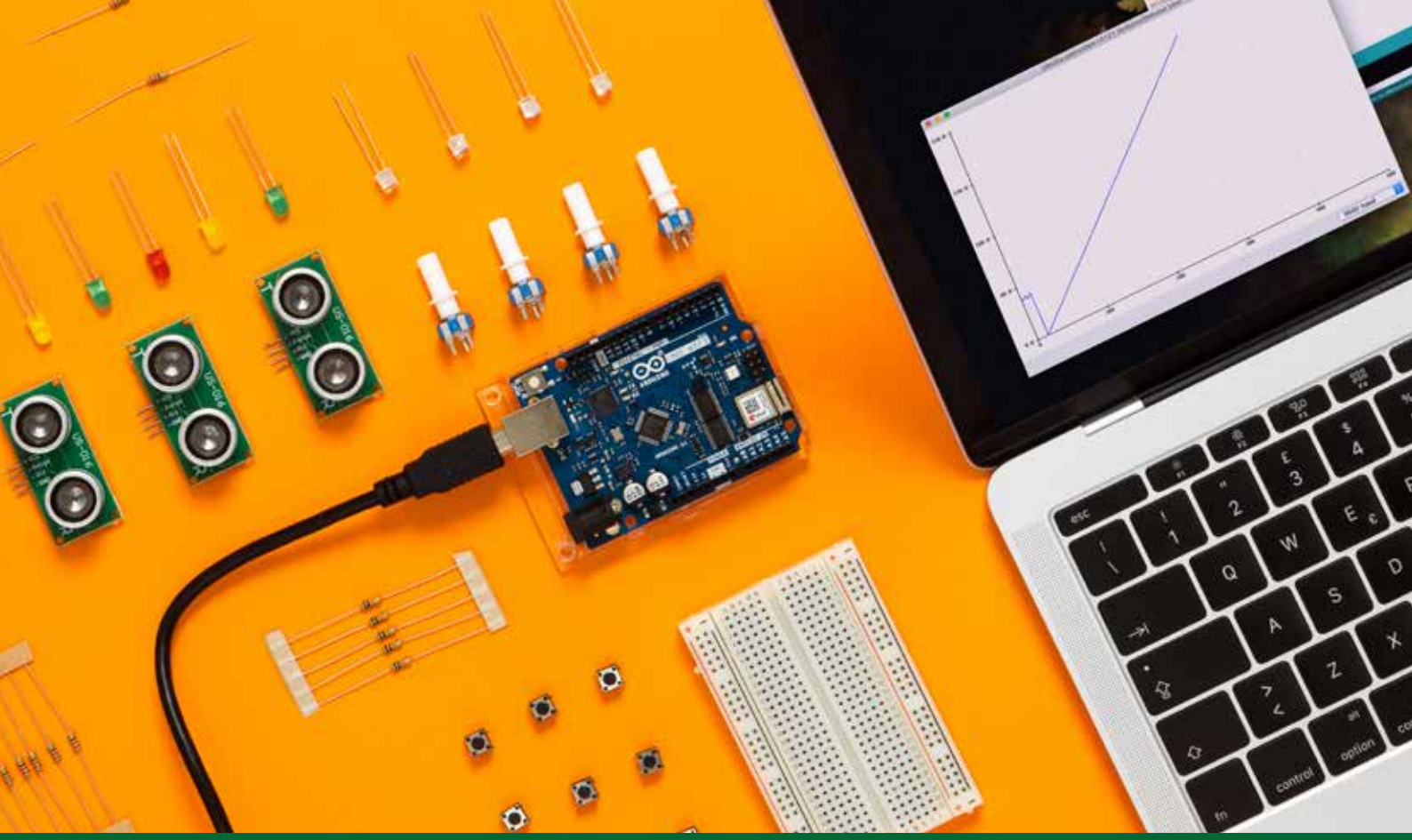


Programming

Full range of Programming products available at:

www.rapidonline.com

REACTION GAME

micro:bit PROJECT

Make a reaction game with real physical switches you can bash as hard as you like!

BBC micro:bit

TASK 1 – MAKE IT

How it works

- Make two physical input switches using cardboard and tin foil – similar to the ones used in the Pressure switch alarm project.
- Connect them to the micro:bit pins as in the picture – one tin foil pad on each switch goes to the micro:bit's GND pin, and the other is connected to pin 1 or pin 2 depending on whether you are player A or player B.
- The program waits a random time between 1 and 5 seconds, then shows a heart on the LED display output.
- You can't hit your button before it lights because it uses Boolean logic to stop anyone cheating! Boolean variables can only have two values: True or False. The game started variable prevents either player pressing their button too soon by only checking which button is pressed while the game has started.
- An infinite loop keeps the game running so you can keep playing.

What you need

- 1 micro:bit
- 4 crocodile clip leads
- Some scrap cardboard, tin foil, glue and scissors

TASK 3 – IMPROVE IT

- Use variables to keep track of each player's score
- Add a timer to show how quick each winner's reaction was
- Track which player has the fastest reaction time

TASK 2 CODE IT

STEP COUNTER
micro:bit PROJECT

Turn your micro:bit into a step counter (or pedometer) to help you track how active you are - and learn some coding at the same time!

TASK 1 – MAKE IT

How it works

- Like the Dice project this program uses the micro:bit's accelerometer to make something happen.
- It counts how many times the micro:bit has been shaken. It stores this number in a variable called 'steps'.
- Variables are used by computers to store information that may change, such as the number of steps you've taken.
- Every time the micro:bit accelerometer input senses a shake, the program increases the variable by 1, and shows the new number on the LED display output.

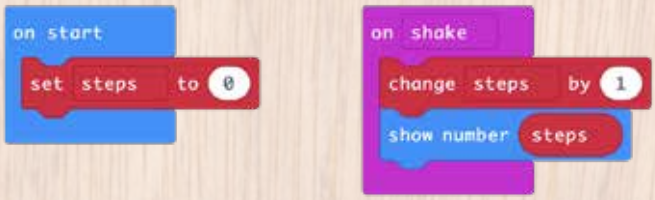
What you need

- micro:bit (or MakeCode simulator)
- MakeCode or Python editor
- Battery pack (optional)
- Something to attach the micro:bit to your shoe or leg – string, tape or hook & loop.

These two videos show you what you'll make and how to code it:

To watch these videos, please view our micro:bit playlist: **Youtube/rapideducationtv**

TASK 2 – CODE IT



TASK 3 – IMPROVE IT

- Add a button to reset the steps to 0.
- Add a graphical representation of how many steps you've taken.
- Measure the length of your average step and get your micro:bit to multiply this by the number of steps to calculate the distance you've walked.

micro:bit

BBC micro:bit

Pocket Sized Codeable Computer

The BBC micro:bit is an educational platform which is perfect for learning the basics of coding and getting started with embedded computing. It's a low cost but feature-packed device that will inspire both students and teachers to get excited, engaged and enthralled by STEM education.

micro:bit can be programmed using a number of different graphical and text-based programming languages which are completely free to access – just visit www.microbit.co.uk and click "Create Code". Programs can be downloaded via a USB cable or over Bluetooth 4.0 from a compatible mobile device.

micro:bit is available on its own or as part of a complete package.

Key features:

- 5 x 5 LED matrix display
- 2x tactile switch button inputs
- Electronic compass
- Accelerometer
- 3x input/output rings
- Bluetooth 4.0 connectivity
- Available on its own or as part of a complete package

Complete kit includes: *1 x micro:bit board, 1 x USB download cable, 1 x switched battery box, 2 x AAA batteries.*

Type	Order code	1+
micro:bit only	**75-0115**	10.49
Complete package	**75-0116**	12.84

563128

Rapid

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+
micro:bit battery box	**18-2899**	0.959

562968

4tronix

Bit:Bot XL Robot for BBC micro:bit with Addressable LEDs

Introducing BitBot XL, taking the much-loved BitBot to the next level. There are several changes, some subtle, some less so, to give a much-improved experience of using and working with the BitBot.

The Microsoft Makecode Extension for Bit:Bot also works for BitBot XL. Go to the Advanced tab or the Tools gear icon and select Extensions, then search for BitBot. It can automatically detect while running which version you have, or you can force it to be the Classic BitBot or the new XL.

- Dimensions: approx 10% larger in length and width
- Chunky wheels
- Ready assembled with battery pack permanently attached
- Motor gearboxes fully covered to minimise fluff, etc., in the gears
- Microbit mounted vertically
- Uses standard breakout connector for ultrasonic breakout
- Line sensors no longer share pins with the Microbit buttons - removes all Bluetooth pairing issues and allows use of buttons in your code
- Pen holder is fitted as standard and is mounted directly over the pivot point for better drawing
- Indicator LEDs added for line follower sensors
- 2 GVS outputs provided for potential servo usage with 5V power
- Makecode extension has been changed so code is compatible with both Classic and XL versions
- Buzzer now connected on Pin 0 so you can play music through it

Plus it still retains all these features from the classic BitBot:

- 2 micro-metal gear motors, both fully controllable in software, for both speed and direction
- Wheels with rubber tyres for maximum grip
- Front ball castor
- 12 smart RGB LEDs in 2 sets of 6 along the arms either side - select any colour for any pixel to produce stunning lighting effects as your Bit:Bot XL moves around
- 2 digital line following sensors - code your own line-following robots and race them to see whose code gets the fastest lap time!
- 2 analogue light sensors allow your Bit:Bot XL to be programmed to follow a light source such as a torch, or you could code it to go and hide in the darkest place it can find
- Buzzer - make beeping sounds or music whenever you want
- Powered from integrated 3x AA battery holder with on/off switch and blue indicator LED
- Easily plug your BBC micro:bit in and out using the vertical edge connector
- Expansion connections at the front for accessories
- Two GVS connectors with 5V for servos (shared with light sensors)

Notes. BBC Micro:Bit is not included - please see **75-0115**. *Batteries, pen and ultrasonic sensor are sold separately - not included.*

Type	Order code	1+
Robot only	**75-5019**	34.90
Robot + bundle	**75-0299**	39.95

568726

4tronix

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.

Also available is the **Robo:Bit MK3** (**75-5014**) that includes, along with the buggy, the line following sensor, ultrasonic distance sensor, integrated pen holder, and the LED light bar.

- 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 MK3	**75-5014**	27.18
Line sensor	**75-0127**	5.00
McRoboFace white	**75-0147**	6.50
HC-SR04 v2	**75-0146**	3.50
Talon/grabber	**75-5008**	10.00

565005

4tronix

Bit:Commander Game Pad for BBC micro:bit

The **Bit:Commander** game pad is a great accessory for the **BBC micro:bit**. With the device you can power and experiment with the micro:bit, plus the Bit:Commander can be used to act as a remote control for another micro:bit device, such as a Bit:Bot, act as a self-contained portable (no wires) games console.

- Great for gaming
- Experiment with D/A inputs as well as speaker and neopixel outputs
- Everything is pre-fitted, no wires, soldering or jumpers to fiddle with

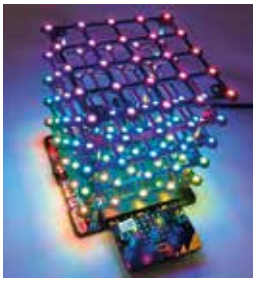
For more details visit **www.rapidonline.com**.

Type	Order code	1+
Bit:Commander	**75-0898**	16.50

566979

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 color 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)

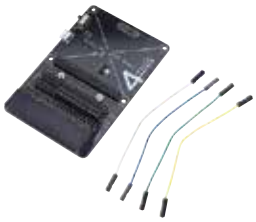
Configuration	Colour	Brightness (255)	Current
3x3x3	Red	40	150mA
3x3x3	White	40	340mA
3x3x3	White	255	1.9A
4x4x4	Red	40	350mA
4x4x4	White	40	800mA
4x4x4	White	255	4.5A
5x5x5	Red	40	680mA
5x5x5	White	255	1.6A
5x5x5	White	255	8.75A

Type	Order code	1+
3x3x3 Addressable RGB LEDs	**75-5009**	18.00
4x4x4 Addressable RGB LEDs	**75-5010**	37.98
5x5x5 Addressable RGB LEDs	**75-5011**	75.00
Base	**75-5012**	10.00

567658

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**	10.53

565006

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

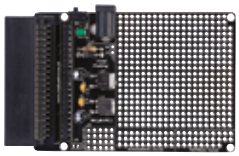
Note: *Neither Arduino nor BBC micro:bit are included.*

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

DFRobot

DFROBOT

KIT0138 Gravity IoT starter Kit for micro:bit

The IoT Starter Kit is an all-in-one bundle for micro:bit beginners to quickly experience and build Internet of Things projects.

The kit comes with a micro:bit microcontroller, a Wi-Fi module and 7 sensors/actuators that are wildly used in real-life IoT applications.

You can easily setup the Wi-Fi connection in MakeCode Block Editor, program your micro:bit and eventually interact with your smart devices.To make things even easier and fun, EasyIoT, a free educational IoT platform, allows subscribers to exchange and visualize the data.

This starter kit is compatible with hundreds of DFRobot Gravity Series modules, bringing endless possibilities to your IoT applications.

Features:

- micro:bit with internet connectivity
- The kit comes with a plug and play Wi-Fi module, Obloq, that adds Internet connectivity to micro:bit
- To start internet connection, simply fill in your Wi-Fi name and password into the coding blocks

Type	Order code	1+
Gravity for micro:bit	**75-0109**	60.48

568374

DFROBOT

DFR0518 Micro:Mate Mini Expansion Board for micro:bit Gravity Compatible

Micro:Mate is a tiny micro:bit I/O expansion board for learning electronics and building DIY projects.

Micro:Mate expands 6 sets of 3-pin I/O interfaces, capable of connecting DFRobot Gravity series modules, servo motors, sensors and jumper wires. Additionally, pins 8, 12, 16 support voltage switch between 3V and 5V, allowing up to 5V, 2A digital (PWM) output.

Micro:Mate is the same size as the micro:bit. It connects to micro:bit through spring-loaded contact pins, ensuring easy, compact and secure connection. The rubber bumpers and the 3.5mm audio jack on the back keep the expansion board installed stable on the board and prevents reversed connection.

Features:

- Colour-coded Gravity 3-pin interface, compatible with hundreds of plug & play electronic modules
- 3-way analog input; 6-way digital input/output (PWM); 3V/5V jumper switch; 3.5mm audio jack
- External Micro USB power port, up to 5V, 2A power output
- Well-designed component layout and silk-screen
- Reversed connection protection

Specification:

- Interface: 6x Gravity 3-pin
- Operating voltage: 5V/3.3V
- Input power: <10W
- Measuring range: 0 to 3.3V (analog), 0 to 5V (digital)
- Dimensions: 68.5 x 53.3mm (2.7 x 2.1in)
- Weight: 22.8g
- **DFRobot type DFR0518**

Note: The mounting screws should be well tightened to ensure a secure connection. Micro:Mate only supports 3V (3.3V) analog input from pins 0, 1 & 2. The Micro USB power port on Micro:Mate cannot be used for data transmission. Components with large power consumption should be connected to pin 8, 12 or 16 with 5V power supply.

Type	Order code	1+
Micro:Mate	**75-0106**	4.87

568372

DFROBOT

DFR0521 micro:bit Expansion Board for Boson (Gravity Compatible)

micro:bit is a pocket-sized microcontroller designed for kids and beginners to learn coding and electronics, letting them easily bring ideas into DIY digital games, interactive projects and robotics.

However, on-board I/O rings and crocodile clips sometimes are not handy and safe enough to connect peripherals. To explore more possibilities with micro:bit, we have designed the micro:bit Expansion Board for Boson, a carry-on board that connects to the micro:bit via an edge connector.

The expansion board comes with 6 fool-proof 3-pin sockets, compatible with hundreds of DFRobot's Boson and Gravity modularised electronic blocks, covering most popular digital and analog sensors and actuators, supporting sound, light and motion interaction.

Moreover, the on-board 3.5mm headphone jack and volume knob supports direct connection of a headphone. To ensure a steady current supply for these peripherals, the expansion board can be powered externally through the USB power port.

Features:

- 3-pin fool-proof connectors x6
- Headphone jack with volume knob
- External power port and ON/OFF switch
- DFRobot Gravity and Boson electronic module compatible

Specification:

- Micro USB power port voltage: 5V
- PH2.0 input/output voltage: 3.3V
- Input/output ring voltage: 3.3V
- Maximum current: 500mA
- Working temperature: 0 to 85°C
- Dimensions: 80 x 70mm/(3.15 x 2.76in)
- Weight: 48g

Type	Order code	1+
micro:bit expansion	**75-0107**	6.52

568373

DFROBOT

FIT0533 micro:bit Enclosure (LEGO Compatible)

Snap this case around your micro:bit and connect common building bricks in seconds.

- A and B buttons still accessible
- Transparent case – matrix LED display still visible
- Cut-outs for battery connector, USB socket and edge connector
- Use your original micro:bit battery box

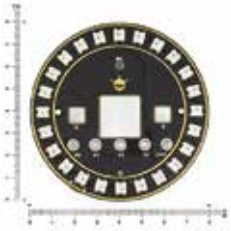
Type	Order code	1+
LEGO compatible box	**75-0104**	1.99

568371

DFROBOT

ROB0150 micro: Circular RGB LED Expansion Board

This circular expansion board for your micro:bit has 24 RGB addressable LEDs that can be individually configured to show any colour. This means you can create bright, eye-catching patterns in thousands of variations.



The A and B buttons as well as the original LED matrix display of the micro:bit is still visible when the board is mounted and it also provides a microphone and buzzer for additional inputs and outputs such as using the LEDs as a colourful audio level meter or to turn on the display when sound is sensed.

- Power from micro-USB or using your original micro:bit battery box
- micro:bit sold separately

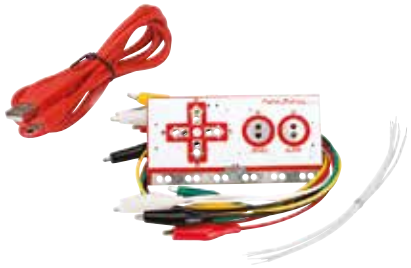
Type	Order code	1+
LED expansion board	**75-0103**	9.45

568370

Makey Makey

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 7 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**	42.52

539085

Makey Makey

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

The Makey MakeyÆ 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 MakeyÆ GO promises to inspire even more science, technology, engineering, and math (STEM) projects than the original, award-winning Makey MakeyÆ – 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**	18.26

564675

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

NEW

Raspberry Pi 4 Model B 8GB

The 8GB Raspberry Pi 4 Model B is the latest product in the popular Raspberry Pi range of computers.

It offers ground-breaking increases in processor speed, multimedia performance, memory, and connectivity compared to the previous generation Raspberry Pi 3 Model B+, while retaining backwards compatibility and similar power consumption.

For the end user, Raspberry Pi 4 Model B provides desktop performance comparable to entry-level x86 PC systems.

The product's key features include a high-performance 64-bit quad-core processor, dual-display support at resolutions up to 4K via a pair of micro-HDMI ports, hardware video decode at up to 4Kp60, 2GB of RAM, dual-band 2.4/5.0GHz wireless LAN, Bluetooth 5.0, Gigabit Ethernet, USB 3.0, and PoE capability (via a separate PoE HAT add-on).

The dual-band wireless LAN and Bluetooth have modular compliance certification, allowing the board to be designed into end products with significantly reduced compliance testing, improving both cost and time to market.

- Memory (RAM): 8GB
- 2.4GHz and 5.0GHz IEEE 802.11b/g/n/ac wireless LAN
- Bluetooth 5.0
- BLE True Gigabit Ethernet
- 2x Micro HDMI ports supporting up to 4K 60Hz video resolution
- Applications include embedded design & development, IoT
- PCB size 85 x 56mm

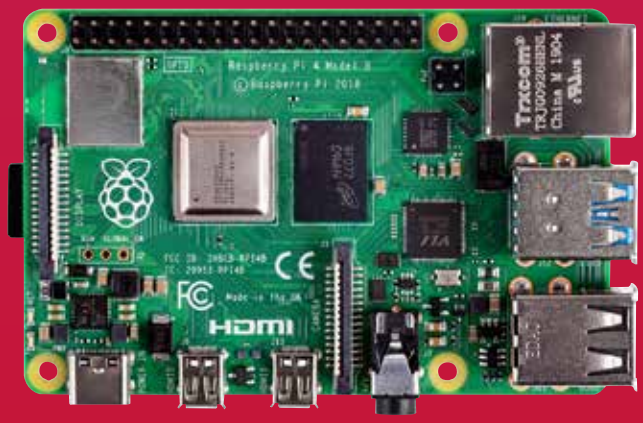
For a suitable 5.1V, 3A, USB C power supply, see order code **85-3011.**

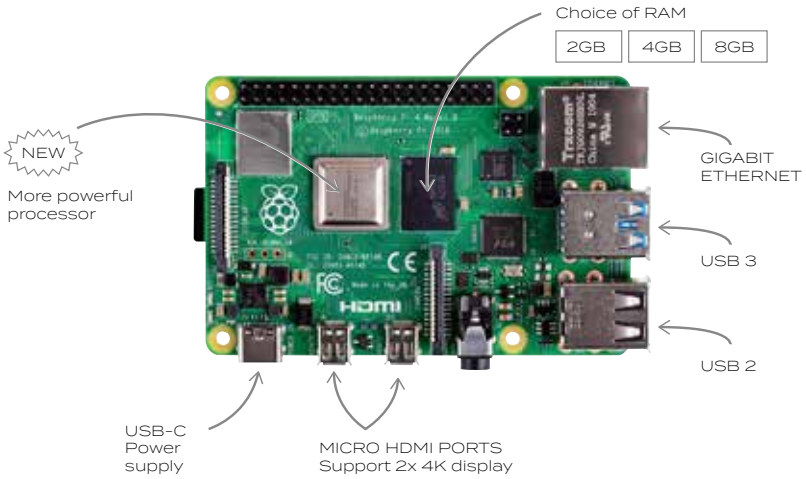
Type	Order code	1+
Raspberry Pi4, 8GB	**75-1013**	62.95

570952

Raspberry Pi 4

Your tiny, dual-display, desktop computer … and robot brains, smart home hub, media centre, networked AI core, factory controller, and much more





Raspberry Pi®

You'll recognise the price along with the basic shape and size, so you can simply drop your new Raspberry Pi into your old projects for an upgrade; and as always, we've kept all our software backwards-compatible, so what you create on a Raspberry Pi 4 will work on any older models you own too.

About Raspberry Pi

The Raspberry Pi Foundation is a registered educational charity based in the UK. The Foundation's goal is to advance the education of adults and children, particularly in the field of computers, computer science and related subjects.

The idea behind a tiny and affordable computer for kids came in 2006, when Eben Upton, Rob Mullins, Jack Lang and Alan Mycroft, based at the University of Cambridge's Computer Laboratory, became concerned about the year-on-year decline in the numbers and skills levels of the A Level students applying to read Computer Science. After many prototypes finally the Raspberry Pi Model B was launched in 2012 with astounding success. It has not only stimulated the teaching of computer science in schools, but has inspired makers, programmers and hobbyists.

2GB
Raspberry Pi 4 Model B
£31.93
Order code 75-1007

4GB
Raspberry Pi 4 Model B
£42.95
Order code 75-1008

8GB
Raspberry Pi 4 Model B
£62.95
Order code 75-1013

Raspberry Pi 4 Model B 2GB and 4GB

The Raspberry Pi 4 Model B is the latest product in the popular Raspberry Pi range of computers.

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The product's key features include a high-performance 64-bit quad-core processor, dual-display support at resolutions up to 4K via a pair of micro-HDMI ports, hardware video decode at up to 4Kp60, up to 4GB of RAM, dual-band 2.4/5.0GHz wireless LAN, Bluetooth 5.0, Gigabit Ethernet, USB 3.0, and PoE capability (via a separate PoE HAT add-on).

The dual-band wireless LAN and Bluetooth have modular compliance certification, allowing the board to be designed into end products with significantly reduced compliance testing, improving both cost and time to market.

- 2.4GHz and 5.0GHz IEEE 802.11b/g/n/ac wireless LAN
- Bluetooth 5.0
- BLE True Gigabit Ethernet
- 2x Micro HDMI ports supporting up to 4K 60Hz video resolution
- Applications include embedded design & development, IoT
- PCB size 85 x 56mm
- **Available in 2GB and 4GB models**

Type	Order code	1+
2GB	**75-1007**	31.93
4GB	**75-1008**	42.95

568266

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.

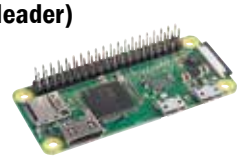
It's definitely a more powerful beast, but it retains the easy connectivity and software of the Raspberry Pi 3.In short, if you love the Raspberry Pi 3, you'll love the 3 Model B+ even more.

- 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+
	75-1005	28.39

566563

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.

For some basic guides to configuring your Raspberry Pi visit www.raspberrypi.org.

The pre-soldered header has 40 pins in a 2 x 20 format with a 0.1in (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+
Wireless board	**75-1030**	16.06

566895

Raspberry Pi Official HDMI Leads

These Official **HDMI cable** assemblies are for use with the **Raspberry Pi 3** board, as well as being backwardly compatible with previous Raspberry Pi boards. The cables have been designed to give the best performance and functionality while being robust and well made. These Raspberry Pi HDMI cables meet the Version 2.0 standards and feature Ethernet and Audio return channel.

- Official Raspberry Pi HDMI cable assemblies
- Male HDMI to male HDMI
- Triple shielded
- Nickel plated contacts
- PVC Outer sheath

Type	Order code	1+
HDMI Lead white 1m	**75-0760**	2.94
HDMI Lead black 1m	**75-0761**	2.94
HDMI Lead white 2m	**75-0762**	3.90

564951

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
- **Not suitable for Raspberry Pi 4**

Type	Order code	1+
NOOBS microSD card	**75-0755**	8.84

564949

Kitting Service

Don't forget we offer a bespoke kitting service

education@rapidonline.com

Pi Kits

Pi 3 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

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**	61.38

566636

Pi 3 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 from http://www.raspberrypi.org/downloads/, 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

Type	Order code	1+
Intermediate student kit	**75-0814**	69.31

566637

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.

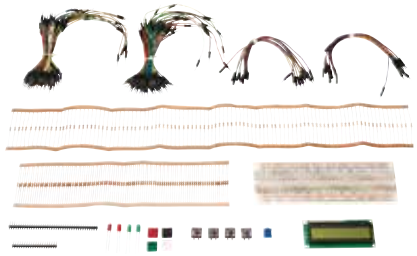
For programming, the latest version of the operating system for the Raspberry Pi can be downloaded for free, and can be loaded onto the microSDHC card for use on the Pi.

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

Type	Order code	1+
Advanced student kit	**75-0815**	85.02

566638

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

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**	14.98

559345

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 OctoCam utilises the compact and capable 5MP Pi Zero camera. It works straight out of the box, with the cable and circuitry all built-in, all you have to do is plug the ribbon cable in to the connector on the Pi Zero W. Your OctoCam will be very busy around the house, there are CCTV duties, recording time lapses for school projects, keep a weather eye on bird feeders or nesting boxes, or even build an amazing pet tracking system.

The kit is simple to assemble and won't take you very. There is a bit more configuration involved in connecting the OctoCam running motionEyeOS to Wi-Fi but comprehensive instructions are contained within the tutorial on setting up motionEyeOS.

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**	40.33

565816

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!

Because the Pi Zero W has **built-in wireless LAN and Bluetooth**, it frees up the micro-USB port, so that the unit is a really tiny package - ideal for use in embedded IoT applications or for minimalist computing set-ups. Supplied as part of the kit is an 8GB micro-SD card pre-loaded with the Raspbian operating system. It just needs popping out of the larger SD card adaptor, inserting into the slot on the Pi Zero W and the whole lot can be safely put in the protective case.

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.

A further treat for you is the inclusion of the **Blinkt! multicolour LED strip**, the perfect way to take the first steps in coding using Python. There is a guide that will teach you the basics, and there's a bunch of code examples in the Blinkt! GitHub code repository to give you an idea of what's possible.

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**	35.25

565815

PIMORONI

PIM259 Raspberry Pi Zero W Mood Light Project Kit

This **Mood Light** kit from **Pimoroni** will look great on your desk, bookcase, bedside table or wherever you want it. It's internet connected so you can do things like connect it to your Twitter feed to track the mood of your recent tweets, or use online sunset/sunrise times to fade through beautiful dawn/dusk colours!

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.

With all the guidance provided, and a superbly designed kit helping things along, you can build a classy looking light that evokes a real pendant light. The Mood Light uses the Unicorn pHAT board that has 32 programmable RGB Neopixel LEDs. The included stand and diffuser cleverly mounts the Pi Zero W and Unicorn pHAT at just the right angle to show a beautifully diffused light.

The handy one-line installer will install the Unicorn pHAT Python library for you.

Kit contents (also requires microSD card - not supplied)
- Raspberry Pi Zero W
- Unicorn pHAT with 32 programmable RGB Neopixel LEDs
- Male and female 2 x 20 pin headers
- White and yellow pendant light 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 (for personalising)
- Comes in a reusable kit box

- Female and male headers require soldering
- Pi Zero W with single core CPU and built-in wireless LAN and Bluetooth
- 8 x 4 Matrix of programmable RGB Neopixel LEDs
- Handy 1-line installer installs the Unicorn pHAT Python library
- 3-Layer white and yellow pendant light stand and diffuser
- 50cm USB A to micro-B cable

Type	Order code	1+
Mood light kit	**75-0784**	20.25

565812

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**	20.41

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**	7.78

559290

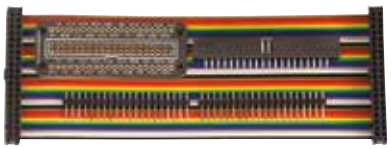
STEAM resources

Don't forget to visit our STEAM Lab online

www.rapidonline.com/steam-lab

CYNTECH COMPONENTS

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**	2.96
Paddle+ breakout	**73-6010**	8.35
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**	4.85

559293

PIMORONI

PIM296 GPIO Hammer Headers inc. Male + Female Header + Installation Jig

For those of you who don't want to solder, or are unable to due to location or other circumstances, then you absolutely have got to have this solderless GPIO header kit - and a hammer!

With just a few gentle taps with your hammer and bob's your uncle, you header is securely attached to your Pi Zero or pHAT, there's absolutely no soldering required. Included in the kit are both male and female headers and a nifty installation jig that takes away the need for precise accuracy when your adjusting something with a 4lb lump hammer (please don't use a 4lb, or any, lump hammer).

The acrylic installation jig has two base pieces, onto which your Pi Zero or pHAT sits. Two steel nuts then secure the Pi/pHAT onto the base, then put the header in place, then the top piece of the jig and carefully tap with a hammer so that the header securing pins pass through the PCB holes. The securing pins on the headers have retaining nubbins that grip tightly into the holes on the PCB. For further details see this guide .

It is strongly recommend that you use the installation jig! The female headers are simpler to insert than the male headers as you can hammer straight onto the plastic of the header, but the male ones are particularly tricky without the jig.

Please note: we can't be held responsible for any damage that you may cause to your Pi Zero, pHAT, fingers, or headers while fitting them. If you follow the guide carefully then you should be fine.

Watch the demo of how to fit the hammer headers on Bilge Tank at www.rapidonline.com.

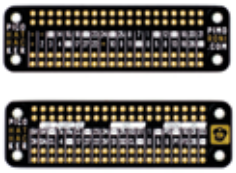
- Includes male & female headers + installation jig
- No soldering required
- Secure mechanical connection

Type	Order code	1+
Hammerable headers	**75-0848**	5.43

566600

PIMORONI

PIM300 Pico HAT Hacker Breakout Board for Raspberry Pi



The **Pico HAT Hacker** is an even smaller version of the Black HAT Hack3r. It gives you full access to all 40 pins on your Pi, broken out at the top.

The PCB is just 0.8mm, same as the SHIMs, so it can be soldered right onto the PI, with still enough room on a standard header to fit a HAT or pHAT on top. All the pins on the HAT hacker are clearly labelled, with BCM pin numbering on one side and descriptive labels on the other side that show I2C, UART, SPI, PWM, and I2S pins are. The board can be soldered either way up, depending on which labels are the most useful to you.

- Compatible with Raspberry Pi 3, 2, B+, A+, Zero, and Zero W
- BCM and descriptive pin labelling
- Mounting holes (M2.5)
- PCB 0.8mm thick

Type	Order code	1+
Pico HAT Hacker	**75-0810**	2.22

565837

Pi Camera Modules

RaspberryPi

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**	19.76

563384

RaspberryPi

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**	19.25

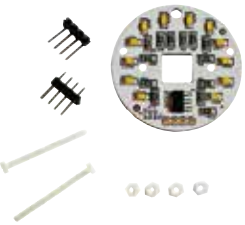
563385

Can't find what you need?

Get in touch **education@rapidonline.com**

CYNTECH COMPONENTS

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 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**	9.95

560444

Raspberry Pi Robotics

4tronix

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 not included.***Note**: *Batteries not included.*

Type	Order code	1+
RoboHAT control board	**75-0284**	14.40

565327

4tronix

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 not included.*

Note: *Raspberry Pi not included.*

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

565331

4tronix

Pi2Go Mk2 Robot for Raspberry Pi & 4WD Upgrade Kit

The Pi2Go Mk2 is the evolution of the very popular original Pi2Go robot for Raspberry Pi, first sold in April 2015.

This latest version works with the Raspberry Pi 4 and all versions of the 40-pin Raspberry Pi.

The robot kit includes motors, sensors, ultrasonic sensor breakout module, IP display board and 6x AA battery board. A 4WD upgrade kit is available separately (not included).

- The major changes are: Improved assembly method, particularly the motor mounts
- No wires for attaching the battery packs
- Better quality wheels with high grip tyres
- Wheel sensors built into both wheels
- Programmatic access to the raw battery voltage
- Improved analog light sensors – one in each corner
- 10 individually addressable Smart RGB LEDs
- 2 edge connectors compatible with Pimoroni's Breakout Garden with full access to I2C signals and individual GPIO signals
- Improved motor controller allowing higher speeds and optional braking on stop

Raspberry Pi, batteries and 4WD Option not included.

Type	Order code	1+
Pi2Go Mk2 robot	**75-5016**	58.12
4WD upgrade kit	**75-5017**	6.84

568351

4tronix

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 not included.***Note**: *Batteries not included.*

Type	Order code	1+
Ultimate Initio	**75-0282**	76.50

565325

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.

The kit combines the Pi Zero W with the swish Scroll pHAT HD board, a dense matrix of 17 x 7 bright white LEDs, with each pixel capable of having its brightness individually controlled, meaning that it's possible to create stunning animations or even anti-aliased text. The LED matrix sits behind Scroll Bot's mouth, and the frosted orange acrylic diffuses the LEDs beautifully.

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**	28.44

565813

NEW

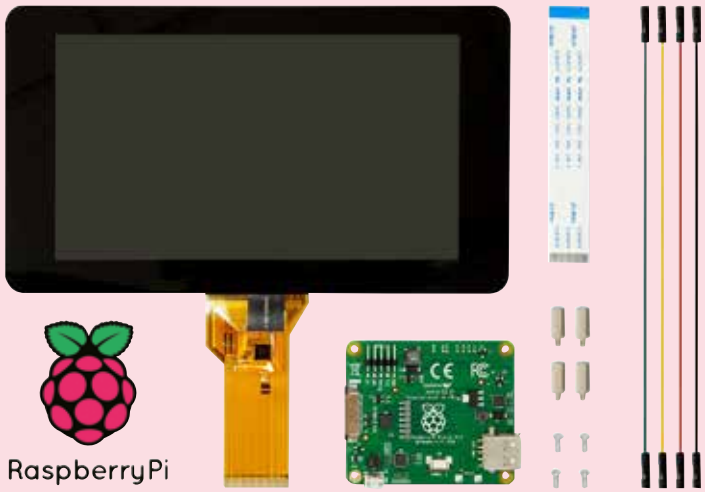
RaspberryPi

Kits coming soon

www.rapidonline.com/education

Pi Light, Sound & Display Add-on Boards

Raspberry Pi 7in LCD Touch Screen



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.

The latest **Raspbian** OS for the Raspberry Pi contains all the latest touch screen drivers necessary, enabling support for 10-finger touch and on-screen keyboard - full functionality without keyboard or mouse. A range of educational software and programs available on the Raspberry Pi will be touch enabled, making learning and programming easier.

To help produce a portable solution we have available a clear ABS case that is designed to house your Raspberry Pi and the LCD touch screen, not only providing protection but also acting as a display bezel, giving the screen a smart and professional appearance and housing the board neatly behind it. The case has cut-outs for all connections, including a camera board connection slot. The case can also be wall mounted using the supplied fixings and there is an easy clip rear cover that protects the rear as well as giving access to connectors/ports. The case is also suitable for use with other devices and will fit the Raspberry Pi 2 B, Raspberry Pi 3 B, Raspberry Pi B+, Raspberry Pi LCD Touch Screen.

- 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**	49.41

564950

adafruit

PiTFT+ 3.5in 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**	44.02

559276

adafruit

PiTFT+ 2.8in 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**	32.37

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

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**	12.03

559328

seeed studio

Studio ReSpeaker 4-Mic Array for Raspberry Pi Voice Assistant

The **ReSpeaker 4-Mic Array** is a Raspberry Pi expansion board that features quad analog microphones and is designed for AI and voice applications. With this board you can design and build more powerful and flexible voice and audio projects that integrate Amazon Alexa Voice Service, Google Assistant, etc.

Differing from the ReSpeaker 2-Mics Pi HAT (75-0544), this board is based around the **AC108**, a highly integrated quad-channel ADC with I2S/TDM output transition for high definition voice capture. An additional feature is the 12x programmable RGB LED ring that gives you the ability to do such things as Voice Activity Detection (VAD), estimation of Direction of Arrival (DOA) and indicate the direction via the LED ring, just like Amazon Echo or Google Home.

This video from Parvinder Yadav teaches how to use ReSpeaker 4-Mic Array for Raspberry Pito make Google assistant. We really appreciate Parvinder's contribution to the community and hope this video can be of help.

- 4x Analog microphones
- 12x Programmable RGB LEDs
- 2x Grove interfaces
- 3m Voice capture distance
- Supports Raspberry Pi Zero, 1 B+, 2 B and 3 B

Note: *There are no audio output interfaces on ReSpeaker 4-Mic Array for Raspberry Pi. It is only for voice capture. You could use the headphone jack on Raspberry Pi for audio output.*

Technical specification

MIC	4x Analog microphones
LED	12x APA102 Programmable RGB LEDs
Raspberry Pi 40-pin headers	Supports Raspberry Pi Zero, 1 B+, 2 B and 3 B
AC108	Highly integrated quad-channel ADC with I2S/TDM output transition
Software algorithm	VAD (Voice Activity Detection), DOA (Direction of Arrival) and KWS (Keyword Search)
Grove	2x Grove interfaces
Voice capture distance	3m Radius
Dimensions	65 x 65 x 9mm

Type	Order code	1+
ReSpeaker 4-mic array	**75-0721**	21.35

566677

4tronix

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

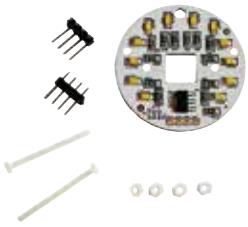
Note: *Raspberry Pi not included.*

Type	Order code	1+
Traffic light RasPi	**75-0287**	2.57

565330

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.

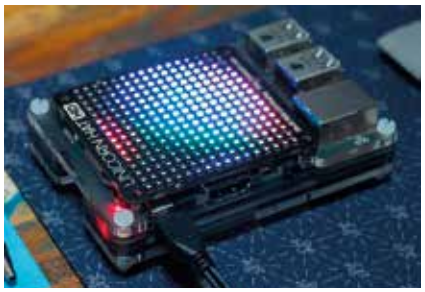
- Choose between cool white LEDs and IR
- Operating voltage 5V DC
- Only uses 1 x GPIO pin

Type	Order code	1+
White LEDs	**75-0042**	10.28
IR Leds	**75-0043**	9.95

560444

PIMORONI

PIM273 Unicorn HAT HD for Raspberry Pi with 256 Addressable RGB LEDs



The Unicorn HAT HD is a step-up from the original model, giving you 256 RGB LEDs in a 16 x 16 matrix, on a single HAT, fully assembled. So much rainbow goodness from a legendary creature.

Still useful for all the applications that you used the old model for, but with 4x as many pixels much more complex and exciting animations are possible, including scrolling text, and even low resolution videos. With the HAT comes the ninja diffuser that makes the light extra shiny by providing some subtle diffusion and blurring the lines between each pixel. Simply use four of the nuts to space the diffuser slightly away from the HAT, and the other four to secure it.

Embedded on the HAT is an ARM chip that handles all the heavy lifting between the Pi and the LED drivers, taking the strain off the data channel for reliable and consistent performance. As ever, there is a Python library so you can start developing those applications, and there are numerous examples too, to show you how to create slick animations, simulate the Game of Life, a forest fire or a flickering candle, and even scroll text!

- Compatible with Raspberry Pi 3, 2, B+, A+, Zero, and Zero W
- Comes fully assembled
- 256 RGB LED pixels in a 16 x 16 matrix
- Pixels driven by ARM STM32F and three STP16CPC26 LED drivers
- Bundled ninja diffuser, plus nuts and bolts
- Unicorn HAT HD pinout

Photo-sensitivity warning: *Flashing, strobing, and patterns of lights may be harmful. Always take care and immediately stop using if you feel unwell (dizziness, nausea, affected vision, eye twitching, disorientation).*

Note: *Unicorn HAT HD requires a 2A or greater micro USB power supply for your Pi.*

Type	Order code	1+
Unicorn HAT HD	**75-0793**	28.38

565821

Pi Touch Sensing

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**	13.84

559291

Bare Conductive®

Pi Cap for Raspberry Pi A+, B+, 2 and 3

The **Pi Cap** is an add-on board that adds precise capacitive touch, distance sensing and high quality audio functions and is designed for use with the **Raspberry Pi** A+, B+ 2 and 3 (and any Raspberry Pi with a 40-pin GPIO connector).

Using the Pi Cap it is very quick and simple to connect a Raspberry Pi to the physical world. The board has 12 capacitive sensing electrodes that can have anything conductive connected to them, including wire, foil strips, copper track, conductive paint, conductive material, crocodile clips, etc. It is then a simple matter to control sounds, videos and more.

To connect to the Raspberry Pi a 40-pin GPIO connector header is provided, with seven of the pins broken out for use as desired. There is an 84 pad (7 x 12) prototyping area with 2.54mm pitch and the 7x GPIO pins broken out from the connector header. This makes it easy to connect additional sensors or buttons for more advanced projects.
A multifunction push button is provided that can be configured to safely shutting down or restarting the Pi.
The audio output of the board is high quality 15.5-bit stereo and the audio circuitry has its own dedicated low-noise PSU. There is a 3.5mm stereo jack for connection and the audio signal is powerful enough to drive headphones. The Pi Cap has a user programmable RGB LED that is precisely colour balanced and the design of the board means that the LED is visible when mounted on a Raspberry Pi.

The software required for the Pi Cap is contained in the official Raspbian repository, so setting-up and starting is easy and updates to software are easy to obtain. To further make project development with the Pi Cap easy, fully featured powerful Python, C++ and Node.js libraries are available so that sensors may be included.

For those users who are looking to develop projects in such areas as robotics, IoT, wearables, interactive toys, etc. the Bare Conductive Pi Cap is an essential purchase.

- Ideal for **IoT** applications
- Extensive online tutorials
- Prototyping area
- 40-pin Connector header
- Ground connection
- Board dimensions 85 x 40 x 7mm

Kit contents:

1x	Light Up Board	1x	Dimmer Lamp Template
1x	Electric Paint 10ml Tube	1x	Proximity Lamp Template
1x	Micro USB Cable	1x	Instruction Test Sheet
1x	Touch Lamp Template		

Type	Order code	1+
Pi CAP	**75-0720**	23.33

564655

PIMORONI

PIM141 Drum HAT with 8x Capacitive Touch Pads for Raspberry Pi

If you think you're the next Ringo or Charlie Watts, then you'll love this **Drum HAT** from Pimoroni. Functionally similar to the Piano HAT (75-0514), just hook up the 8x advanced capacitive finger-sized drum pads with LED indicators to start laying down a beat with your Raspberry Pi.

There are intuitively-designed light channels on the drum pads so that every pad can light up with a tap, but none of the LEDs get in your way, creating a cool under-lighting effect. You can use the Drum HAT to play music in Python, control software drum synths on your Pi, take control of hardware drum machines, or just build your own elaborate percussion project.

The Drum HAT comes with a ready-to-go example, with sampled drum sounds - all you have to do is hook up a set of speakers to your Pi's headphone jack. Why not get technical and get Drum HAT to output regular MIDI commands via a USB to MIDI adapter, and control your software drum synths or hardware drum machine over MIDI.

- Compatible with **Raspberry Pi 3B+, 3, 2, B+, A+, Zero and Zero W**
- 8x Capacitive touch pads
- 8x Bright white LEDs
- Works alongside Piano HAT
- Microchip CAP1188 capacitive touch driver chip
- Drum HAT pinout
- Pythonlibrary
- Comes fully assembled
- Software does not support Raspbian Wheezy

Type	Order code	1+
Drum HAT	**75-0846**	6.00

566569

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**	17.13

559288

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**	16.29

553924

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**	23.12

559294

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.

Not only will this **case** protect your Raspberry Pi from damage, it also looks good and will enhance any project - whether it be a demonstration or presentation, or where the finishing touch is needed on an innovative installation.

- 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**	5.70

564948

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**	5.32

547699

PIMORONI

Pibow Coupe Cases for Raspberry Pi 4

These attractive cases are crafted out of five unique layers, including a transparent top and base (Red and Ninja), that leave your beautiful Raspberry Pi 4 visible inside.

Each layer is laser-cut from colourful, high-quality, cast acrylic and once stacked they securely contain a Raspberry Pi 4 while leaving the primary ports, including the camera port, display port and GPIO accessible.

Weighing just over 50 grams, the case is lightweight and ideal for mounting to any surface. No tools are required for assembly or disassembly.

The cases are available with Rainbow, Red and Ninja colour schemes.

- Protects your beloved Pi
- Clear top and base (Ninja and Red) leave Raspberry Pi 4 visible
- Cutout in lid for 40 x 30mm heatsink or Fan SHIM
- Leaves all ports accessible
- GPIO cut-out
- Handy laser-etched port labels
- Super-slimline profile
- Fully HAT-compatible
- Works great with standoffs
- Made from lightweight, high-quality, cast acrylic
- Great for hacking and tinkering
- Dimensions: 99 x 66 x 15mm (W x L x H) excluding bolt heads and nuts
- Made in Sheffield, UK

Note: Compatible with Raspberry Pi 4 only. Raspberry Pi 4 not included.

Colour	Order code	1+
Rainbow	**75-0850**	7.40
Red	**75-0916**	7.40
Ninja	**75-0917**	7.40

568278

Pi Supply

Raspberry Pi 3 Model B+ Case with Cooling Fan

Need **extra cooling for your Raspberry Pi**? Then this **case with cooling fan** are for you!

The case is made from sturdy and secure ABS plastic and is compatible with the Raspberry Pi Model 3B+/3/2. Small cut-outs allow for any heat dissipating from the Raspberry Pi to escape.

The included fan is optional. You can use the screws provided to mount it inside the case.

- Colour: white
- Material: ABS
- Compatible with the Raspberry Pi Model 3B+/3/2
- Comes with 1x case, 1x set of screws & 1x cooling fan

Case colour	Order code	1+
White	**75-0319**	4.66

567835

Pi Supply

Pi Zero Case

The Pi Supply Raspberry Pi Zero case is a sturdy plastic enclosure designed specifically for the Raspberry Pi Zero mini computer.

The case has been designed to protect the Raspberry Pi while allowing sufficient clearance around each connector so that thick cables can fit securely.

- 2-part clip-together construction
- Access to microSD port
- Leaves all ports accessible
- Colour: black
- Raspberry Pi Zero clips in - no screws are needed
- Gap for camera cable
- No tools are needed for assembly or disassembly
- Designed and made in the UK from high quality material
- 4x rubber feet included
- **Pi-Supply type PIS1186**

Type	Order code	1+
Pi Zero Case	**75-0310**	8.50

567828

PIMORONI

Fan SHIM for Raspberry Pi 4

Make your Raspberry Pi seriously cool with the Fan SHIM! This 30mm no-solder, controllable CPU fan with RGB LED and tactile switch will give your Raspberry Pi significantly better thermal performance.

The Fan SHIM uses a friction-fit header, so it just slips onto your Pi's pins and it's ready to go, no soldering required.

The fan can be controlled via software, so you can do crafty things like toggle it on when the CPU reaches a certain temperature. Use the LED as a handy visual indicator to show the fan status, CPU load/temperature, etc. The tactile switch can also be programmed, so you can use it to toggle the fan on or off, or to switch between temperature-triggered or manual mode.

The Fan SHIM is compatible with the new Pibow Coupe 4 cases for Raspberry Pi 4.

Features:

- 30mm, 5V DC fan
- 4,200 RPM, 0.05m³/minute air flow
- 18.6dB acoustic noise
- Friction-fit header, no soldering required
- Programmable RGB LED (APA102) and tactile switch
- Compatible with Raspberry Pi 4 (and 3 B+, 3 A+)
- Python library and daemon
- Dimensions: 45 x 39 x 11mm

Kit contains:

- Fan SHIM PCB
- 30mm 5V DC fan with JST connector
- M2.5 nuts and bolts

Notes: *Basic assembly required. Not compatible with Raspberry Pi 4 Heatsink. Due to the height of the fan, a booster header will be required if you want to use HATs or pHATs with Fan SHIM. Case and Pi not included.*

Type	Order code	1+
Fan SHIM	**75-0918**	9.12

568279

seeed studio

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 fanw	**75-0393**	5.10

560357

PICAXE

PICAXE

PICAXE 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**	3.63			
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

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

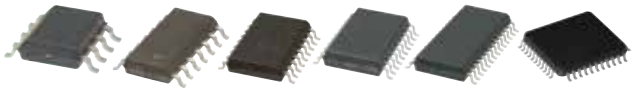
Type	Pins	Variant	Lines of memory	Total I/O pins	No. of inputs	No. of outputs	ADC	Order code
PICAXE-20X2	20	X2	2000 to 3200	13	1 - 16	1 - 16	11	**13-5000**
PICAXE-28X2	28	X2	4x 2000 to 3200	22	1 -	1 -	11	**13-5002**
PICAXE-40X2	40	X2	4x 2000 to 3200	33	1 -	1 -	12	**13-5004**

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



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 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**	4.77		

519054

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

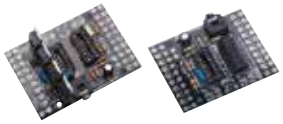
Note: *There is no operating system support for Windows 95 or NT.*

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

077630

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

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

Type	Order code	1+
T4 PICAXE trainer	**13-1548**	60.92
T4 PICAXE trainer x5	**13-1546**	265.33

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

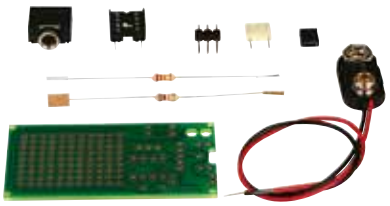
Free Delivery*

on all orders over £30 (excl. VAT) – (UK mainland only)

* See Terms & Conditions for full details

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.

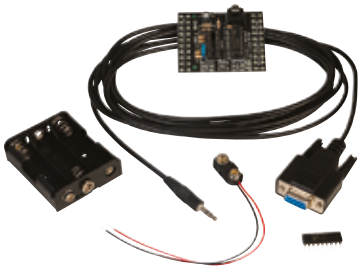
- The board provides the basic circuit and download connector, with a small prototyping area to allow connection of input and output interfacing circuits
- Supplied as a self-assembly kit of PCB and all parts, excluding the PICAXE-08 chip which is available separately

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

061441

PICAXE

PICAXE-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

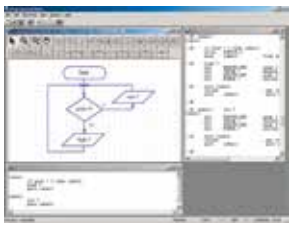
PICAXE-20M microcontroller
20-pin Project board and instruction leaflet
USB download cable
4.5V Battery box for 3x AA batteries

Type	Order code	1+
PICAXE-20 Starter kit	**13-0874**	22.61

081641

PICAXE

Editor Software CD



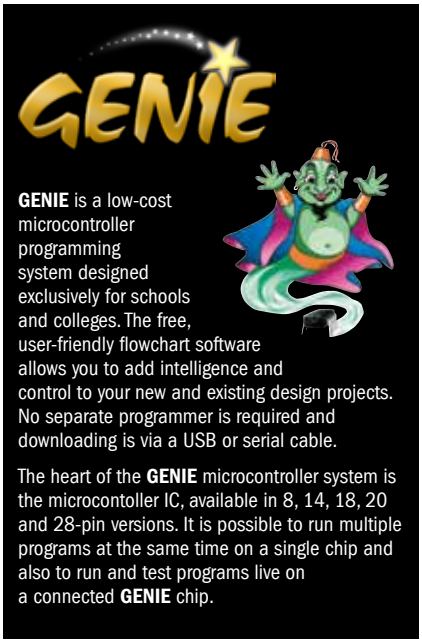
The Programming Editor software provides a complete programming environment for generating BASIC programs for the PICAXE. Programs can be edited, compiled and downloaded to the PICAXE chips (all sizes) from within the same free software. This software supports both textual 'BASIC' program listings and 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

GENIE Microcontrollers

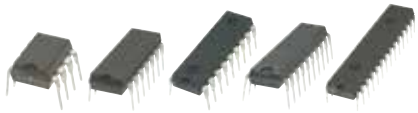


GENIE is a low-cost microcontroller programming system designed exclusively for schools and colleges. The free, user-friendly flowchart software allows you to add intelligence and control to your new and existing design projects. No separate programmer is required and downloading is via a USB or serial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

GENIE

Microcontrollers Version 1



These 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.*

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**

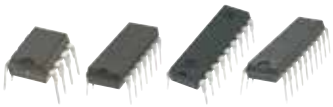
* Approx. no. of commands

Type	Package	Order code	1+	25+	100+	250+
GENIE C08 IC	DIL-8	**13-6001**	3.23	3.09	2.63	2.46
GENIE C14 IC	DIL-14	**13-6002**	2.99	2.67	2.61	
GENIE E18 IC	DIL-18	**13-6004**	3.62			
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



These 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**	1.96	1.89	1.61	1.50
GENIE 14 MCU	**13-6041**	2.42	2.15	2.10	
GENIE 18 MCU	**13-6042**	2.51	2.44	2.33	
GENIE 20 MCU	**13-6043**	2.71	2.57	2.40	
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.

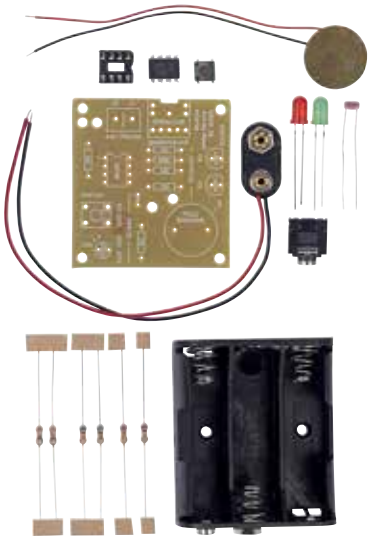
- 16 character by 2 row liquid crystal display (LCD)
- Contrast dial for display
- All components included in kit
- A spare LCD control chip (**13-6036**) is also available separately
- Testing mode included

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**	15.20	11.68
LCD Control chip	**13-6036**	3.00	

200110

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.*

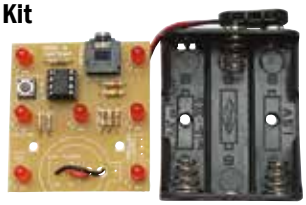
Note: *The* **GENIE Design Studio** *software is free to download directly from www.genieonline.com.*

Type	Order code	1+	5+	25+
GENIE C08 Activity kit	**13-6009**	4.62	4.17	4.05
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**	0.50		

082991

C08 Light Kit



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..*

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

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.*

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

Type	Order code	1+	5+	25+
GENIE 14 Audio kit	**13-6046**	4.77	4.59	4.24
GENIE 14 Audio PCB	**13-6044**	0.829		
GENIE 14 Loudspeaker	**13-6045**	0.604		

552407

GENIE

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.*

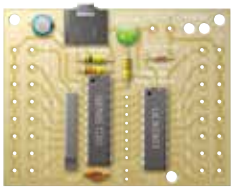
Note: *The* **GENIE Design Studio** *software is free to download directly from www.genieonline.com.*

Type	Order code	1+	5+	25+
GENIE 18-pin activity kit	**13-6014**	5.70	5.44	5.06
GENIE 18-pin project kit	**13-6015**	3.95		
GENIE 18-pin motor kit	**13-6016**	7.52	7.12	6.55
GENIE activity kit PCB	**13-6031**	1.39	1.29	
GENIE project kit PCB	**13-6032**	1.78	1.58	1.39
GENIE motor kit PCB	**13-6033**	1.61	1.46	1.32

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

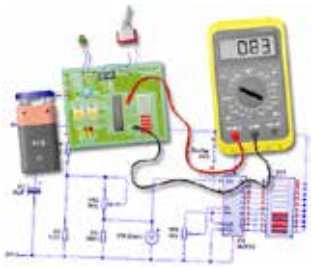
Note: *The* **GENIE Design Studio** *software is free to download directly from www.genieonline.com.*

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

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

Microcontroller Project Kits

RK Education

Blank PCB for RKP18HP High Power Project Board

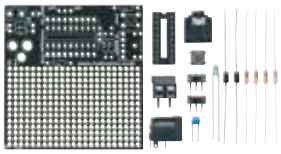
A blank PCB designed for use with the RK Education RKP18HP High Power Project Board.

Type	Order code	1+
PCB only	**70-9014**	1.58

082428

RK Education

RKPT18 Project Board



RKPT18 prototype board with large prototype area for use with 18-pin PIC and Genie® microcontrollers.

- A low-cost method of prototyping PIC, Genie® and other projects
- Professional double-sided PCB
- Compact design
- Includes software download socket and circuit
- Can be mains-powered
- Large prototype area with high quality plated-through holes
- Empty PCBs are available separately, order code **70-9020**
- Suitable for **Key Stages 4 & A Level** (ages 14 to 18)

Type	Order code	1+
Project board	**70-6004**	1.98
PCB only	**70-9020**	0.80

082431

DFRobot Arduino Boards & Kits

DFROBOT

Romeo Arduino Robot Control Boards

The Romeo family is an All-in-One Arduino-based control board especially designed for robotics applications from DFRobot. It benefits from the Arduino open source platform, it is supported by thousands of open source codes, and can easily be expanded with your Arduino shields. The integrated 2-way DC motor driver and wireless socket allows you to start your own robot project immediately without the need for an additional motor driver. Romeo is also designed to have extra power for servos which need more current.

Romeo is also featured with DFRobot's standard 3 pin-out design and is compatible with Gravity series sensors and actuators. Hundreds of sensors are now plug-play with Romeo. You may also check the Bluetooth microcontrollor selection guide to get more information.

Type	Order code	1+
Romeo V1+motor driver	**75-0171**	22.95
Romeo V2+motor driver	**75-0167**	22.94
Romeo BLE	**75-0169**	28.03
Romeo BLE mini	**75-0168**	14.36

568384

DFRduino

A range of Adruino compatible microcontrollers including Mini and Nano and an Ethernet shield.

- **DFRobot type: DFRduino**

Type	Order code	1+
DFRduino R3	**75-0173**	13.34
DFRduino mini 3.3V	**75-0175**	8.18
DFRduino mini 5V	**75-0183**	9.86
DFRduino nano	**75-0184**	11.72
DFRduino shield	**75-0187**	11.48

568385

KIT0131 Gravity: KnowFlow – A DIY Water Monitoring Basic Kit

KnowFlow is designed for environmentalists who want to monitor water quality and get real time data. It can monitor 2 parameters with the basic kit: pH and electronic conductivity. The kit is based on the Arduino and is easy to change and add more sensors and modules. It stores the data on a micro-SD card, also the data can be viewed on your smart phone via Bluetooth communication.

Using the water monitor, you can measure the water quality in real time and store the data into the TF card for later analysis. It can be used for environment study, pollution sourcing and teaching, etc.

The KnowFlow Kit uses the DFRobot Gravity Sensor series. Gravity Sensor series are easy to use and are highly compatible. If you are not interested in coding, you can just upload the sketch into the Bluno board without any coding. After that you will find that the data is being stored on the TF card.

Features:

- pH, EC auto record
- Micro-SD local storage
- Extendable design
- Plug and play
- Bluetooth built-in
- Specification: Bluno Microcontroller:
- On-board BLE chip: TI CC2540
- Wireless programming via BLE
- Supports AT command to configure the BLE
- Transparent communication through Serial link
- Upgrade BLE firmware easily
- DC supply: USB Powered or External 7V to 12V DC
- Microcontroller: Atmega328p
- Bootloader: Arduino Uno (disconnect any BLE device before uploading a new sketch)
- Compatible with the Arduino Uno pin mapping
- Size: 60mm x 53mm (2.36 x 2.08in)
- Weight: 30g
- Supplied with pH sensor and EC (electrical conductivity) sensor

Kit contains:

1x Bluno (DFR0267)
1x Gravity: Analog pH Sensor/Meter Kit For Arduino (SEN0161-V2)
1x Gravity: Analog Electrical Conductivity Sensor/Meter For Arduino (DFR0300)
1x Gravity: IO Expansion Shield for Arduino V7.1 (DFR0265)
1x Gravity: I2C SD2405 RTC Module (DFR0469)
1x MicroSD card module for Arduino (DFR0229)
1x Gravity: Analog Signal Isolator (DFR0504)
1x SD/MicroSD Memory Card (8 GB Class10 SDHC) (FIT0393)
2x Analog sensor cable
1x Digital sensor cable

Type	Order code	1+
Water monitoring kit	**75-0113**	161.59

568376

DFR0100 Beginner Kit for Arduino (Best Starter Kit)

TheArduino Beginner/ Starter Kit is ideal for those who are interested in learning about Arduino and electronics, starting from basic LED control to more advanced environmental sensing, monitoring and actuators.

The kit will guide youthrough the world of sensing and controlling the physical world using sensors and the Arduino microcontroller via carefully designed projects. It comes with 20 high quality components and 15 project flash-cards which make the kit easy to learn and teach. Also included in the kit is a DFRduino UNO R3 (compatible with Arduino Uno R3), the most stable and commonly used Arduino processor which is 100% compatible with Arduino IDE, together with DFRobot's best selling Arduino prototype shield.

The kit also includes premium quality jumper wires, resistors, LEDs, a 9g servo, an IR remote transmitter and receiver, a relay, a motor, a fan and a potentiometer. Project reference flash-cards with wiring guides of each project help you make it faster and minimize errors. All the components packaged inside the kit are extremely easy to locate and relocate quickly with our customised black labels.

Kit contains:

- DFRduino UNO R3 x1
- Prototyping shield x1
- Jumper cables male/male x30, female/male x10
- Resistor 220R x20, 4.7K x20, 10K x20, 1K x20
- 5mm LED x10
- IR receiver diode x1
- Mini push button x4
- Ambient light sensor x1
- Tilt switch sensor x1
- 8-segment LED x1
- LM35 temperature sensor x1
- Relay x1
- Buzzer x1
- Fan x1
- 130 motor x1
- 10K potentiometer x3
- Micro servo x1
- Mini controller (with CR2025 battery) x1
- Battery holder for 6xAA batteries x1
- 400 tie-point interlocking solderless breadboard x1

Type	Order code	1+
Arduino starter kit	**75-0114**	38.95

568377

KIT0133 Gravity: Arduino Zero to Hero Kit

The DFRobot KIT0133 Gravity: Arduino Zero to Hero Kit comes complete with an online course created by a well-known Australian Robotics Engineer and Teacher: Sanjin Dedić.

The online course is perfect for ambitious beginners and intermediate Arduino users trying to take their circuitry and programming to the next level.

Kit includes:

- DFRduino UNO R3 x1
- USB cable type A to type B x1
- Jumper cables male to male x30, female to male x10
- Resistors: 220R x20, 4.7K x20, 10K x20, 1K x20
- 5mm LED x10
- IR receiver diode x1
- Mini push-button x4
- Ambient light sensors: PT5I850AC x1, GL5528 x1
- 2N3904 transistor x1
- Tilt switch sensor x1
- 8-segment LED x1
- LM35 temperature sensor x1
- Buzzer x1
- 10K potentiometer x3
- Mini controller (with CR2025 battery) x1
- 400 tie-point interlocking solderless breadboard x1, Acrylic breadboard holder for Arduino x1
- Gravity IO expansion shield for Arduino V7.1 x1
- Gravity: analog sound sensor for Arduino x1
- Gravity: digital speaker module x1
- Gravity: digital PIR (motion) sensor for Arduino x1
- 6 DOF sensor - MPU6050 x1
- MicroSD card module for Arduino x1

Specification:

Microcontroller: DFRduino UNO R3
Power supply: 5V USB power
Dimensions: 220 x 165 x 65mm
Weight: 300g

Type	Order code	1+
Zero to hero kit	**75-0126**	60.32

568378

ROB0050 4WD MiniQ Arduino Robot V2.0

This 4WD MiniQ mobile robot kit is especially designed for education and learning purposes. It comes fully assembled and all you need is a PC with Arduino IDE and 4x AA batteries.

This new version of MiniQ 4WD Arduino Robot Kit comes with Arduino Leonardo controller (ATmega32u4) and also integrates modules such as RGB LED, photosensitive diode, infra-red transmitters, infra-red receivers, infra-red line tracking sensors, light sensors, additional buttons and buzzer.

Along with this mobile robot kit, there are 8 lessons for beginners, from entry-level to line-following, obstacle avoidance and remote control. Users can easily grasp the principles by working through the tutorial. All coding and tutorials are open and free to download.

Lesson 1. Get to Know Your Robot
Lesson 2. Control Buzzer
Lesson 3. Light Direction Indication
Lesson 4. Line-following
Lesson 5. RGB LED
Lesson 6. Obstacle Avoidance
Lesson 7. Encoder
Lesson 8. IR Remote Control

Specification

- Controller: Atmega 32U4 (Arduino Leonardo)
- Power supply: 4x AA batteries or micro-USB
- Working voltage: 4.5 to 6V
- Driving mode: 4WD
- Max. speed: 79cm/s
- Size: 115 x 110 x 45mm (4.5 x 4.3 x 1.8in)
- Supplied complete with 1x IR remote controller & 1x micro USB cable
- **DFRobot type ROB0050**

Type	Order code	1+
4WD Arduino robot	**75-0166**	75.03

568383

KIT0003 EcoDuino - An Auto Planting Kit

EcoDuino is designed by DFRobot to help you grow plants. By using a series of microcontrollers, sensors and actuators, the EcoDuino system can make your efforts to grow plants much easier.In this system, sensors are used to collect data which can show you plant conditions like temperature, humidity, light intensity, etc.If you want, EcoDuino can message you and tell you how your plants are doing through wireless communications. It will also water your plants automatically when they are thirsty, or at a pre-determined interval.

The only thing you may need to do is manage your EcoDuino system through a PC with a graphic user interface.The cool thing about the EcoDuino is that it is developed based on Arduino which means you can not only program EcoDuino in the Arduino IDE environment but also use any Arduino compatible hardware in your EcoDuino system.

EcoDuino is evolving and has a new enclosure that protects it from water splashes, so it is safe to use beside your plants. It now sports an Atmega32U4 which removes the need for an adapter. Sketches can simply uploaded viaMicro USB just like Arduino Leonardo.Another improvement is that the DS18B20 sensor is now directly supported.

Specification:
- Board power supply: 6 to 12V DC
- Micro controller: Atmega32U4 (Bootloader: Leonardo)
- 4 Analog I/O ports, 5 Digital I/O ports
- Terminal for interfacing a Carbon rod (Soil moisture sensor)
- Terminal for interfacing a DS18B20 temperature sensor (Soil temperature sensor)
- Terminal for interfacing a motor or a solenoid valve
- Potentiometer to set the threshold soil moisture value of watering
- Xbee slot
- Micro USB
- 3.5mm screw terminal
- Board dimensions: 75 x 50mm
- Diving pump power supply: 4.5 to 12V DC
- Pumping head: 200cm
- Flow capacity: 100 to 350L/H
- Power range: 0.5W to 5W
- Pump dimensions: 38 x 38 x 29mm
- Pump weight: 125g

Type	Order code	1+
Auto plant kit	**75-0137**	42.92

568379

KIT0111 Gravity: Starter Kit for Arduino

The Gravity Arduino Starter kitis a plug & play electronics toolkit that provides Arduino beginners and makers with the easiest experience of learning and playing with the Arduino platform.

The kit includes a DFRduino UNO R3 microcontroller, which functions exactly the same as Arduino UNO, and 12 most popular and interesting electric components and sensors. With the IO expansion shield, sensors can be connected directly onto the board without jumper wires or bread-board. The sensors in the kit belong to DFRobot's Gravity Series and are built highly modularised and interact with microcontrollers via a 3-pin header. Moreover, different types of sensors can be easily identified by the logo printed on the back of the PCB board. All components included in the kit are fully compatible with Arduino microcontrollers.

The Gravity Starter Kit also includes a tutorial, which aims to help Arduino learners understand Arduino programming. The tutorial goes through the installation of the software, the Arduino IDE, and its programming language, then teaches you how to build electric circuits, how to use different electric components and their function. It also includes instructions for building projects, from lighting up an LED, to using multiple components to making a real project such as 'Fire Alarm' or 'Weather Station'. The tutorial is full of graphics and is written in such a way that anyone can build their own project.

Specification:
- Microcontroller: DFRduino UNO R3
- Power supply: 6x AA batteries or 6 to 12V AC power adapter
- Dimensions: 220 x 165 x 65mm
- Weight: 300g

Type	Order code	1+
Gravity for Arduino	**75-0111**	42.95

568375

KIT0069 Bluetooth 4.0 RGB LED Strip Kit (Support iPhone & Android)

With just a mobile device that has Bluetooth4.0 (BLE), you can easily control every single one of the 180 LEDs in the strip, even program the LEDs individually to react to music.

What's more, the kit can be divided conveniently into separate parts, so you can make more use in your Arduino project wherever you want to.

Applications:
- Home decorations
- Learning about Arduino
- Learning about Phone-Arduino interactions
- Festive effects
- Audio interactions

Specifications:
- Working voltage: 5V
- Max. current: 1A (per metre LED strip) @ 5V
- Sound sensor and Audio Analyzer for Spectrum analyzer
- Change the colour of every LED individually
- Length: 3m
- 60 LEDs per metre
- Total number of LEDs: 180

Type	Order code	1+
RGB LED strip kit	**75-0207**	103.24

568389

TEL0002 Bluetooth Adapter Mini

This version 4.0 Bluetooth adapter has a bandwidth of approximately 3Mbps and is widely used for small file transfer (less than 10MB) for pictures, ring tones, e-books, manuscripts, etc.The device does not include any drivers or software, however, you shouldn't need any as it supports the native Windows Bluetooth stack (Windows XP, Vista, 7). Plug it in and Windows should handle the rest.

Bluetooth is a type of wireless network transmission technology originally used to replace infra-red. Compared with infra-red technology, Bluetooth can transmit data without needing a clear line of sight and the transmission distance is greater. Bluetooth technology is ideal for low power digital devices to share data with each other, e.g. mobile phones, hand-held computers. Bluetooth devices can also be used to transmit sound, e.g. Bluetooth headsets.

Specification:
- Bluetooth standard 4.0
- USB interface: USB2.0 standard
- Operates in the 2.4 to 2.483GHz frequency band using FHSS (Frequency Hopping Spread Spectrum) technology
- Operational range in open space approx. 20m
- Intuitive software user interface, without complicated settings
- For Win7, Win8, Win10, WinXP, Mac OS X operating system
- Sensitivity <-85dBM
- Data transfer rate up to 3Mbps

Features:
- PC/Mac: Bluetooth dial-up internet access (subject to mobile phones and other devices with Bluetooth)
- PC: Bluetooth wireless local area network
- PC: Bluetooth wireless fax (computer must be equipped with fax software)
- PC/Mac: Bluetooth File Transfer
- PC/Mac: Bluetooth wireless data synchronization
- PC: Bluetooth Virtual Serial Port
- PC: Bluetooth wireless printing
- PC/Mac: Bluetooth Human Interface e.g. Bluetooth mouse and Bluetooth keyboard
- Bluetooth serial port with the computer, microcontroller, Basic Stamp 2, DF-Bluetooth Bluetooth module, Roboduino or Arduino controller connection, to achieve Bluetooth wireless remote control

Type	Order code	1+
Bluetooth 4.0 adaptor	**75-0206**	2.90

568388

Bluetooth 2.0 Modules For Arduino

These DFRobot Bluetooth 2.0 modules are ideal for use with Arduino microcontrollers.

- **TEL0026** is compatible with the APC220 communication interface and can be directly used in I/O Expansion Shield, Romeo, XBoard, etc. It uses either a 3.5 to 8V DC or a 3.3V DC/50mA power supply
- **TEL0023** can be plugged into the Arduino controller using the XBEE base for Bluetooth wireless control. It uses a 3.3V power supply
- Both modules use the CSR BC417143 chip and operate at 2.4 to 2.48GHz on the unlicensed ISM band.

Type	Order code	1+
Bluetooth 2.0 V3	**75-0208**	15.54
Bluetooth 2.0 Bee	**75-0209**	15.71

568390

TEL0108 Bluetooth Audio Receiver and Playback Module (Bluetooth 4.0)

This Bluetooth 4.0 audio receiver module also includes a USB port and a TF card slot. With its pre-amp level output, it can drive headphones or a 3W speaker directly. You can also add an active power amplifier and connect a loudspeaker for more volume.

The module supports MP3, WMA, WAV and lossless FLAC audio formats. It supports playback from either a TF card or USB flash drive or via Bluetooth. All playback is controlled by push-buttons and the built-in sound equalizer can be adjusted to your favourite settings.

With its compact size and simple 5V DC power requirement, this is an ideal module to add a Bluetooth feature to your

car or turn an old hi-fi loudspeaker into a wireless Bluetooth speaker.

- Power supply: 5V DC (MicroUSB connector)
- Audio decoding: MP3, WMA, WAV, FLAC
- Audio input: Bluetooth, USB, TF card
- Dimensions: 40 x 53mm
- Weight: 12g
- **DFRobot type TEL0108**

Type	Order code	1+
Bluetooth audio	**75-0204**	11.48

568387

Arduino

NEW

Student Kit AKX00025

Learn the basics of programming, coding and electronics, including current, voltage and digital logic. No prior knowledge or experience is necessary as the kit guides you through step by step.

You'll get all the hardware and software you need for one person, making it ideal to use for remote teaching, home-schooling, and for self-learning. There are step-by-step lessons, exercises, and for a complete and in-depth experience, there's also extra content, including invention spotlights, concepts, and interesting facts about electronics, technology, and programming.

Lessons and projects can be paced according to individual abilities, allowing them to learn from home at their own level. The kit can also be integrated into different subjects such as physics, chemistry, and even history. In fact, there's enough content for an entire semester.

How educators can use the kit for remote teaching

The online platform contains all the content you need to teach remotely: exclusive learning guidance content, tips for remote learning, nine 90-minute lessons, and two open-ended projects. Each lesson builds off the previous one, providing a further opportunity to apply the skills and concepts students have already learned. They also get a logbook to complete as they work through the lessons.

The beginning of each lesson provides an overview, estimated completion times, and learning objectives. Throughout each lesson, there are tips and information that will help to make the learning experience easier. Key answers and extension ideas are also provided.

How the kit helps parents home-school their children

This is your hands-on, step-by-step remote learning starter kit that will help your child learn the basics of programming, coding, and electronics at home. As a parent, you don't need any prior knowledge or experience as you are guided through step-by-step. The kit is linked directly into the curriculum so you can be confident that your children are learning what they should be. The kit additionally provides an opportunity for them to become confident in programming and electronics. You'll also be helping them to acquire vital skills like critical thinking and problem-solving.

Self-learning with the Arduino Student Kit

Students can use this kit to introduce themselves to the basics of electronics, programming, and coding. As all the lessons follow step-by-step instructions, it's straightforward for them to work their way through and learn on their own. The students can work at their own pace, have fun with all the real-world projects, and increase their confidence as they go. They don't require any previous knowledge as everything is clearly explained, coding is pre-written, and there's a vocabulary of concepts to refer to.

The Arduino Student kit comes with several parts and components that will be used to build circuits while completing the lessons and projects throughout the course. Here is a brief description of what is included in the kit: Access code to exclusive online content including learning guidance notes, step-by-step lessons and extra materials such as resources, invention spotlights and a digital logbook with solutions

- 1x Arduino Uno
- 1x USB cable
- 1x Board mounting base
- 1x Multimeter
- 1x 9V battery snap, 1x 9V battery
- 20 LEDs (5 red, 5 green, 5 yellow & 5 blue)
- 5x Resistors 560Ω, 5x Resistors 220Ω, 1x Resistor 1kΩ, 2x Resistors 4.7kΩ, 1x Resistor 10kΩ
- 1x Breadboard 400 points
- Solid core jumper wires
- 1x Small Servo motor
- 2x Potentiometers 10kΩ, 2x Knob potentiometers
- 2x Capacitors 100uF
- 5x Pushbuttons
- 1x Phototransistor
- 1x Jumper wire black, 1x Jumper wire red
- 1x Temperature sensor
- 1x Piezo
- 1x Jumper wire female to male red, 1x Jumper wire female to male black
- 3x Nuts and Bolts

Type	Order code
Student kit	N **73-0207**

570943

NEW

AKX00023 Arduino Education Starter Kit

Teach 11 to 14 year old (middle school) students the basics of programming, coding, and electronics. No prior knowledge or experience is necessary as the kit guides you through step-by-step, you are well-supported with teacher guides, and lessons can be paced according to your students' abilities. You can integrate the kit throughout the curriculum, giving your students the opportunity to become confident in programming and electronics with guided sessions and open experimentation. You'll also be teaching them vital 21st-century skills such as collaboration and problem-solving.

The Arduino Education Starter Kit contains all the hardware and software you need for eight students (in groups of 2). You get step-by-step-lessons, teacher notes, exercises, and for a complete and in-depth class experience there's also extra optional resources including activities, concepts, history, and interesting facts.

The online platform contains the teacher content, nine 90-minute lessons, and two open-ended group projects that teach students coding and electronics. Each lesson builds on the previous one, giving students a further opportunity to apply the skills and concepts they have already learned. Students also get an engineering logbook that they complete as they work through the lessons.

The beginning of each lesson provides an overview, estimated completion times, and learning objectives. Throughout each lesson, there are teacher notes and information that help the lesson go smoothly. Extension ideas are provided at the end of each lesson..

Lessons:

Getting Started (30 min.). In this lesson the students get familiar with the kit's material. Learn about electrical safety, how to setup the software and create their first program.

Lesson 1 - Electricity Fundamentals (90 min.). In this lesson the students explore some of the basic concepts of electricity and build their first simple circuit while learning about the components that make up the circuit.

Lesson 2 - Ohm's Law (90 min.). The students explore one of the physical laws that determine how electricity behaves in a circuit: Ohm's Law . They will learn, by building, the difference between parallel and series circuits and will investigate how electrical measurements behave using a multimeter as a tool.

Lesson 3 - Traffic Signals (90 min.). In this lesson, students are introduced to the Arduino Software (IDE) and program their first light circuit that controls how the circuit operates.

Lesson 4 - Dimmer Switch (90 min.). The students learn about the potentiometer and how they can be used manually to control a circuit. As a result, they will build an LED circuit where the Arduino board will control the brightness of the LEDs based on the position of the potentiometer. As the students code their circuit they will be introduced to concepts such as variables, conditional statements and serial communication.

Lesson 5 - Project Holiday Lights (90 min.). The students will complete an open-ended project to design, build and program their own holiday light circuit. The project must follow the project's objectives, criteria and constraints.

Lesson 6 - Sports Robot (90min.). In this lesson, the students will learn how to use a servo motor to create a simple sports robot. They will program the robot to hit, kick or throw a ball.

Lesson 7 - Windshield wipers (90 min.). This lesson introduces new programming concepts to the students such as nested conditionals, switch-case structures, and loops. The students learn the new concepts by programming and building a windshield wiper circuit.

Lesson 8 - Musical Keyboard (90 min.). In this lesson, students learn about piezo buzzers and how to produce different sounds, tones and music. With that understanding, the student will build and code a musical keyboard.

Lesson 9 - Light Wave Radar (90 min.). Students will use their Arduino board and a phototransistor to measure the intensity of the light and will learn the basic principle about how information is transmitted through light waves.

Lesson 10 - Project Greenhouse Control System (180 min.). The students will complete an open-ended project to design, build and program a climate-control system for a greenhouse. The project must follow the project's objectives, criteria and constraints.

What's in the kit? Access code to exclusive online course content, teachers' guidance notes, and printable student worksheets

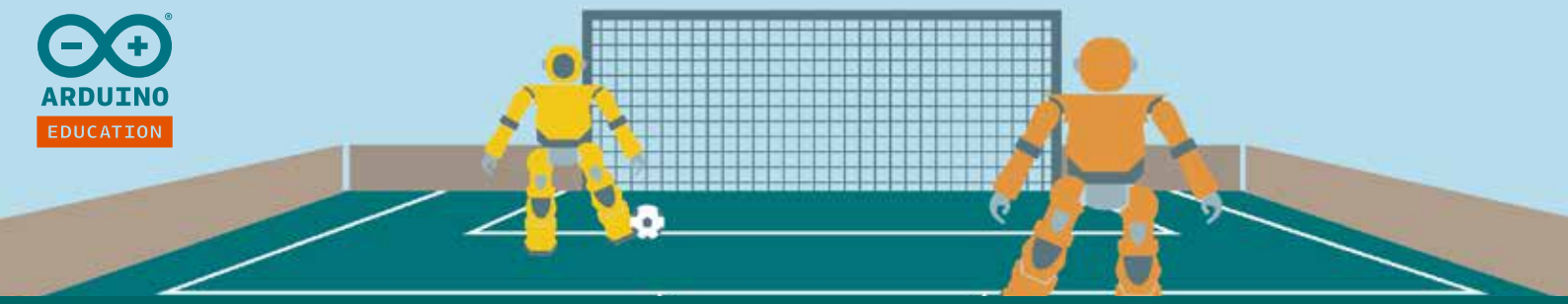
- 4x Arduino UNO rev 3
- 4x Starter Kit mounting base Easy-to-assemble plastic base
- 4x Battery Snap 9V, 8x Batteries 9V
- 4x Breadboard 400 points
- 4x Capacitor – 100µF
- 4x Female-male Jumper Wires (red), 4x Female-male Jumper Wires (black)
- 20x LEDs (red), 20x LEDs (green), 20x LEDs (yellow), 20x LEDs (blue)
- 4x Multimeters
- 4x Piezo Buzzer (PKM17EPP-4001-B0)
- 4x Photo-transistors
- 8x Potentiometer 10kOhms
- 20x Push Button
- 4x Resistors: 1 kΩ, 20x Resistors: 10 kΩ, 20x Resistors: 220 Ω, 20x Resistors: 560 Ω
- 70x Jumper Wires
- 4x Stranded jumper wires (red)
- 4x Servo Motor
- 4x Temperature sensor (TMP36)
- 4x USB Cable
- 12x M3 Screw, 12x M3 Bolts

Type	Order code	1+	5+
Arduino starter kit	**73-0166**	205.95	185.95

570939

SPORTS ROBOT

ARDUINO PROJECT



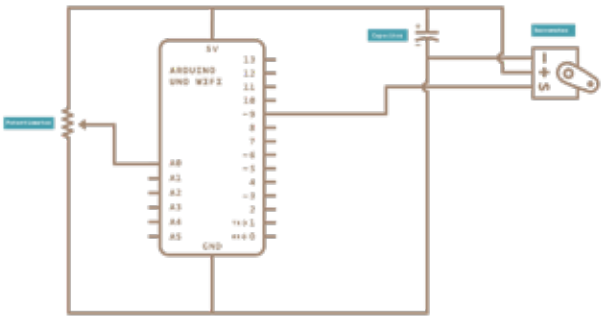
By using a servo motor, you will be able to create a simple sports robot.

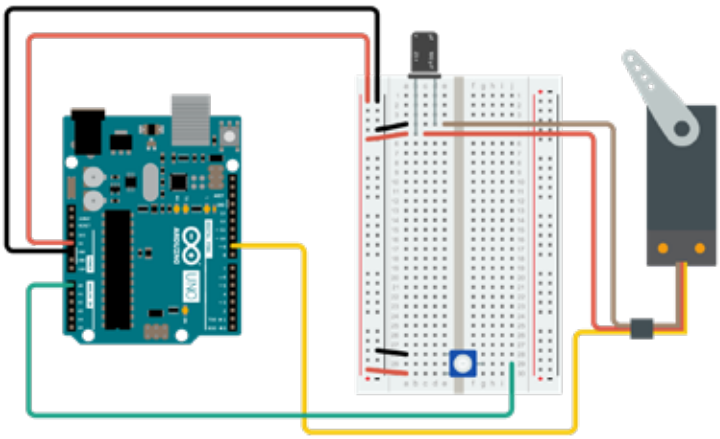
At the end, the robot should be able to hit, kick or throw a ball. You will also be able to experiment and test your robot's abilities.

KEY STAGE 3

TASK – BUILD THE CIRCUIT

Follow the following wiring diagram to build the circuit.





TASK – CODE CREATION

In this step you upload (or write) a sketch that enables you to control the angle of the servo by turning the potentiometer

ARDUINO EDUCATION

DID YOU KNOW WE ARE ARDUINO'S EDUCATION PARTNER IN THE UK?

By working together it is the aim of Arduino and Rapid to bring integrated STEAM solutions to schools. Providing rich content and resources, we will ensure that teachers have everything they need to implement STEAM subjects in their school.

IF YOU WANT TO TEST AND MODIFY YOUR SPORTS ROBOT ABILITIES, YOU CAN CHECK OUT LESSON 6 OF THE ARDUINO STUDENT KIT CONTENT. ENJOY!

Design and Technology UK curriculum alignment

The Arduino Student Kit provides an interesting hands-on way to educate students about design, technology and making. The English National Curriculum states that students at 11 to 14 years of age (key stage 3) should *"be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of domestic and local contexts, and industrial contexts, for example, engineering, manufacturing, and construction."*

UK Curriculum Key stage 3 and Student Kit:

	English National Curriculum	Student Kit
DESIGN	Identify and solve their own design problems and understand how to reformulate problems given to them.	Two open-ended projects allow students to design and develop their own kind of solution to a given real-world example or problem. While making the project students use a Logbook which includes a template to plan and document each phase of their project, from ideas, pseudocode to demonstration and scoring. Students are encouraged to present their projects to others to learn more how to communicate their ideas and learn how others have solved the same problem in different ways.
	Develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations, and computer-based tools.	
MAKE	Select from and use specialist tools, techniques, processes, equipment, and machinery precisely, including computer-aided manufacture.	When building the circuits and creating the programs students are using tools, such as Arduino, IDE and text-based programming languages that are commonly used in industries and possibly in their future careers.
EVALUATE	Analyse the work of past and present professionals and others to develop and broaden their understanding.	In the Invention Spotlight, students learn about different inventions and inventors. They will get a broader view and historical insight and better understanding of how technology has evolved over time and how different inventions have affected how we live, communicate or move things in the present days.
	Understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists.	
TECHNICAL KNOWLEDGE	Understand how more advanced electrical and electronic systems can be powered and used in their products [for example, circuits with heat, light, sound and movement as inputs and outputs].	In the lessons and projects students build circuits using common electronic components. They learn to program microcontroller boards, sense light and temperature using different sensors and based on the input control lights, motors and sounds. As well they have a multimeter to experiment and measure changes in voltage, current and resistance.
	Apply computing and use electronics to embed intelligence in products that respond to inputs [for example, sensors], and control outputs [for example, actuators], using programmable components [for example, microcontrollers].	

see online or contact us for more information on the full range

K000007 Starter Kit Including Uno Board

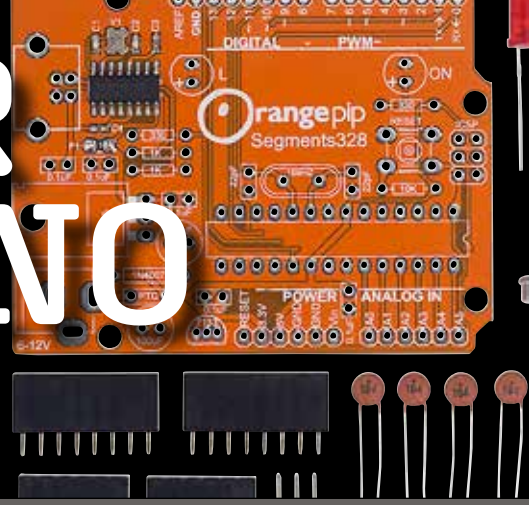
This starter kit serves as a hands-on introduction to the basics of the Arduino system. Using the accompanying 170-page project book and the comprehensive kit contents, you will learn to build useful, creative projects.

AKX00014 Science Kit Physics Lab

The kit, based on the Arduino MKR WiFi 1010, includes a range of sensors to measure light, temperature, motion, and magnetic fields; plus it comes with a set of props and full access to online course content for teachers and students to conduct nine exciting science projects.

BUILD YOUR OWN ARDUINO

Segments328 board



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 Segments 328 kit from Orangepip will let you into the secret - and will encourage you to develop your soldering skills in the process.

TASK – CONSTRUCTION OF BOARD

What you have got:

- PCB board pre-drilled
- 16MHz crystal
- ATmega328 microcontroller
- Dual in line socket
- Tactile switch
- Red and green LED
- 6 pin dual row header
- 2x 8 & 6 pin row sockets
- USB Socket
- Power supply jack socket
- 1x 10K, 2x 330R and 2x 1K resistors
- 2x 47uF electrolytic capacitors
- 1N4007 diode
- 7805 and 7133 voltage regulators
- PTC resettable fuse
- 0.1uF and 22pF ceramic capacitors

What you will need:

- Soldering iron, solder wire & helping hands assembly aid
- Side cutters
- Snipe nose pliers
- Multimeter

KEY STAGE 3+

What you have to do:

- Insert each of the components into the board in the order and location as indicated on the Build Instructions manual
- Solder each component into place
- Follow our guide to installing the software and uploading your first program to the Orangepip Segments board that you have just made

Build & Programming PDF instruction notes available online!

Orangepip® Segments328

Orangepip Segments 328 Build Your Own Arduino Class Pack of 15

£120.00

Order code 75-1201

Only **£11.95** Order code 75-1200

Orangepip Segments 328 Build your Own Arduino Kit

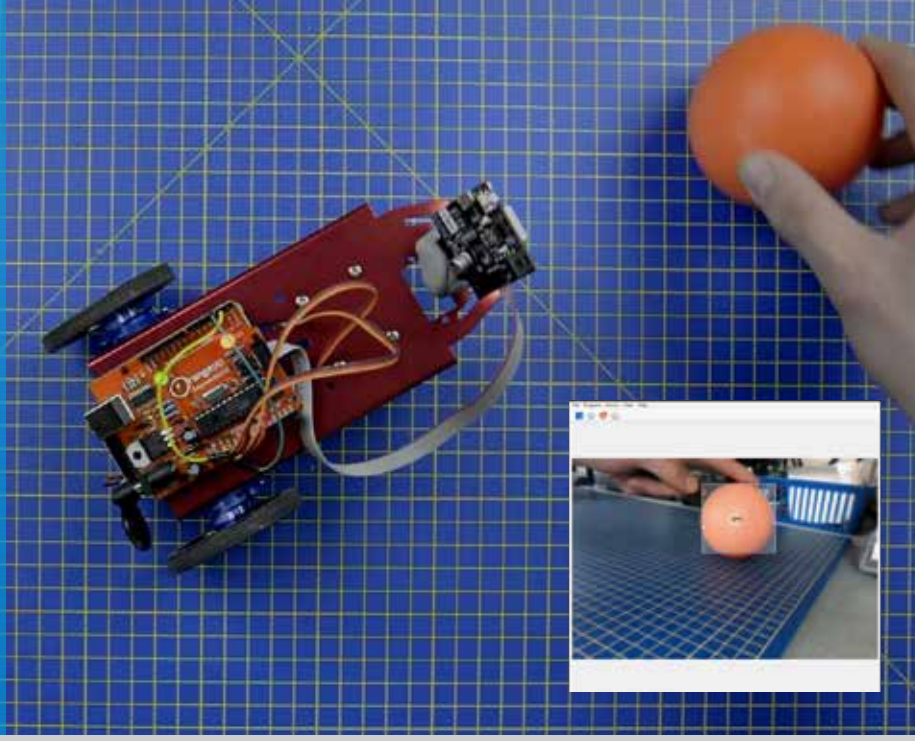
Orangepip USB Cable A Male to B Male 50cm

Only **£1.72** Order code 75-0552

TASK
BUILDING A SIMPLE OBJECT TRACKING ROBOT

What you will need:

- Segments328 (75-1200)
- Pixy 2 camera (75-1010)
- Servo robot platform (70-6415)



Watch our step-by-step video
youtube.com/rapideducationtv

HELPFUL TIP – IDENTIFY THE VALUE OF A RESISTOR

330R x 2 pieces.
Orange, Orange, Black, Black, Brown

1K x 2 Pieces.
Brown, Black, Black, Brown, Brown

10K x 1 piece.
Brown, Black, Black, Red, Brown

There are three ways to identify the value of a resistor:

1 Using a Multimeter
- Polarity doesn't matter to the measurement.
- It removes the possibility of misreading one of the resistor colour bands.
- It can be a quick way to check when you have multiple resistors.

2 Resistor Card
- It doesn't need power or the Internet so you can use it anywhere
- It teaches you to read the values without the aid of any equipment

3 Online guide
- Inputting the resistor colour bands will give you the exact value of the resistor
- The calculations are done for you which makes it easier to use than a resistor card.
- You just need to accurately identify the colours to get the correct result.

KONA & MEGA BOARDS

Mega2560 Arduino Mega2560 Compatible Development Board

Single **£21.61** Order code 75-0551

Pack of 10 **£195.86** Order code 75-0593

Kona328 Arduino UNO Compatible Development Board

Single **£11.95** Order code 75-0550

Pack of 15 **£128.72** Order code 75-0592

Orangepip Enclosure for Kona328

Single **£9.31** Order code 75-0547

Small Form Factor Development Boards

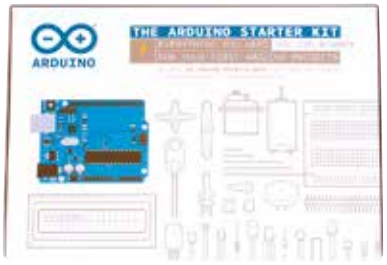
Arduino is an innovative and exciting open source prototyping platform that is based around hardware and software that is easily obtainable and easy-to-use. To further make things easier, Arduino provide an open-source and easy-to-use Integrated Development Environment (**IDE**) that enables the writing 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**	12.96
Micro	**73-4614**	13.28

563364

K000007 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 contents of the Arduino starter kit is listed below:

QuantityDescriptionQuantityDescription1Arduino projects book (170 pages)1Small DC motor 6/9V1Arduino UNO board Rev. 31Small servo motor1USB cable1Piezo capsule [PKM17EPP-4001-B0]1Breadboard1H-bridge motor driver [L293D]1Easy-to-assemble wooden base2Optocouplers [4N35]19V Battery snap5Transistor [BC547]70Solid core jumper wires2MOSFET transistors [IRF520]2Stranded jumper wires5Capacitors 100nF6Photoresistor [VT90N2 LDR]3Capacitors 100µF3Potentiometer 10kΩ5Capacitor 100pF10Pushbuttons5Diodes [1N4007]1Temperature sensor [TMP36]3Transparent gels (red, green, blue)1Tilt sensor1Male pins strip (40 x 1)1Alphanumeric LCD (16 x 2 characters)20Resistors 220Ω1LED (bright white)5Resistors 560Ω1LED (RGB)5Resistors 1kΩ8LEDs (red)5Resistors 4.7Ω8LEDs (green)20Resistors 10Ω8LEDs (yellow)5Resistors 1MΩ3LEDs (blue)5Resistors 10MΩ

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!

Type	Order code	1+
Starter kit including Uno board	**73-4642**	58.46

563530

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 Rev. 3	**73-4440**	17.43	
Leonardo board with headers	**73-4441**	13.77	
Uno SMD board Rev. 3	**73-4443**	14.37	
Due board ARM Cortex M3	**73-4445**	29.90	
Mega2560 board Rev. 3	**73-4450**	27.16	

563355

Selected brands

Arduino 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**	14.36
Motor/stepper/servo shield kit	**73-4497**	19.54
Motor and power shield kit	**73-4526**	14.07

559650

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.*

Each bundle includes:

1x	Arduino MKR1000 board, with header soldered	1x	Small servo motor
1x	Micro USB cable	1x	Piezo capsule (PKM17EPP-4001-B0)
1x	400-point breadboard	1x	H-bridge motor driver (L293D)
70x	Solid-core jumper wires	1x	Octocouplers (4NE5)
1x	9V Battery snap	2x	MOSFET transistors (IRF520)
1x	Stranded jumper wire	5x	Capacitors (100µF)
1x	Stranded jumper wire	5x	Diodes (1N4007)
6x	Phototransistors	3x	Transparent gels (R,G,B)
3x	Potentiometers (10kΩ)	1x	Male pin strip (40 x 1)
10x	Pushbuttons	20x	Resistors (220Ω)
1x	Temperature sensor (TMP36)	5x	Resistors (560Ω)
1x	Tilt sensor	5x	Resistors (1kΩ)
1x	Alphanumeric LCD (16 x 2 characters)	5x	Resistors (4.7kΩ)
1x	Bright white	20x	Resistors (10kΩ)
34x	LEDs (1 bright white, 1 RGB, 8 red, 8 green, 8 yellow, 3 blue)	5x	Resistors (1MΩ)
1x	Small DC motor (6/9V)	5x	Resistors (10MΩ)

Type	Order code	1+
MKR to IoT bundle	**73-4845**	53.58

566447

AKX00015 CTC GO! Core Module

The **Arduino CTC GO!** core module is an educational program that consists of several modules that can be combined to teach different STEAM (Science, Technology, Engineering, Arts, and Mathematics) subjects.

The modules are:

Toolbox

All the materials to build several guided experiments and projects per module for a class with up to 24 students.

Online Platform

Access to the Arduino Education Learning Management System with step-by-step instructions and lessons for 24 students and 3 teachers.

Premium Training and Support

Online welcome training webinar with an Arduino Education expert, training video lessons explaining concepts that the educators will use with the students, extra knowledge video pills which expands the content of the lesson plans and a support email to get the assistance of an education expert.

With the Core Module you will go through the foundations of CTC and build 8 exciting projects based on teamwork and learning by doing activities.

- The program is tailored for ages 14 to 17
- Additional information is available here
- Discover the potential of the Arduino CTC GO with the WHACK-A-MOLE project here

Type	Order code	1+
CTC Go! core module	**73-4866**	1175.71

568827

AKX00002SL CTC 101 - SELF

The **Arduino CTC 101** is a modular STEAM program consisting of a toolbox with 26 projects and easy to assemble experiments, an online platform, and guided educators support.

Creative Technologies in the Classroom 101, or CTC 101, is a 5x module **STEAM** program, tailored for students ages 13 to 17. It is the flagship Arduino Educational Program for schools. CTC 101 uses ìproject-basedî learning methodology. Students are introduced to the foundations of programming, electronics, and mechanics through a series of playful, well-documented projects and easy-to-assemble experiments.

The CTC 101 has been certified by the Finish Kokoa Education Standard that guarantees high educational value and robust pedagogical design on global learning.

TOOLBOX

Boards, shields and components for a class of up to 30 students, and for the educators to get trained. More than 700 components for a class.

ONLINE PLATFORM

Access to the Arduino Education Learning Management System with step-by-step instructions and lessons for 26 experiments based on themed modules.

SUPPORT

Self-administered training, onboarding webinar, and forum monitored by Arduino Education experts.

- Tailored for students ages 13 to 17
- Additional information is available here
- You can also download the full brochure here here

Type	Order code	1+
CTC 101 self	**73-4867**	1188.30

568828

AKX00021 CTC GO! Motions Expansion Pack

NEW

Build on your high school students' STEAM knowledge with more complex programming concepts that develop computational thinking and 21st-century skills.

If you've taken your students through the CTC GO! - Core Module, the Motions Expansion Pack will build on what they have already learned about how to use technology as a tool and how to apply that knowledge in the real world. The Motions Expansion Pack challenges them to go a step further in computing and design and technology by introducing them to new and more complex programming concepts that develop their logical reasoning, computational thinking, and problem-solving skills. Students will expand on their knowledge and skills in STEAM subjects to learn about motions by adding mobility to the hands-on, playful projects and transforming the movement their motors provide.
As an educator, you'll still get all the teaching support you need with webinars, videos, guides, and direct contact with an expert.

What is CTC GO! - Motions Expansion Pack? The Motions Expansion Pack includes four practical lessons during which you can introduce students to the basics of motions by teaching them about easy connection and control motors. Students then go on to create four different guided projects by applying the knowledge they have acquired during the lessons.

The **seven self-guided project-building sessions** that follow give students the confidence they need to work both under their own initiative and collaboratively with their peers, boosting their essential 21st-century skills. These projects allow students to demonstrate their imagination and curiosity by designing, building and testing projects all the way from an initial idea to a final solution to real-world problems they find meaningful. Students will learn about and follow a design process to develop their competence, creativity and knowledge in computer science and engineering design.

Benefits of CTC GO! - Motions Expansion Pack:

- Extend students' learning and challenge them to go one step further
- Boost learning outcomes in STEAM subjects
- An easy-to-implement, seamless addition to the Core Module
- Teach engaging lessons that are relevant, playful, and enable all students to thrive
- Enhance students' problem-solving and teamwork skills with specially-designed content and class dynamics

What's included?

A toolbox with all the specific motions components and materials you need to build several guided experiments and projects in addition to the Core Module components:

- Eight standard servo motors
- Eight continuous servo motors
- 16 Li-ion 18650 batteries
- Eight battery holders
- Two battery chargers
- Eight 9V batteries
- Jumper wires
- Assembly mechanical pieces
- Two markers
- Two screwdrivers

14 learning sessions of 45 minutes each:

- Four guided lessons to learn how to start working with motors
- Three guided project-building sessions to apply this knowledge
- Seven self-guided project-building sessions

Software platform for educators with all the materials you need for each lesson, resources to help you with lesson preparation, content tips, timing suggestions for classroom management, and curriculum links.

Software platform for pupils with step-by-step instructions, assembly videos, and fun activities to help them get started with programming, electronics and building fully-functional, interactive projects (educators also have prior access to this platform so they can prepare and adapt their lesson plans).

Training and support including a welcome training webinar with an Arduino Education expert, training videos which explain each lesson's concepts, shorter videos which expand on lesson content, and direct email support from an education expert.

In order to successfully use the Motions Expansion Pack, you will need the following elements from your Core Module:

- Arduino UNO Wifi Rev 2 board
- Arduino Education shield
- Student boxes with all electronic components
- Jumper wires and connectors
- Assembly pieces

Curriculum alignment

The CTC GO! - Motions Expansion Pack is aligned to the National Curriculum of England, used in international schools across the world, for computing and design and technology for students aged 14 to 17. Curriculum links are provided within the educators' software platform. Additionally, these lessons teach students important 21st-century skills such as collaboration, project management, problem-solving and critical thinking.

Key learning values

- Understanding the basics of servo control and being able to translate servo's rotational and linear motion by using gears and pulleys
- Expanding programming knowledge and concepts, controlling multiple attributes by reading data from sensors
- Being creative in ways of using resources and technology to design and develop physical computing projects
- Working collaboratively and efficiently to tackle real-world problems by following a design process

Type	Order code	1+	5+
Motions expansion	**73-0163**	645.95	595.95

570938

Arduino 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. Itís very fun to make and use.

Whiteboard Drawing Robot

This amazing robot can take a drawing itís given and duplicate it on a whiteboard. Itís 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:

- MATLAB and Simulink basics
- Connect MATLAB and Simulink to the Arduino MKR1000 and read/write data from connected sensors (encoders, IMU, hall sensor) and actuators (DC motors, servo motor)
- Analyze and visualize data from Arduino
- Apply custom algorithms for complex math operations, image processing, and PID control
- Model and simulate behaviour of dynamic systems in Simulink
- Incorporate logic-based algorithms that define system behaviour for different ìstatesî (e.g. move forward, turn, stop)
- Build and run a working Arduino application from a Simulink model
- Tune and optimize Simulink model parameters as the application is running on
- Download the completed Simulink model for standalone execution on the Arduino

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

Type	Order code	1+
Engineering kit	**75-0999**	165.36

567168

AKX00022 Arduino Engineering Kit Rev2

The Arduino Engineering Kit Rev 2 provides extensive learning outcomes, giving students a strong understanding of basic engineering concepts through fun projects that create a collaborative learning environment. Students are able to connect what they learn with real-world industries, are encouraged to think critically, and improve their depth of knowledge by learning through experimentation. Ideal for advanced high school and college students.

The Arduino Engineering Kit Rev 2 is a versatile, hands-on learning tool that demonstrates key control systems concepts, core aspects of mechatronics, and MATLAB and Simulink programming. The projects cover the basics of model-based design, control systems, image processing, robotics, signal processing, and more - plus they're fun to do! The kit includes all the physical components you need, including learning materials and software, to build the three projects: a self-balancing motorcycle, a webcam controlled rover, and a drawing robot. There's online step-by-step guidance, so it's ideal for students working in small groups or for facilitating remote learning.

The kit is primarily for three types of users: students learning about mechatronics engineering, professors looking for practical resources to support their class, and makers with an interest or background in robotics, either professionally or as a hobby.

Adapting the kit and further experimentation

Educators can freely tailor the Arduino Engineering Kit Rev2 to their students' needs and their own curriculum. You can use this versatile kit as the core of a new engineering mechatronics class or freely adapt the content to your own ideas and experiments while implementing MATLAB and Simulink, for example as part of laboratories and final projects.

Opportunity for lots of experimentation for both educators and students.

In addition to the three projects, students have the freedom to experiment, design, and develop new solutions using the software and hardware components in the kit, which are some of the tools that are used in industry and help students learn valuable career skills they'll use in the future. Students can also buy the kit and use it to experiment at home and for extended learning.

The kit includes: Several customized parts, a complete set of electronics, and all the mechanical components needed to assemble each project (a webcam controlled rover, a self-balancing motorcycle, and a drawing robot):
Arduino Nano 33 IoT

- Nano Motor Carrier with IMU and battery charger
- Three sets of mechanical pieces to assemble the projects
- Li Ion 18650 battery
- Two geared motors with encoders
- DC motor with encoders
- Servo motor
- USB cable
- Two whiteboard markers
- Two wheels
- Allen key
- Webcam
- Nylon thread
- Screws, nuts and bolts
- A hard plastic, stackable toolbox ideal for storage and years of use
- A one-year individual license for MATLAB and Simulink
- Student e-learning platform with step-by-step guidance

Type	Order code	1+	5+
Engineering kit	**73-0167**	165.95	152.95

570940

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

Type	Order code	1+
Grove starter kit	**75-0383**	37.42

563361

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 contents:

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

Type	Order code	1+
SideKick for Arduino	**75-0390**	14.15

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 contents:

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

Type	Order code	1+
Arduino starter kit	**75-0391**	48.47

563534

seeed studio

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**	18.03

563359

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**	8.44

560364

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.

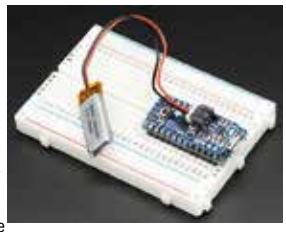
- Available in 3.3 or 5V versions
- Onboard USB bootloading support
- Optiboot support
- LED Indication for bootloading
- PCB Dimensions only 1.5 x 0.7 x 0.2mm
- Mounting holes
- Up to 16V input
- Ultra low dropout regulator
- Reverse polarity protection, thermal and current-limit protection
- Power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

Type	Order code	1+
Adafruit 2000	**75-0509**	9.74
Adafruit 2010	**75-0510**	9.74

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**	4.85

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**	6.82
5V Trinket	**75-0581**	6.82

561301

Adafruit NeoPixel LED

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**	18.24
16 NeoPixel ring	**60-8817**	11.94
12 NeoPixel ring	**60-8818**	8.53

560439

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**	10.50
12x LED ring warm	**73-5274**	9.41
16x LED ring natural	**73-5276**	13.07
24x LED ring natural	**73-5269**	21.31
24x LED ring warm	**73-5270**	19.87

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**	5.91
RGB & natural white (4500K)	**73-5271**	8.05
RGB & warm white(3000K)	**73-5272**	8.05

563207

NeoPixel 8x8 Addressable RGB LED Matrix

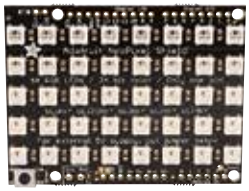
The **Adafruit 8 x 8 NeoPixel matrix** lets you address every single one of the 64 LEDs and set its 24-bit RGB value. Make subtly shaded displays or light up the room at full power, the choice and the responsibility is yours. The matrix has 3 x solder pads, 2 x for power (5V DC) and 1 x for the data 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**	35.60

560438

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**	25.89

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**	7.16

560441

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.

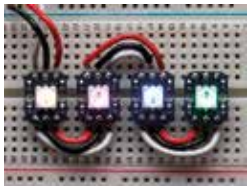
- 8-pixel RGBW NeoPixel Stick
- Warm white (3000K) or natural white (4500K)
- Requires 5V DC power
- Sticks can be daisy-chained together
- Dimensions: 10.2 x 51.1 x 3.2mm (0.4 x 2.0 x 0.13in)

Type	Order code	1+
Natural white (4500K)	**73-5277**	7.89
Warm white (3000K)	**73-5278**	7.89

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**	10.63

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**	6.20

563231

Wearables

Light Stitches E-Textiles for Education

iPod™ Holder Smart Textiles Project Kit

A KS3 project that uses smart textiles and LEDs to create an illuminated iPod™ pouch.

The iPod™ holder uses 1 colour changing LED for a visual display. The LED is activated when the metal press stud is closed (Press stud acts as a switch turning the LED ON/OFF).

- Includes all components and materials to make one LED colour changing iPod™ holder
- Free downloadable instruction booklet includes all the printable resources needed for those lessons
- Due to this NEW smart material (conductive thread) connections can now be produced by a simple knot or sewing around the LEDs (Lights)
- The iPod™ holder can be easy altered to suit various items like phones, mp3 players, etc.

Type	Order code	1+
iPod pouch kit	**87-6105**	4.83

300686

Light Stitches E-Textiles for Education

Flashing LED Pencil Case Project Kit

A KS3 textile and electronics project that uses smart textiles and electronic components to create a flashing LED pencil case.

The pencil case uses 2 flashing green LEDs for a visual display. The LED is activated when the metal zip is closed (Zip acts as a switch turning the LED ON/OFF).

- Includes all components and materials to make one flashing green LED pencil case
- Free downloadable instruction booklet includes all the printable resources needed for lessons
- Due to this NEW smart material (conductive thread) connections can now be produced by a simple knot or sewing around the LEDs (Lights)

Type	Order code	1+
Pencil case kit	**87-6107**	4.68

300688

Light Stitches E-Textiles for Education

Camper Van Key Ring Kit

The Light Stitches Camper Van Key Ring Kit is a **KS3 textile and electronics project**. It is available as a single kit.

It uses smart textiles and electronic components to create headlights (LEDs) that turn on when the soft switch, hidden in the window, is pressed. The kit uses smart conductive thread allowing connections to be easily made by simply tying a knot or sewing around the LEDs and other components.

- Kit includes all components and materials
- Smart conductive thread allows connections to be made by simply tying a knot or sewing around the LEDs (Lights)
- Free downloadable instruction booklet including template
- Booklet shows in detail how to turn metal textiles materials like zips, press studs, etc., into switches
- Due to their simplicity, Light Stitches kits are currently being used by various textile consultants and throughout education from Primary to University level

Type	Order code	1+
Single kit	**87-6149**	5.09

539460

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Quick quote service available online

Either click on a product and ask for a quick quote or visit **www.rapidonline.com/quotation** for more details

Light Stitches

E-Textiles for Education

Light Stitches specialises in supplying electronic textile kits and components for education, business and individuals. Whether you are a crafter or just interested in STEAM products we have the right product for you.

Camper Van Keyring

Create headlights (LEDs) that turn on when the soft switch, hidden in the window, is pressed.

£5.09
Order code 87-6149

Flower LED Pencil Case

A project that uses smart textiles and electronics to create a flashing LED pencil case

£4.68
Order code 87-6107

Ipod Pouch Kit

A KS3 project that uses smart textiles and LEDs to create an illuminated iPod™ pouch.

£4.83
Order code 87-6105

Soft Switch and Conductive Thread Kit Pink LEDs

£2.81
Order code 87-6128

Conductive Thread Kit Yellow LEDs

£2.35
Order code 87-6119

Blue Surface Mount LED Kit

£3.93
Order code 87-6141

Junior Soft Switch Kit with Red LED

Easily incorporated into soft toy and felt projects.

£1.80
Order code 87-6139

Sewable Coin Cell Battery Holder

Easy pop-in, pop out feature for changing battery.

£1.35
Order code 87-6113

Easy-Sew Battery Holder with Switch

This battery holder holds a CR2032 coin cell battery.

£1.81
Order code 87-6159

Light Stitches E-Textiles for Education

Dancing Toy Smart Textiles Project

This exciting smart textiles and electronics project provides a fun way of using and understanding the properties of two smart materials, muscle wire and polymorph.

A polymorph or MDF model is constructed by the student. This is suspended by the muscle wire and via a set of levers. On passing a current through the wire the composition of the wire changes which makes it contract, the toy will then move its limbs and the spring will move them back.

- History of muscle wire, how muscle wire is crimped, underlying technology, contraction time
- Useful benefits, future research, sample applications, Frequently Asked Questions
- Four muscle wire projects
- Scheme of work, lesson plans, brief, design specification, product analysis
- Levers and linkages
- High-medium-low ability worksheets, assessment sheets, etc.

Type	Order code	1+
Dancing toy book and CD	**87-6123**	15.00

300744

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**

Type	Order code	1+
6m Bobbin	**87-6147**	2.65

300692

Light Stitches E-Textiles for Education

Conductive Thread Kits

The extremely successful Light Stitches projects use a new smart material, Conductive Thread to attach LEDs (lights) to textile projects by simply fastening a knot or sewing onto the LED. This highly conductive thread acts and behaves like conventional thread with the added bonus of being extremely conductive.

- Free downloadable teachers booklet
- Various flashing and colour changing kits available
- Includes 2 metres of conductive thread and all components to easily attach the 5mm LEDs to textiles projects
- No soldering involved. If the thread breaks tie the two ends together and it still works perfectly
- FREE downloadable booklet includes all information needed including schemes of work and lesson plans. It shows in detail how to turn metal textiles materials like zips, press studs, etc., into switches
- Originally designed as a KS3 project, these extremely popular projects are being used by various textile consultants and due to their simplicity are being used throughout education from primary to university
- Introduction to product design encouraging the mixing of different D&T elements thus encouraging creativity in later school life

Please note that the kits each contain 2 LEDs except the Rainbow kit 87-6104, which only contains 1.

Type	Order code	1+
Red	**87-6103**	2.51
Yellow	**87-6119**	2.35
Blue	**87-6100**	2.51
Green	**87-6102**	2.51
Rainbow	**87-6104**	2.60

300685

Light Stitches E-Textiles for Education

Soft Switches

These new Light Stitches Soft Switch Kits are a development of our best selling conductive thread kits. This version includes an extra self-adhesive pad which allows the user to make a reliable switch which can then be incorporated into a textiles project to turn on the LEDs.

This same system is used in the Light Stitches Monster Kits, where the soft switch is fixed into the hand of the Monster so when squeezed, the eyes light up.

- Each kit includes:
- Soft switch pad
- 2 metres of conductive thread
- 2 LEDs
- Battery and battery holder
- Available in a range of different colours

Type	Order code	1+
Yellow	**87-6125**	2.81
Blue	**87-6126**	2.81
Pink	**87-6128**	2.81

500598

Light Stitches E-Textiles for Education

Junior Soft Switch Kit

This inexpensive kit uses a felt pad as both a switch and a battery holder and can be easily incorporated into soft toy and felt projects. When completed, pressing the felt pad turns the 2 flashing red LED lights on, and releasing it turns the lights off.

The kit has been specially designed to use as little electronics as possible, while providing a pleasing visual indication of success for the novice crafter.

See the PDF Datasheet, available on our website, for full constructional details.

Kit contains:

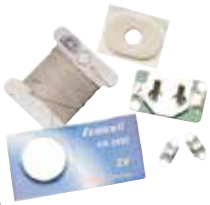
- Adhesive felt pad
- CR2032 coin cell battery
- Conductive thread
- 2x Red flashing LEDs

Type	Order code	1+
Soft Switch Kit	**87-6139**	1.80

519344

Light Stitches E-Textiles for Education

Easy-Sew Soft Switches Kits Blue LED



This Easy-Sew Light Stitches Soft Switch Kit has been designed to make connection even easier. It uses a surface-mounted battery holder and LEDs, mounted on small circuit boards with large connection holes, so the conductive thread can be easily tied directly to them.

The kit includes a self-adhesive pad which allows the user to make a reliable soft switch which can then be incorporated into their textiles project to turn the flashing lights on and off.

Check out our Light Stitches mini-sitefor teacher resources, lesson plans, videos demonstrating how to use the products, and the full range of Light Stitches products that Rapid Electronics offer.

Each kit includes:

- 2 Easy-Sew LEDs
- Battery and Easy-Sew battery holder
- Soft switch pad
- 2 metres of conductive thread
- Available with blue LEDs

Type	Order code	1+
Blue LEDs	**87-6141**	3.93

519345

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.

- 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**	1.35
Battery holder+switch	**87-6159**	1.81

519349

Light Stitches E-Textiles for Education

Conductive Hook and Loop Strip 25mm x 100mm

This conductive hook and loop is perfect for use as a switch in your electronic textile projects.

The material is a base of **DuPont** nylon which undergoes one of the world's most advanced nano silver layer curing techniques which incorporates silver into the base material, that is then woven into the hook and loop fabric.

As well as being the perfect conductive fastening for your art and design projects, this fabric has superb anti-electromagnetic radiation, electrical conductivity, anti-static, antibacterial deodorant properties.

- 100% Silver plated fibre
- Lifetime 10,000 openings/closings
- Surface resistivity 1Ω/cm
- EM Shielding better than 60dB
- Excellent holding power
- Conducts along its length and across the gap
- Can easily be cut to size
- Size 100mm length and 25mm width

Type	Order code	1+
Hook and loop strip	**87-6101**	4.49

567333

Silicone Elastomer 4x4 Keypad and Driver Board

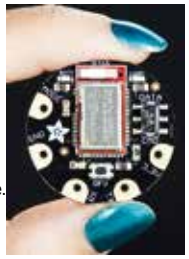
The **Adafruit Silicone Elastomer 4 x 4 Button Keypad** is a little different from most microcontroller keyboards, instead of hard plastic buttons, these are squishy elastomer. Each button has room for a 3mm LED so that you can illuminate just those keys that are active in your project. You don't have to add LEDs, but it does look pretty cool; diffused LEDs are the best. Because they're made from soft silicon, they're washable and you can trim off any buttons you don't want. Adafruit have also made the keypads edge to edge tileable to create larger arrangements. Each button has a conductive ring which makes contact with a properly designed PCB underneath. Adafruit provide an EagleCad library so that you can design your own. Alternatively you can pick up an Adafruit Trellis driver PCB which will do it for you. The elastomer 4 x 4 keypad and the Trellis driver PCB are sold separately.

- 4 x 4 button matrix with room for 3mm LEDs in each button
- Buttons are wipe clean, tileable, cuttable
- 3mm travel per button
- 4 x 4 keypad and LED driver PCB with I2C connectivity
- Tileable for up to 8 x boards in total
- Dimensions: 60 x 60mm (2.4 x 2.4in)

Type	Order code	1+
Elastomer button pad	**73-5381**	4.85
RGB driver board	**73-5431**	12.24

563280

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**).

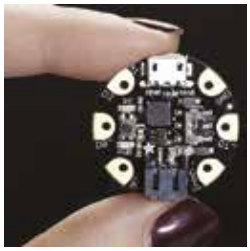
See Adafruit's "Quick Start" guide, part of their massive free tutorial with software examples. They also provide an Android app and an iOS app which can talk BLE to your project.

- 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**	17.13
Wearable Bluetooth LE	**73-5314**	16.20

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.

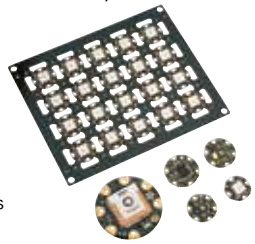
Supplied as a fully assembled and tested board. Adafruit supply a free tutorial to get you started with this seriously small, low cost board. Please note that GEMMA doesn't have a serial port for debugging, something had to give to make it so small.

- 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**	9.74

563228

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**	13.84
20 x RGB NeoPixels	**73-5369**	32.37
Wearable GPS module	**73-5376**	37.00
FLORA colour sensor	**73-5356**	7.78

563219

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**	24.28

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**	3.67
LED sequins blue	**73-5392**	3.88
LED sequins red	**73-5390**	3.67
LED sequins white	**73-5393**	3.88

563202

adafruit

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**	14.64

561286

Adafruit Feather

adafruit

HUZZAH32 ESP32 Feather Board

The HUZZAH32 is the ESP32-based Feather, made with the official WROOM32 module. Adafruit have packed in everything you love about Feathers: built in USB-to-serial converter, automatic bootloader reset, lithium-ion/ polymer charger, and just about all of the GPIOs brought out, so you can use it with any of our Feather Wings.

That module nestled in at the end of this Feather contains a dual-core ESP32 chip, 4MB of SPI Flash, tuned antenna, and all the passives you need to take advantage of this powerful new processor. The ESP32 has both WiFi and Bluetooth Classic/LE support. That means it's perfect for just about any wireless or Internet-connected project.

Because it's part of the Feather eco-system, you can take advantage of the 50+ Wings that Adafruit have designed to add all sorts of cool accessories.

The ESP32 is a perfect upgrade from the ESP8266 that has been so popular. In comparison, the ESP32 has way more GPIO, plenty of analog inputs, two analog outputs, multiple extra peripherals (like a spare UART), two cores so you don't have to yield to the WiFi manager, much higher-speed processor, etc.

Comes fully assembled and tested, with a USB interface that lets you quickly use it with the Arduino IDE or the low-level ESP32 IDF. Includes headers so you can solder it in and plug into a solderless breadboard. Lithium polymer battery and USB cable are not included.

- 240MHz dual core Tensilica LX6 microcontroller with 600 DMIPS
- Integrated 520KB SRAM
- Integrated 802.11b/g/n HT40 Wi-Fi transceiver, baseband, stack and LWIP
- Integrated dual mode Bluetooth (classic and BLE)
- 4MByte flash include in the WROOM32 module
- On-board PCB antenna
- Ultra-low noise analog amplifier
- Hall sensor
- 10x capacitive touch interface
- 32kHz crystal oscillator
- 3x UARTs (only two are configured by default in the Feather Arduino IDE support, one UART is used for boot-loading/debug)
- 3x SPI (only one is configured by default in the Feather Arduino IDE support)
- 2x I2C (only one is configured by default in the Feather Arduino IDE support)
- 12x ADC input channels
- 2x I2S Audio
- 2x DAC
- PWM/timer input/output available on every GPIO pin
- OpenOCD debug interface with 32kB TRAX buffer
- SDIO master/slave 50MHz
- SD-card interface support
- Dimensions: 51.0 x 22.7 x 7.3mm (2.0 x 0.9 x 0.3in)
- Weight: 6.8g (0.2oz.)

Please note: *The ESP32 is still targeted to developers.*

Not all of the peripherals are fully documented with example code and there are some bugs still being found and fixed. Adafruit got all of their Featherwings working under Arduino IDE, so you can expect things like I2C and SPI and analog reads to work. But other elements are still **under development**.

For that reason, we recommend this Feather for makers who have some experience with microcontroller programming and **not as a first development board**.

Type	Order code	1+
ESP32 feather board	**73-5436**	19.54

568254

adafruit

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.

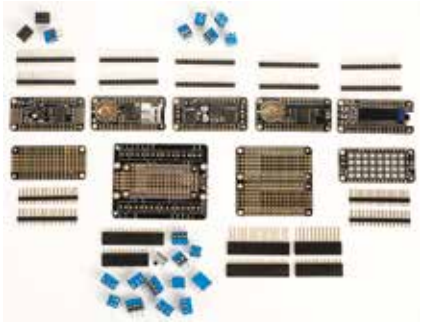
- 4 x mounting holes
- Dimensions 51 x 23 x 8mm (2.0 x 0.9 x 0.28in)

Type	Order code	1+
32u4 Bluetooth LE	**73-5308**	30.80
32u4 basic proto	**73-5309**	19.54
32u4 RFM69HCW	**73-5250**	25.66
ATSAMD21 cortex M0	**73-5300**	19.54
Cortex M0 datalogger	**73-5306**	20.52
ESP8266 WiFi	**73-5299**	16.60

563217

adafruit

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+
Data logger FeatherWing	**73-5268**	8.77
DC motor & stepper ctrl.	**73-5304**	19.80
Real-time clock	**73-5258**	8.73
128x32 OLED display	**73-5305**	14.64
Prototyping add-on	**73-5307**	4.85
4x8 RGB LED	**73-5298**	13.84
Terminal block breakout	**73-5267**	13.84

563216

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**	74.03

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**	44.02
FONA uFL	**75-0588**	23.63

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**	2.44
RFID/NFC clear fob	**73-5290**	2.31
RFID/NFC clear tag	**73-5291**	2.31
RFID/NFC leather fob	**73-5289**	3.12

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**	41.09

563277

Grove - User Interface and Control Modules

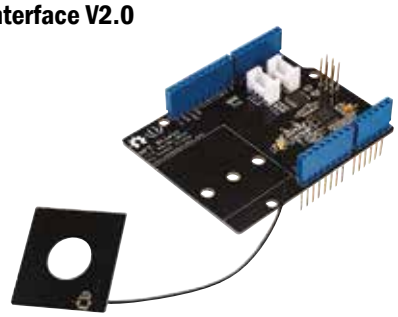
The **User Interface and Control Modules from Seeed Studio** are a selection from Seeed's collection of Grove add-ons which allow the user to interact with their projects.

- 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**	10.57
125KHz RFID reader	**75-0434**	9.77
Relay board	**75-0436**	2.58
Thumb joystick	**75-0457**	5.16

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**	18.93

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+
Combo pack	**75-0485**	2.38

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**	17.13
LIS3DH	**73-5283**	4.85

563257

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**	7.33

563266

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**	9.74
MPL3115A2	**73-5402**	10.23

563262

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**	19.54

563263

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**	9.74
TSL2591	**73-5410**	6.82

563265

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**	7.78
Adjustable gain	**73-5328**	6.82

563200

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**	12.28
MAX31855K	**73-5329**	14.64

563259

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**	7.67

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**	7.78

563270

Flowol

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**	29.90
Flowol 4 Primary	**70-0291**	139.29
Flowol 4 Middle	**70-0292**	219.00
Flowol 4 Secondary	**70-0293**	313.95
Flowol 2 to 4 Upgrade	**70-0294**	93.35

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Flowol 4

Primary 3D Mimic Pack 1

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**	9.29
Pri. Mimic Pk1 School	**70-0297**	44.57

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Flowol 4

Secondary 3D Mimic Pack 1

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**	9.29
Sec. Mimic Pk1 School	**70-0299**	53.86

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