
- 40x GPIO pins brought out as an interface
- Use as a display for running the X interface, or pygame

Type	Order code	1+
Touchscreen	**75-0495**	30.08

559277

PIMORONI

Pibrella Add-On Makes Sounds, Drives Motors, Lights LEDs and More!

The **Pimoroni Pibrella** is a one stop shop of gadgets to interface to your Raspberry Pi (A, A+, B, and B+). It gives you a tactile switch (big red button), 3 x LEDs (Red, Amber, Green), a Piezo speaker, 4 x protected inputs, and 4 x high-power outputs. Each of the 8 inputs and outputs has its own LED so that you can see what's happening. All the on-board gadgets can be used from Python and Scratch with code libraries available from the **pip** Python package installer. For examples and getting started guide, go to pibrella.com, the Pibrella dedicated website.

The high power interfacing is performed by a ULN2003A Darlington array which supports 500mA per channel as long as the total current draw for the entire chip is kept below 500mA. This means you can have one channel draw 500mA or 4 channels draw 125mA each. Of course, that current has to come from somewhere and the standard 1A supply on the B for example hasn't got much to spare. Consider upgrading to the 2A PSU recommended for the B+. With this kind of power at your disposal you can be more adventurous in your projects by including devices like motors, relays, solenoids etc.

The Pibrella is a great tool for learning electronics; make noises, run traffic lights, spin motors, don't press the big red button.

- Tactile switch
- Red, green, and amber LEDs
- Piezo speaker
- 4 x protected inputs
- 4 x high-power outputs

Type	Order code	1+
Pibrella	**73-6044**	8.15

550308

PIMORONI

Display-O-Tron RGB 16x3 LCD Display for Raspberry Pi for A+, B+, Pi 2

An upgraded HAT version of the Display-O-Tron, now with capacitive touch pads, a six-zone RGB backlight, and GPIO breakout pins. Features a super slim 16 x 3 character LCD which has a full ASCII character set where it is possible to define eight custom characters for special icons, graphs, or decoration. Six capacitive touch buttons are provided that are ideal for navigating on-screen menus or inputting data. They are labelled left, right, up, down, enter, and back but can be used for any purpose. The display has a six-zone RGB backlight with diffuser as well as a six-element LED bar graph which is ideal for monitoring changing statistics such as CPU load or memory usage.

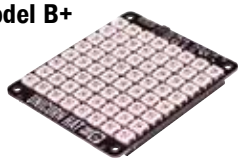
- Fully assembled
- Broken out common GPIO pins to integrate with other projects and sensors
- Full Pimoroni Python support

Type	Order code	1+
Display-O-Tron	**75-0513**	17.74

559327

PIMORONI

Unicorn HAT 8x8 RGB LED Matrix for Raspberry Pi Model B+



The **Pimoroni Unicorn HAT 8 x 8 LED matrix** is specifically designed for the new B+ HAT specification (Hardware Attached on Top). The HAT specification uses two dedicated pins on the extended 40-way GPIO header to tell Linux which drivers to load for whatever device has landed on top of the Pi. The Unicorn provides 64 individually addressable RGB LEDs (WS2812B) which are driven by PWM to create dazzling displays. Or not, you may prefer soft shades and subtle animation. As usual with add-ons for the Pi there is excellent software support with a library and examples in C and Python on Pimoroni's Github repository.

The LEDs can draw up to an amp which isn't much considering they can be turned up to eye-watering brightness (you have been warned) so be sure to use a good PSU with your Pi; 2A is good. If you intend to use them at full brightness then you should consider using a diffuser to protect your eyes.

As it uses PWM on the Pi and GPIO18 it will interfere with analogue audio, HDMI audio isn't affected. The Pibow Coupe cases are ideal, the Pibow Ninja, Rainbow and Timber cases won't do unfortunately. As it uses PWM and GPIO18 on the Pi it will interfere with analogue audio, HDMI audio isn't affected. The Pibow Coupe cases are ideal, the Pibow Ninja, Rainbow and Timber cases won't do unfortunately. Whilst the Unicorn sits neatly on the B+, it won't do that with the B but it's possible to hack it to work, letting B owners enjoy the blinkiness.

- 8 x 8 LED matrix (64 x WS2812B)
- For Raspberry Pi A+ and B+
- HAT compatible for automatic configuration

Type	Order code	1+
8x8 RGB LED matrix	**73-6042**	17.50

550306

PIMORONI

Piano HAT 13-Key Full Octave for Raspberry Pi A+, B+ or Pi 2

This Piano HAT is a mini musical companion for the Raspberry Pi and features a touch sensitive, 13-key full chromatic octave piano keyboard, plus octave up/down and instrument patch change keys. Using Python it is possible to play music, control software synths as well as controlling midi-enabled hardware synths.

Use the Piano HAT to play .wav samples with PyGame, or create piano-controlled contraptions. An included MIDI example enables music to be played with Sunvox, Yoshimi and others. Includes a PyGame example that includes a few octaves of piano and some drums.

- Compatible with Raspberry Pi A+, B+ and Pi 2
- Comes fully assembled
- 16 LEDs that can light automagically, or be driven with Python
- Output regular MIDI commands via a USB to MIDI adaptor
- Full Python library, documentation and examples

Type	Order code	1+
Piano HAT	**75-0514**	11.28

559328

Pi Touch Sensing

Pi Supply

Flick HAT 3D Tracking & Gesture HAT for Rasbperry Pi

If you want to control your Raspberry Pi using gestures then you need the Flick HAT - a 3D tracking and gesture HAT for the Raspberry Pi.

You can use swipes, flicks, taps, double taps, airwheels and touch to control your hardware, so the possibilities are almost endless. The Flick uses technology that enables it to detect gestures from up to 150mm away in 3D space. Draw a circle, swipe your hand - Flick will track it. Integrate Flick into your Raspberry Pi project to give you multiple ways of controlling it. Using the near field gesture technology, you're able to hide your project behind non-conductive material (wood/acrylic) and still use Flick (please note however that mounting it in this way may reduce the sensor range).

The Flick is plug and play, so you can be up and running within minutes. Use the software libraries (complete with one line installer) to fully explore what you can do with Flick. Control your computer, TV, music system and more all with a Flick of the wrist.

Follow this guideto set up your Flick Zero board and case.

Software for the Flick boards is available hereon GitHub.

- Compatible with Raspberry Pi A+, B+, 2B, 3B and 3B+
- Also works with Raspberry Pi Zero, Zero Wireless and other Pis with 40 GPIO pins
- Proximity and touch Sensing up to 150mm
- Communicates with the Raspberry Pi via I2C
- Red/green dual LED can be driven using pins LED1 and LED2
- Level shifting on board so can work either 5V or 3V3 power and data signals
- Compatible with the Hillstar Development Kit over USB on PC
- Works even through the Flick Large case
- No detection blind spots
- Low power design
- No soldering required
- Dimensions 65 x 30 x 6mm

Type	Order code	1+
Flick Zero 3D HAT	**75-0890**	16.66

567113

adafruit

Capacitive Touch HAT for Raspberry Pi A+ B+ Pi 2

A **capacitive touch** HAT that works with the **Raspberry Pi** models A+, B+ and Pi 2. The HAT has 12x capacitive touch sensors that are broken out to 'figure 8' board connections that can be connected, via crocodile clips and wire, to an electrically-conductive (e.g. metal) object or water-filled (e.g. vegetables/fruit) object, making it possible to create practical and fun controllers for a wide range of projects.

- Similar to the Makey Makey concept
- Works with Raspberry Pi Model A+, B+, or Pi 2
- Comes with a 2 x 20 socket header
- Can be used with Model A or B but requires an extra-tall 2 x 13 header (not included)

Type	Order code	1+
Capacitive touch HAT	**75-0508**	12.85

559291

PIMORONI

Skywriter 3D Gesture Sensing for Arduino and Raspberry Pi

The Skywriter is compatible with Raspberry Pi and Arduino and enables 3D gesture sensing to projects. Using Python and Arduino libraries positional data (x, y, z) and common gestures (e.g. flick left, tap, double tap). The sensing distance is up to 150mm so the Skywriter can be hidden from view.

- Electrical near-field 3D and gesture sensing
- Comes with 4x non-slip rubber feet and strip header
- Mounting holes
- Dimensions 94 x 122mm

Type	Order code	1+
Skywriter	**73-6053**	16.48

553925

Pi Motor & Power Driver Boards

adafruit

16 Channel Servo HAT/PWM for Raspberry Pi A+, B+ or 2

This HAT adds the capability to control up to 16 servos as well as providing 12-bit PWM of up to 1.6kHz. The module has the features and performance to produce the very specific and repetitive timing pulses required to precisely set servos while reducing the processing load of the Raspberry Pi. For use with Raspberry Pi Model A+, B+, or Pi 2 can be used with the Model A or B with a tall 2 x 13 header instead of the included 2 x 20. Perfect solution for any project that requires a lot of servos or PWM outputs.

- Drive up to 16 servos or PWM outputs over I2C with only 2 pins
- On-board PWM controller will drive all 16 channels simultaneously
- Stack up to 62 modules to control up to 992 servos
- Python library to get up and running instantly
- Supplied with a Servo HAT, a 2-pin terminal block, four 3 x 4 headers and a 2 x 20 socket header

Type	Order code	1+
Servo HAT/PWM	**75-0505**	15.26

559288

adafruit

Stepper Motor & DC HAT for Raspberry Pi A+, B+ or 2

This new DC+Stepper Motor HAT from **Adafruit** is a Raspberry Pi add-on that is perfect for any **motion** project, being able to drive up to 4x DC or 2x stepper motors with full PWM speed control. An onboard fully-dedicated PWM driver chip controls both motor speed and direction, with commands coming over via I²C. Up to 32 motor HATs can be stacked together for controlling up to 64 stepper motors or 128 DC motors (or a mix of the two). The motors are controlled by TB6612 MOSFET drivers with 1.2A per channel and 3A peak current capability and built-in flyback diodes.

- Compatible with Raspberry Pi model A+, B+, or Pi 2
- Polarity protection FET on the power pins
- Small prototyping area
- Thermal shutdown protection
- Can run motors on 4.5VDC to 13.5VDC
- Big terminal block connectors for 18-26AWG wires and power
- Comes with HAT, terminal blocks, and 2 x 20 plain header
- Raspberry Pi and motors are not included

Type	Order code	1+
Stepper motor HAT	**75-0512**	17.33

559294

PIMORONI

Explorer HAT Pro for Raspberry Pi A+, B+ and Pi 2

The Explorer HAT Pro is a prototyping board that is compatible with the Raspberry Pi A+, B+ and Pi 2. The board features: 4x buffered 5V tolerant inputs, 4x powered 5V outputs, 4x capacitive touch pads, 4x capacitive crocodile clip pads, 4x coloured LEDs, 4x analog inputs, 2x H-bridge motor drivers, mini breadboard.

- Can supply up to 500mA per channel
- Motor drivers can drive 2x 5V motors bidirectionally with 200mA per channel
- Ideal for driving motors, analog sensors, etc.
- Comes fully assembled

Type	Order code	1+
Explorer HAT Pro	**73-6052**	14.83

553924

Pi Power Supplies & Heat Management

TruPower

Plugtop PSU for Raspberry Pi 3 2.5A 5.1V

This plugtop power supply can supply the **Raspberry Pi 3** with 2.5A it requires for operation. The PSU features a universal voltage input and a long MTBF of 50,000 hours.

- 2.5A Output for use with Raspberry Pi 3
- Micro USB B connector
- Cable length 1.5m
- Automatic recovery from short circuit and over current conditions
- ErP Level VI efficiency rating
- UL Approval

Type	Order code	1+
PSU	**75-0715**	6.02

564611

stadium STONTRONICS

T5875DV Official Raspberry Pi PSU 5.2V 2.5A Multinational Plugs

Stontronics have designed a 5V power supply especially for the Raspberry Pi. Features such as universal input voltage, 2.5A output, interchangeable multinational input connectors and 1.5m USB cable make this power supply perfect for use with and Raspberry Pi board. The PSU is designed to take full advantage of the improved power management on the Raspberry Pi 3.

- Compatible with all Raspberry Pi Models
- Interchangeable UK, Euro, Aus & US plugs
- Universal input voltage 90 to 264V AC
- Output Voltage 5.2 V
- Output current up to 2.5A
- Output power 13W
- Short circuit, over current, over voltage protection

For technical specification visit **www.rapidonline.com**.

Type	Order code	1+
Pi PSU 5.2V 2.5A	**75-0532**	6.73

563386

ENERGENIE

Pi-mote Home Automation Kit for the Raspberry Pi

The **Energenie Raspberry Pi-mote** is a wireless home automation system for your mains devices. The Pi-mote itself is a GPIO board for the Raspberry Pi B and B+ which can communicate wirelessly (433.93MHz) with compatible mains sockets. Once activated, each socket can be switched on or off from up to 30m away using the Pi or manually using the button on the socket and can accomodate any mains appliance up to 3kW. A simple Python program is included to demonstrate how easy it is to take control of your appliances but you can use any programming language that can access the GPIO pins. You can use the Raspberry Pi stand alone or connected to the internet, a smartphone or tablet giving you the opportunity to create a system tailored to your exact needs. Each GPIO board can address four separate sockets and you can have more than one socket listening to each address. For example, you might have three table lamps in your lounge, with three remote sockets all listening to one address. You can turn them all on or off simultaneously and still have the capacity to drive 3 more sockets. Should you need to extend the wireless range you can solder a short piece of plain wire to the Pi-mote GPIO board to act as an aerial. We supply a Pi-mote starter kit (**73-6016**) that contains the GPIO board and two wireless mains sockets, the Pi-mote on it's own (**73-6014**) and additional wireless sockets (**73-6015**).

- Starter kit with GPIO board and two sockets
- Uses 433.92MHz (not WiFi)
- Control up to 3kW per socket
- Control 4 addressable sockets
- Multiple sockets on one address
- Extend the wireless range if needed

Type	Order code	1+
Starter kit	**73-6016**	17.10
Pi-mote GPIO board	**73-6014**	8.23
Mains RF socket	**73-6015**	5.68

548678

Pi Supply

PiJuice Portable Power Platform for Raspberry Pi

The PiJuice Portable Power Platform is a fully uninterruptible power supply that will keep your Raspberry Pi powered and portable. The unit is designed for the Raspberry Pi A+, B+, 2B, 3B and 3B+, as well as being compatible with the Raspberry Pi Zero v1.3 and Raspberry Pi Zero Wireless. The revolutionary PiAnywhere technology, contained in every PiJuice HAT, is the best way to take your Pi "off the grid"!

To further enhance the potential uses for the Raspberry Pi using PiJuice why not use solar panels to provide power - great for remote, unattended applications such as an autonomous camera system, weather station, off-grid desktop, and other great outdoor projects.

PiJuice solar panels available separately (see page 27):

Order code: **75-0852** Solar panel 6W
Order code: **75-0853** Solar panel 12W
Order code: **75-0854** Solar panel 22W
Order code: **75-0855** Solar panel 40W

PiJuice HAT box contains:
1 x PiJuice HAT
1 x Battery and battery surround
1 x PiJuice guide
4 x Mounting posts attached to PiJuice
8 x Mounting screws (4 are already assembled to the board)
1 x Pogo pin
3 x Stickers

- Onboard 1820 mAh off the shelf Lipo/LiIon battery for 4 to 6 hours in constant use
- Support for larger Lipo Battery of 5000 or 10,000mAH
- Integrated Real Time Clock
- Onboard intelligent On/Off switch
- Low power deep-sleep state with wake on interrupt/ calendar event
- Programmable multicoloured RGB LEDs buttons with configurable options
- Hardware watchdog timer keeps your Pi on in mission-critical remote applications
- Revolutionary PiAnywhere technology
- Full power management API available to OS with auto shutdown when running low on batteries
- Raspberry Pi HAT compatible layout, with onboard EEPROM for easy plug and play operation
- Low profile design to fit inside lots of existing Raspberry Pi cases
- Customisable scripts for enhanced flexibility and full report of battery status
- All GPIOs available via stackable header for ease of expandability and connectivity
- Charge via on-board micro USB or via the Raspberry Pi micro USB (or from onboard pin headers)
- Batteries can be charged from different type of sources and voltages
- Replace the battery without downtime
- Compatible with any single cell LiPo or LiIon battery
- Battery safety tested
- Fully CE and FCC tested design

Type	Order code	1+
PiJuice Pwr Platform	**75-0851**	39.99

567099

Pi Supply

PiJuice Solar Panels for PiJuice & Raspberry Pi

These PiJuice Solar Panels are the ideal way to charge and/ or power your PiJuice HAT and Raspberry Pi, for free, and anywhere where there is sunshine. Using the solar panel along with a PiJuice, containing the revolutionary PiAnywhere technology, you can take your Pi "off the grid" - and create many different projects involving autonomous operation and remote control.

The devices feature SunPower solar panels that provide industry-leading solar conversion efficiency. The panels fold down and can be secured with magnets into a super-compact size so that they're easy to pack up and go. Eye-holes in each corner allow easy attachment to backpacks, tents, trees, sheds, etc.

These solar panels have regulated 5V USB outputs that work with your PiJuice, smartphones, tablets, audio players and more.

What's inside:
PiJuice Solar Panel
USB to microUSB Cable
User Manual

- Available in 6, 12, 22, and 40W
- Highly portable
- Easily mountable
- Has a useful storage pouch for storing any essential items
- Incredibly durable stitching and construction
- Built in smart-power chip
- Lightweight
- Water resistant up to IPX4 rating

Type	Order code	1+
Solar panel 6W	**75-0852**	35.00
Solar panel 12W	**75-0853**	58.25
Solar panel 22W	**75-0854**	77.50
Solar panel 40W	**75-0855**	116.25

567101

Pi Supply

Lithium Ion Batteries for PiJuice HAT Module

These Lithium-Ion batteries are ideal for use with the PiJuice HAT module. The PiJuice HAT comes with a 1820mAh battery as standard so these batteries are great for a little extra boost (**75-0896**), or as a replacement (**75-0897**).

- Choice of capacities
- Output 3.7V
- Short circuit and overcharge protection

Technical specification

Order code	**75-0896**	**75-0897**
Part no.	**PIS-0786**	**PIS-0787**
Type	Li-Ion	Li-Ion
Capacity	2300mAh/85.51Wh	1600mAh/5.92Wh
Voltage	3.7V	3.7V
Dimensions	49.50 x 45.00 x 11.00mm	49.50 x 45.00 x 11.00mm

Type	Order code	1+
Li-Ion 2300mAh	**75-0896**	16.66
Li-Ion 1600mAh	**75-0897**	14.99

567102

Pi Cases

RaspberryPi

Official Pi 3 Model B Case Red/White

For the best way to keep your Raspberry Pi 3 B safe and protected you need the **Official Raspberry Pi 3 Model B** case. This extraordinarily handsome red and white case has an easy snap-fit assembly design and features removable side panels and lid to give easy access to GPIO, camera, and display connectors.

- For use with the **Raspberry Pi 3 B**
- Cut-outs for all connection points and microSD card port
- Light pipes for power and activity LEDs
- High-quality ABS construction
- Stick on rubber feet for case stability

Type	Order code	1+
Case for Pi 3 B	**75-0752**	5.31

564948

PIMORONI

PIM258 Raspberry Pi Zero W Pibow Case

If you have a **Raspberry Pi Zero W**, you'll want it looking after - so use the stylish **Pibow** Zero W case. The case is laser cut from the best lightweight, high-quality cast **Sheffield** acrylic, and consists of four layers - including a transparent top and base so you can still see your Pi inside, and a design that leaves the primary ports and GPIO accessible.

Note that this is the case for the Raspberry Pi Zero W only. This case is not compatible with the Pi Zero v1.2/1.3, or any other models of Raspberry Pi.

- Raspberry Pi not included
- Beautiful berry colours - red, purple, and blue
- Super-slimline profile
- Fully HAT/pHAT compatible
- Ideal for mounting to any surface

Type	Order code	1+
Pi Zero W Pibow case	**75-0789**	4.17

565817

CYNTECH COMPONENTS
ELECTROMECHANICAL SPECIALISTS

Raspberry Pi Model B+/2/3 Case in Black or Clear

The **Cyntech Raspberry Pi model Pi B+, 2 and Pi 3 cases** have a wear resistant matt finish while the centre top is highly polished allowing you an excellent view of your Pi with the clear case. The cases include a set of light pipes which transfer the light from the Pi's activity LEDS to the outside of the case so that you always know what the Pi is doing. Available in clear or black.

- Compatible with the Raspberry Pi 3 model
- Raspberry Pi B+ clip fit with optional screw locking (screws included)
- Positive and secure case locking via screws (screws included)
- Available in clear or black
- GPIO 40-pin ribbon cable slot
- CSI camera cable slot
- DSI LCD video cable slot
- Strong and durable ABS plastic
- 50mm VESA mount and wall mount features

Type	Order code	1+
Clear Pi B+/2/3 case	**73-6004**	4.95
Black Pi B+/2/3 case	**73-6017**	4.95

547699

seeed studio

Seeed Raspberry Pi Enclosure with Fan for B+ & 2

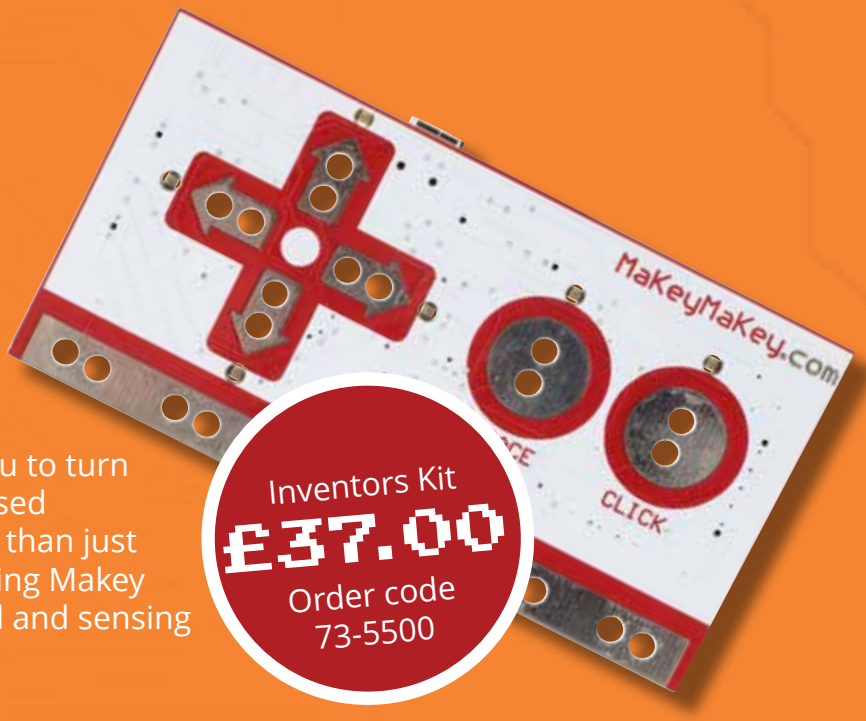
The **Raspberry Pi Enclosure with Fan from Seeed Studio** protects your Pi and keeps it cool with a built-in 30mm fan. Made from clear acrylic the case will house the Pi B+ or the Pi 2.

- Made from 3mm acrylic
- Light and easy to transport
- Good heat dispersion
- Compatible with Raspberry PiB+/2
- Case size: 95x65.5x34.5mm
- Fan size: 30x30x7mm
- M3 screws and nut included

Type	Order code	1+
Enclosure with fan	**75-0393**	6.03

560357

Makey Makey™



Inventors Kit
£37.00
Order code
73-5500

Makey Makey is an invention kit that allows you to turn everyday items into a touch pad that can be used to control your computer. But it is much more than just a replacement for your keyboard – by integrating Makey Makey with Scratch, you can now bring control and sensing to your programs.

So what is so cool about Makey Makey?

Well, you can turn just about anything that is conductive into an input device for your computer. Tin foil, fruit and veg, or just by drawing a shape with a normal pencil, the list goes on and on.

Your students will learn about conductivity as well as getting to design their own input device or adding additional functionality to their Scratch programs.

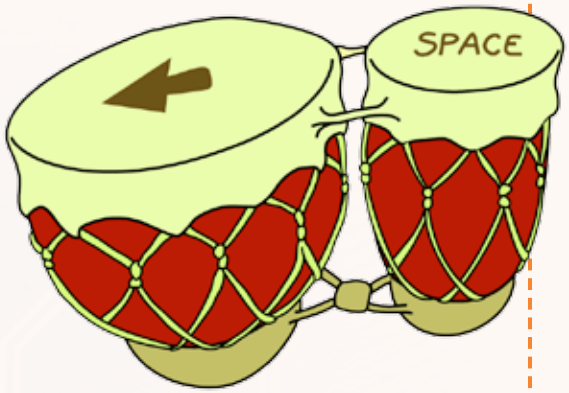
PROJECT IDEAS

Sounds great, so give me some examples of what I could do.

OK, let's start with something really simple – some Play Dough bongos. You can use off-the-shelf stuff or make your own from basic store-cupboard ingredients. Check out our Makey Makey page for a recipe!

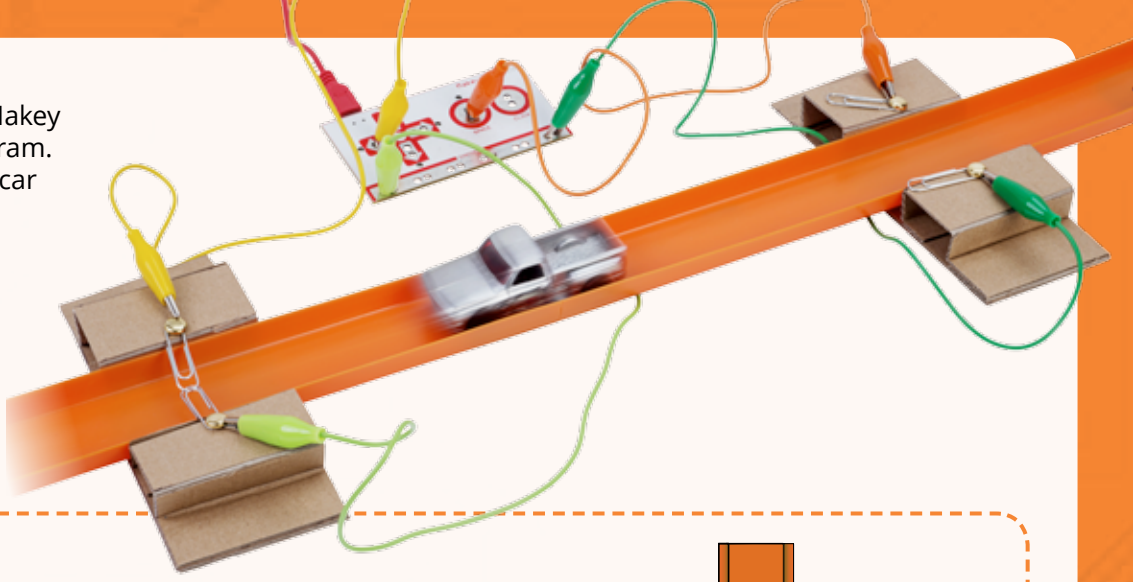
Example 1

1) Once you have some Play Dough, make a couple of bongo shapes, one larger and one smaller.
2) Now visit **apps.makeymakey.com/bongos** in your browser.
3) Plug your Makey Makey into your USB port
4) Connect one crocodile clip lead to the left arrow pad and put the other end in the large bongo. Now connect another crocodile clip to the space pad and put the other end in the small bongo.
5) Make sure you are touching the earth on the Makey Makey with one hand and play the Play Dough bongos with the other!



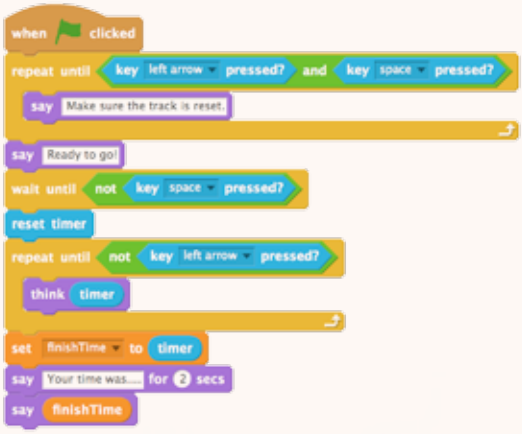
www.rapidonline.com/makeymakey

Now try integrating your Makey Makey with a Scratch program. This one times a small toy car travelling along a track. You'll need some card, split pins, paperclips, a car and some track. You'll also need Scratch running on a computer with your Makey Makey connected to it.

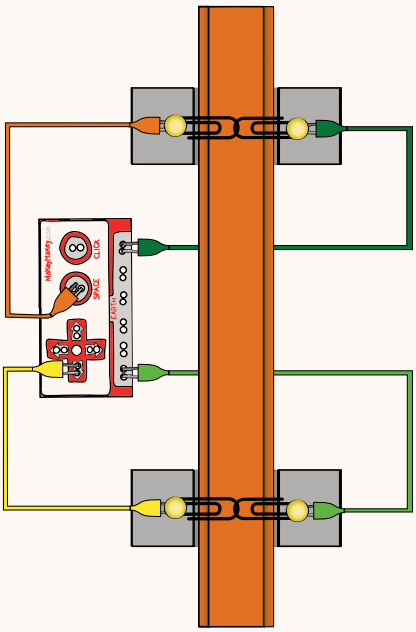


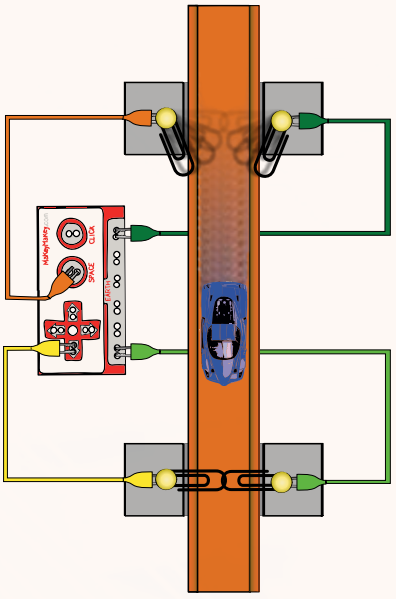
Example 2

1) Using card, paper fasteners and paper clips, make some gates to suit your car track similar to those shown. The aim is to make the paperclips touch when the gate is closed and so they can be pushed open by the car as it passes through.
2) Place the gates one metre apart near the end of the track
3) Connect one side of each gate to the earth of the Makey Makey
4) Connect the first gate to the space pad and the second gate to the left arrow.
5) In Scratch, create the program as shown and run it



6) Make sure both gates are closed, the program will prompt you if they aren't. You will also see green lights on the Makey Makey next to the arrow and space keys if your gates are closed
7) Run the car down your track – the program will time how long it takes to pass between the two gates

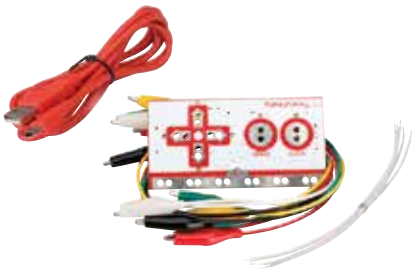




Can you modify the program to tell you the speed in metres per second?

Makey Makey

Inventors Kit



The Makey Makey® kit can turn almost anything into a keyboard or mouse, even unlikely things like your cat, a carrot or a coin. Anything that can conduct even the smallest amount of electricity will work completely safely, there's no danger of shocking the cat!

See what works for you - plants, coins, your grandma, silverware, anything that is wet, most foods, dogs as well as cats, aluminium foil, rain, and a lot more. The list goes on and you can always experiment with more.

Plug the Makey Makey® into your computer, connect yourself to the earth bar simply by holding an alligator clip, and then touch any of the shiny pads to make it work. You will see an LED flash every time you touch the board. Now attach one end of the alligator clips to the shiny pads and the other end to almost anything, touch that and the LEDs light up again. Every flashed LED is a key press or mouse command sent to the PC to control your favourite software.

Find music programs, games on the internet and let your imagination run away as you design a custom controller for them. Try drawing a game controller in pencil, hook up the alligator clips and the drawing IS the controller.

The kit comes with 5 alligator clips and 6 connector wires as well as a USB cable. No extra purchases are necessary to get the thing to work, not even fruit. For the dedicated inventor you can plug in two or more boards at once and create an orchestra of Makey Makeys! (tested with up to 3, but could work for more).

Tthe software is Open Source so you can find it on the internet and modify to it to really experiment. Makey Makey® is compatible with the Arduino development environment (IDE).

- Arduino compatible
- Simple USB connection
- Challenge your imagination
- Invent ways to experiment and play
- Expand your imagination
- Almost anything can be used as a keyboard

Type	Order code	1+
Inventors Kit	**73-5500**	37.00

539085

GO with Case and Magnet, Croc Lead, Keyring and Instruction Guide

The Makey Makey® GO brings inventing - on the go - to tinkerers, makers, and anyone who wants a fun and exciting way to transform a host of everyday objects, with just the snap of a croc clip, into an internet touchpad!

See what you've got to hand - banana, plant, frying pan, pencil line, coin, pet or friend (doesn't work with imaginary friends, which are non-conductive), or anything even a little bit conductive, and use it to send a signal, through the USB Invention Stick to a computer. Just plug, clip and play - no complicated setup, no programming knowledge needed, no software to install and works on both PC and Mac.

There are 1000s of possibilities for projects! You can make cardboard smart swords, slack line score boards, animal skype phones - whatever your imagination can conjure up. The USB Invention Stick is small enough for a keychain, bag or pocket - making it a doddle to take with you, wherever you go.

The Makey Makey® GO promises to inspire even more science, technology, engineering, and math (STEM) projects than the original, award-winning Makey Makey® – named one of Consumer Reports' "Best Tech Toys of 2014."

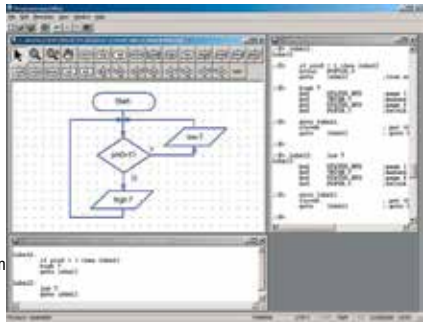
- Contents: USB Invention Stick, case with magnet, 1 white crocodile lead, key ring, and instruction guide
- Simple USB connection
- Have fun and expand your imagination
- For ages 6 to infinity

Type	Order code	1+
Makey Makey GO	**73-5502**	16.38

564675

PICAXE

Editor Software CD



The Programming Editor software provides a complete programming environment for generating BASIC programs for the PICAXE. Programs can be edited, compiled and downloaded to the PICAXE chips (all sizes) from within the same free software. This software supports both textual 'BASIC' program listings and the generation of programs via graphical flowcharts. Flowcharts can be created and simulated on screen, and then automatically converted into BASIC program listings. The software runs under any Windows operating system (Windows 95, 98, ME, NT, 2000, XP). No other platforms (DOS, Linux, Mac etc.) are currently supported, although Linux is under development.

- Supports flowcharts, BASIC, logic diagrams and assembler code programming.
- Supports on-screen simulation of BASIC and flowchart programs
- Supports serial and USB direct cable downloading of all PICAXE products.
- Has inbuilt BASIC-assembler interpreter so that BASIC programs can be automatically converted into sequential assembler code (requires Serial PIC Programmer)
- Full assembler code development environment with easy to use interface and programmer

Type	Order code	1+
Editor software CD	**13-1262**	1.86

061483

Chips

PICAXE is a microcontroller system that uses low cost FLASH memory based microcontrollers with a unique, pre-programmed **PICAXE** bootstrap code. This gives a device that may be reprogrammed typically 100,000 times without the need for an expensive and complicated programmer. **PICAXE** is programmed using a simple BASIC language or via the **Logicator** flowcharting software. Windows, Mac and Linux are all supported by the free BASIC software which can be downloaded from www.picaxe.co.uk.

Programming is carried out via a simple USB (**13-0849**) or serial (**13-0847**) cable. In addition to the microcontroller chips, starter, tutorial, and upgrade kits are available to provide a complete **PICAXE** solution. **PICAXE** microcontroller chips are available in 8, 14, 18, 20, 28 and 40-pin versions, giving a choice of the number of input and output lines, and also in several variants which offer differing amounts of memory and extra features so a choice can be made according to project need.

- Suitable for education, industry and hobbyists
- Low cost and simple to use
- Wide range of variants
- Can be programmed using an intuitive graphical flowchart
- Free, easy to use Programming Editor software

NOTE: *See also the* **PICAXE X2** *chips section for the* **X2** *variant* **PICAXE** *chips.*

Technical specification

PICAXE	Pins	Variant	Lines of memory	Total I/O pins	No. of inputs	No. of outputs	ADC (L=low)	Order code
PICAXE-08M2	8	M2+	800-1800	5	1-4	1-4	3	**13-5022**
PICAXE-14M2	14	M2	800-1800	11	5	6	7	**13-5024**
PICAXE-18M2	18	M2+	600-1800	16	1-8	1-8	10	**13-5026**
PICAXE-20M2	20	M2	80-1800	18	8	8	11	**13-5028**
PICAXE-28X1	28	X1	1000-2200	22	0-12	9-17	4	**13-0862**

Variant feature highlights:

M2 variants
- Infra red, servo and ring tone music features
- Greater memory and RAM
- Touch sensor support
- parallel task processing

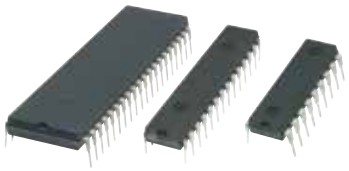
X/X1 variants
- Greater memory and RAM
- Scratchpad RAM area
- I²C, SPI, EUSART interfaces
- Higher baud rate
- Enhanced maths capabilities

Type	Order code	1+	25+	100+	250+
PICAXE-08M2	**13-5022**	2.75	2.64	2.24	2.09
PICAXE-14M2	**13-5024**	3.46	3.10	3.00	2.91
PICAXE-18M2	**13-5026**	4.00	3.74	3.55	3.29
PICAXE-20M2	**13-5028**	3.64	3.39	3.30	
PICAXE-28X1	**13-0862**	8.31	8.11	8.04	

079671

PICAXE

X2 Chips



PICAXE is a microcontroller system that uses low cost FLASH memory based microcontrollers with a unique, pre-programmed **PICAXE** bootstrap code. This gives a device that may be reprogrammed typically 100,000 times without the need for an expensive and complicated programmer.

PICAXE is programmed using a simple BASIC language or by using an intuitive graphical flowchart system, enabling younger students and hobbyists to start generating programs quickly and easily.

Programming is carried out via a simple serial or USB cable which means that a simple project kit is easily assembled. In addition to the microcontroller chips, starter, tutorial, and upgrade kits are available to provide a complete **PICAXE** solution.

PICAXE X2 microcontroller chips are available in 20, 28 and 40-pin versions, giving a choice of the number of input and output lines. Every pin is individually configurable for greater I/O flexibility. These latest designs of the **PICAXE** chip feature increased memory, scratchpad and RAM, plus additional features such as the ability to boot or run programs from I2C memory, additional timers, a SRLatch and additional interrupts.

- Suitable for education, industry and hobbyists
- Low cost and simple to use
- Can be programmed using an intuitive graphical flowchart
- Easy to use Program Editor software

Technical specification

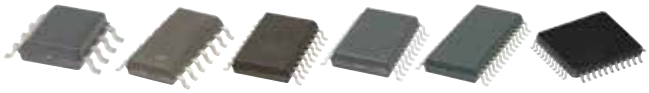
Type	Pins	Variant	Lines of memory	Total I/O pins	No. of inputs	No. of outputs	ADC	Order code
PICAXE-20X2	20	X2	2000 to 3200	13	1 - 16	1 - 16	11	**13-5000**
PICAXE-28X2	28	X2	4x 2000 to 3200	22	1 -	1 -	11	**13-5002**
PICAXE-40X2	40	X2	4x 2000 to 3200	33	1 -	1 -	12	**13-5004**

Type	Part no.	Order code	1+	25+	100+
20-Pin chip	AXE012X2	**13-5000**	5.45	5.29	5.20
28-Pin Chip	AXE010X2	**13-5002**	9.05	8.89	8.79
40-Pin chip	AXE014X2	**13-5004**	9.05	8.89	8.79

180699

PICAXE

SMD X1/X2/M2 Chips



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PICAXE is programmed using a simple BASIC language or via the intuitive **Logicator** flowcharting software that especially enables younger students and hobbyists to start generating programs quickly and easily. Windows, Mac and Linux are all supported by the free BASIC software which can be downloaded from www.picaxe.co.uk.

Programming is carried out via a simple USB (**13-0849**) or serial (**13-0847**) cable. In addition to the microcontroller chips, starter, tutorial, and upgrade kits are available to provide a complete **PICAXE** solution.

These **PICAXE** microcontroller chips are available in surface mounting 8, 14, 18, 20, 28 and 44-pin versions, giving a choice of the number of input and output lines, and pins are individually configurable for greater I/O flexibility. As well as the standard X1 types, M2 and X2 variants are offered that provide differing amounts of memory and extra features so a choice can be made according to project need.

- Surface mount devices
- Suitable for education, industry and hobbyists
- Low cost and simple to use
- Wide range of variants
- Can be programmed using an intuitive graphical flowchart
- Free, easy to use Programming Editor software

Technical specification

Type	Pins	Variant	Lines of memory	Total I/O pins	No. of inputs	No. of outputs	ADC	Order code
PICAXE-08M2	8	M2	800-1800	5	1-4	1-4	3	**13-5036**
PICAXE-14M2	14	M2	800-1800	11	5	6	7	**13-5052**
PICAXE-18M2	18	M2	600-1800	16	1-8	1-8	10	**13-5050**
PICAXE-20M2	20	M2	80-1800	16	8	8	11	**13-5042**
PICAXE-28X2	28	X2	4x 2000 to 3200	22	21	21	16	**13-5040**

Type	Package	Order code	1+	25+	100+
PICAXE-08M2	SO-8	**13-5036**	2.91	2.86	2.81
PICAXE-14M2	SO-14	**13-5052**	3.44	3.35	3.19
PICAXE-18M2	SO-18	**13-5050**	3.60	3.51	3.35
PICAXE-20M2	SO-20	**13-5042**	3.60	3.51	3.35
PICAXE-28X2	SO-28	**13-5040**	8.10	7.91	7.74

519054

PICAXE

T4 Trainer Starter Kit (USB)

This PICAXE starter kit, although designed to meet the T4 technology curriculum in Ireland, is also ideal as a general purpose training aid - serving as a self-contained introduction to the PICAXE system. The kit is based around the T4 control training board (AXE055) which comes pre-assembled and is supplied with analogue and digital inputs as well as a range of output devices. The training board can be used with any software application that supports the PICAXE hardware, including the free 'PICAXE Programming Editor' and/or 'Logicator' software.

Key features of the T4 Control Training Board (AXE055):
LED on each output (can be enabled/disabled)
7-Segment display output (can be enabled/disabled)
Piezo sounder output (can be enabled/disabled)
Servo output connector
Stepper motor output connector
4x Darlington driver buffered outputs
2x Reversible motor driver outputs
LDR light sensor analogue input
DS18B20 temperature sensor input
Variable resistor analogue input
Push switch inputs
Input, output and power test points

- The trainer starter pack includes both the training board, download cable and a power supply
- The software needed is free, so all extra you need to get started, is a computer
- Board supplied with PICAXE-18M2 microcontroller
- Also available in a **bulk pack of 5**

Kit contents:

AXE055	PICAXE T4 Trainer
AXE015	PICAXE-18X Microcontroller
PWR009A	UK 9V Power Supply
AXE027	USB Download Cable

Type	Order code	1+
T4 PICAXE trainer	**13-1548**	74.29
T4 PICAXE trainer x5	**13-1546**	288.00

526212

PICAXE

Development System

The **PICAXE AXE091U development board** is compatible with any size or revision of PICAXE chip and allows circuits to be quickly tested using its prototyping breadboard. A PICAXE 18M2 chip is supplied which operates at 32MHz and has 2048bytes of program memory, 512bytes RAM, 512bytes of table memory, 2 PWM channels, I2C, SPI and an internal temperature sensor. The development board provides connectors for computer downloads and power, as well as simple input, output devices, such as LEDs and switches to get you started faster. Supplied with a PICAXE 18M2 chip, a USB download cable, battery holder, and a CDROM containg software and manuals.

- Supports all 8/14/18/20/28 and 40-pin PICAXE chips
- Large breadboard area (300 holes + 100 power supply holes)
- Regulated power supply or battery powered, with LED power indicator
- 3 LED indicator outputs and 3 switch inputs
- On-board 7-segment display
- LDR and 10kΩ potentiometer analogue inputs
- DS18B20 digital temperature sensor
- Infrared input/output (sensor and LED)
- Keyboard connector (PS2)
- Serial (inverted and true (MAX202 buffered)) RS232 connectors
- Sockets for I2C and SPI memory chips (not supplied)
- Support for DS1307 Real Time Clock (not supplied)

Type	Order code	1+
PICAXE dev kit	**13-1550**	78.00

547654

PICAXE

PICAXE-08 USB Starter Kit

This starter kit contains everything required to gain familiarity with the **PICAXE-08** system, using the **PICAXE-08** microcontroller.

The kit includes a **PICAXE** microcontroller, **PICAXE** project board, USB download cable and battery box.

Software may be downloaded fom Picaxe

- Low cost and simple to use
- Program using BASIC or by graphical flowcharts
- Easy to use Program Editor software
- Extensive online documentation and online support forum

Technical specification

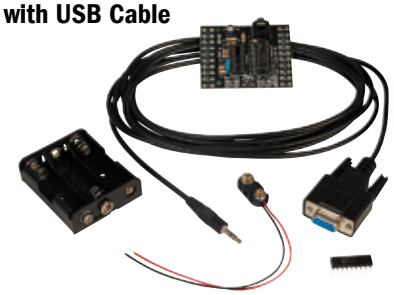
PICAXE–08M microcontroller
Proto board and instruction leaflet
USB download cable
4.5V Battery box for 3x AA batteries

Type	Order code	1+	10+
PICAXE-08 USB kit	**13-5020**	31.30	29.26

080318

PICAXE

PICAXE-18 USB Trainer Starter Pack with USB Cable



This Picaxe starter pack contains everything required to gain familiarity with the **PICAXE-18** system, using the **PICAXE-18** microcontroller.

An ideal starter pack for UK development, the kits include a **PICAXE** microcontroller, **PICAXE** project board, USB download cable and a battery box. The project board can be used with any of the software applications that support the PICAXE hardware, including the Logicator for PIC Micros software and/or the free PICAXE Programming Editor.

The training board comes pre-assembled and is ready for use with all the PICAXE-18M2's analogue and digital inputs and outputs. Wires can be soldered directly onto the board, or used with screw terminal blocks.

Software may be downloaded fom Picaxe

- Picaxe Kits are pre-assembled
- Low cost and simple to use
- Program using BASIC or by graphical flowcharts
- Easy to use Program Editor software
- Extensive manuals and online support forum

Requires either 3x AA alkaline batteries (not included), or a regulated 5V DC supply.

Technical specification

PICAXE–18 microcontroller
Standard project board and instruction leaflet
USB download cable
4.5V Battery box for 3x AA batteries
Battery clip

Type	Order code	1+
PICAXE-18 USB kit	**13-5018**	25.32

079665

PICAXE

PICAXE-20 USB Starter Kit

This starter kit contains everything required to gain familiarity with the **PICAXE-20** system, which features the **PICAXE-20M** microcontroller.

The kit includes a project board (unassembled), **PICAXE-20M** microcontrolle USB download cable, and battery box.

- USB to serial interface
- Low cost and simple to use
- Program using BASIC or by graphical flowcharts
- Easy to use Program Editor software
- Extensive online documentation and online support forum

Requires either 3x AA alkaline batteries (not included), or a regulated 5V DC supply.

Technical specification

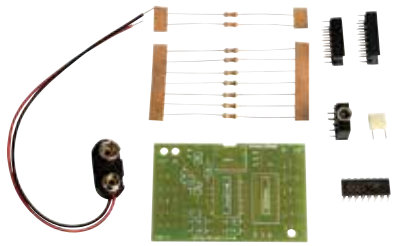
PICAXE-20M microcontroller
20-pin Project board and instruction leaflet
USB download cable
4.5V Battery box for 3x AA batteries

Type	Order code	1+
PICAXE-20 Starter kit	**13-0874**	33.59

081641

PICAXE

PICAXE-14 Project Board Kit



The **PICAXE-14** project board kit provides a quick and simple method of developing applications for the **PICAXE-14M** microcontroller.

The kit is self-assembly, and includes a PCB and the associated circuitry required to assemble one project board.

- For use with **PICAXE-14M** microcontroller **13-0866**
- Provides basic download circuit and input/output connection points

Technical specification

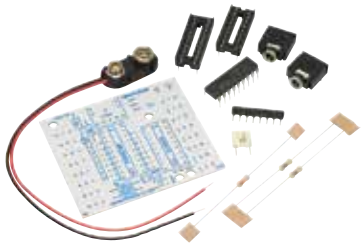
Kit includes:
7 x 10k resistors
2 x 22k resistors
1 x 100nf polyester capacitor
ULN2003A Darlington driver
Project board PCB
Stereo download socket
Battery clip
1 x 14-pin IC socket
1 x 16-pin IC socket

Type	Order code	1+
PICAXE-14 Project board	**13-0878**	6.09

081642

PICAXE

PICAXE-20 Project Board Kit



The **PICAXE-20** project board kit provides a quick and simple method of developing applications for the **PICAXE-20M** microcontroller. The kit is self-assembly, and includes a PCB and the associated circuitry required to assemble one project board.

- For use with **PICAXE-20M** microcontroller **13-0876**
- Provides basic download circuit and input/output connection points

Technical specification

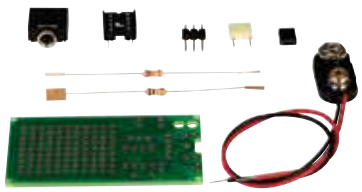
2 x 10k resistors
7 x 10k 8-pin resistor array
1 x 100nF Polyester capacitor
ULN2803A Darlington driver
Project board PCB
Stereo download socket
Battery clip
1 x 18-pin IC socket
1 x 20-pin IC socket

Type	Order code	1+
PICAXE-20 Project board	**13-0879**	5.56

081643

PICAXE

PICAXE-08 Proto Board Kit



The proto board kit consists of a small self-assembly board to allow rapid prototyping of PICAXE-08 circuits.

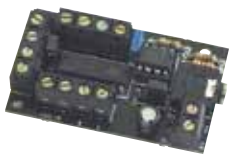
- The board provides the basic circuit and download connector, with a small prototyping area to allow connection of input and output interfacing circuits
- Supplied as a self-assembly kit of PCB and all parts, excluding the PICAXE-08 chip which is available separately

Type	Order code	1+
PICAXE-08 Proto board	**13-1202**	2.69

061441

PICAXE

PICAXE-08 Motor Driver Board



The motor driver board is a pre-assembled circuit that includes the PICAXE-08M2 chip and L293D output driver chip. The board can be used to drive four individual On/Off outputs (e.g. buzzers), or the outputs can be used in pairs to allow forward-reverse-stop control of two motors.

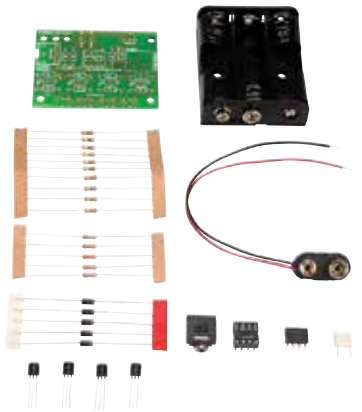
- Pre-assembled circuit for quick and easy robotics projects
- Connections are via screw terminal blocks
- Includes PICAXE 08M2 and L293D motor driver chips

Type	Order code	1+
PICAXE-08 Driv. board	**13-1204**	15.80

061443

PICAXE

PICAXE-08 Project Board



The project board PCB is a professional quality PCB that provides a convenient solution for students who wish to use a microcontroller for control in their project work.

- The PCB has 4 outputs and 1 input
- Space for the PICAXE-08 chip, download socket and 4 transistors for driving output devices such as motors and buzzers
- The high quality PCB has a solder-resist layer, which assists those less experienced in soldering to produce good results
- The PCBs are supplied as a **set of 5 PCBs** and **5 kits of components** for self-assembly

Type	Order code	1+
PICAXE-08 Project board	**70-1206**	20.37

061444

PICAXE

PICAXE-08 Cyberpet Project Kit Pack of 25

This low-cost project uses an 8-pin microcontroller to create an electronic pet with LED eyes and a piezo sounder voice that reacts to touch (via a push-switch) and light (via a miniature light-dependent resistor).

- PCB size: 50 x 50mm
- Supplied in a money-saving **bulk pack of 25** containing 25 PCBs and 25 kits of components

Type	Order code	1+
Pack of 25	**70-1211**	77.97

061445

PICAXE

PICAXE-08 Safety Light Project

The PICAXE08 safety light uses three high intensity LEDs to create a safety light for cyclists and pedestrians.

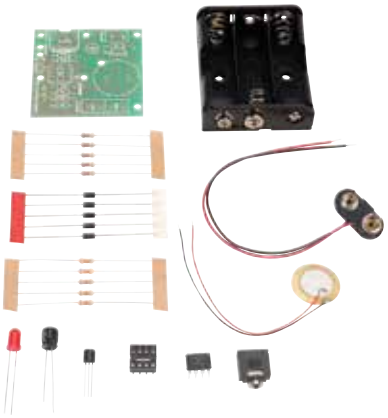
- Programmable light patterns
- Addition of an LDR can change the pattern, for example, in response to a car's headlights
- Kit contains sufficient parts to make 5 circuit boards
- The high quality, translucent red plastic case with belt clip is sold separately
- Case houses 2x AAA batteries (not included) to power the unit

Type	Order code	1+
Safety light project	**70-1218**	19.16
Red plastic case	**13-1222**	5.24

077548

PICAXE

PICAXE-08 Alarm Project



This low-cost project uses an 8-pin microcontroller to allow a customisable alarm to be created.

- The alarm responds to a number of user selectable inputs such as tilt switches or light sensors, and activates a bicolour LED and piezo siren
- Supplied as a **set of 5** projects containing 5 PCBs and 5 kits of components

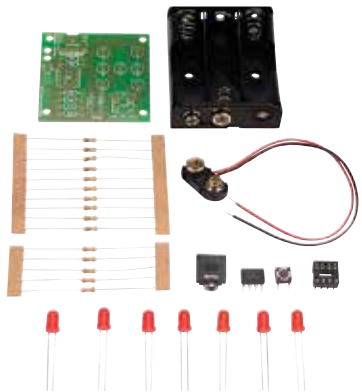
Suitable tilt switches are available separately - see **Sensors** *section*

Type	Order code	1+
PICAXE-08 Alarm project	**70-1214**	19.16

061447

PICAXE

PICAXE-08 Electronic Dice Project Set of 25



This low-cost project uses an 8-pin microcontroller to create a random output electronic dice display with LED spots. The kit includes extensive project notes that go from an introduction to the components all the way to programming the microcontroller.

- Kits contain a PCB and kit of components
- Includes battery box
- Available in **sets of 25** kits

Type	Order code	1+
Set of 25	**70-1209**	82.29

061449

PICAXE

PICAXE-20 x 2 Microbot

The **BOT120 Microbot** from **Revolution** uses a unique patented '**Microbric**' technology to join various input/output modules together so that the robot can be reconfigured using only an Allen key.

The **PICAXE-20X2** based motherboard contains two motors/gearboxes with speed control, two LED eyes and a piezo sounder. The bumper, servo connector and line follower modules are connected to the motherboard via the **Microbric** connectors.

The pack is supplied as a self-assembly kit of parts (PCBs are pre-soldered, all assembly is with the Allen key supplied).

Also available is the **Microbot sensor pack** that adds two further light sensors, two infrared emitters and an infrared sensor. This enables multiple **Microbots** to communicate together, for instance to develop 'swarming' behaviour.

- Supplied as a self-assembly kit

Note: *Requires 3x AAA batteries (not included) - see* **Batteries** *section*

Type	Model	Order code	1+
PICAXE-20X2	Microbot BOT120	**13-5006**	65.36

180808

PICAXE

Touch Sensor Demo Board AXE181

The PICAXE touch sensor demo board is a development kit that provides a system for testing the touch sensor capabilities of the PICAXE-18M2 microcontroller.

- Includes the PICAXE-18M2 microcontroller
- Supports 4 touch sensors with 4 matching LED outputs
- Self-assembly kit
- Only basic tools required
- Requires simple soldering for assembly

Kit contents:

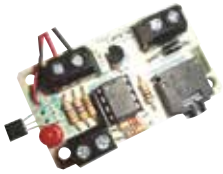
Quantity	Description
1	Touch sensor demo board PCB
1	10K Resistor (brown black orange gold)
1	22K Resistor (red red orange gold
4	470R Resistor (yellow violet brown gold)
1	100nF Polyester capacitor
1	100µF Electrolytic capacitor
4	3mm Yellow LED
1	3-Pin header
1	Stereo download socket
1	Battery clip
1	4.5V (3x AA) Battery box
1	18-Pin IC socket
1	PICAXE-18M2 microcontroller

Type	Order code	1+
Touch sensor kit	**13-5062**	14.14

526220

PICAXE

Digital Temperature Sensor Kit AXE113S



This PICAXE kit is based around the DS18S20 digital temperature sensor in conjunction with a PICAXE-08M microcontroller chip. Supplied with all necessary components the kit is relatively easy to assemble and includes 2x LEDs and a piezo that can be used to indicate current temperature. The sensor will output temperatures of between -55°C and +125°C.

- Self-assembly kit
- Only basic tools required
- Requires simple soldering for assembly

Kit contents:

Quantity	Description
1	4K7 Resistor (yellow violet red gold)
1	1K Resistor (brown black red gold)
1	330R Resistor (orange orange brown gold
2	10K Resistor (brown black orange gold)
1	22K Resistor (red red orange gold)
1	1N4001 Diode
1	100nF Polyester capacitor
1	5mm LED
1	BC548B Transistor
1	Piezo sounder
2	2-Pin terminal block
1	Stereo download socket
1	PICAXE-08M microcontroller
1	8-Pin IC socket for microcontroller
1	DS18B20 Digital temperature sensor
1	PCB
1	Battery snap
1	4.5V Battery box

Type	Order code	1+
Temp. sensor kit	**13-5060**	14.14

526219

PICAXE

Serial OLED Display Kits

A range of OLED displays and associate components that will provide important components in PICAXE systems. OLEDs are state-of-the-art components that are the future of optoelectronic displays. OLEDs typically have a much brighter display, better viewing angle and lower current consumption than conventional LCD displays and are a feature in many modern electronic devices.

Serial OLED Kit 16 x 2 AXE133Y (13-1276)

This budget-conscious serial OLED module, available with a 16 x 2 yellow on black alphanumeric display, allows the visual display of user instructions, sensor reading, etc. of **PICAXE** microcontroller projects. Connection is via a simple 1-wire serial interface. The included PICAXE-18M2 is fitted on to a small serial interface PCB and is pre-programmed with the open source **AXE133**/**AXE134** firmware that allows the microcontroller to act as a 'slave' serial driver for the OLED display. This allows the main project to display text on the OLED via simple 'serout' commands.

The control codes that are used in this kit is identical to those used in the **AXE033** module, enabling the kit to be used as an alternative to the **AXE033**. The 18M2 microcontroller can also be reprogrammed, e.g. to change the power-up welcome message. The kit is self-assembly and requires some simple soldering.

Serial OLED/LCD Driver Kit AXE132 (13-1270)

The **AXE132** is the same serial interface board that is supplied in the **AXE133Y** and **AXE134Y** kits. The heart of the board is the **PICAXE-18M2** microcontroller which is pre-programmed with the open source **AXE133** firmware, allowing the module to drive an OLED or LCD display.

- Industry proven **PICAXE** family
- 16 x 2 or 20 x 4 OLED displays with yellow on black text
- Simple 1-wire serial connection
- programmable pre-defined messages
- Kits supplied complete

Technical specification

For kit contents and assembly instructions see relevant datasheets.

Type	Device	Order code	1+
16x2 OLED kit	AXE133Y	**13-1276**	23.66
OLED/LCD Driver	AXE132	**13-1270**	11.85

503102

PICAXE

Breadboard adaptor AXE029

This breadboard adaptor kit is an easily-assembled method of connecting a PICAXE cable to a prototyping breadboard. When assembled the adaptor will support the standard download circuit and has a 2-way jumper for ease of layout of PICAXE circuits for both 18-pin and 28/40 pin PICAXE mocrocontrollers. The adaptor connects a 3.5mm jack socket to pins that are then inserted into the breadboard, making a more reliable circuit connection than plugging a jack socket.

- Self-assembly kit
- Only basic tools required
- Requires simple soldering for assembly

Technical specification

Kit contents:

Description	Quantity
Adapter PCB	1
10K Resistor (brown black orange gold)	1
22K Resistor (red red orange gold	1
3-Pin header and jumper link	1
Stereo download socket	1
4-Pin double sided headers	2

Type	Order code	1+
Breadboard adapter	**13-5056**	3.51

526217

PICAXE

USB Download Cable

The **PICAXE** USB download cable has been designed to facilitate the downloading of **PICAXE** programs into **PICAXE** chips. The cable connects via the USB port on the computer to a 3.5mm jack for connection to the **PICAXE**. Moulded into the body of the USB connector is a circuit board that contains a USB to serial convertor chip that ensures that the data transfer is via a 5V logic level serial connection.

- For use on computers without a serial port
- High quality connectors with 1.8m cable
- Software drivers for the cable assembly are downloadable for free from www.picaxe.co.uk
- Driver versions for Windows XP, XP (64-bit edition), 2003, 2000, ME, 98SE, Vista, Windows 7, Windows 8.1 and Windows 10

Note: *There is no operating system support for Windows 95 or NT.*

Type	Order code	1+	15+
PICAXE USB Cable	**13-0849**	22.46	20.46

077630

RVFM

PICAXE or Genie Download Cable

A cable fitted with 9-way D socket at one end and a stereo 3.5mm plug on the other.

- Suitable for PICAXE or GENIE project boards

Type	Order code	1+	20+	50+
Download cable	**13-0847**	5.34	4.46	3.57

061479

TruConnect

PCB Jack Sockets (Stereo & Mono)

Switched PCB mounting 3.5mm jack sockets in either stereo or mono.

- Stereo and mono versions available
- Chrome plated trim
- Both circuits switched
- Also suitable for GENIE and PICAXE download circuits

		MOQ 10 - In Multiples of 10		
Type	Order code	10+	100+	500+
3.5mm Stereo PCB skt	**20-0137**	0.157	0.105	0.098
3.5mm Mono PCB skt	**20-0138**	0.145	0.101	0.088

063492

PICAXE

Low Insertion Force (LIF) Socket

A low insertion force (LIF) socket, 8 ways, ideal for programmers, PICs, etc, where an IC may be frequently removed and replaced for reprogramming.

- Takes standard 8-pin DIL / DIP ICs
- Ideal for programmers, PICs, etc., where an IC may be frequently removed and replaced for reprogramming

Type	Order code	1+
8-pin LIF Socket	**22-1480**	9.37

061490

PICAXE

Microcontroller Project Boards

A choice of project boards suitable for 18-pin microcontrollers.

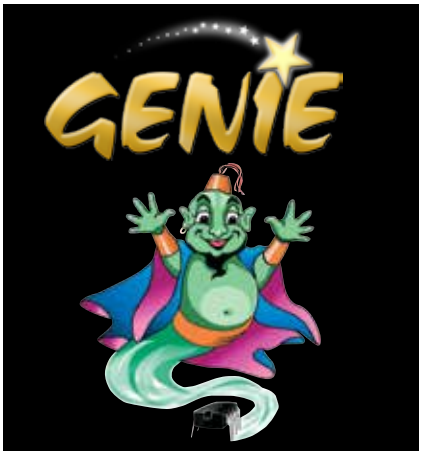
- The standard board includes Darlington drivers for eight outputs
- The high power board includes four high power FETs and offers the option to add an L293D motor driver IC (order code **82-0192**) to enable the control of two DC motors

Note: *The boards are not supplied with microcontrollers.*

Type	Order code	1+
Standard board	**13-0855**	8.89
High power board	**13-0860**	11.00

077547

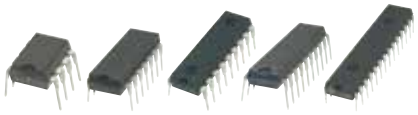
GENIE Microcontrollers



GENIE is a low-cost microcontroller programming system designed exclusively for schools and colleges. The free, user-friendly flowchart software allows you to add intelligence and control to your new and existing design projects. No separate programmer is required and downloading is via a USB or serial cable.

The heart of the **GENIE** microcontroller system is the microcontoller IC, available in 8, 14, 18, 20 and 28-pin versions. It is possible to run multiple programs at the same time on a single chip and also to run and test programs live on a connected **GENIE** chip.

Microcontrollers Version 1



The chips are designed to work with the **GENIE** flowchart programming software for Microsoft Windows™ and there are free online resources and community website at www.genieonline.com.

- Developed by the authors of **Livewire, PCB Wizard** and **Circuit Wizard**
- Free, user-friendly **GENIE** flowchart programming software
- More memory means more commands and better programs
- On-screen monitoring and calibration of digital and analogue signals
- Polyphonic (multi-channel) music support
- Plug & play operation automatically detects a **GENIE** IC when it is connected
- Supports advanced I/O such as events, interrupts and infrared
- Also available is a plug & play USB download cable, which eliminates COM port problems

Note: *The* **GENIE Design Studio** *software is free to download directly from www.genieonline.com. For convenience,* **Rapid** *can also supply this software on CD-ROM (see* **13-6024***).*

Technical specification

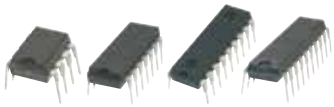
Device	Package	Pins	In	Out	ADC	Starts	Memory *	Order code
C08	DIL-8	8	1 - 4	1 - 4	3	2	160	**13-6001**
C14	DIL-14	14	5	6	2	2	160	**13-6002**
E18	DIL-18	18	5	9	3	4	2200	**13-6004**
C20	DIL-20	20	8	9	4	2	160	**13-6003**
E28	DIL-28	28	8	9	4	4	2200	**13-6005**

* Approx. no. of commands

Type	Package	Order code	1+	25+	100+	250+
GENIE C08 IC	DIL-8	**13-6001**	2.39	2.29	1.95	1.82
GENIE C14 IC	DIL-14	**13-6002**	2.99	2.67	2.61	
GENIE E18 IC	DIL-18	**13-6004**	3.06			
GENIE C20 IC	DIL-20	**13-6003**	3.44	3.25	3.03	
GENIE E28 IC	DIL-28	**13-6005**	5.09	4.97	4.92	
Type		**Order code**	**1+**	**15+**		
GENIE USB Download cable		**13-6023**	13.34	12.88		

082990

Microcontrollers Version 2



The new version 2 **GENIE** microcontrollers have been designed as replacements for the older version 1 devices. The version 2 MCUs are faster and more powerful and are capable of storing larger flowchart or BASIC programs.

The heart of the microcontroller system are the new version 2 microcontroller ICs, available in 8, 14, 18 and 20-pin versions. It is possible to run multiple programs at the same time on a single chip and also to run and test programs live on a connected **GENIE** chip.

The chips are designed to work with either the **Circuit Wizard 3** software or the **GENIE** flowchart programming software for Microsoft Windows™ and there are free online resources and community website at www.genieonline.com.

- Developed by the authors of **Livewire, PCB Wizard** and **Circuit Wizard**
- Free, user-friendly **GENIE** flowchart programming software
- 32 MHz 'turbo' speed mode
- 1-Wire, I2C and servo support
- On-screen monitoring and calibration of digital and analogue signals
- Plug & play operation automatically detects a **GENIE** IC when it is connected
- Also available is a plug & play USB download cable, which eliminates COM port problems

Note: In order to program these version 2 GENIE microcontrollers, either Circuit Wizard 3 or the free GENIE Programming Editor software is required.

Technical specification

Device	Pins	Analogue inputs	ADC res.	Digital inputs	Digital outputs	Starts	Program memory
GENIE 08	8	3	8 bits	1-4	1-4	2	1KB
GENIE 14	14	2	8 bits	5	6	16	10KB
GENIE 18	18	3	8 bits	6	9	16	10KB
GENIE 20	20	4	8 bits	8	9	16	10KB

Type	Order code	1+	25+	100+	250+
GENIE 08 MCU	**13-6040**	1.79	1.73	1.47	1.37
GENIE 14 MCU	**13-6041**	2.15	1.91	1.87	
GENIE 18 MCU	**13-6042**	2.43	2.36	2.26	
GENIE 20 MCU	**13-6043**	2.59	2.46	2.29	
Type	**Order code**	**1+**	**15+**		
USB Download cable	**13-6023**	13.34	12.88		

552404

USB Download Cable

A Plug & Play download cable that allows your computer to talk to a GENIE Microcontroller. The cable has a USB connector at one end and a 3.5mm stereo jack at the other.

- Plug & Play download cable
- Allows your computer to talk to a GENIE Microcontroller
- USB connector at one end and a 3.5mm stereo jack at the other
- Please see the PDF datasheet for step-by-step details of how to use this cable

Type	Order code	1+	15+
Genie Download Cable	**13-6023**	13.34	12.88

501700

Serial LCD Kit

The **GENIE** Serial LCD module allows GENIE-based projects to display messages on a LCD. The kit includes full instructions on how to construct the LCD module and then explains how to connect to **GENIE** microcontrollers in order to output text and graphics.

- 16 character by 2 row liquid crystal display (LCD)
- Contrast dial for display
- All components included in kit
- A spare LCD control chip (**13-6036**) is also available separately
- Testing mode included

Note: *The* **GENIE Design Studio** *software is free to download directly from www.genieonline.com.*

Type	Order code	1+	26+
GENIE Serial LCD kit	**13-6026**	14.50	11.15
LCD Control chip	**13-6036**	3.00	

200110

C08 Light Kit

GENIE is a low-cost microcontroller programming system designed exclusively for schools and colleges. The **GENIE C08 Light Kit** is an ideal project kit for introducing students to simple lighting projects, such as an electronic die, a wearable badge or a night-time warning system.

The kit is based around the **GENIE C08** 8-pin microcontroller and the **GENIE Design Studio** flowchart programming software for Microsoft Windows™.

The kit contains all components required for construction and requires only the download cable (**13-6023**) to connect to the computer for downloading programs.

- Perfect introduction to simple light projects
- PCB also available separately
- Also available is a plug and play USB download cable, which eliminates COM port problems
- Battery power is 3 to 5V supplied by either AA or AAA batteries or by a 3V coin-cell battery
- PCB Mounting holes
- PCB Dimensions 52.5 x 49mm

Note: The **GENIE Design Studio** *software is free to download directly from www.genieonline.com. For convenience,* **Rapid** *can also supply this software on CD-ROM (see* **13-6024***).*

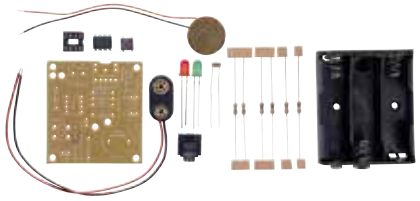
Technical specification

Component	Qty	Order Code
GENIE C08 IC	1	-
PCB508 Light PCB	1	-
8-pin DIL socket	1	**22-0107**
3.5mm stereo socket	1	**20-0137**
Battery clip	1	**18-0092**
3 x AA battery holder	1	**18-0126**
6 x 6mm switch	1	**78-0620**
Red LED	7	**55-1790**
100R resistor	4	**62-0346**
180R resistor	1	**62-0352**
10k resistor	1	**62-0394**
22k resistor	1	**62-0402**
100k resistor	1	**62-0418**

Type	Order code	1+	5+	25+
GENIE C08 Light kit	**13-6029**	4.21	3.89	3.70
GENIE Light kit PCB	**13-6035**	0.89	0.75	0.71

517918

8-pin Microcontroller System Kits



Available from **Rapid** are three exclusive kits that have been designed to provide a fun and challenging introduction to the **GENIE** microcontroller system.

13-6009 GENIE 08 Activity kit

This kit provides a great introduction to the **GENIE** system. It allows students to control two LEDs and a piezo sounder for making sounds. These outputs can be made to respond to a push switch (for sensing touch) and an LDR (for sensing light).

13-6011 GENIE 08 Project kit

This 8-pin kit is ideal for adding intelligence to student projects. It is based on an 8-pin **GENIE** 08 microcontroller providing off-board connections for 2 digital inputs (1 of which can also be used for sensing an analogue signal) and 3 outputs (one of which is buffered to provide medium-power output suitable for controlling lamps and small motors).

13-6012 GENIE 08 Jukebox kit

This kit allows students to have fun with 2-channel polyphonic music by making use of **GENIE's** unique ability to play several notes at the same time. Two LED outputs flash in time to the music. A single digital input switch is provided to control the music, such as when creating a musical box project that starts the music playing when the lid is opened.

The kits are designed to work with the **GENIE** flowchart programming software for Microsoft Windows™.

- Developed by the authors of **Livewire, PCB Wizard** and **Circuit Wizard**
- Free, user-friendly **GENIE** flowchart programming software
- On-screen monitoring and calibration of digital and analogue signals
- Supports advanced I/O such as events, interrupts and infrared
- The bare PCBs from the kits are also available, enabling the design of custom projects
- Download cables are also available, see **13-0847** or **13-6023**

Note: *These kits are supplied with Version 2 GENIE microcontrollers. To program them, Circuit Wizard 3 or the free GENIE Programming Editor software is required.*

Note: *The* **GENIE Design Studio** *software is free to download directly from www.genieonline.com.*

Technical specification

13-6009 GENIE 08 Activity kit

Order code	Description	Quantity
13-6040	Genie C08 Microcontroller IC	1
13-6020	Genie C08 activity PCB	1
18-0585	Battery clip	1
18-0564	3x AA Battery holder - studs	1
20-0137	3.5mm Stereo PCB socket	1
22-0107	Tube (60) 8-pin 7.62mm DIL socket	1
35-0200	Uncased piezo transducer	1
55-1790	5mm red LED	1
55-1792	5mm green LED	1
58-0134	Miniature photoresistor	1
62-0358	330R 0.25W CF resistor	2
62-0394	10K 0.25W CF resistor	2
62-0402	22K 0.25W CF resistor	1
62-0418	100K 0.25W CF resistor	1
78-0620	Tactile switch 6 x 6mm height 4.3mm	1

13-6011 GENIE 08 Project kit

Order code	Description	Quantity
13-6040	Genie C08 Microcontroller IC	1
13-6021	Genie C08 project PCB	1
08-0235	100n 5mm Pitch ceramic disc capacitor	1
11-1400	220µ 10V 85° radial electrolytic	1
18-0585	Battery clip PP3 - end entry	1
18-0564	3x AA Battery holder - studs	1
20-0137	3.5mm Stereo PCB socket	1
22-0107	Tube (60) 8-pin 7.62mm DIL socket	1
47-3130	1N4001 1A 50V Silicon rectifier diode	1
47-3309	1N4148 75V 150mA Signal diode	1
55-1792	5mm green LED	1
62-0358	330R 0.25W CF resistor	1
62-0370	1K 0.25w CF resistor	1
62-0394	10K 0.25w CF resistor	2
62-0402	22K 0.25w CF resistor	1
62-0418	100K 0.25w CF resistor	1
81-0466	BC548B Transistor TO-92 30V NPN TRU	1

13-6012 GENIE 08 Jukebox kit

Order code	Description	Quantity
13-6040	Genie Microcontroller IC	1
13-6022	Genie C08 jukebox PCB	1
18-0585	Battery clip PP3 - end entry	1
18-0564	3x AA Battery holder - studs	1
20-0137	3.5mm Stereo PCB socket	1
22-0107	Tube (60) 8-pin 7.62mm DIL socket	1
35-0044	PCB Mount piezo transducer	2
55-1790	5mm red LED	1
55-1792	5mm green LED	1
62-0358	330R 0.25W CF resistor	2
62-0394	10K 0.25W CF resistor	1
62-0402	22K 0.25W CF resistor	1
62-0418	100K 0.25W CF resistor	1
78-0620	Tactile switch 6 x 6mm height 4.3mm	1

Type	Order code	1+	5+	25+
GENIE C08 Activity kit	**13-6009**	4.44	4.17	3.89
GENIE C08 Project kit	**13-6011**	4.50	4.23	3.94
GENIE C08 Jukebox kit	**13-6012**	4.43	4.16	3.88
Type	**Order code**	**1+**	**25+**	**50+**
GENIE L08 Activity PCB	**13-6020**	1.22	1.13	0.86
GENIE C08 Project PCB	**13-6021**	1.22	1.06	0.86
GENIE C08 Jukebox PCB	**13-6022**	0.94	0.81	

082991

14-pin Microcontroller Project Kit

Featuring the **GENIE C14** microcontroller, this project board is ideal for adding intelligence to design or electronic projects. Simply wire up to the digital or analogue inputs, connect to the low or medium power outputs for a world of microcontrolled magic.

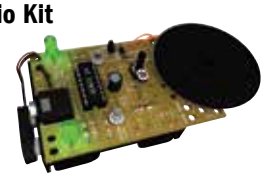
- Developed by the authors of **Livewire, PCB Wizard** and **Circuit Wizard**
- Free, user-friendly **GENIE** flowchart programming software
- On-screen monitoring and calibration of digital and analogue signals
- Supports advanced I/O such as events, interrupts and infrared
- Also available is the PCB board associated with this kit (**13-6030**), enabling the design of custom projects
- Download cables are also available, see **13-0847** or **13-6023**

Note: *The* **GENIE Design Studio** *software is free to download directly from www.genieonline.com. For convenience,* **Rapid** *can also supply this software on CD-ROM (see* **13-6024***).*

Type	Order code	1+	5+	25+
GENIE 14-pin project kit	**13-6013**	3.87	3.51	3.22
GENIE 14-pin PCB	**13-6030**	1.28	1.14	0.99

124895

GENIE 14 Audio Kit



The **GENIE 14 Audio Kit** is a project kit that enables the playing of 16-channel MIDI and realistic sound effects through the kits' 50mm loudspeaker. The kit consists of a PCB on to which the components are soldered. All required components, including a 14-pin microcontroller are supplied and the kit is easily assembled by anyone with soldering skills.

To showcase the **GENIE 14 Audio Kit** it is possible to produce two signature projects: the **GENIE Cuddly Creatures** and the **GENIE Rock Star**.The audio PCB and 50mm loudspeaker are also available for purchase separately.

- Uses a GENIE 14 version 2 microcontroller
- Digital push switch input
- Light sensor input
- Two LED outputs
- 50mm Loudspeaker output
- Two spare low-power outputs

Kit contents

Qty.	Description	Qty.	Description
1x	GENIE Audio PCB	2x	10kΩ resistor
1x	GENIE 14 (14-pin) IC	1x	22kΩ resistor
1x	3x AA battery pack	1x	100kΩ resistor
1x	Battery clip	1x	220µF electrolytic capacitor
1x	50mm loudspeaker	1x	1N4001 diode
1x	14-pin chip socket	1x	BC337 transistor
1x	Download socket	1x	Push switch
2x	330Ω resistor	1x	Light-dependent resistor (LDR)
1x	1kΩ resistor	2x	Green LEDs

Type	Order code	1+	5+	25+
GENIE 14 Audio kit	**13-6046**	4.67	4.50	4.15
GENIE 14 Audio PCB	**13-6044**	0.69		
GENIE 14 Loudspeaker	**13-6045**	0.604		

552407

Microcontroller System Kits 18-pin

This **GENIE Elite** range of electronic kits features the **GENIE E18** microcontroller. The available kits are:

Activity Kit:

This activity kit allows students to experiment with a variety of inputs and outputs. Features built-in speaker, LEDs, switches and an LDR light sensor.

Project Board:

This project board is ideal as a basic board for adding intelligence to design or electronic projects. The analogue or digital inputs and the medium power outputs, together with the driver chip which drives even higher power outputs, make this a powerful design tool.

Motor Board:

This powerful board provides the solution for adding motor control to design projects. Connect a control signal to the analogue or digital inputs and wire up a DC, stepper or servo motor to the outputs for precise forward and backwards control.

- Developed by the authors of **Livewire, PCB Wizard** and **Circuit Wizard**
- Free, user-friendly **GENIE** flowchart programming software
- On-screen monitoring and calibration of digital and analogue signals
- Supports advanced I/O such as events, interrupts and infrared
- Also available are the PCB boards associated with these kits, enabling the design of custom projects
- Download cables are not supplied but are also available, see **13-0847** or **13-6023**

Note: *These kits are supplied with Version 2 GENIE microcontrollers. To program them, Circuit Wizard 3 or the free GENIE Programming Editor software is required.*

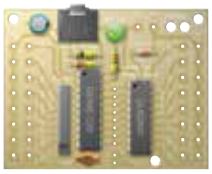
Note: *The* **GENIE Design Studio** *software is free to download directly from www.genieonline.com.*

Type	Order code	1+	5+	25+
GENIE 18-pin activity kit	**13-6014**	5.44	5.20	4.83
GENIE 18-pin project kit	**13-6015**	5.39	5.12	4.73
GENIE 18-pin motor kit	**13-6016**	7.18	6.80	6.26
GENIE activity kit PCB	**13-6031**	1.39	1.29	
GENIE project kit PCB	**13-6032**	1.32	1.17	1.03
GENIE motor kit PCB	**13-6033**	1.36	1.23	1.11

124896

GENIE

20-pin Microcontroller Project Kit



The **GENIE C20** microcontroller is at the heart of this project board. Features eight inputs, including provision for connection of an analogue sensor and eight medium-power outputs driven by a dedicated driver chip. Adds powerful microcontrolled intelligence to design or electronic projects.

- Developed by the authors of **Livewire, PCB Wizard** and **Circuit Wizard**
- On-screen monitoring and calibration of digital and analogue signals
- Supports advanced I/O such as events, interrupts and infrared
- Also available is the PCB board associated with this kit (**13-6034**), enabling the design of custom projects
- Download cables are also available, see **13-0847** or **13-6023**
- The Genie Design Studio software for programming the Genie is available free to download from www.genieonline.com, or for convenience to buy from Rapid in CD-ROM format; see 13-6024

Note: *The* **GENIE Design Studio** *software is free to download directly from www.genieonline.com. For convenience,* **Rapid** *can also supply this software on CD-ROM (see* **13-6024***).*

Type	Order code	1+	5+	25+
GENIE 20-pin project kit	**13-6017**	4.13	3.73	3.49
GENIE 20-pin PCB	**13-6034**	1.07	0.954	

124897

GENIE

Circuit Wizard v3 Electronics, CAD/CAM, Simulation, Programming Software

Circuit Wizard 3 is the latest version of the revolutionary design software that combines circuit design, PCB design, electronic circuit simulation and CAD/CAM manufacturing - all in one complete package designed exclusively for schools and colleges. By integrating the entire design process, the software provides all the tools necessary to produce an electronics project from start to finish - including on-screen simulation and testing prior to production.

Version 3 of the software features a host of notable improvements, including: new panel design, enhanced component library, new teaching resource centre.

- Available in 5, 10, 15, 20 and 25 user licences - plus site licence and home user licence
- Supports latest (v2) GENIE microcontrollers
- Incorporates a suite of powerful CAD/CAM tools
- Full support for Microsoft Windows 8

Technical specification

Order code	Mftrs Part No.	No. of licences
13-6047	CircuitWizard 5 Users	5 User
13-6048	CircuitWizard 10 Users	10 User
13-6049	CircuitWizard 15 Users	15 User
13-6050	CircuitWizard 20 Users	20 User
13-6051	CircuitWizard 25 Users	25 User
13-6052	CircuitWizard Site Users	Site licence
13-6053	CircuitWizard Home Users	Home user

No. of licences	Order code	1+
5 User	**13-6047**	311.05
10 User	**13-6048**	415.08
15 User	**13-6049**	519.11
20 User	**13-6050**	623.14
25 User	**13-6051**	727.17
Site licence	**13-6052**	831.20
Home user	**13-6053**	311.05

552306

Arduino

What is Arduino?

Arduino is an open-source single board microcontroller platform. The boards are preassembled and the software can be downloaded for free. It makes using microcontrollers much easier by mapping the inputs/outputs and breaking them out to defined headers.

Who is it for?

It is intended for artists, designers, hobbyists, and anyone interested in creating interactive projects. The amazing community support on the Arduino forum means it's suitable for new and advanced users alike.

What can it be used for?

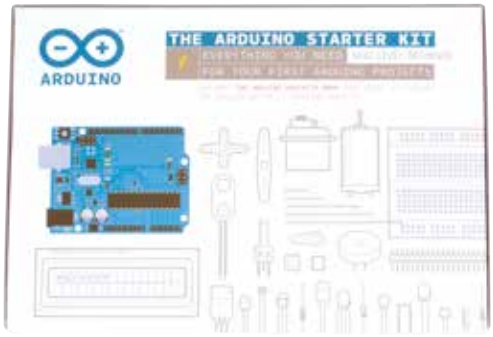
The Arduino can essentially act as the brain of your project. Use sensors to feed data into the Arduino's inputs and the outputs to trigger the required outcome. You could use a temperature sensor to monitor the temperature and have the Arduino activate an output such as a fan when the desired temperature has been reached.

How do I start?

The official Arduino Starter Kit below (**73-4642**) is an ideal place to start. It contains a book with lessons to follow to teach you the basics. If you prefer to go your own way, why not grab the most popular board, the Uno (**73-4440**) and hit the Arduino forum and find something that inspires you!

ARDUINO

Starter Kit including Uno Board



This starter kit serves as a hands-on introduction to the basics of the Arduino system. Using the accompanying 170-page project book and the comprehensive kit contents, you will learn to build useful, creative projects. Beginning with the basics of electronics and progressing to more complex projects, the kit will enable control of the physical world through sensors and actuators.

The projects that are covered in this kit, using the accompanying book, are:

Get to know your tools - an introduction to the concepts you'll need to use this kit
Spaceship interface - design a control panel for your spaceship
Love-o-meter - measure how hot-blooded you are
Colour mixing lamp - produce any colour with a lamp that uses light as an input
Mood cue - clue people in to how you're feeling
Light theremin - create a musical instrument you play by waving your hands
Keyboard instrument - play music and make some noise with this keyboard
Digital hourglass - a light-up hourglass that can stop you from working too much
Motorized pinwheel - a colour wheel that will have your head spinning
Zoetrope - create a mechanical animation you can play forward or reverse
Crystal ball - a mystical tour to answer all of your tough questions
Knock lock - tap out the secret code to open the door
Touchy-feel lamp - a lamp that responds to your touch
Tweak the arduino logo - control your personal computer from your arduino
Hacking buttons - create a master control for all your devices!

Order code **73-4642** **£60.73**

Orangepip®

GIVES A ZEST FOR LEARNING!

WHAT IS ORANGEPIP?

See your projects grow with Orangepip – a distinctive range of open source boards which offer a colourful introduction to coding and prototyping. Based on the ATmega328 and ATmega2560 microcontrollers, the Orangepip boards are fully compatible with Arduino shields, sensors, accessories and software – giving users access to the global Arduino community of makers and projects.

The boards themselves are rich with features, including 16MHz oscillator, ATmega16u2 for serial conversion, 14 digital GPIO I/O pins (Kona328) and 54 I/O pins (Mega2560), quick reset buttons and machine screw holes. The high performance ATmega 8-bit AVR RISC-based microcontrollers give Orangepip users enough power and memory to store and run multiple lines of complex code.

Kona328

The Orangepip Kona328 is an Arduino UNO compatible development board that is based around the ATmega328 microcontroller. The board features 14x digital I/O pins (six of which may be used as PWM outputs), 6 analog inputs and a 16MHz crystal oscillator. The board is simple to use, just requiring connection to a computer via USB to get started.

Only
£8.17
per board when bought in a classpack
Almost half the price of an Arduino Uno!

Only
£12.43
Order code 75-0550
Individually

Only
£122.59
Order code 75-0592
Class Pack of 15

Mega2560

The Orangepip Mega2560 is an Arduino Mega2560 compatible development board that is based around the ATmega2560 microcontroller. The board features 54x digital I/O pins (14 of which may be used as PWM outputs), 16 analog inputs, 4x UARTs (hardware serial ports) and a 16MHz crystal oscillator. The board is simple to use, just requiring connection to a computer via USB to get started. The Orangepip Mega2560 is also compatible with shields designed for the Arduino Mega2560.

Only
£20.58
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Individually

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£178.78
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BUILD YOUR OWN ARDUINO!

orangepip® Segments328

Orangepip Segments328

- An Arduino compatible board you can use in your own projects.
- Test your soldering skills!
- Understand the components needed to support a microcontroller.

SINGLE
£11.95
Order code 75-1200

CLASSPACK OF 15
£120.00
Order code 75-1201

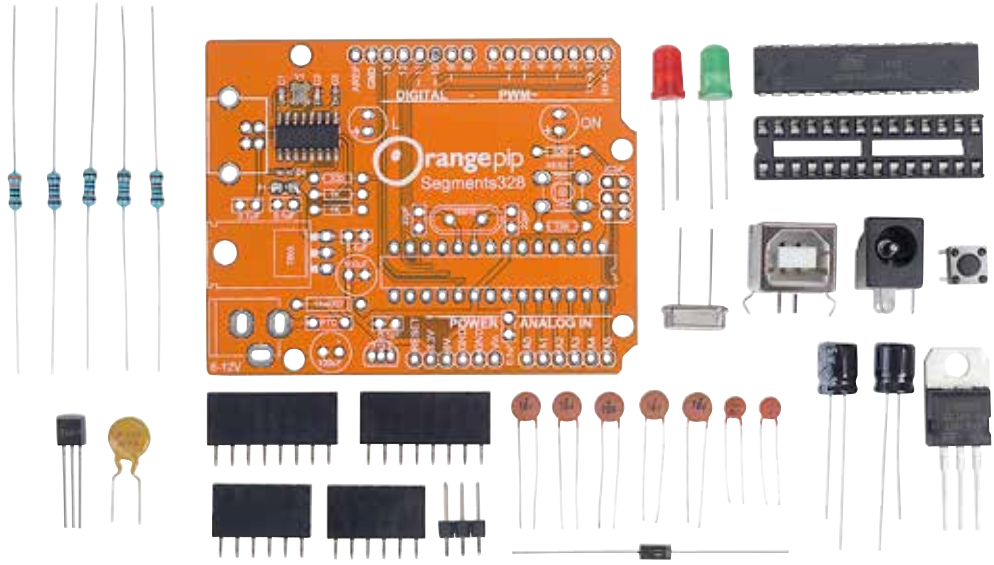
ORANGEPIP SEGMENTS328 BUILD YOUR OWN ARDUINO KIT

You may well be familiar with an Arduino board and aware of all the clever things it can help you to do. But how many people understand how the Arduino works? Do you know what components make up the "magic" box?

This Segments328 kit from Orangepip will let you into the secret - and will encourage you to develop your soldering skills in the process.

Ideal for students in higher or further education, the Build Your Own Arduino Kit includes all the through-hole components required. Just follow the easy-to-understand instructions to produce your own fully-programmable open source prototyping platform.

All you need is access to a soldering iron and solder, cutters and pliers and ideally a multimeter and you're good to go.



Contents includes:

1 Orangepip Segments PCB
1 x 16MHz crystal
1 ATmega328 microcontroller
1 Dual in line socket
1 Tactile switch
1 Red LED
1 Green LED
1 x 6-pin dual row header
2 x 8-pin single row sockets
2 x 6-pin single row sockets
1 ISB socket
1 Power supply jack socket
1 x 10K resistor
2 x 330R resistors
2 x 1K resistors
2 x 47µF electronic capacitors
1 x 1N4007 diode
1 x 7805 voltage regulator
1 x 7133 voltage regulator
1 PTC resettable fuse
5 x 0.1µF ceramic capacitors
2 x 22pF ceramic capacitors

CTC 101 STEAM Education Kit

Arduino has become much more than just a tool for making, tinkering and exploring both physical and digital interaction. It has become an entire ecosystem supporting students across all disciplines. Arduino Education is committed to empowering educators with the necessary hardware and software tools to create a more hands-on, innovative learning experience.

The CTC 101 kit (Creative Technologies in the Classroom 101), is Arduino's one-of-a-kind STEAM (Science, Technology, Engineering, Arts, and Mathematics) program for 13 to 17 year-olds in upper secondary education.
Students are introduced to the foundations of programming, electronics, and mechanics through a series of 25 playful, well documented projects and easy-to-assemble experiments. CTC is the ideal professional development program for upper secondary school teachers and educators.
CTC 101 is currently available in Spanish and English.

CTCs learning activities were developed for the classroom, ensuring that no one is left behind. Both teachers and students alike can benefit from five themed modules, and more than 25 hands-on experiments with different degrees of complexity to accommodate various skill levels.

Teachers will:
- Learn how to get started with Programming and Physical Computing
- Adapt their lesson plans with more engaging and creative techniques
- Take a hands-on approach to achieving defined learning objectives

Students groups will:
- Get started with programming
- Build fully-functional, interactive projects
- Explore robotics
- Learn about connectivity and wireless communication via Bluetooth
- Enhance their problem-solving and teamwork skills in a collaborative environment

What Will You Find in a CTC 101 Kit?

CTC 101 is a kit for the classroom, and it can accommodate up to 24 students. It includes more than 700 components and parts:

- 6 Arduino 101 Boards - a microcontroller with programmable inputs and outputs that allow users to create interactive electronics
- 6 Education Shields - a unit that is placed on top of an Arduino board to make connecting electronic components easier
- A set of Sensors and actuators - includes light sensors, button inputs, knock sensors, potentiometers, touch/capacitive sensors, tilt sensors, infrared array, a joystick, LEDs, buzzers, a speaker, servo motors, and more
- Component Modules - quick-connect modules that include necessary components onboard
- Connectors and various components - other items needed to complete electronics assembly

Order code
73-4463
£1,562.00

AKX00004 Engineering Kit

The Arduino Engineering Kit brings together the power of the Arduino MKR1000 with MATLAB and Simulink.

The kit is intended for students, educators and makers who want to learn and/or teach the more advanced concepts in engineering. The kit covers system modelling, controls, image processing, robotics, signal processing, among many others. Concepts are not covered at an advanced level.

The Arduino Engineering Kit includes three cutting-edge Arduino-based projects so that students can learn fundamental engineering concepts, key aspects of mechatronics, and MATLAB and Simulink programming. These projects will challenge them intellectually and help them develop physical engineering skills — and they're also fun to do.

Self-Balancing Motorcycle
This motorcycle will manoeuvre on its own on various terrains and remain upright using a flywheel for balance. It's very exciting to build and to see in action.

Mobile Rover
This vehicle can navigate between given reference points, move objects with a forklift and much more. It's very fun to make and use.

Whiteboard Drawing Robot
This amazing robot can take a drawing itís given and duplicate it on a whiteboard. It's most impressive.

The Arduino Engineering Kit is built on its own education Learning Management System (LMS) with step-by-step instructions and lessons.

The content of this kit is divided into six chapters, featuring a short introduction, a getting-started guide for the tools that will be used, a concepts section, and finally the projects themselves. Users will receive access to the online platform for one year and can purchase additional licenses to extend platform access.

Learning objectives include, but are not limited to the following:

The online platform will help students learn fundamental engineering concepts, key aspects of mechatronics, and MATLAB and Simulink programming.

The kit comes in a super-sturdy hard plastic, stackable box that will provide years of storage and reuse. Inside the box is an easy-to-use Arduino MKR1000 board, several customised parts, and a complete set of electrical and mechanical components needed to assemble all three projects.

In addition to the state-of-the-art, high-quality, open-source hardware provided, after registering online, the student will have access to a dedicated e-learning platform and other learning materials. Additionally, they are granted a one-year individual license for MATLAB and Simulink. This provides them with hands-on experience in system modelling and embedded algorithm development.

- Based on the Arduino MKR1000 SBC
- Includes motor shield and IMU shield
- Comprehensively equipped kit
- Great as a practical resource for demonstrating engineering concepts

Order code
75-0999
£202.43

Open-Source Single Board Computer Boards

Arduino is an innovative and exciting open source prototyping platform that is based around hardware and software that is easily obtainable and easy-to-use. To further make things easier, Arduino provide an open-source and easy-to-use Integrated Development Environment (**IDE**) that enables the writing of code and uploading of code to the board.

The main building block of any Arduino project is the **Arduino board**. They are available in 8-bit and 32-bit MCU versions and are able to read inputs, such as light, proximity or air quality from a sensor, or an SMS or Twitter message, and process it into an output for example activating a motor, turning on a light, publishing content online or triggering external events.

The **Arduino** range has revolutionised electronics by providing a number of **open source** standard designs. These designs are the starting point for complete ecosystems of hardware, software and tutorials dramatically shortening the time taken to develop even quite complex systems. Our collection of Arduino standard boards includes the popular types including **UNO, YUN** and **MEGA**.

- Inexpensive and flexible hardware
- Simple programming environment
- Cross-platform
- Open source and extensible hardware and software

Type	Order code	1+	5+
Uno board	**73-4440**	16.60	
Leonardo board	**73-4441**	13.47	13.27
Uno SMD board	**73-4443**	15.54	
Due board	**73-4445**	31.62	30.03
Mega2560 board	**73-4450**	28.12	

563355

Motor & Servo Driver Boards

The **Arduino Motor and Servo Driver Shields** will help you bring movement into your next Arduino project. Whether you're building a robot, animatronics or maybe a motorised camera dolly, there will be a board in this collection to suit your needs.

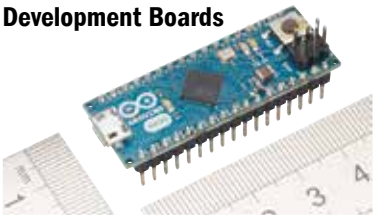
Technical specification

Order code	Mftrs. Part no.	Features
73-4455	**A000079**	L298 2 x H-bridge shield, TinkerKit compatible
73-4497	**E000003**	4 x H-bridge shield, plus 2 x 5V servo channels
73-4526	**KA03**	L298 2 x H-bridge shield, self assembly

Type	Order code	1+
Motor shield rev.3	**73-4455**	17.40
Mtr./stpr./srv shield	**73-4497**	20.20
Motor shield kit	**73-4526**	13.44

559650

Small Form Factor Development Boards



Arduino is an innovative and exciting open source prototyping platform that is based around hardware and software that is easily obtainable and easy-to-use. To further make things easier, Arduino provide an open-source and easy-to-use Integrated Development Environment (**IDE**) that enables the writing of code and uploading of code to the board.

- Arduino Nano v3
- Arduino Micro
- Arduino Mini with pin headers

Type	Order code	1+
Nano	**73-4448**	14.11
Micro	**73-4614**	13.28

563364

GKX00006 The MKR IoT Bundle Learn by Making 5 IoT Projects

The **MKR IoT Bundle** is a kit based around the MKR1000, and is a great way to get started with developing projects involving the **Internet of Things** (IoT).

The best way to learn is by doing, and the bundle includes everything you need to build five creative IoT projects, walking you through the basics of using the **Arduino MKR1000** for IoT applications, following step-by-step online tutorials on the Arduino Project Hubonline platform.

The MKR IoT Bundle is based around the **MKR1000**, a powerful and feature-rich board that combines all the functionality of the **Zero** and the **Wi-Fi Shield**, in the compact MKR form factor. The whole bundle has been designed to enable makers to add Wi-Fi connectivity to their IoT designs with minimal prior networking experience.

The 5 experiments you can make:
I Love You Pillow
Puzzle Box
Pavlov's Cat
The Nerd
Plant Communicator

- External 5V supply via USB port
- Runs with or without the LiPo battery connected
- Limited power consumption
- Supports certificate SHA-256
- 32 bit ARM technology
- 3.3V Operating voltage
- Microusb connector

Caution: *The MKR1000 runs at 3.3V. The maximum voltage that the I/O pins can tolerate is 3.3V. Applying voltages higher than 3.3V to any I/O pin could damage the board.*

Type	Order code	1+
MKR to IoT bundle	**73-4845**	57.35

566447

102010004 Seeeduino V4 Arduino Compatible Board with Upgrades

The **Seeeduino v4.0** is an open source development board based around the **ATmega328P-MU** MCU. The board inherits all the features of the Arduino **Duemilanove** and **Uno** but also adds some of its own. The **Seeeduino** has pin layout compatibility with the Duemilanove and Uno, as well as compatibility with the Duemilanove's screw holes and board dimensions. The board features upgrades that improve performance and useability such as a micro-USB to keep a low profile, switchable 3.3 and 5V DC input and solder pads for all GPIOs.

Seeed provide technical documentation, example projects and software libraries on their product pages.

- Easy-to-use development board
- 14x Digital I/O pins
- ICSP for the ATMEGA16U2 USB to serial chip
- Micro-USB instead of USB type B

Type	Order code	1+
Seeeduino V4	**75-0401**	16.20

563359

110060024 Grove Starter Kit V3 for Arduino

The **Grove Starter Kit for Arduino from Seeed Studio** gets you off to a flying start on your next project. It includes 10 of their most popular Grove modules, but what is Grove? Seeed describe it as "a modular electronic platform for quick prototyping", where each module has a specific function. You take a building block approach, adding just the functionality you need, without overloading your Arduino with useless bits and bobs. This kit consists of an Arduino shield which has Grove connectors, a set of sensors, a set of output modules, a manual and a handy storage case. Within minutes of unpacking you could be using the light sensor to control servo rotation or touch to send information to the LCD display. Simply add an Arduino.

Seeed provide technical documentation, example projects and software libraries on their product pages.

- Part of the Grove system, other modules available
- Other base modules are available, i.e. for the Raspberry Pi
- Extensive demo code, tutorials and documentation

Kit contents:
1 x Base Shield
1 x Grove - LCD RGB Backlight
1 x Grove - Smart Relay
1 x Grove - Buzzer
1 x Grove - Sound Sensor
1 x Grove - Touch Sensor
1 x Grove - Rotary Angle Sensor
1 x Grove - Temperature Sensor
1 x Grove - LED
1 x Grove - Light Sensor
1 x Grove – Button
1 x DIP LED Blue-Blue
1 x DIP LED Green-Green
1 x DIP LED Red-Red
1 x Mini Servo
10 x Grove Cables
1 x 9V to Barrel Jack Adapter
1 x Grove starter kit Manual
1 x Green Plastic Box

Type	Order code	1+
Grove starter kit	**75-0383**	29.93

563361

seeed studio

Arduino Grove Base Shield V2

The **Arduino Grove Base Shield from Seeed Studio** is switchable between 5V and 3.3V making it compatible with the official and a wide range of unofficial Arduinos. This board is the hub for a whole system of sensors, actuators, displays and more. Starting with simple LEDs and building to more complicated devices such as accelerometers, Bluetooth, sound / light / temperature sensors, the Grove system seems to have one of everything you could want. Adding a new module is as simple as plugging it into the Grove base shield and adding a few lines of code, thanks to extensive sample code available online. The Grove base shield has 4 x analog, 6 x digital, 4 x I2C and 1 x UART connectors, plus the standard GPIO headers. All the Grove products are supported with getting started guides, manuals, wiki pages, code snippets and libraries.

- Hub for the Grove family of add-on modules
- Dozens of add-on modules available
- Comprehensive documentation and code samples

Type	Order code	1+
Grove Base Shield	**75-0392**	7.21

560364

seeed studio

110060025 Sidekick Basic Component Starter Kit for Arduino V2

The **SideKick Basic Component Starter Kit for Arduino from Seeed Studio** is a great learning resource with components to build 7 different projects. Seeed's website has instructions on how to build the projects, arranged as a series of lessons, which introduce you to every aspect of the SideKick kit. They range from blinking an LED through to controlling the position of a servo motor. Take the lessons at your own pace and feel free to branch out on your own at any stage if you get sudden inspiration. This kit isn't just for the Arduino family of boards, it's useful for any microcontroller project.

Seeed provide technical documentation, example projects and software libraries on their product pages.

- Learning resources online
- Compatible with Arduinos and other microcontroller boards
- Supplied in a handy storage box

Kit contains:

1x Breadboard
5x Green LED
5x Red LED
1x RGB Common Anode LED
20x Ceramic Capacitors (10nF x 10, 100nF x 10)
5x Aluminium capacitors (100uF x 5)
30x Resistors (330R x 10, 1k x 10, 10k x 10)
1x Tilt switch
1x Thermistor
1x Photo resistor
1x Diode
1x Buzzer
5x Button
5x Switch
1x Mini Servo
1x Potentiometer with knob
25x Breadboard jumper wires (5 x long, 20 x short)
4x Box

Type	Order code	1+
SideKick for Arduino	**75-0390**	14.12

563533

seeed studio

110060004 ARDX Arduino Starter Kit Includes UNO Board

The **ARDX Starter Kit for Arduino from Seeed Studio** is a great learning resource with components to build 13 different projects. Seeed's web-site has instructions on how to build the projects, arranged as a series of lessons, which introduce you to every aspect of the ARDX kit. They range from the usual blinking an LED through to using the Piezo sensor to detect vibration. Take the lessons at your own pace and feel free to branch out on your own at any stage if you get sudden inspiration. The great thing about this kit is that it comes complete with a set of paper circuit templates that you lay over the breadboard and push the components through. These take away all the worry of wiring the project incorrectly, you **will** be able to get the projects working.

Seeed provide technical documentation, example projects and software libraries on their product pages.

- Learning resources online
- Emphasis on fun, informal learning
- Arduino UNO R3 included
- Innovative circuit templates simplifies building the projects
- Supplied in a handy storage box

Kit contains:

1x Arduino UNO R3
75x Premium jumper wires
1x Type B USB cable
1x 9V battery clip
1x 5mm diffused RGB LED
1x Piezo Sensor - Minisensor 100
10x 5mm red LEDs
10x 5mm green LEDs
1x 10mm blue LED
1x Toy DC motor
1x 9g High Sensitive Mini sensor
1x 74HC595
1x Buzzer
1x 1M resistor
2x Pushbuttons
1x Potentiometer (10K)
1x Light sensor (5528)
1x TMP36
1x Relay (5v,3A/120VAC)
2x P2N2222A
25x 560 Ohm resistors
3x 2.2k Ohm resistors
3x 10k Ohm resistors
1x 220uf capacitor
2x 1N4001
1x Breadboard
1x Male pin header
4x Plastic rivet
1x Acrylic holder
4x Rubber bumpers
13x Colour breadboard layout sheets
1x Full colour printed Experimenteris Guide

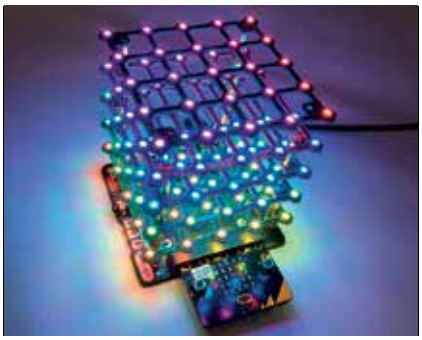
Type	Order code	1+
Arduino starter kit	**75-0391**	52.41

563534

Cube:Bit

4tronix

Cube:Bit Addressable RGB LEDs



Awesome is the best way to describe these magical RGB LED cube kits. The **Cube:Bit** can be assembled using just a screwdriver and within a few minutes you'll have created some stunning lighting and visual effects that you can use for a whole host of things, such as learning about coordinates in 2D and 3D, indications for sensory events from your SBC, decorative lighting, the possibilities are endless.

The Cube:Bits are made out of pre-assembled slices that have neopixel LEDs on both sides, giving an all-round effect to the lighting. There are three configurations available, 3x3x3, 4x4x4 and 5x5x5. Once assembly is done you have to use the Cube:Bit Base (available separately) to provide power and to connect a controller or to directly connect to a **BBC micro:bit** or **Raspberry Pi Zero** (full size Raspberry Pi work fine of course, but don't fit directly without using an extension GPIO cable, or simply 3 female-female jumper cables for 5V, Gnd and GPIO18).

With micro:bit we have written a special Makecode package (see below) that "knows" about the shape of all the cubes and can map from x, y, z coordinates directly to a pixel anywhere in the cube. Write to a whole plane of pixels at once, create a moving rainbow effect in only a few lines. With Raspberry Pi you can use any of the neopixel code already available to drive your Cube:Bit eg. Pimoroni, Adafruit or 4tronix neopixel products.

MakeCode Package for 4tronix Cube:Bit Magical RGB Cubes of Awesome

Helper routines for using the neopixels in the Cube:Bit range of Cubes

Defining the Cube

The first thing you should do is create a Cube object with the required dimensions per side. Use the block:

create cube:bit on pin0 with side <3/4/5/6/7/8>

Then set the brightness to be used from 0 to 255. If this block is not used, then the brightness is set to 40.
We strongly recommend keeping this at less than 100.
All values sent to the LEDs after this command will be scaled down to fit in this maximum brightness level.

set cube:bit brightness to <0...255>

##Using Cube:Bit Pixels Each pixel can be addressed by using the pixel ID which is a number from 0 to the number of pixels in the cube minus one. eg. a 3x3x3 cube has 27 pixels so the ID can be 0 to 26, 4x4x4 has 64 (ID 0 to 63) and 5x5x5 has 125 (ID 0 to 124)

set pixel colour at ID to

The colour value is a number. There are some pre-define colours (eg. Red, Yellow, etc) or you can put in a simple number, or you can define separate Red, Green and Blue values using the map colour block

convert from red, green, blue

If you want to specify the x,y,z position of the pixel then use the mapping block to create the pixel ID

map from x y x

Whenever changing the colour of pixels or clearing them, or rotating them, you will need to display the result afterwards. Use the show changes block for this

show Cube:Bit changes

You can also set a whole plane of pixels to the same colour. eg. set the top slice to blue, or the left side to green. Use the set plane block:

set planon axis <xy, xz, yz> to <colour>

- Available in 3, 4 or 5 LED square configuration
- Let your imagination roam free
- No soldering involved
- You can stack them, to make a tower as high as you like!
- Full RGB - contains every visible colour ever known (black not included)

Note. *Base not included with Cube:Bits.*

Technical specification

Dimensions

3x3x3	49mm on a side
4x4x4	69mm on a side
5x5x5	89mm on a side

Example currents (from a 5V power supply)

Configuration	Colour	Brightness (255)	Current
3x3x3	Red	40	150mA
3x3x3	White	40	340mA
3x3x3	White	255	1.9A
4x4x4	Red	40	350mA
4x4x4	White	40	800mA
4x4x4	White	255	4.5A
5x5x5	Red	40	680mA
5x5x5	White	255	1.6A
5x5x5	White	255	8.75A

Type	Order code	1+
3x3x3	**75-5009**	18.00
4x4x4	**75-5010**	40.00
5x5x5	**75-5011**	75.00
Base	**75-5012**	10.00

567658

Adafruit Trinket

adafruit

Small Form Factor Development Boards ATmega328 MCU

The Adafruit **Pro Trinket** is based around the **ATmega328** MCU and has a feature set that makes it similar to the **Arduino** Pro Mini but with a USB interface and more pins.

The Pro Trinket is Arduino compatible, working with 99% of existing Arduino **sketches**. Programming of the board can be done via AVRdude and/or the Arduino IDE and a reset button is provided for entering the bootloader or restarting the program.

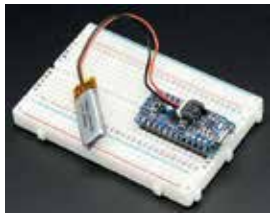
- Available in 3.3 or 5V versions
- Onboard USB bootloading support
- Optiboot support
- LED Indication for bootloading
- PCB Dimensions only 1.5 x 0.7 x 0.2mm
- Mounting holes
- Up to 16V input
- Ultra low dropout regulator
- Reverse polarity protection, thermal and current-limit protection
- Power with either USB or external output (e.g. battery) - with automatic switch over

Type	Order code	1+
Adafruit 2000	**75-0509**	8.94
Adafruit 2010	**75-0510**	8.64

563365

adafruit

Pro Trinket Li-Ion/Li-Poly Backpack Add-On



The **Adafruit Pro Trinket Li-Ion / Li-Poly Backpack Add-On** has been cleverly designed to sit on top of the Adafruit Pro Trinket (75-0509 & 75-0510) and connect to its power inputs with header pins. Not only does it give you somewhere convenient to connect a battery, it will also charge the battery when the Trinket is powered from its USB port. Once USB power is removed, the fully charged battery will take over. The backpack has a RED charging LED and a green fully charged LED. It uses a 3-stage process, starting with a preconditioning charge, then a constant current fast charge and a final constant voltage trickle charge to keep the battery topped up. By default it uses a 100mA charging current but this can be increased to 500mA by closing a solder jumper for 500mAh or larger batteries. Please only use 3.7 or 4.2V Li-ion or Li-poly batteries, not the older 3.6 or 4.1V types. If you need an On/Off button, carefully cut the marked trace between the pair of solder pads then solder the switch to the pads, nice and easy.

Supplied as a fully assembled and tested charger board plus a strip of 3 x 0.1in. header pins for you to solder between the charger and the Pro Trinket. This tiny add-on board saves you time and effort while greatly extending the use of the Pro Trinket and keeping your project as small as possible.

- Mounts onto a Pro Trinket power lines via a 3-pin header
- 3-stage charging process for 3.7 and 4.2V Li-ion and LiPo batteries
- Dimensions: 15 x 17 x 2mm (0.6 x 0.7 x 0.08in.)
- Adafruit part no.: 2124

Type	Order code	1+
Trinket backpack	**73-5418**	4.75

563240

adafruit

Trinket ATtiny85 Arduino Compatible

The **Adafruit Trinket mini-microcontrollers** are tiny (27 x 15mm) Arduino compatible processor boards which are programmable via their micro-USB socket. Their ATtiny85 processor has 8k bytes of flash (programme) memory, 512 bytes of SRAM (static RAM), 512 bytes of EEPROM and runs at 8MHz. The boards are capable of outputting 150mA and have an ultra-low drop-out regulator which will switch between USB and battery supply automatically. Adafruit provide a free tutorial and example code to get you started, imagine driving 150 NeoPixels with such a dinky board.

There are two versions, 75-0580 which uses 3.3V and runs at 8MHz or 75-0581 which uses 5V and runs at 8 or 16MHz.

- Arduino IDE and AVRdude compatible
- 3.3 or 5VDC internal voltage regulator
- 8k bytes flash memory, 5 x GPIO lines including analogue inputs and PWM outputs
- Hardware I2C and SPI channels
- 8MHz clock speed, and 16MHz for 5V version
- Power supply up to 16V DC, reverse polarity, thermal and current-limit protection
- Dimensions 27 x 15 x 4mm (1.1 x 0.6 x 0.2in.)

Type	Order code	1+
3.3V Trinket	**75-0580**	6.12
5V Trinket	**75-0581**	6.12

561301

Adafruit NeoPixel LEDs

adafruit

NeoPixel 8x8 Addressable RGB LED Matrix

The **Adafruit 8 x 8 NeoPixel matrix** lets you address every single one of the 64 LEDs and set its 24-bit RGB value. Make subtly shaded displays or light up the room at full power, the choice and the responsibility is yours. The matrix has 3 x solder pads, 2 x for power (5V DC) and 1 x for the data input.

A matching set of pads has a data out line allowing you to daisy chain the panels for even larger displays. Since the data protocol has strict timing requirements, the panel is best controlled by a real-time microcontroller (MCU) such as the Arduino rather than a Linux board like the Raspberry Pi. Use an MCU with a clock speed of 8MHz or greater (Arduino is 16MHz). Adafruit have published a driver library to save you the trouble and let you get on with designing eye catching displays.

- 64 NeoPixels
- 24-bits of RGB for each
- Power supply: 5V DC at 2A
- Max. current: 3.5A (all LEDs white)

Type	Order code	1+
8x8 RGB LED matrix	**60-8815**	28.08

560438

adafruit

NeoPixel Rings Addressable RGB LEDs

The **Adafruit NeoPixel Rings** let you address every single one of the 24, 16 or 12 LEDs and set its 24-bit RGB value. These seemingly simple gadgets have triggered an amazing array of creative projects, from watches and compasses to steampunk goggles and more. Each ring has solder pads for 5V DC and Gnd, plus data in and data out. Simply feed the data out from one into the data in of another to control them both from the same microcontroller (MCU).

Since the data protocol has strict timing requirements, the ring is best controlled by a real-time microcontroller such as the Arduino rather than a Linux board like the Raspberry Pi. Use an MCU with a clock speed of 8MHz or greater (Arduino is 16MHz). Adafruit have published a driver library to save you the trouble and let you get on with designing eye catching displays.

- 24, 16 or 12 NeoPixels
- 24-bits of RGB for each
- ~18mA per NeoPixel
- Can be daisy-chained

Type	Order code	1+
24 NeoPixel ring	**60-8816**	14.72
16 NeoPixel ring	**60-8817**	8.92
12 NeoPixel ring	**60-8818**	6.88

560439

NeoPixel Shield for Arduino 40 Addressable RGB LEDs

The **Adafruit 40 NeoPixel Shield** lets your Arduino address every single one of the 40 LEDs and set its 24-bit RGB value. The result is a very 53 x 69mm (2.1 x 2.7in.) neat rectangle of bling. These seemingly simple gadgets have triggered an amazing array of creative projects, from watches and compasses to steampunk goggles and more. The shield only uses 1 x digital ouput pin on the Arduino and more NeoPixel shields can be daisy-chained together and still use just that one pin. A 2-pin terminal block is supplied so that you can power the LEDs with an external supply if you intend adding more boards or driving the first one at full white. Adafruit have published a driver library to save you the trouble and let you get on with designing eye catching displays.

- Drive 40 NeoPixels with 1 x digital output
- 24-bits of RGB for each
- Can be daisy-chained
- 2-pin terminal block for external supply

Type	Order code	1+
NeoPixel shield	**60-8819**	23.38

560440

NeoPixel Stick with 8 Addressable RGB LEDs

The **Adafruit 8 NeoPixel Stick** lets you address any one of the 8 LEDs and set its 24-bit RGB value. The result is a diminutive 51mm (2in.) tall column of LEDs and is the height of bling. These seemingly simple gadgets have triggered an amazing array of creative projects, from watches and compasses to steampunk goggles and more, perhaps a full RGB Larsen scanner. Each stick has solder pads for 5V DC and Gnd, plus data in and data out. Simply feed the data out from one into the data in of another to control them both from the same microcontroller (MCU).

Since the data protocol has strict timing requirements, the stick is best controlled by a real-time microcontroller such as the Arduino rather than a Linux board like the Raspberry Pi. Use an MCU with a clock speed of 8MHz or greater (Arduino is 16MHz). Adafruit have published a driver library to save you the trouble and let you get on with designing eye catching displays.

- 8 NeoPixels
- 24-bits of RGB for each
- ~18mA per NeoPixel
- Can be daisy-chained
- Operating voltage: 4 to 7V DC

Type	Order code	1+
8 x NeoPixel stick	**60-8820**	5.78

560441

NeoPixel Addressable 5050 LED Rings RGBW

The popular **Adafruit NeoPixel Addressable LED Rings** have had an upgrade and now feature 12, 16 or 24 x 5050 RGB + White LEDs. The white LEDs are very intense and add a new dimension to your NeoPixel projects, with the 8-bit PWM you get 32-bits of colour. These seemingly simple gadgets have triggered an amazing array of creative projects, from watches and compasses to steampunk goggles and more. Each ring has solder pads for 5V DC and Gnd, plus data in and data out, using just 1 x GPIO pin on your microcontroller. Simply feed the data out from one ring into the data in of another to control them both from the same microcontroller (MCU).

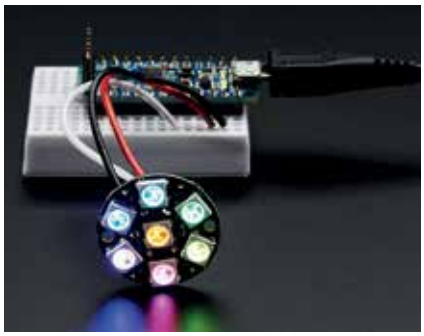
Since the data protocol has strict timing requirements, the ring is best controlled by a real-time microcontroller such as the Arduino rather than a Linux board like the Raspberry Pi. Use an MCU with a clock speed of 8MHz or greater (Arduino is 16MHz).

- RGB plus white NeoPixel rings
- Natural white (4500K) and Warm White (3000K)
- Available with 12, 16 and 24 LEDs
- Requires 5V DC power
- Rings can be daisy-chained together
- Outside diameter 37mm (1.45in.)

Type	Order code	1+
12x LED ring natural	**73-5273**	8.47
12x LED ring warm	**73-5274**	8.47
16x LED ring natural	**73-5276**	10.55
16x LED ring warm	**73-5275**	10.55
24x LED ring natural	**73-5269**	17.20
24x LED ring warm	**73-5270**	15.48

563205

NeoPixel Jewels 7 x 5050 RGB/RGBW LEDs with Integrated Drivers



The **Adafruit NeoPixel Addressable LED Jewels** have had an upgrade and now feature 7 x 5050 RGB + White LEDs. The white LEDs are very intense and add a new dimension to your NeoPixel projects; with the 8-bit PWM you get 32-bits of colour. These seemingly simple gadgets have triggered an amazing array of creative projects, from watches and compasses to steampunk goggles and more. Each jewel has solder pads for 5V DC and Gnd, plus data-in and data-out, using just 1 x GPIO pin on your microcontroller. Simply feed the data-out from one jewel into the data-in of another to control them both from the same microcontroller (MCU).

We also supply the RGB Jewels, **73-5411**.

Since the data protocol has strict timing requirements, the jewels are best controlled by a real-time microcontroller such as the Arduino rather than a Linux board like the Raspberry Pi. Use an MCU with a clock speed of 8MHz or greater (Arduino is 16MHz).

Adafruit have published a driver library to save you the trouble and let you get on with designing eye catching displays. They have a reputation for the quality of their supporting documentation and you will find their Uberguide to NeoPixels and their Best Practices guides invaluable. In particular the Best Practices guide will help you prolong the life of your NeoPixels and avoid common mistakes. Please make sure you use the NeoPixel RGBW library for the RGBW jewels, and the RGB library for the RGB jewels.

- 7-pixel RGBW or RGB NeoPixel Jewels
- Available without white, with warm white (3000K) and natural white (4500K)
- Requires 5V DC power
- Jewels can be daisy-chained together
- Dimensions 23mm diameter x 2mm (0.9 x 0.1in.)

Type	Order code	1+
RGB	**73-5411**	5.78
RGB & natural white (4500K)	**73-5271**	6.49
RGB & warm white (3000K)	**73-5272**	6.49

563207

NeoPixel Addressable LED Sticks 8 x 5050 RGBW

The **Adafruit NeoPixel Addressable LED Sticks** have had an upgrade and now feature 8 x 5050 RGB + White LEDs. The white LEDs are very intense and add a new dimension to your NeoPixel projects; with the 8-bit PWM you get 32-bits of colour. These seemingly simple gadgets have triggered an amazing array of creative projects, from watches and compasses to steampunk goggles and more. Each stick has solder pads for 5V DC and Gnd, plus data-in and data-out, using just 1 x GPIO pin on your microcontroller. Simply feed the data-out from one stick into the data-in of another to control them both from the same microcontroller (MCU).

Since the data protocol has strict timing requirements, the sticks are best controlled by a real-time microcontroller such as the Arduino rather than a Linux board like the Raspberry Pi. Use an MCU with a clock speed of 8MHz or greater (Arduino is 16MHz).

Adafruit have published a driver library to save you the trouble and let you get on with designing eye catching displays. They have a reputation for the quality of their supporting documentation and you will find their Uberguide to NeoPixels and their Best Practices guides invaluable. In particular the Best Practices guide will help you prolong the life of your NeoPixels and avoid common mistakes. Please make sure you use the NeoPixel RGBW library, the RGB library will give odd results.

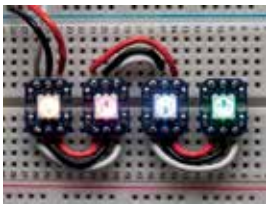
- 8-pixel RGBW NeoPixel Stick
- Warm white (3000K) or natural white (4500K)
- Requires 5V DC power
- Sticks can be daisy-chained together
- Dimensions: 10.2 x 51.1 x 3.2mm (0.4 x 2.0 x 0.13in.)

Type	Order code	1+
Natural white (4500K)	**73-5277**	7.24
Warm white (3000K)	**73-5278**	7.24

563206

adafruit

Breadboard-friendly RGB NeoPixels (Pack of 4)



The **Adafruit Breadboard-friendly RGB NeoPixels** take the FLORA NeoPixels and rework them for your breadboard with 3 x input pins and 3 x output pins on a 0.1in. pitch. The pin arrangement allows the data and power lines to be easily daisy chained together on a breadboard or a stripboard.

NeoPixels are individually addressable and can give you 24-bits of colour with 8-bit PWM. These seemingly simple gadgets have triggered an amazing array of creative projects, from watches and compasses to steampunk goggles and more. Each jewel has solder pads for 5V DC and Gnd, plus data-in and data-out, using just 1 x GPIO pin on your microcontroller. Simply feed the data-out from one jewel into the data-in of another to control them both from the same microcontroller (MCU).

Since the data protocol has strict timing requirements, the jewels are best controlled by a real-time microcontroller such as the Arduino rather than a Linux board like the Raspberry Pi. Use an MCU with a clock speed of 8MHz or greater (Arduino is 16MHz).

Adafruit have published a driver library to save you the trouble and let you get on with designing eye catching displays. They have a reputation for the quality of their supporting documentation and you will find their Uberguide to NeoPixels and their Best Practices guides invaluable. In particular the Best Practices guide will help you prolong the life of your NeoPixels and avoid common mistakes.

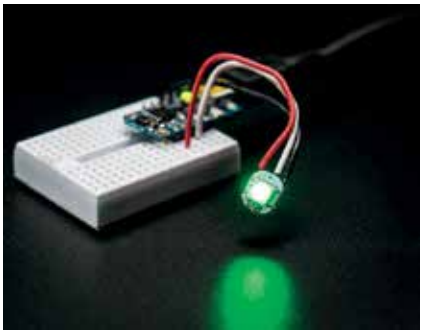
- Supplied in a pack of 4 x NeoPixels
- Breadboard and stripboard friendly pin layout and pitch
- 60mA current draw per NeoPixel at maximum brightness
- Adafruit part no.: 1312

Type	Order code	1+
RGB LEDs NeoPixel	**73-5352**	7.40

563229

adafruit

RGB NeoPixel Mini PCB – Pack of 5



The **Adafruit Mini PCB NeoPixels** are the smallest breakout boards for NeoPixels you can get. They measure a neat 8 x 10mm and have 2 x sets of 3 x pads on the back for power, data-in and data-out.

NeoPixels are individually addressable and can give you 24-bits of colour with 8-bit PWM. These seemingly simple gadgets have triggered an amazing array of creative projects, from watches and compasses to steampunk goggles and more. Each NeoPixel has solder pads for 5V DC and Gnd, plus data-in and data-out, using just 1 x GPIO pin on your microcontroller. Simply feed the data-out from one NeoPixel into the data-in of another to control them both from the same microcontroller (MCU).

Since the data protocol has strict timing requirements, the NeoPixels are best controlled by a real-time microcontroller such as the Arduino rather than a Linux board like the Raspberry Pi. Use an MCU with a clock speed of 8MHz or greater (Arduino is 16MHz).

Adafruit have published a driver library to save you the trouble and let you get on with designing eye catching displays. They have a reputation for the quality of their supporting documentation and you will find their Uberguide to NeoPixels and their Best Practices guides invaluable. In particular the Best Practices guide will help you prolong the life of your NeoPixels and avoid common mistakes.

- Supplied in a pack of 5 NeoPixels
- 800kHz protocol speed
- Dimensions 8 x 10mm (0.3 x 0.4in.)
- Adafruit part no.: 1612

Type	Order code	1+
RGB LEDs mini PCB	**73-5385**	5.00

563231

Wearables

Light Stitches E-Textiles for Education

Conductive Thread

This highly conductive thread is ideal for introducing electronics into textile projects. The thread looks and behaves like conventional sewing thread with the added bonus of being highly conductive.

- Thread has a resistance of approximately 0.4Ω/cm, or 12Ω/foot
- Resistance does not vary significantly from one length of thread to the next as some are reported to do, so you should be able to use this thread without concern for "dead" sections
- The thread has a breaking strain of around 4.2kg (9.3 pounds)
- It comprises roughly 96 individual filaments, each coated with a micron-thick layer of natural silver. 16 of these filaments are wound together to form an initial twist; two of these twists are then twisted together, and finally three of these twists are combined
- In thread terms, thickness is approximately 18 denier
- This thread does not fray: there are no loose ends of filaments except where they have been cut
- Available on **bobbins of 6m** and **reels of approx. 182m**

For more information, visit our Light Stitches minisite at www.rapidonline.com/lightstitches

Type	Order code	1+
6m Bobbin	**87-6147**	2.52
182m Reel	**87-6111**	28.88

300692

Light Stitches E-Textiles for Education

Easy-Sew Battery Holders

The Light Stitches Battery Holder has been specifically designed with large attachment holes that make it easy to sew or tie Light Stitches conductive thread to it. The battery holder houses a standard 3V, CR 2032 lithium coin cell battery to power various Light Stitches projects.

The battery holder is available with or without an On/Off switch.

- Large attachment holes for easy attachment
- Easy to connect to conductive thread
- Houses a standard 3V, CR 2032 battery
- Available with or without an On/Off switch

Type	Order code	1+
Battery holder	**87-6113**	1.09
Battery holder+switch	**87-6159**	1.61

519349

Rapid education — We bring STEM to life

adafruit

Bluefruit BLE Bluetooth Low Energy Boards

The **Adafruit Bluefruit Low Energy range** lets you cut through the pile of Bluetooth Classic APIs, development tools and licences, and treat a Bluetooth LE connection just like a serial link. Send and receive keystrokes from your favourite terminal software, from software such as Python (via PySerial) or from your smartphone. Adafruit have built a software stack right into the Bluetooth LE boards, so you can focus on sending and receiving the data you want for your application. The optional command mode lets you create GATT services and characteristics, make them into a UriBeacon and set the device advertising. The UriBeacon is part of the Google "Physical Web" initiative where a Bluetooth LE device broadcasts a URI which smartphone and tablet apps can detect. For example, the URI could lead to your home page for a wearable project or an interactive page for sensor data. Another particularly useful feature is the over the air (OTA) programming from any BLE capable iOS or Android device.

The Bluetooth boards are based around the very capable MDBT40 chipset (similar to the Nordic nRF51822) with Adafruit's own 100% custom firmware. The MDBT40 has an ARM Cortex M0 core running at 16MHz, 256kbytes Flash memory, 32kbytes SRAM. It talks to the host microcontroller over 4 or 5 wire SPI.

Supplied as a wearable FLORA Bluetooth board (**73-5314**) or as a Bluetooth Friend breadboard friendly module (**73-5296**).

See Adafruit's "Quick Start" guide, part of their massive free tutorial with software examples. They also provide an Android app and an iOS app which can talk BLE to your project.

- Easily create Bluetooth Low Energy (BLE) connections with compatible devices
- Supports Google's "Physical Web" initiative with UriBeacons
- Uses simple serial UART commands
- Secure over the air programmable

Type	Order code	1+
Bluetooth LE friend	**73-5296**	14.52
Wearable Bluetooth LE	**73-5314**	13.45

563276

GEMMA v2 - Miniature Wearable Electronic Platform

The **Adafruit GEMMA V2 Miniature Wearable Electronic Platform** takes small wearable microcontrollers to a new level of tiny. Measuring just 28mm across the board features a micro-USB connector for power and programming, a 2-pin JST battery connector, a regulated power output, 3 x GPIO pads and an On/Off switch. Based around the super small ATtiny85 with 8kbytes of Flash, 512 bytes of RAM and 512 bytes of EEPROM running at 8MHz the board only draws 9mA when running. Compatible with the Arduino IDE although a couple of simple configuration tweaks are required. The 3 x GPIO pins can be configured to have 1 x analogue input and 2 x PWM outputs and 1 x hardware I2C bus as well as the normal digital IO functions.

The on board ultra-low dropout 3.3V power regulator supplies up to 150mA and will accept voltages up to 16V. It has reverse polarity, thermal cut-out and current limit protection. The board can be powered from either the USB or from an external source such as a battery and it will automatically switch from one to the other.

Supplied as a fully assembled and tested board. Adafruit supply a free tutorial to get you started with this seriously small, low cost board. Please note that GEMMA doesn't have a serial port for debugging, something had to give to make it so small.

- ATtiny85 Arduino IDE compatible MCU @8MHz
- On/Off switch, Reset switch on board
- Power LED and 1 x user blinky LED
- Micro-USB for power and programming
- 2-pin JST connector for external power
- Hardware I2C
- Dimensions 28mm diameter x 7mm high (1.1in. x 0.28in.)
- Adafruit part no.: 1222

Type	Order code	1+
GEMMA v2	**73-5320**	9.00

563228

659 FLORA Wearable Electronics Board Arduino Compatible

The **Adafruit FLORA V2** is their latest wearable Arduino compatible microcontroller board and it features a programmable NeoPixel for added blinkiness. They have put a lot of thought into this board, with a 2A power FET attached to the tiny on-off switch, a 3.3V regulator with protection diode and USB fuses. It can drive up 50 NeoPixels using the onboard supply or up to 500 with an external 5V source. You can program it either via Adafruit's version of the Arduino IDE or with Arduino IDE version 1.6.4+ with a little tweaking to install FLORA support.

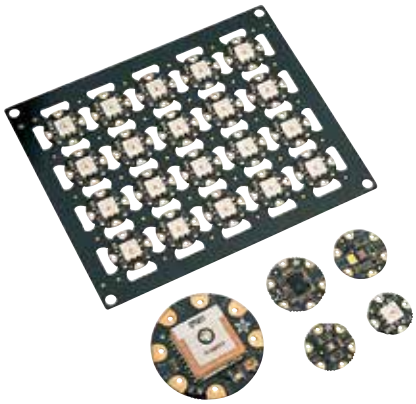
Adafruit supply a comprehensive getting started guide for FLORA and an Arduino IDE 1.6.4 guide .

- Wearable Arduino with 14 x sewable pads
- Onboard 2-pin JST connector for battery power
- Onboard reset button
- Diameter 44.45mm (1.75in.), weighs 4.4g
- Adafruit part no. 659

Type	Order code	1+
FLORA main board	**75-0569**	13.66

561286

FLORA Wearable Sensors, Modules and NeoPixels



The **Adfruit FLORA range** is a purpose designed suite of electronic modules for wearable and sewable projects. Based around the Arduino-compatible FLORA main board there are add-on boards with the ever popular NeoPixels, sensors, and even a GPS module. Each one has been carefully designed and thought out with real world applications in mind and using the best components for the job. Each product page contains links to Adafruit's resources.

- A range of compatible modules
- Sewable using conductive thread
- Communicate via I2C
- Excellent documentation and support online

Type	Order code	1+
Accelerometer/compass	**73-5353**	12.92
20 x RGB NeoPixels	**73-5369**	30.00
Wearable GPS module	**73-5376**	35.08
FLORA colour sensor	**73-5356**	6.49

563219

Sewable CR2032 Battery Holder for Wearables

The **Adafruit Sewable Battery Holder** is ideal for providing power to your next wearable project. It accepts the popular CR2032 sized batteries which are usually 3V at 200mAh. The battery holder has holes in the +ve and -ve tabs which will accept a #5 needle and conductive thread. Should you want an extra secure fixing, the back of the holder is flat enough to provide a good glue surface.

- Attach by sewing or gluing
- Body measures 28 x 16 x 6.7mm (1.10 x 0.63 x 0.26in.)
- The +ve and -ve tabs add another 4mm to the length
- Adafruit part no.: 653

Type	Order code	1+
Battery holder	**73-5379**	2.57

563279

Gemma Wearable Starter Pack

The **Adafruit Gemma Wearables Starter Pack** gets your first wearable project off to a flying start. The pack contains a GEMMA main board, 4 x RGB NeoPixel LEDs, 1 x coin cell battery holder with on/off switch, 2 x CR2032 coin cell batteries, a spool of thin, stainless conductive thread, a 20-piece needle set, a USB programming cable and a pack of 12 x crocodile clip test leads.

The Adafruit GEMMA V2 Miniature Wearable Electronic Platform takes small wearable microcontrollers to a new level of tiny. Measuring just 28mm across the board features a micro-USB connector for power and programming, a 2-pin JST battery connector, a regulated power output, 3 x GPIO pads and an On/Off switch. Based around the super small ATtiny85 with 8kbytes of Flash, 512 bytes of RAM and 512 bytes of EEPROM running at 8MHz the board only draws 9mA when running. Compatible with the Arduino IDE although a couple of simple configuration tweaks are required. The 3 x GPIO pins can be configured to have 1 x analogue input and 2 x PWM outputs and 1 x hardware I2C bus as well as the normal digital IO functions.

The on board ultra-low dropout 3.3V power regulator supplies up to 150mA and will accept voltages up to 16V. It has reverse polarity, thermal cut-out and current limit protection. The board can be powered from either the USB or from an external source such as a battery and it will automatically switch from one to the other.

- Arduino IDE compatible (ATtiny85)
- Main board is only 28mm in diameter
- Needles and conductive thread included
- Battery holder and batteries are included!
- Adafruit part no.: 1657

Type	Order code	1+
Gemma starter pack	**73-5383**	23.14

563278

LED Sequins for Wearables - Pack of 5

The **Adafruit Wearable LED Sequins** can hook to your Gemma or Flora board to show off your coding and your design skills at the same time. Use PWM to make them fade or sparkle for your next wearable or cosplay project. They consist of a 1206 size LED with a 100 Ohm limiting resistor and only draw 5mA at 3.3V letting you stack 4 or 5 of them on a single GPIO pin. You don't strictly need an MCU either, simply power them from a LiPo or coin battery.

- 1206 size LEDs with 100 Ohm series resistor
- 4 x 9mm (0.16 x 0.35in.)
- 2mm thick
- Holes are 7mm (0.28in.) apart
- Sold in packs of 5

Type	Order code	1+
LED sequins green	**73-5391**	3.68
LED sequins blue	**73-5392**	3.31
LED sequins red	**73-5390**	3.68
LED sequins white	**73-5393**	3.68

563202

Adafruit Feather

Feather Main Boards

Adafruit are setting a new standard for single board microcontrollers and it's called Feather. The range is based around a small collection of microcontrollers and a large collection of add-on cards, all with the same small footprint.

New to Feather? Adafruit have designed a range of processor boards with a consistent board shape and pinout together with a range of add-on boards with a huge range of functionality. The main boards are based on several popular 3.3V DC microcontrollers (MCU) so that you can choose the one that suits your requirements or your budget. MCUs include the Atmel 32U4, Atmel ATSAMD21G18 with an ARM Cortex A0 core, and the popular ESP8266 which is widely used in Internet of Things (IoT) projects. Because Adafruit has used the smallest components available there's room at one end of each board for a specialist function such as an SD-card holder, Bluetooth LE, packet radio, LoRa, a prototyping area or even WiFi.

The **Feather main boards** feature a USB port for power and programming, a LiPo battery connector, and support for serial, I2C and SPI in hardware. The various processors offer different numbers of GPIO pins and analogue inputs, please refer to the individual product pages and the technical specification for details. Each one has a 3.3V DC regulator which is able to supply up to 500mA peak current. The boards have a 100mA LiPo charging function with a status indicator LED and there's also a general purpose LED for blinking. The Feather boards are about ⅓ x the size of an Arduino UNO and there's even a Reset button.

Once you've chosen your processor, select one or more FeatherWing add-on boards and get developing. The range includes development tools such as prototype boards and an over-size board with screw terminal blocks for external wiring.

- 4 x mounting holes
- Dimensions 51 x 23 x 8mm (2.0 x 0.9 x 0.28in.)

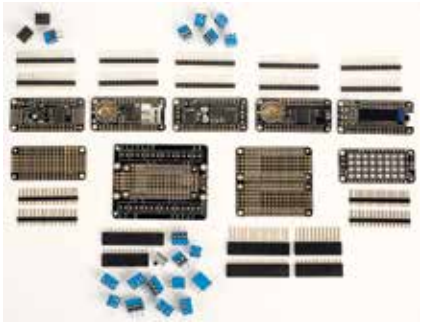
Technical specification

Order code	Adafruit part no.	MCU	GPIO	Analogue inputs	PWM	Function
73-5250	3076	32U4	20	10	8	Packet radio
73-5260	3027	32U4	20	10	8	Mobile phone & data
73-5301	2795	32U4	20	10	8	Data logging
73-5308	2829	32U4	20	10	8	Bluetooth LE
73-5309	2771	32U4	20	10	8	Prototyping
73-5299	2821	ESP8266	9	1	-	WiFi
73-5256	3061	M0	20	6	20	WiFi
73-5300	2772	M0	20	6	20	Prototyping
73-5306	2796	M0	20	6	20	Data logging

Type	Order code	1+
32u4 datalogger	**73-5301**	18.23
32u4 Bluetooth LE	**73-5308**	25.40
32u4 basic proto	**73-5309**	16.71
32u4 FONA	**73-5260**	29.28
32u4 RFM69HCW	**73-5250**	20.86
ATSAMD21 cortex M0	**73-5300**	16.81
Cortex M0 datalogger	**73-5306**	18.12
Cortex M0 WiFi	**73-5256**	29.00
ESP8266 WiFi	**73-5299**	16.84

563217

FeatherWing Add-ons for all Feather Boards



The **Adafruit FeatherWing** range of add-on boards is a large and growing collection of useful modules you can use for your Feather projects. Current add-ons include precision real-time clocks, prototyping, eye-watering LED displays and more. The modules are compatible with all the Feather main boards although there is the occasional exception which is noted on the individual product page.

Some soldering may be required as boards are usually supplied with strips of 0.1in. header where appropriate.

New to Feather? Adafruit have designed a range of processor boards with a consistent board shape and pinout together with a range of add-on boards with a huge range of functionality. The main boards are based on several popular microcontrollers (MCU) so that you can choose the one that suits your requirements or your budget. MCUs include the 32U4, Atmel ATSAMD21G18 with an ARM Cortex A0 core, and the popular ESP8266 which is widely used in Internet of Things (IoT) projects. Each main board has a micro-USB socket for power and programming, a battery connector with charging function and a special function. Because Adafruit has used the smallest components available there's room at one end of the board for a specialist function such as an SD-card holder, Bluetooth LE, packet radio, LoRa, a prototyping area or even WiFi.

The **Atmel ATSAMD21G18** is a very interesting chip, it's the one chosen to power the **Arduino Zero** so you know it will be supported by Arduino development tools, libraries and IDEs. It has a Cortex M0 core with 256kbytes of Flash memory, 32Kbytes of RAM, and runs at 48MHz and 3.3V DC. Compared to the **Atmel 32U4** it has 8 x the Flash memory, 16 x RAM and a much faster clock speed, 48Mhz compared to 8MHz.

Once you've chosen your processor, select one or more add-on boards and get developing. The FeatherWing range includes development tools such as prototype boards and an over-size board with screw terminal blocks for external wiring.

- Standard Feather pinout, plug and play
- Standard Feather board size 51.2 x 22.8 x 8mm (2. x 0.9 x 0.28in.)

Type	Order code	1+
PWM & Servo FeatherWing	**73-5303**	8.57
Data logger FeatherWing	**73-5268**	7.71
DC motor & stepper ctrl.	**73-5304**	15.04
Real-time clock	**73-5258**	10.85
Doubler prototype add-on	**73-5302**	5.59
128x32 OLED display	**73-5305**	12.52
Prototyping add-on	**73-5307**	4.39
4x8 RGB LED	**73-5298**	12.79
Terminal block breakout	**73-5267**	11.44

563216

Order online

Save time, and place your order at:
www.rapidonline.com
24 hours a day

Adafruit FONA

FONA 3G Cellular/GPS Breakout Board

The **Adafruit FONA 3G Cellular Breakout Board** adds to their impressive 2G phone breakouts with 3G and GPS built in. You can expect better coverage, backwards compatibility with GSM and a fast GPS with a 1s hot start time to first fix (TTFF). On the phone side, it's quad-band and will connect to any GSM network with a 2G SIM, plus dual-band UMTS/HDSPA. It can send and receive SMS messages, and send and receive GPRS data. Plug the module into your PC USB and you can send AT commands at up to 4Mbits/sec, talk GPS NMEA, and a use it as a modem. The GPS module has 16 x acquisition channels, 1s hot start time to first fix and an accuracy of 2.4m; an active GPS antenna is highly recommended to achieve best results.

Adafruit have surrounded this fine module with a host of extras including 500mAh+ LiPo and Li-ion battery charging, a TRRS headphone jack, and breakouts for an 8Ω speaker plus electret mic. Plus 2.8 to 5V power and logic compatibility, LEDs for power, battery charge and network, uFL connectors for phone and GPS antennas and a SIM socket. You will need a few things to complete a working gadget including a 2G or 3G SIM card, a 500mAh or larger battery, a micro USB cable, external uFL antennas for GSM and GPS, and a TRRS headset.

Daunted? This is quite an advanced product and best suited to the experienced. However, Adafruit have a simpler products, the FONA mini cellular breakout (75-0587) and FONA 800 Shield for Arduino (73-5316), with more mature libraries, instructions and community.

Supplied as a fully assembled and tested 3G breakout board plus a strip of 0.1in. header pins for you to solder on as required.

- Mobile phone and GPS in one module
- Accepts 2G and 3G SIMs
- On board GPS, accurate to 2.4m
- Built-in battery charger for 500mA+ LiPo and Li-ion batteries
- Dimensions: 50 x 46 x 7mm (2.0 x 1.8 x 0.3in.)
- Adafruit part no.: 2691

Type	Order code	1+
FONA 3G / GPS	**73-5311**	62.06

563272

FONA Mini Cellular GSM Breakout SMA Version

The **Adafruit FONA Mini Cellular GSM breakout boards** could put your next project in touch with the world. Send and receive SMS messages and GPRS data, make and answer phone calls, and listen to FM radio. In fact enough functions to build a working phone, including driving a vibration motor and recharging a LiPo battery from the USB power. The boards need a microcontroller to drive them and will work with any microcontroller that can send and receive serial data, from an Arduino to a Raspberry Pi. The example wiring uses only 4 x microcontroller pins, though you can probably get by with just Tx/Rx. Adafruit have a FONA tutorial which demonstrates how to wire them up and interact with them using the AT command set from a serial terminal. While you're developing your application you can use a serial terminal to send commands and get responses so that you can see exactly what's happening.

There are two versions, **75-0587** which has an SMA connector and **75-0588** which has a uFL connector.

- Use mobile voice, text, SMS and data in your next project
- SMA or uFL antenna connector versions
- Add a headset or speaker & electret mic for voice calls
- AT serial command interface
- 3 to 5V power and logic compatible

Type	Order code	1+
FONA SMA	**75-0587**	37.14
FONA uFL	**75-0588**	33.14

561307

RFID/NFC

MiFare Classic 13.56MHz RFID/NFC Cards, Tags and Fobs 1KB

The **Adafruit MiFare Classic 13.56MHz RFID / NFC devices** can be read by almost any RFID/NFC reader that can handle ISO/IEC 14443 Type A cards. With 1kbytes of stored data the cards also have a permanent 4-byte ID burned into each one so that you can uniquely identify them. They support up to 100,000 re-writes. We also supply a suitable reader, **73-5294**. Adafruit's learning site has tutorials describing how to get the breakout board working with the Raspberry Pi or with an Arduino.

Please note that the NFC forum decided not to support ISO/IEC 14443 Type A in 2014 so newer phones don't support this standard. If your project isn't phone or tablet based then this shouldn't be an issue.

- 1 kbyte (8 kbit) non-volatile EEPROM storage
- Built in encryption engine with 48-bit key
- 4-byte unique identifier burned into the chip
- Reading distance approx. 50 to 100mm (2 to 4in.)

Type	Order code	1+
RFID/NFC card	**73-5288**	2.35
RFID/NFC clear fob	**73-5290**	2.35
RFID/NFC clear tag	**73-5291**	2.35
RFID/NFC leather fob	**73-5289**	3.67
RFID/NFC sticker	**73-5292**	2.35
RFID/NFC white tag	**73-5293**	2.35

563203

PN532 NFC / RFID Controller Breakout Board v1.6

The **Adafruit PN532 NFC / RFID Controller Breakout Boards** are the perfect complement to Adafruit's range of RFID tags and cards. Based on the PN352 NFC chip, the most popular chip on the market, these boards are very capable and flexible. They can read and write NFC/RFID Type 1 to 4 tags and cards, they can appear to other devices to actuallybea card and they can perform bi-directional communication with mobile phones and tablets.

Talking to the boards is simple, using 3.3V TTL serial communications at any baud rate, I2C or SPI. Because the NFC chip is so popular it is supported by the Open Source package libnfc which will let you control a board via an FTDI cable using any Linux, Mac or Windows computer. Each board has an FTDI header for just this purpose. The boards have a built in 13.56MHz antenna for compatibility with popular cards and tags. Adafruit have produced a tutorial to get you started which has links to useful libraries and other downloads.

Supplied with the PN532 breakout board, 0.1in. header strip, a pair of jumpers, a 4040 level shift chip and an RFID card.

- Uses popular PN532 chip
- Built-in 13.56MHz antenna
- Drive the boards using free libnfc and an FTDI cable
- Dimensions 51 x 117.7 x 1.1mm (2 x 4.7 x 0.425in.)
- Adafruit part no.: 364

Type	Order code	1+
NFC / RFID controller	**73-5294**	31.98

563277

Grove - User Interface and Control Modules

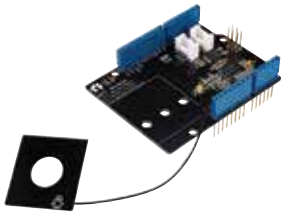
The **User Interface and Control Modules from Seeed Studio** are a selection from Seeed's collection of Grove add-ons which allow the user to interact with their projects.

- 6 x 2 LCD Display RGB Backlight
- Relay Add on Board 250V @ 10A
- Thumb Joystick
- 125KHz RFID Reader

Type	Order code	1+
16x2 LCD	**75-0430**	9.79
125KHz RFID reader	**75-0434**	9.77
Relay board	**75-0436**	2.28
Thumb joystick	**75-0457**	6.90

560373

NFC Shield with Antenna SPI Interface V2.0



The **NFC Shield from Seeed Studio** lets your Arduino read and write 13.56MHz RFID tags. A separate PCB antenna is included giving you more flexibility. The shield itself has two Grove connectors for access to Seeed's large array of add-on modules, extension headers to plug in other shields and an extension connector for the ICSP signals. Seeed have provided a software library and several examples on the NFC Shieldpage of their wiki.

- 50mm max. effective range
- SPI pin saving interface
- Serve for contactless communication at 13.56MHz
- Supports P2P communication
- Supports ISO14443 Type A and B protocols

Type	Order code	1+
NFC shield	**75-0478**	20.94

560360

RFID Tags 13.56MHz

The **13.56MHz M1 RFID Fob from Seeed Studio** is a small, easy to carry tag which operates at 13.56MHz. If your NFC/RFID reader can read Mifare cards at 13.56MHz then it can probably read these. Applications include access control, customer identification , object tracking and others.

Type	Order code	1+
Fob style tag	**75-0481**	0.766
Book style tag	**75-0483**	1.09
Combo pack	**75-0485**	2.07

560359

Breakout Sensor Boards

Triple-Axis Accelerometer Breakout Boards

The **Adafruit Triple-Axis Accelerometers** offer adjustable sensitivity and a choice of either I2C or SPI bus connectivity. Select from ±2, 4, 8 or 16g sensitivity; ±2g gives a higher resolution for slow movements while ±16g is best for high speed tracking. They can be configured to detect various events, such as a single tap or free-fall.

Supplied as a fully assembled and tested accelerometer boards plus a strip of 0.1in. pitch header pins for you to solder on as required. Adafruit provide a free tutorials to help get you started, please refer to the individual product pages for details.

- 3-axis accelerometers with adjustable full scale
- Detect free-fall events etc.
- I2C or SPI connectivity
- Breadboard friendly

Type	Order code	1+
ADXL345	**73-5332**	14.88
LIS3DH	**73-5283**	5.89

563257

adafruit

VCNL4010 Proximity/Light sensor I2C

The **Adafruit VCNL4010 Proximity / Light sensor** is a useful board for measuring proximity from 10 to 150mm. Proximity sensing is always handy for robotics applications, but this sensor could also be used for touchless switching etc. It has built-in I2C connectivity making it compatible with most microcontrollers. Adafruit have also added a voltage regulator and level shifters to make it 3.3 to 5V logic and power compatible. Depending on your application, it's worth powering the board with 5V DC as this provides more power to its infra-red emitter for better illumination of nearby objects. Additional features include a visible light sensor and an interrupt output so that your microcontroller doesn't have to keep polling the sensor.

Supplied as a fully assembled and tested proximity sensor board plus a strip of 0.1in. header pins for you to solder on as required. Adafruit provide working example code to help get you started.

- Measure proximity between 10 and 150mm using infra-red
- Additional visible light sensor approximates human eye response
- I2C connectivity
- 3.3 to 5V DC logic and power compatible
- Dimensions: 23 x 23 x 3.2mm (0.9 x 0.9 x 0.125in.)
- Adafruit part no.: 466

Type	Order code	1+
VCNL4010	**73-5285**	7.20

563266

adafruit

Barometric Pressure/Altitude/ Temperature Sensors

The **Adafruit I2C Barometric Pressure/Altitude/ Temperature Sensors** use only 2 x GPIO pins (I2C) and provide you with precision air pressure measurements. Each board contains a 3.3V regulator, an I2C level shifter and pull-up resistors on the I2C bus making it 5V ready.

Adafruit supply a libraries and example code to get you started, please see the individual product pages for the appropriate links. Supplied with a fully assembled and tested sensor board plus a strip of 0.1in. header pins for you to solder on as required.

- Measure temperature and pressure, and altitude
- 3 to 5V logic compatible
- Pressure range: 500 to 1100hPa (9000m to -500m above sea level)
- Temperature range: -40 to +85°C

Type	Order code	1+
BMP280	**73-5286**	8.62
MPL3115A2	**73-5402**	9.00

563262

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BME280 I2C or SPI Temperature Humidity Pressure Sensor

The **Adafruit BME280 Temperature, Humidity, Pressure Sensor** is an excellent choice for your next environmental/weather project with the advantage of I2C and SPI connectivity. See below for details about its measurement accuracy, in particular the pressure sensor is accurate enough to reliably measure altitude to within 1m. The board has an onboard regulator and level shifting to make it 3.3 and 5V compatible for logic and power.

Supplied as a fully assembled and tested sensor board plus a strip of 01.in. header pins for you to solder on as required. Adafruit provide a free tutorial and software library to help get you started.

- Humidity accuracy ±3%
- Temperature accuracy ±1.0°C
- Barometric pressure accuracy ±1hPa
- Altitude accuracy ±1m
- 3.3 to 5V logic and power compatible
- Dimensions: 19.0 x 18.0 x 3.0mm (0.7 x 0.7 x 0.1in.)
- Adafruit part no.: 2652

Type	Order code	1+
BME280	**73-5287**	16.41

563263

adafruit

Digital Infra-red/Visible Light Sensors with I2C, 5V ready

The **Adafruit Digital Light Sensors** let your next project measure the illuminance under a variety of ambient conditions. Ideal for adjusting LCD brightness according to the ambient illumination or for setting photographic exposure times etc. If you need the UV index, use **73-5395**. For measurements tuned to the human eye's response use **73-5327** or the extremely sensitive **73-5410**. They're all 3 to 5V compatible and can communicate via I2C.

Adafruit supply information and software to get you started, please see the individual product pages for details. Supplied as a fully assembled and tested sensor board plus a strip of 0.1in. header pins for you to solder on as required.

- Measure Infra-red and visible illuminance
- 3 to 5V compatible
- Communicate via I2C

Type	Order code	1+
SI1145	**73-5395**	8.57
TSL2561	**73-5327**	5.34
TSL2591	**73-5410**	6.14

563265

adafruit

Electret Microphone with Built-in Amplifier

The **Adafruit Electret Microphone Boards** feature a built-in microphone and use specialist microphone amplifier chips. Choose between automatic gain control (AGC) and adjustable gain versions. Suitable for purely analogue applications such as sound recording or digital applications attached to a microcontroller and suitable software. For example, use Adafruit's FFT library to extract frequency information to make a sound visualising display. Please see the individual product pages for links to Adafruit's tutorials.

If you want to connect one to a Line Input then use a blocking capacitor of between 1 and 100µF unless you have a differential amplifier or it already has its own blocking capacitor. Blocking capacitors aren't necessary when connecting to an analogue to digital converter of an Arduino for example.

Supplied with a fully assembled amplifier board, and a strip of 0.1in. header pins for you to solder on if required.

- Built-in electret microphone
- Built-in amplifier drives small headphones, Line Input or ADC

Type	Order code	1+
Auto gain control	**73-5387**	7.54
Adjustable gain	**73-5328**	7.13

563200

adafruit

AD8495 Analogue Output K-Type Thermocouple Amplifier Breakout

The **Adafruit K-Type Thermocouple Amplifiers** offer a quick and easy way of hooking up a thermocouple to your next project. Thermocouples need a cold-compensation reference and a good amplifier which is where these breakout boards come in. They handle all the electrical complications and provide you with either an analogue (**73-5399**) or digital SPI output (**73-5329**) which you can feed into your microcontroller or other circuitry if you are going old school.

The analogue output amplifier (**73-5399**) has a measurement temperature range of -24 to +400°C while the digital output (**73-5329**) amplifier has a -200 to +1350°C range.

Supplied as a fully assembled and tested thermocouple amplifier board plus a strip of 0.1in header pins and a 2-way screw terminal block for you to solder on as required. Adafruit only recommend these amplifiers for K-type thermocouples although the datasheets mentions other types. Feel free to experiment, but we only support their use with K-type thermocouples.We supply the thermocouples separately.

- Choose from analogue or SPI output
- For use with K-type thermocouples only

Type	Order code	1+
AD8495	**73-5399**	9.60
MAX31855K	**73-5329**	12.76

563259

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www.rapidonline.com/activate

Contact-less Infrared Thermopile Sensor Breakout

The **Adafruit Contactless Infrared Thermopile Sensor Breakout** is unusual in that it uses a thermopile which senses infra-red radiation at a distance in order to measure temperature. It has an almost 180° field of view and measures the average temperature across that view. In order to focus in on a specific target the sensor has to be close enough that the object occupies a significant portion of its field of view. Please refer to the datasheet and manual for details. It's possible to have up to 8 x thermopile sensors on one I2C bus.

Supplied as a fully assembled and tested infrared sensor board plus a strip of 0.1in. header pins for you to solder on as required.

- Contactless temperature measurement
- 2 x mounting holes
- Dimensions: 20mm x 20mm (0.8 x 0.8in)
- Adafruit part no.: 1296

Type	Order code	1+
Thermopile sensor	**73-5331**	9.00

563264

RGB Colour Sensor with IR filter Arduino Compatible

The **Adafruit RGB Colour Sensor** uses the TCS34725 sensor which includes 4 x photodiodes covered by an IR blocking filter for greater accuracy. Three of the photodiodes are covered with coloured filters to provide the individual RGB values and the fourth is left clear for an overall value. With a dynamic range of 3.8 million to 1 and adjustable integration time and gain it's even possible to use this sensor behind darkened glass or possibly fabric. Adafruit have added a neutral white LED to provide consistent illumination when you are trying to measure the colour of a surface. It is under software control so it can be switched off when not in use to save power or kept off depending on your application. The board has a 3.3V regulator and level shifting circuitry to make it 3.3 to 5V logic and power compatible.

Adafruit provide a free tutorial and an open source software library for you to download to help you get started.

- Separate R, G, B and white photodiodes
- IR filter for increased accuracy
- On board neutral white LED (4150K) for consistent illumination
- Uses high speed I2C, up to 400KHz
- 3,800,000:1 dynamic range
- 2 x mounting holes
- Dimensions mm diameter 20.4 x 20.3mm (0.8 x 0.79in.)
- Adafruit part no.: 1334

Type	Order code	1+
RGB colour sensor	**73-5333**	7.21

563270

Flowol

Flowol 4

Primary 3D Mimic Pack 1 for Flowol 4

Mimics are on-screen simulations of real-life situations that can be controlled by your Flowol program as if they were real machines. The Primary Mimic Pack 1 is available as a Single-User licence or a School Site licence.

- **The Horse Ride Mimic** is controlled by two independent motors so the type of ride can be varied. Virtual inputs can be used to stop the ride in its lowest position
- **The Pirate Ship Mimic** uses motors to control the motion of the ship and the sliding doors on its side. Virtual inputs are also available to detect the ship in its mid position and to indicate when the doors are shut
- **The Teacup Ride Mimic** uses motors to control the rotation of the ride, the spin of the cups and the opening of gates. Lights on the rim of the base can be illuminated and a virtual input detects the position of the ride
- **The Grabber Game Mimic** allows the user to win a teddy bear by controlling the four motors needed to manipulate the grab

Type	Order code	1+
Pri. Mimic Pk1 Single	**70-0296**	10.30
Pri. Mimic Pk1 School	**70-0297**	49.44

519523

Flowol 4

Secondary 3D Mimic Pack 1 for Flowol 4

Mimics are on-screen simulations of real-life situations that can be controlled by your Flowol program as if they were real machines. The Secondary 3D Mimic Pack 1 is available as a Single-User licence or a School Site licence.

- **The Car Park Mimic** gives students the opportunity to explore the control features of car park barriers. Input switches on the ticket posts and pressure mats can be used to operate the articulated barrier. A variable can be used to count the cars in and out, control the Full sign and illuminate the seven segment display to indicate the available spaces
- **The Bridge Mimic** gives students the opportunity to explore the operation and safety features of a lifting road bridge. The beacons and road signals can be controlled and the left and right road barriers operated separately. The main bridge and barriers each have virtual input switches to detect when they are fully open or closed
- **The Lift Mimic** gives students the opportunity to explore the control features of a lift. The position of the lift is detected by virtual sensors on each floor. These can be used to stop the lift accurately and operate the floor indicator lights. By combining the inputs from the call buttons and position sensors, the lift's movement can be controlled. When the doors operate, warning messages can be added by using the sound files included with the mimic
- **The Flume Mimic** gives students the opportunity to explore and control the excitement and safety of a theme park ride. The sign, camera and fountain can be activated by the virtual inputs tripped by the moving logs. The log movements can be controlled by gates and feedback switches. (Initially choose one log with two gates and then introduce two logs with three gates)

Type	Order code	1+
Sec. Mimic Pk1 Single	**70-0298**	10.72
Sec. Mimic Pk1 School	**70-0299**	62.13

519524

Flowol 4

Licences and Licence Upgrades

Flowol 4 allows students of all ages to develop logical reasoning and problem solving talents, develop programming skills and explore the world of automatic, autonomous systems and robots.

Programming visually with a flowchart allows the student to focus on the logic of their solution rather than the syntax of a written program.

The Flowol 4 software is distributed as an internet download. Your purchase will include full download and installation instructions and a license key for either the Windows PC or Apple Mac version of Flowol 4.

Supports numerous pieces of well known hardware including:

- VEX Robotics
- PICAXE
- Arduino
- Fischertechnik ... and more.

Flowol supports many programming elements:

- Sequences of instructions
- Branching using decisions
- Loops (infinite, or based on a condition or count)
- Variables and simple variable manipulation
- Sub-procedures (parameters optional)
- Multiple parallel threads

System Requirements for Windows PC:

- Microsoft Windows XP, Vista, Windows 7 or Windows 8 (both 32bit and 64bit supported)
- 512 MB of RAM
- 120 MB of available hard-disk space
- Internet connection to download and activate the software (Flowol 4 includes an MSI for installation on networks)

System Requirements for Apple Mac:

- Apple Mac computer with Intel processor
- Mac OS X 10.8 (Mountain Lion), 10.7 (Lion), 10.6 (Snow Leopard) or 10.5 (Leopard)
- 512 MB of RAM
- 100 MB of available hard-disk space
- Internet connection to download and activate the software

Type	Order code	1+
Flowol 4 Single	**70-0290**	30.90
Flowol 4 Primary	**70-0291**	160.68
Flowol 4 Middle	**70-0292**	226.60
Flowol 4 Secondary	**70-0293**	321.36
Flowol 2 to 4 Upgrade	**70-0294**	95.34

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