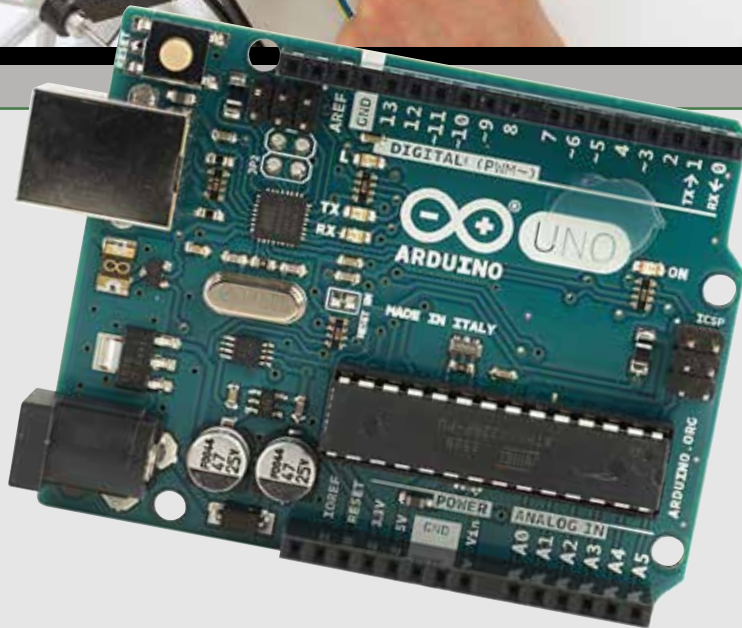
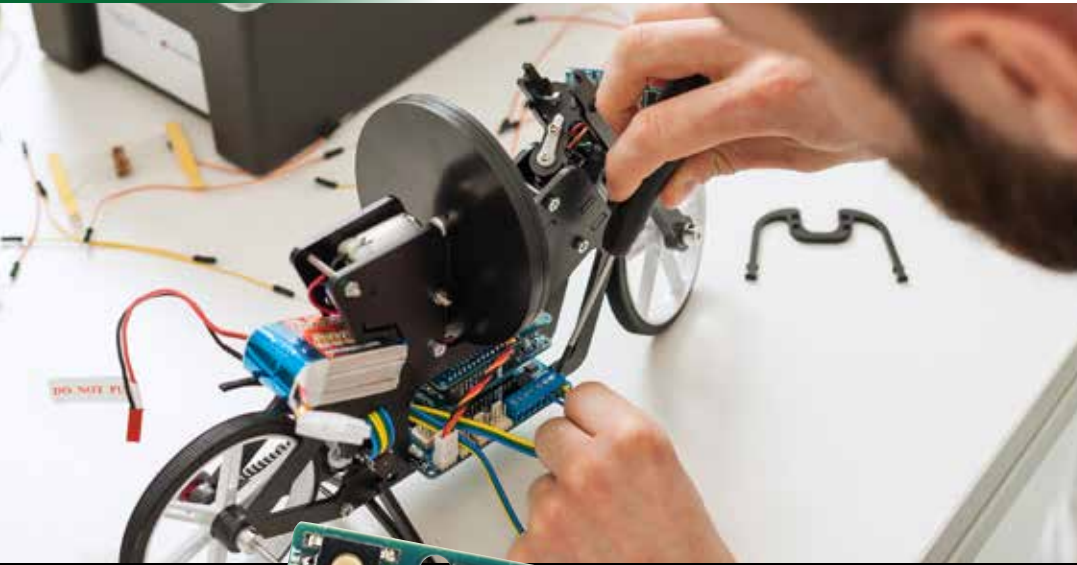


# Single Board Computers & Microcontrollers



Arduino Uno A000066 Board R3

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Full range of Single Board Computers & Microcontroller products available at:

**[www.rapidonline.com](http://www.rapidonline.com)**

## micro:bit



## BBC micro:bit Pocket Sized Codable Computer V2

The BBC micro:bit is a pocket-sized computer that introduces you to how software and hardware work together. It has many features that let it interact with you and your world.

The original BBC micro:bit has been a great success, helping to educate students in the joys of coding and embedded computing. Now there is a NEW BBC micro:bit with the same great features but now with speaker and microphone. The new computer adds even more opportunities for learning, exploration and creativity in the classroom.

This latest micro:bit will fit right in to your existing lessons and materials; all the existing MakeCode blocks and MicroPython code will work in the same way as they do on the original micro:bit. The previous micro:bit will also continue to work just as it did before.

With the built-in speaker, microphone and touch sensor on the new micro:bit, there are even more exciting things you can add to your projects:

- Clap hearts - Clap your hands to make the heart beat using the sound sensor
- Bumblebee - Fly your bumblebee to see how motion affects the frequency, tempo and volume of its sound
- Hold the note - Keep singing to make all the LEDs light up
- Mimic - Talk to your micro:bit and listen to it mimic the rhythm of your speech

## Software development and compatibility

Online editors are designed to be really easy to use to program the micro:bit and this will continue for the new features of sound sensing, sound-making and touch.

The latest micro:bit will fit right in to your existing lessons and materials; all the existing MakeCode blocks and MicroPython code will work in the same way as they do on the original micro:bit. The previous micro:bit will also continue to work just as it did before.

- Built-in speaker, microphone and touch sensor
- Sense and react to sound
- Capacitive touch sensor (a bit like your phone!)
- Power saving mode
- More computing power
- Also available in a money-saving bundle, complete with USB cable, battery box & batteries

Type	Order code	1+	25+	50+
micro:bit only	75-0153	11.41		
V2 GO bundle	75-0278	14.13	13.86	13.60

5/11/17



## BBC micro:bit Pocket Sized Codeable Computer Starter Kit

This BBC micro:bit Pocket Sized Codeable Computer Starter Kit features the new V2 micro:bit board. 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](http://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.



- New V2 micro:bit board
- 5 x 5 LED matrix display
- 2x tactile switch button inputs
- Electronic compass
- Accelerometer
- 3x input/output rings
- Bluetooth 4.0 connectivity

Complete kit includes: 1 x V2 micro:bit board, 1 x USB download cable, 1 x switched battery box, 2 x AAA batteries.

Type	Order code	1+	25+	50+
Starter kit	78-7230	14.79	14.58	14.18

5/3/20



## 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.

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 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	31.92
Line sensor	75-0127	1.57
HC-SR04 v2	75-0146	3.87

5/5/20



## 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 BitBot 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 following 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 caster
- 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 BitBot 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 BitBot 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 not included. Batteries, pen and ultrasonic sensor are not included.

Type	Order code	1+
Robot only	75-5019	31.45

5/8/20

## 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.



### Raspberry Pi Model 4 2GB, 4GB & 8GB

The 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, up to 8GB 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, 4GB & 8GB models

Type	Order code	1+
2GB	<b>75-1007</b>	38.34
4GB	<b>75-1008</b>	45.00
8GB	<b>75-1013</b>	60.49

568266

## Technical specifications

Technical specifications for all of these products can be found at

[www.rapidonline.com](http://www.rapidonline.com)



### Raspberry Pi 3 Model A+ 512MB Quad Core WiFi & Bluetooth

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

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

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

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

For technical specialisation visit [www.rapidonline.com](http://www.rapidonline.com)

Type	Order code	1+
Pi 3 Model A+	<b>75-1006</b>	22.80

561730



### 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.

**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.

- Broadcom BCM2837B0, Cortex-A53 (ARMv8) 64-bit SoC @ 1.4GHz
- 1GB LPDDR2 SDRAM
- 2.4GHz and 5GHz IEEE 802.11.b/g/n/ac wireless LAN, Bluetooth 4.2, BLE



- Gigabit Ethernet over USB 2.0 (maximum throughput 300 Mbps)
- Extended 40-pin GPIO header
- Full-size HDMI
- 4 x USB 2.0 ports
- CSI camera port for connecting a Raspberry Pi camera
- DSI display port for connecting a Raspberry Pi touchscreen display
- 4-pole stereo output and composite video port
- Micro SD port for loading your operating system and storing data
- 5V/2.5A DC power input
- Power-over-Ethernet (PoE) support (requires separate PoE HAT)

Type	Order code	1+
Pi 3 Quad core 1.4GHz	<b>75-1005</b>	29.15

566563



### Raspberry Pi 3 RASPERRY-MODB+-512M Model B+ BCM2835 CPU

The RASPERRY-MODB+-512M is a card sized computer with a design that is based around the Broadcom BCM2835 SoC, which includes an ARM1176JZF-S 700MHz processor, VideoCore IV GPU, and 512Mbytes of RAM.

The **Raspberry Pi** plugs into your TV and a keyboard, transforming into a little PC that can be used for many of the things that your desktop PC does, like spreadsheets, word processing and games, as well as high definition video.

The design does not include a built in hard disk or solid state drive, instead relying on a microSD card for booting and long term storage. This board is intended to run **Linux** kernel based operating systems.

Suitable applications include hobby and education, imaging, video and vision, consumer electronics, communications and networking.

- Capable of playing full 1080p high definition Blu-Ray quality video
- Versatile, and developer friendly Debian GNU/Linux operating system
- HDMI Video, output and RCA video output
- 5V, 2A Power is provided by a micro USB socket
- Four USB ports
- 4-pole 3.5mm stereo audio jack with composite video output
- microSD, MMC, SDIO flash memory card slot
- 40 pin, 2.54mm header expansion slot

Type	Order code	1+
Pi 3 Model 3 B+	<b>75-0191</b>	22.81

568117



### Raspberry Pi Compute Module CM3/3+ Development Kit

Only

**£78.60**

Order code 75-1140

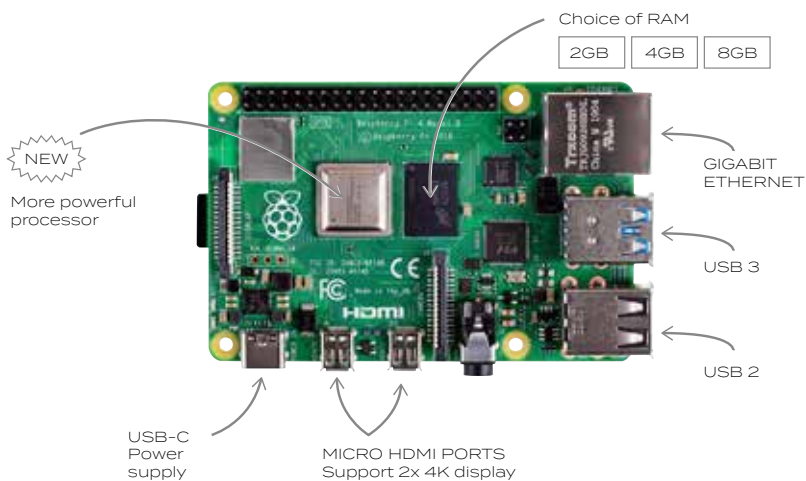
[www.rapidonline.com](http://www.rapidonline.com)





# 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



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**  
**£38.34**

Order code  
75-1007

**4GB**  
**Raspberry Pi 4**  
**Model B**  
**£45.00**

Order code  
75-1008

**8GB**  
**Raspberry Pi 4**  
**Model B**  
**£60.49**

Order code  
75-1013





## Raspberry Pi Pico RP2040 Microcontroller Board

The **Raspberry Pi Pico** is a single board computer that features the dual-core Arm Cortex-M0+ processor, that has 264KB internal RAM and support for up to 16MB of off-chip Flash.



This microcontroller board has been designed to be a low cost, flexible development platform that supports many possible applications over a wide range of skill levels. Getting started is as easy as dragging and dropping a file, and more experienced users can take advantage of the boards rich feature set, including a wide range of flexible I/O options includes I2C, SPI, and programmable I/O (PIO).

The Raspberry Pi Pico is programmable in C and MicroPython, and is adaptable to a vast range of applications from controlling appliances to operating a light display, Raspberry Pi Pico puts the technology that underpins countless everyday operations into your hands.

- RP2040 microcontroller with 2MByte Flash
- Dual-core cortex M0+ at up to 133MHz
- Micro-USB B port for power and data (and for reprogramming the Flash)
- 40 pin 21x51 DIP 1mm thick PCB with 0.1" through-hole pins also with edge castellations
- On-board USB1.1 (device or host)
- 26x Multi-function 3.3V General Purpose I/O (GPIO)
- 23x GPIO are digital-only and 3 are ADC capable
- 3-pin ARM Serial Wire Debug (SWD) port
- Simple yet highly flexible power supply architecture
- Options for powering the unit from micro-USB, external supplies or batteries
- High quality, low cost, high availability
- Comprehensive SDK, software examples and documentation

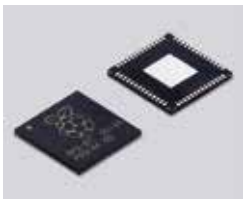
Type	Order code	1+
Pico RP2040	<b>75-1132</b>	2.88

582927



## Raspberry Pi RP2040 Microcontroller

The Raspberry Pi RP2040 is the first microcontroller designed in-house at Raspberry Pi ("Raspberry Silicon"). Previously, the RP2040 has only been available on Raspberry Pi Pico. It is now available as a single component, and in reel quantities.



- Dual-core Arm Cortex-M0+ @ 133MHz
- 264KB of on-chip RAM
- Support for up to 16MB of off-chip Flash memory via a QSPI bus
- DMA controller
- Interpolator and integer divider peripherals
- 30 GPIO pins, 4 of which can be used as analogue inputs
- 2x UARTs, 2x SPI controllers and 2x I2C controllers
- 16x PWM channels
- 1x USB 1.1 controller and PHY, with host and device support
- 8x Raspberry Pi Programmable I/O (PIO) state machines
- USB mass-storage boot mode with UF2 support, for drag-and-drop programming
- Available singly and on reels of 500 or 3400

Quantity	Reel size	Order code	1+
Single	-	<b>75-1197</b>	0.74
500	7 in.	<b>75-1147</b>	345.00
3400	13 in.	<b>75-1142</b>	2414.00

583596



## Raspberry Pi Zero 2 W

Building on the success of the current Zero family, Raspberry Pi Zero 2 W is built around a Raspberry Pi-designed System-in-Package, which integrates the BCM2710A1 die used in Raspberry Pi 3 with 512MB of RAM. Raspberry Pi Zero 2 W is footprint-compatible with earlier members of the Zero family.



Raspberry Pi Zero 2 W is fully compatible with our existing range of Raspberry Pi Zero accessories as well as our range of Raspberry Pi keyboards and Mouse.

- 1GHz quad-core, 64-bit ARM Cortex-A53 CPU
- VideoCore IV GPU
- 512MB LPDDR2 DRAM
- 802.11b/g/n wireless LAN
- Bluetooth 4.2 / Bluetooth Low Energy (BLE)
- MicroSD card slot
- Mini HDMI and USB 2.0 OTG ports
- Micro USB power
- HAT-compatible 40-pin header
- Composite video and reset pins via solder test points
- CSI camera connector

Type	Order code	1+
Pi Zero	<b>75-2230</b>	11.25

586613

## Pi Kits



## Raspberry Pi B+ Intermediate Student Kit



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

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

For programming, the latest version of the operating system for the Raspberry Pi can be downloaded for free 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

Kit contains:

- 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 PIM341 Pibow 3 Coupe® Red Case for Raspberry Pi
- 19-7950** Kingston SDGS2/32GB Canvas Select Plus microSD Card With Adaptor 32GB
- 19-4921** TruConnect URT-601G 1m Green Cat5e Utp Moulded Lead
- 16-1361** TruConnect CDLHD-303 HDMI Lead Gold Plated 3m
- 73-6044** Pimoroni Pibrella Add-On makes sounds, drives motors, lights and LEDs
- 19-4115** Wireless Combo black keyboard and mouse

Type	Order code	1+
Intermediate student kit	<b>75-0814</b>	70.82

566837



## Raspberry Pi 3 B+ Advanced Student Kit



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

Rapid has 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.

**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.

Type	Order code	1+
Pi 3 B+ Advanced Kit	<b>75-0815</b>	85.02

566838

## STEAM resources

Don't forget to visit our  
STEAM Lab online

[www.rapidonline.com/steam-lab](http://www.rapidonline.com/steam-lab)





## Raspberry Pi RPI400 Keyboard incorporating Single Board Computer



The Raspberry Pi RPI400 is a Raspberry Pi built into a portable keyboard. The powerful and easy-to-use computer incorporates a purpose-built board based on the Raspberry Pi 4, and features a quad-core 64-bit processor, 4GB of RAM, wireless networking, dual-display output, and 4K video playback, as well as a 40-pin GPIO header.

The unit features the same powerful processor as the Pi and has specially designed thermal pads to keep your computer cool and silent while you're hard at work. The GPIO pins remain accessible, so if you want to explore beyond the desktop, you can connect components and prototype your projects.

Available as a kit (**75-1133**) or just the Pi 400 unit only (**75-1134**). The kit contains a mouse, power supply, micro HDMI to HDMI cable, and SD card preloaded with Raspberry Pi OS, as well as the official Raspberry Pi Beginner's Guide to help you get the most out of your new computer.

### Technical specification:

Processor	Broadcom BCM2711 quad-core Cortex-A72 (ARM v8) 64-bit SoC @ 1.8GHz
RAM	4GB LPDDR4-3200
Connectivity	Dual-band (2.4GHz and 5.0GHz) IEEE 802.11b/g/n/ac wireless LAN Bluetooth 5.0, BLE Gigabit Ethernet 2 x USB 3.0 and 1 x USB 2.0 ports
GPIO	Horizontal 40-pin GPIO header
Video & sound	2 x micro HDMI ports (supports up to 4Kp60)
Multimedia	H.265 (4Kp60 decode); H.264 (1080p60 decode, 1080p30 encode); OpenGL ES 3.0 graphics
SD card support	MicroSD card slot for operating system and data storage
Keyboard	78- or 79-key compact keyboard (depending on regional variant)
Power	5V DC via USB connector
Operating temp	0°C to +50°C
Dimensions	286 x 122 x 23mm

Type	Order code	1+
Pi 400 kit	<b>75-1133</b>	76.81
Pi 400 unit only	<b>75-1134</b>	55.80

582928



## Kitting Service

Don't forget we offer a bespoke  
kitting service

education@rapidonline.com

## 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 Blink! 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 Blink! - while your Pi is safely tucked away in its case.

A further treat for you is the inclusion of the **Blink! 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 Blink! 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  
Blink! 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
- Blink! 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

For technical specialisation visit [www.rapidonline.com](http://www.rapidonline.com)

Type	Order code	1+
Pi Zero W starter kit	<b>75-0787</b>	37.02

565815



We bring  
STEAM to life

## STEAM resources

Visit our STEAM lab for  
project ideas

[www.rapidonline.com/steam-lab](http://www.rapidonline.com/steam-lab)

## Pi Cases



### Raspberry Pi Official Pi 3 Model A+ Case Red/White

For the best way to keep your Raspberry Pi 3 A+ safe and protected you need the **Official Raspberry Pi 3 Model A+ 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.

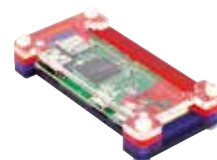
- For use with the **Raspberry Pi 3 A+**
- Cut-outs for all connection points and microSD card port
- Light pipes for power and activity LEDs
- High-quality ABS construction
- Stick on rubber feet for case stability

Type	Order code	1+
Case for Pi 3 B	<b>75-0752</b>	2.62
Case for Pi 3 B	<b>75-0752</b>	2.62
Case for Pi 3 B	<b>75-0752</b>	2.62

564948

## PIMORONI

### Pimoroni PIM258 Raspberry Pi Zero W Pibow Case



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

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

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

Type	Order code	1+
Pi Zero W Pibow case	<b>75-0789</b>	4.64

565817

# 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



**Rainbow Case**  
Order code  
75-0850

**Only  
£8.40**



**Red Case**  
Order code  
75-0916

**Only  
£8.16**



**Ninja Case**  
Order code  
75-0917

**Only  
£8.40**

## Pi Power Supply



### Raspberry Pi 4 Model B Official PSUs, USB-C, 5.1V, 3A, UK Plugs

These official USB-C power supplies are specially designed to power your new Raspberry Pi 4.

They are available in black or white to match your case and accessories.

- **UK 13A plug pins**
- Compact, moulded design with official logo
- Output voltage: 5.1V DC, 3A
- 15.3W maximum output power
- Reversible USB-C connector
- 1.5m 18AWG captive cable
- Available in black or white
- 1 year manufacturers warranty



Type	Order code	1+
White	<b>75-1123</b>	6.46
Black	<b>75-1125</b>	6.46

571074



### T5875DV Official Raspberry Pi PSU 5.2V 2.5A Multinational Plugs



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

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

For technical specialisation visit [www.rapidonline.com](http://www.rapidonline.com)

Type	Order code	1+
Pi PSU 5.2V 2.5A	<b>75-0532</b>	7.25

563386

**No minimum order value**  
UK mainland only

## T Electronics

### 5V DC 1A UK with Micro USB Output Lead

This 5V DC 1A USB power supply comes complete with a Micro USB output lead and a set of AC interchangeable AC pins. The PSU has a 90-264V AC input for world use. It carries full international safety approvals and meet the latest ErP stage 2 requirements with high reliability (M.T.B.F of 50K hours at 25 degrees C.) The SW4149-B power supply can be used to charge a wide range of products.

- Part Number: SW4450-B
- Output: 5V DC
- Current Min.: 0.01A
- Power (Watts): 5W
- USB output lead
- Rated Input Voltage: 100 to 240V AC

Type	Order code	1+	10+
5V DC 1A USB PSU	<b>85-2890</b>	5.54	5.03

526286

# PIMORONI

## Fan SHIM for Raspberry Pi



Order code  
75-0918

**Only  
£10.06**

## Pi HDMI Leads



### 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	<b>75-0760</b>	3.06
HDMI Lead black 1m	<b>75-0761</b>	3.09
HDMI Lead white 2m	<b>75-0762</b>	4.52

564951



## Pi NOOBS SD Card



## 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	<b>75-0755</b>	11.23



## 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.	<b>75-0289</b>	11.59



## Raspberry Pi PoE+ Hat

The Raspberry Pi PoE+ HAT is designed to replace the existing PoE HAT in all new and existing designs. The PoE+ HAT meets all the requirements of the IEEE 802.3af (802.3at Type 1) specifications.

- Input voltage: 37 to 57V DC, Class 2 device
- Output power: 5V DC / 3.0A
- Cooling: 25mm x 25mm brushless fan delivering 2.2CFM for processor cooling
- Features
- Fully isolated switch-mode power supply
- Fan control
- Mechanically compatible with the existing Raspberry Pi PoE HAT
- Raspberry Pi board not included.

## Technical Specification:

	PoE Hat	PoE+ Hat
802.3af	Yes	Yes
802.3at	No	Yes
Output voltage	5V	5V
Max. current	2.5A	5A
Max. power	12.5W	25.5W
Fan	Yes	Yes
Current sense	No	Yes
Transformer	Wire wound	Planar
PCB	4-layer 2oz	4-layer 2oz
Works with	PI3B+, PI4, CM4IO	PI3B+, PI4, CM4IO

Type	Order code	1+
Pi PoE+ Hat	<b>75-1148</b>	15.20



## Stepper Motor &amp; 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 I<sup>2</sup>C. 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 main header
- Raspberry Pi and motors are not included

Type	Order code	1+
Stepper motor HAT	<b>75-0512</b>	19.30



## Pi Motion Sensing



## Raspberry Pi Sense HAT - as used on Tim Peake's Astro Pi Mission

The Sense HAT is an add-on board for the Raspberry Pi, creating such an innovative and useful experimental tool (called the Astro Pi) that it has even been used on the International Space Station to carry out experiments during the Principia mission. During this mission the British astronaut **Tim Peake** used the Raspberry Pi and the Sense HAT to run experiments that were created and coded by school students, utilising the full range of the board and HATs features.

Now the Sense HAT is available for every budding Mr Spock to buy and add to their Raspberry Pi.

The HAT features an 8 x 8 RGB LED matrix that can display sense data via shapes, icons and text. A five-button joystick gives you full control of what's going on, serving as both keyboard and mouse, and the HAT provides the following sensors:

- Inertial Measurement Unit (IMU) - consisting of a gyroscope, accelerometer and magnetometer
- Temperature sensor
- Barometric pressure sensor
- Humidity sensor

The HAT, together with the Raspberry Pi, is great for learning about environmental conditions such as velocity, orientation and gravity measurements as well as other aspects of space science. Once the HAT and Pi are assembled you just need to install the Astro Pi software and away you go. The Raspberry Pi Foundation provide some great examples to get started with and there is also a Python library, providing easy access to everything on the board.

- Sense HAT + Pi Board = **Astro Pi**
- Plenty of sensing functionality
- Fits perfectly on top of your Raspberry Pi
- Live long and prosper

**Note:** You will need eight M2.5 screws and four hexagonal standoffs to attach the HAT to your Pi.

Type	Order code	1+
Pi Sense HAT	<b>75-0765</b>	26.29



## 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	<b>73-6052</b>	14.25



## PIM183 Raspberry Pi Pan &amp; Tilt HAT

**Only £30.49**

Order code 75-0790



## Pi Camera Modules



### Raspberry Pi Camera Board v2 8MP 3280 x 2464

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

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

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

Type	Order code	1+
Camera board	<b>75-0530</b>	20.17

563384



### Raspberry Pi NOIR Camera Board v2 8MP 3280 x 2464

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

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

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

Type	Order code	1+
NOIR Camera board	<b>75-0531</b>	20.25

563385

## Arduino



**EDUCATION PARTNER**

### 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

Discover the potential of the Arduino CTC GO! with the WHACK-A-MOLE project at [www.rapidonline.com](http://www.rapidonline.com).

Type	Order code	1+
CTC Go!	<b>73-4866</b>	1065.71

568827



**EDUCATION PARTNER**

## LEARNING SOLUTIONS FROM ARDUINO EDUCATION

Arduino Education is a platform that is relevant for children and young adults throughout their educational life; from early programming principles to a tool for learning about key science, maths and engineering concepts. As part of its wide-reaching education program, Arduino Education has developed comprehensive kits for primary, secondary and university level, with Arduino technology at the heart of them all. They are projects designed for group learning, founded on the Arduino Education open-source approach to software and support, and deliver innovative, engaging experiences for both student and teacher.





## Education 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.

### What's new in Revision 2?:

- Optimized compact hardware design with the new professional Arduino Nano 33 IoT
- Improved battery management with the custom Nano Motor Carrier Board
- Improved box and kitting for better classroom management and cargo safety
- Enhanced robot performance with new Simulink models
- Reduced assembly time and improved overall performance with better mechanical structure designs
- Content is upgraded and available on a new online platform for better user experience
- Upgraded Matlab and Simulink to 2020A version

### 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+
Engineering kit	73-0167	160.95

570940



## Education 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+
Arduino starter kit	73-0166	218.31

570939



## X000018 Arduino UNO Holder - Pack of 5pcs Various Colours

These brand new plastic holders are designed to protect your UNO-sized board.

- Provides excellent board protection
- Extends life of the board
- Each pack contains 5 holders in various colours



Type	Order code	1+
UNO Holder pack	73-4852	4.84

566454





## 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.

### 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.
	Develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations, and computer-based tools.	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.
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



Only  
**£63.62**  
Order code  
73-4642

### 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.



Only  
**£90.05**  
Order code  
73-0168

### AKX00027 Explore IoT Kit

The Arduino IoT Starter Kit is an open programmable IoT platform that allows you to build custom IoT devices with full control over algorithms and data.



## Education 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	1+
Student kit	73-0207	49.95

570943



## 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 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!

For contents of the Arduino starter kit visit [www.rapidonline.com](http://www.rapidonline.com)

Type	Order code	1+
Starter kit	73-4642	63.62

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+
Uno board	73-4440	16.23
Leonardo board	73-4441	14.10
Uno SMD board	73-4443	14.80
Due board	73-4445	26.04
Mega2560 board	73-4450	27.97

563355



## 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

Type	Order code	1+
Nano	73-4448	14.23
Micro	73-4614	14.10

563364



### Nano 33 IoT

This small, robust and powerful board has WiFi and Bluetooth connectivity that combined with its low power architecture makes it a practical and cost effective solution for your connected projects.

Arduino Nano33 IoT is fully compatible with the Arduino IoT Cloud and supports full TLS secure transport: the ATECC608A crypto-chip stores the cryptographic keys in hardware, offering a very high level of security for this class of products. The integration with the Arduino IoT Cloud offers also a very efficient way of setting up online dashboards with little coding and minimal effort.

In the same iconic size of the Arduino Nano, the Arduino Nano 33 IoT hosts an Arm Cortex-M0+ SAMD21 processor, a WiFi and Bluetooth module based on ESP32, a 6-axis Inertial Measurement Unit (IMU) and a crypto chip which can securely store certificates and pre shared keys.

The board can either be used in a breadboard (when mounting pin headers), or as a SMT module, directly soldering it via the castellated pads.

- The board is based on the SAMD21G18A microcontroller
- Clock frequency up to 48MHz
- Flash 256KB
- SRAM 32KB
- WiFi connectivity
- Bluetooth connectivity
- Fully compatible with Arduino IoT Cloud
- Same size as Arduino Nano
- **Arduino type: Nano 33 IoT**

**Please note: The Arduino Nano 33 IoT only supports 3.3V I/Os and is NOT 5V tolerant so please make sure you are not directly connecting 5V signals to this board or it will be damaged. Also, as opposed to Arduino Nano boards that support 5V operation, the 5V pin does NOT supply voltage but is rather connected, through a jumper, to the USB power input.**

To avoid such risk with existing projects, where you should be able to pull out a Nano and replace it with the new Nano 33 IoT, the 5V pin on the header, positioned between RST and A7 is not connected as a default factory setting. This means that if you have a design that takes 5V from that pin, it won't work immediately. This is a precaution put in place to draw attention to the 3.3V compliance on digital and analog inputs.

Type	Order code	1+
Arduino Nano 33 IoT	73-4863	16.14

568282



### Nano Every

This small, robust and powerful board has the same classic Nano footprint loved worldwide.

It can be programmed with the easy-to-use Arduino IDE available offline and online. Get started in minutes with thousands of sketches available in open-source or write your own: it is the perfect choice for your everyday projects.

Based on the ATmega4809 AVR processor, the Arduino Nano Every is flexible to the requirements of your design. It can be used in a breadboard when mounting pin headers, or as a SMT directly soldered on a PCB thanks to its castellated pads. An SAMD11 ARM Cortex M0+ processor acts as a high performance USB to serial converter that can be re-programmed by skilled users to expand further the applications of this board.

- Board based on the ATmega4809 microcontroller
- Clock 20MHz
- Flash 48KB
- SRAM 6KB
- EEPROM 256byte
- **Arduino type: Nano Every**

Type	Order code	1+
Arduino Nano Every	73-4864	7.75

568283



### ABX00018 MKR WAN 1400 GSM Connectivity 3.3V IoT

The Arduino MKR GSM 1400 is a powerful and feature-packed board that combines the functionality of the Arduino Zero with global GSM connectivity. For those wanting to design IoT projects that have GSM connectivity, and have little or no experience in networking, it is a practical and cost effective solution.

The board is based around the Atmel SAMD21 MCU with a SARAU201 GSM module, all in the compact MKR form factor. The board is powered from a LiPo battery (not supplied) or via external 5V power source, with automatic switching from one source to the other. The MKR GSM 1400 features 32 bit computational power, along with a rich set of I/O interfaces, global GSM communications, and the ease of use of the Arduino IDE for code development and programming. Combining the compact form factor, the excellent Arduino functionality and the global GSM connectivity, you get a board that is the preferred choice for IoT battery-powered projects in a portable form factor.

- GSM Connectivity
- 32 bit ARM technology
- 3.3V Operating voltage
- MicroUSB connector

For details on getting started, please visit [www.rapidonline.com](http://www.rapidonline.com).

**Caution:** The MKR GSM 1400 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.

**Caution:** During cellular transmissions the peak current required by the board will exceed 500mA. This is in excess of what can be sourced by a standard USB port, so it is MANDATORY to have a 1500mAh or higher LiPo battery plugged all the time. When powering the board using Vin, a 5V power supply that can supply at least 2A is required.

**Note:** This board does not ship with a SIM card.

For technical specialisation visit [www.rapidonline.com](http://www.rapidonline.com)

Type	Order code	1+
MKR WAN GSM	73-4841	51.61

566443



### Uno WiFi Rev.2 with Onboard IMU

If you want to add Wi-Fi to your devices then get the new Arduino Uno WiFi Rev.2. The Rev.2 is basically a Arduino Uno Rev.3 with bigger muscles and comes with a brand new 8-bit microprocessor from Microchip, and an onboard IMU (Inertial Measurement Unit). Wi-Fi security is handled by the new ECC608 crypto chip accelerator.

The Wi-Fi Module is a self-contained SoC with integrated TCP/IP protocol stack that can provide access to a Wi-Fi network, or act as an access point.

The Arduino Uno WiFi has 14x digital input/output pins (six of which can be used as PWM outputs), 6x analog inputs, a 16MHz ceramic resonator, a USB connection, a power jack, an ICS header, and a reset button. Just connect it to a computer with a USB cable or power it with an AC adaptor or battery to get started.

- Add this board to a device and you'll be able to connect it to a Wi-Fi network
- 5V Operating voltage

For technical specialisation visit [www.rapidonline.com](http://www.rapidonline.com)

Type	Order code	1+
UNO WiFi Rev.2	73-4861	32.25

567166



### ABX00023 MKR1010 WiFi Enabled IoT Board ESP32

The Arduino MKR Wi-Fi 1010 board is the best way of adding Wi-Fi to your IoT-based prototyping projects.

This is the newest version of the board, adding an ESP32 Wi-Fi module from U-BLOX.

The board easily connects to other Arduino hardware and is configurable using Arduino software, without the need for you to be a network expert.

The board is composed of three main blocks:

- SAMD21 Cortex-M0+ 32bit Low Power ARM MCU
- U-BLOX NINA-W10 Series Low Power 2.4GHz IEEE 802.11 b/g/n Wi-Fi
- ECC508 Crypto Authentication

The performance and features make this board the preferred choice for the emerging IoT battery-powered projects in a compact form.

- Board runs at 3.3V only
- Speeds up and simplifies the prototyping of WiFi based IoT applications
- Low power consumption
- 32-bit Computational power
- Rich set of I/O interfaces
- Low power Wi-Fi with a Cryptochip for secure communication using SHA-256 encryption
- Ease of use Arduino Software (IDE) for code development and programming

For more handy information please see the Getting Started page - [www.rapidonline.com](http://www.rapidonline.com).

For technical specialisation visit [www.rapidonline.com](http://www.rapidonline.com).

Type	Order code	1+
Wi-Fi IoT board	73-4857	22.59

567162



**EDUCATION  
PARTNER**

## LEARNING SOLUTIONS FROM ARDUINO EDUCATION

Arduino Education is a platform that is relevant for children and young adults throughout their educational life; from early programming principles to a tool for learning about key science, maths and engineering concepts. As part of its wide-reaching education program, Arduino Education has developed comprehensive kits for primary, secondary and university level, with Arduino technology at the heart of them all. They are projects designed for group learning, founded on the Arduino Education open-source approach to software and support, and deliver innovative, engaging experiences for both student and teacher.





### TSX00083 Proto Shield Rev.3

The Arduino Proto Shield Rev.3 is a prototyping board that makes working on your projects and custom designs a whole lot easier.

The SMD area is designed for a maximum of 24-pins SOIC IC and the TH area contains a lot of space for the needed components around your project. You can even stick a mini breadboard (not included) on the proto area for solderless operation.

The proto area also includes two power lines (IOREF and GND), two LEDs pads and SPI signals breakout pads for boards with SPI only on the ICSP header like Zero.

- Uno-sized prototyping board
- Solder TH or SMD ICs on prototyping area
- 1.0 Arduino Pinout
- 1x ICSP Connector footprint
- 2x LEDs and resistor footprint
- IOREF and GND power lines
- SPI Signals pads
- 24-pin SMD footprint (50 mils pitch)

Type	Order code	1+
Proto Shield Rev.3	73-4862	8.05

567167



## Technical specifications and datasheets

Technical specifications and datasheets can be found at

[www.rapidonline.com](http://www.rapidonline.com)



### Selected brands

#### Arduino Relay Shields

These **Arduino Relay Shields** are designed to interface your Arduino to much higher voltages and currents than would be possible with just the Arduino alone. We even have a board which will switch mains AC.

For technical specialisation visit [www.rapidonline.com](http://www.rapidonline.com)

Type	Order code	1+
4-relay shield	73-6057	15.66
I/O Shield kit	73-4528	26.20

559051



### Tiny Machine Learning Kit

Have you ever wondered how to build a small intelligent device that reacts to sounds like a keyword being spoken, recognizes gestures like waving a magic wand, or even recognize faces?

With this kit combined with the power of Tiny Machine Learning (TinyML) you can do all of that and much more. Explore how these possibilities can be part of your own tiny smart device!

The Tiny Machine Learning Kit, combined with the exciting TinyML Applications and Deploying TinyML on Microcontrollers courses that are part of the Tiny Machine Learning (TinyML) specialization from EdX will equip you with all the tools you need to bring your ML visions to life.

#### The Tiny Machine Learning Kit includes:

- Arduino Nano 33 BLE Sense board
- OV7675 Camera
- Arduino Tiny Machine Learning Shield
- USB A to Micro USB Cable

Type	Order code	1+	30+
Tiny Machine	78-4851	34.95	33.85

586604



EDUCATION  
PARTNER

## BRACCIO 2 Robotic Arm

Contact us for details and pricing



EDUCATION  
PARTNER

### T05000 TinkerKit BRACCIO Robotic Arm

The TinkerKit Braccio robotic arm will help you unlock the unlimited possibilities in your robotic project. The arm can be assembled in a variety of different ways and the BRACCIO can support various objects on the end of the arm. A BRACCIO shield is included that allows you to hook up the servos directly to your Arduino board.

For further details please visit <https://github.com/arduino-org/arduino-library-braccio>.

- Versatile design
- Includes BRACCIO shield
- Kit includes tools
- Maximum load 400g
- Includes 5V 5A power supply
- For technical specialisation visit [www.rapidonline.com](http://www.rapidonline.com)

Type	Order code	1+
Robotic arm	73-4447	155.30

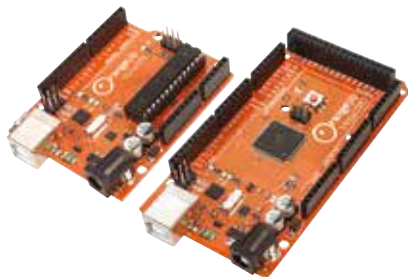
566789



## Orangepip



### Arduino Compatible Open Source Development Boards



OrangePip is a distinctive new range of open source boards that are based on the ATmega2560 and ATmega328 microcontrollers. The OrangePip boards offer a colourful introduction to coding and prototyping and are fully compatible with Arduino shields, sensors, accessories and software – giving users access to the global Arduino community of makers and projects.

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

- A colourful introduction to coding and prototyping
- Based on **Arduino** boards
- Similar to the Arduino Uno and Mega
- Compatible with Arduino IDE
- A 500mm USB A male to B male cable is also available

Type	Order code	1+
Kona328 board	<b>75-0550</b>	12.95
Mega2560 board	<b>75-0551</b>	22.70
USB Cable	<b>75-0552</b>	1.81

563366



### Arduino Class Pack Development Kits



These Orangepip development kits are based around Arduino development boards, offering all the advantages of the Arduino system in a handy class pack. The boards have lots of features and are simple to use, just requiring connection to a computer via USB to get started.

Available kits are:

#### Orangepip Kona328 Arduino Uno Development Kit Class Pack (x15 pieces)

The OrangepipKona328 board is based around the ATmega328 MCU and is compatible with the **Arduino Uno** development board.

#### Orangepip Mega2560 Arduino Mega Development Kit Class Pack (x10 pieces)

The Orangepip Mega2560 board is based around the ATmega2560 MCU and is compatible with the **Arduino Mega2560** development board.

- Includes 500mm USB Male A to Male B cable
- USB Port for connection to computer
- Power jack
- Can be powered by battery

Type	Order code	1+
Orangepip Uno pack	<b>75-0592</b>	135.16
Orangepip Mega pack	<b>75-0593</b>	205.66

563363



### Segments328 Build Your Own Arduino Kit



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

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

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

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

Contents includes:

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

Type	Order code	1+
Segments 328	<b>75-1200</b>	12.55

567653

Don't forget  
your soldering  
equipment ...

www.rapidonline.com



### Segments Build Your Own Arduino Classpack



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

Type	Order code	1+
Pack of 15 Segments	<b>75-1201</b>	161.00

567744



### Orangepip Enclosure for Kona 328

A clip-together 2-U shell enclosure for the Kona 328.

The enclosure has been custom manufactured from 3mm acrylic capped white ABS and 3mm gloss orange HIPS by CamdenBoss.

- Simplistic low-profile design
- Cut-outs for access to connectors and headers
- Compatible with Orange Pip Kona 328 board
- Printed with Orange Pip logo
- Dimensions L x W x H: 73 x 65.2 x 22.5mm
- **Type Q4953**

Type	Order code	1+
Kona 328 case	<b>75-0547</b>	9.78

568449





# 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

### 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



How to program Orangepip Segments328 with your PC

Build & Programming PDF instruction notes available online!

Build Instructions



Orangepip Segments 328  
Build Your Own Arduino  
Class Pack of 15

**£161.00**

Order code 75-1201



Only  
**£12.55**

Order code  
75-1200

Orangepip Segments 328  
Build your Own Arduino Kit

Orangepip  
USB Cable  
A Male to  
B Male  
50cm

Only  
**£1.81**

Order code  
75-0552



 **orangepip®**  
Segments328



# TASK

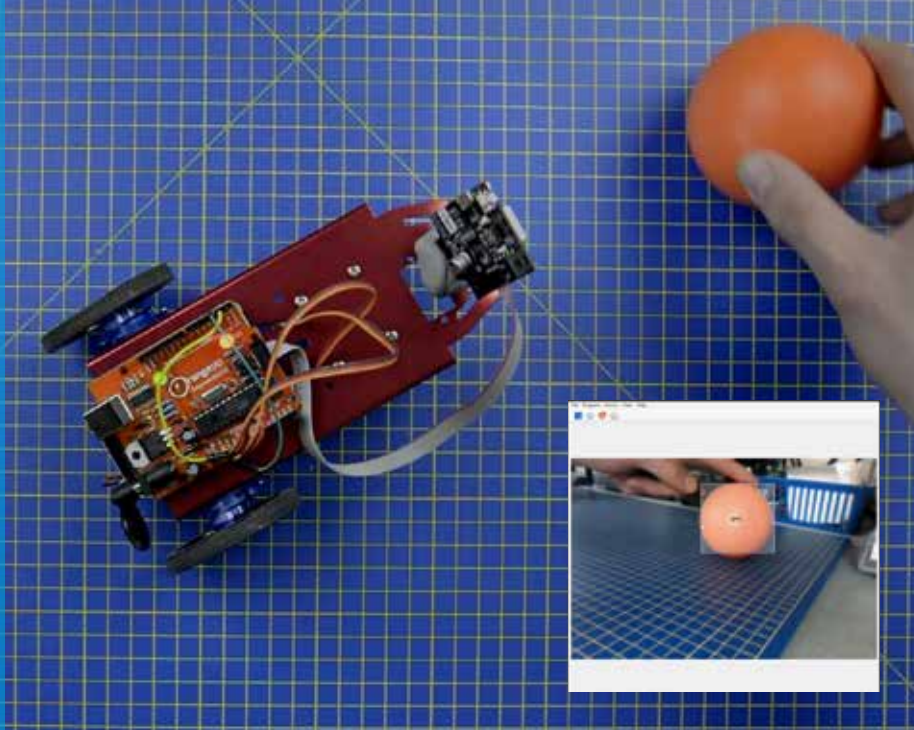
## BUILDING A SIMPLE OBJECT TRACKING ROBOT

### 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](https://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

**£22.70**

Order code  
75-0551

Pack of 10

**£205.66**

Order code  
75-0593

### Kona328 Arduino UNO Compatible Development Board



Single

**£12.95**

Order code  
75-0550

Pack of 15

**£135.16**

Order code  
75-0592

### OrangePi Enclosure for Kona328



Single

**£9.78**

Order code  
75-0547





## CUSTOMISE & BRAND YOUR BOARDS

### THE PROCESS

#### 1 CHOOSE YOUR OWN BOARD

##### A Kona328



The Kona328 is a high quality Arduino UNO compatible board based on the ATmega328.

250+ **£12.50**  
500+ **£11.50**  
1000+ **£10.80**  
per board

##### B Segments328



The Segments328 board is a build it yourself board designed to help students understand and appreciate the workings of a microcontroller development board.

Kona	Segments
75-0550	75-1200

Minimum MOQ of 250 pieces

#### 2 SUPPLY A COPY OF YOUR LOGO AND CHOOSE YOUR COLOUR

#### 3 RAPID'S DESIGN TEAM WILL CREATE A PROOF FOR YOUR APPROVAL

#### 4 PHYSICAL SAMPLE OF THE BOARD ARE MANUFACTURED FOR FINAL APPROVAL

#### 5 YOUR ORDER WILL BE MANUFACTURED AND SHIPPED TO YOUR DESTINATION(S) OF CHOICE

FOR MORE DETAILS CONTACT [EDUCATION@RAPIDONLINE.COM](mailto:EDUCATION@RAPIDONLINE.COM)

# The Warwickino: an Orangepip board with a bespoke branding

Ian Griffith, an Electronics Engineer from the School of Engineering at the University of Warwick, explains how using the service provided by Rapid was of such value to his department

## WARWICKINO

### WHAT IS THE 'WARWICKINO'?

The Warwickino is a microcontroller board, based on the open source Arduino platform, which has been produced in the university's choice of colours and typography. It is, effectively, an Orangepip Segments 328, an Arduino Uno compatible board but available at a significantly reduced price for end users. We have been able to provide our students with a branded product to teach them soldering skills in what has been a very challenging year.

### WHY DID YOU FEEL THE NEED FOR A BRANDED ORANGEPIP?

We had already designed our own version of the Arduino but wanted it to be branded more directly. The Warwickino brings together branding, cost effectiveness and a simple way to present to students their teaching outcomes.

### HOW DOES IT FIT INTO YOUR CURRICULUM OR TEACHING?

The Warwickino is the foundation of the engineering department's soldering lab. Students learn how to solder using their own board, which they can keep and use throughout their degree program.

### WHY DID YOU CHOOSE RAPID TO WORK WITH?

We had already designed our own version of the Arduino but the cost was not as competitive as the custom Orangepip route. Rapid have greater purchasing power and could use their global links to provide the contract manufacturing. We also wanted it to be branded more directly.

### HOW WOULD YOU SUMMARISE THE PROJECT?

In what has been an extremely difficult year, Rapid has shown great flexibility and worked very closely with us. In the current climate, the fact that each board is individually wrapped helped assist with our Covid-safe protocols. I believe the students really enjoyed their soldering experience.







# Starter Kits



Adding to our popular Orangepi range of open source boards we are excited to introduce the Orangepi Starter Kit!

The Orangepi Starter Kit is a great way to get started with coding and electronics.

The Starter Kit can be bought with either an Orangepi Uno Mega or an Orangepi Uno Kona Arduino compatible development board. As well as this you will receive a selection of common components – everything you need to get making and creating!

Kona328 Kit

**£57.60**

Order code 86-3192

Mega2560 Kit

**£73.86**

Order code 86-3191

## KITS CONTAIN:

### 1x Kona328 or Mega2560

#### Resistor Kit:

10x 10R  
10x 100R  
10x 220R  
10x 470R  
10x 1K  
10x 2K2  
10x 4K7  
20x 10K  
10x 100K  
10x 1M  
10x 10M

#### Capacitor Kit:

5x 100uF 25V  
2x 10uF 50V  
5x 22pF Ceramic  
5x 100pF Ceramic5

#### LED Kit

5x Red  
5x Green  
5x Blue  
5x Yellow  
2x Bright White  
1x RGB  
1x 7-Segment Display

#### Switch/Potentiometer Kit

10x Tact Switches  
3x Carbon Potentiometers 10k

#### Sensor & Semiconductor Kit

5x Transistor (BC547)  
2x Mosfet Transistors (IRF620PBF)  
5x Diodes (1N4007)  
1x H-Bridge motor driver  
1x Optocoupler  
5x Photo resistor  
1x Temperature sensor  
1x Tilt sensor  
1x Servo  
1x DC Motor  
1x Jumper wires  
1x 16 x 2 Display  
1x Breadboard  
1x Piezo sounder  
1x 9v Battery clip  
1x Trimming Tool  
1x USB Cable



## Rapid Prototyping

Grove makes it easier to connect, experiment, and simplify the prototyping process. No jumpers or soldering required.

## Cross-Platform Support

Grove is now compatible with most development platforms including Arduino, Raspberry Pi, Beaglebone and more! Start a project with your favorite one.

**Piezo Buzzer with Analog Capability**



**Only £1.54**

Order code 75-0534

**GSR Galvanic Skin Response with Finger Sensors**



**Only £7.92**

Order code 75-0453

**16x2 LCD Display RGB Backlight I2C**



**Only £9.58**

Order code 75-0430

**Grove Inventors Kit for micro:bit**



**Only £46.87**

Order code 75-0719

**GPS Receiver 22 Tracking & 66 Acquisition Channels**



**Only £18.86**

Order code 75-0435

**Ultrasonic Ranger Distance Sensor 3cm to 4m 5V**



**Only £3.09**

Order code 75-0427

**3-Axis Digital Accelerometer(±16g) Based on ADXL-345**



**Only £5.55**

Order code 75-0454

**Temperature & Humidity Sensor Pro High Accuracy**



**Only £7.95**

Order code 75-0429

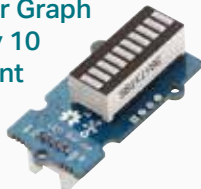
**Barometer Sensor Based on BMP280 I2C 3.3V or 5V**



**Only £7.01**

Order code 75-0487

**LED Bar Graph Display 10 Segment V2.0**



**Only £3.28**

Order code 75-0538

**Connect Grove Module to Raspberry Pi B+, 2, & 3**



**Only £25.61**

Order code 75-0479

**Infrared Reflective Sensor 4.5-5.5V**



**Only £3.97**

Order code 75-0465



Seeed



## 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	<b>75-0401</b>	7.31

PCB design and comes with ten additional Grove Arduino sensors. All the modules have been connected to the Seeeduino through the PCB stamp holes so no Grove cables are needed to connect. The modules can also be taken out for use with Grove cables to connect the modules.

- All modules are pre-wired, no breadboard or jumper cables required
- With 12 step by step project tutorials provided, this is ideal for beginner and STEAM education
- Arduino UNO compatible board(ATmega320p based Seeeduino Lotus) + 10 most commonly used Arduino modules
- 74 Page PDF wiki + 12 step by step project tutorials
- Super friendly to beginner and STEAM education
- Compatible with over 300 Grove modules

Kit contents:		
<b>Sensors</b>		
1 x Temperature and humidity sensor		<b>Output Modules</b>
1 x 3-Axis accelerometer		1 x LED
1 x Air pressure sensor		1 x Buzzer
1 x Light sensor		<b>Display Module</b>
1 x Sound sensor		1 x OLED Display
<b>Input Modules</b>		6 x Grove Cables
1 x Rotary potentiometer		1 x Micro USB Cable
1 x Button		
Type	Order code	1+
Grove beginner kit	<b>75-0442</b>	18.57



## Grove - Environmental Sensor Modules

The Environmental Sensor Modules from Seeed Studio lets you monitor environmental factors such as temperature, humidity, etc. and even the amount of dust in the air.

- Grove compatible
- Applications include weather station, greenhouse monitoring etc.

Type	Order code	1+
Dust sensor	<b>75-0428</b>	7.95
Light sensor	<b>75-0447</b>	5.55
Moisture sensor	<b>75-0431</b>	2.47
T & RH sensor pro	<b>75-0429</b>	7.35
T & RH sensor 2%	<b>75-0440</b>	4.69
Water sensor	<b>75-0451</b>	1.78



## Grove Touch Sensor Capacitive Sensor Based on TTP223-BA6

The Grove Touch Sensor module is an ideal alternative for a mechanical pushbutton.

The simple device uses the TTP223-B touch detector IC to measures the capacitance of a metallic pad. When a finger is near or on the pad that sensor detects it an actuates the switch.

As the sensor detects the proximity of the finger as well as direct touch, there are many ways to use this module. You can place the metallic pad under a non-metallic surface such as a plastic sheet, glass/wood table, etc. Great for projects that need to be waterproof. Why not construct a hidden button to stylishly actuate a device.

- Grove compatible interface
- Inconspicuous button
- Water proofed electric product
- Button key replacement
- Voltage 2.0 to 5.5V DC
- Fast response time
- Low power consumption
- 20 x 20mm Twig module
- Power indicator LED

For technical specialisation visit [www.rapidonline.com](http://www.rapidonline.com)

Type	Order code	1+
Grove touch sensor	<b>75-0542</b>	3.18



## 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	<b>75-0430</b>	9.12
125KHz RFID reader	<b>75-0434</b>	10.13
Relay board	<b>75-0436</b>	2.19
Thumb joystick	<b>75-0457</b>	2.62



## Gear Stepper Motor Driver Pack

The gear stepper motor driver pack from Seeed Studio is a simple, low-cost solution for position control for small microcontrollers (MCU) such as the Arduino. It includes a stepper motor and a matching motor drive board.

The motor is a four-phase, eight-step stepper motor and is easily controlled via the drive board - all you need to do is supply 4 low current, logic level outputs from the MCU.

Plug the motor into the driver board, connect the driver board's pin header to the MCU and power and you are ready to give it a spin.

### Typical applications:

- Desktop printers
- Plotters
- 3D printers
- CNC milling machines

### Features:

- Low noise
- Large torque
- Built-in gearbox
- Weight 44.8g

For technical specialisation visit [www.rapidonline.com](http://www.rapidonline.com)

Type	Order code	1+
Motor & driver pack	<b>75-0414</b>	4.98



## Grove Serial Bluetooth v3.0

The Grove Serial Bluetooth v3.0 is designed for transparent wireless serial connection and is compatible with the Grove Base Shield.

The module has fully qualified Bluetooth V2.0+EDR (Enhanced Data Rate) 2Mbps modulation with complete 2.4GHz radio transceiver and baseband. It uses the CSR Bluecore 04-External single chip Bluetooth system with CMOS technology and with AFH (Adaptive Frequency Hopping feature).

For more information see the Wiki at <http://wiki.seeedstudio.com>.

- Fully qualified Bluetooth V2.0+EDR 3Mbps modulation
- Selectable baud rate
- Auto-reconnect in 30 min after out-of-range
- Small footprint of just 12.7 x 27mm

For technical specialisation visit [www.rapidonline.com](http://www.rapidonline.com)

Type	Order code	1+
Grove Bluetooth V3.0	<b>75-0541</b>	14.18



## 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.

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

Seeed provide technical documentation, example projects and software libraries on their product pages. If you require this information please visit this product's page.

Type	Order code	1+
Grove starter kit	<b>75-0383</b>	37.99



## Grove Beginner Kit for Arduino with 10 Sensors and 12 Projects

The Grove Beginner Kit for Arduino is one of the best kits for beginners to be able to build any Arduino project.

The kit is powered by one Arduino UNO compatible Board (ATmega320p based Seeeduino Lotus), has an all-in-one







### Mini Vibration Motor 3V 2.0mm Circular

The Mini Vibration Motor from Seeed Studio operates from 3V DC and vibrates constantly when energised. The motor is not sensitive to the polarity of the voltage applied.

- Ø 10 x 2mm



Type	Order code	1+
Vibration motor	<b>75-0416</b>	0.889

560351



### Grove Connector Cables and Jumpers

The Universal 4-pin Grove Connectors from Seeed Studio simply connect between two Grove boards, such as between a Grove base shield and a Grove add-on module. Handy for rapid prototyping.

- Grove 4-pin connectors both ends
- 5 per pack. Cable length 200mm



Type	Order code	1+
Grove to header pins	<b>75-0437</b>	2.89
Grove to Grove	<b>75-0438</b>	2.19

560345



### Grove Motion Sensor, Control and Actuator Modules

The Grove Motion Sensor Modules from Seeed Studio give you a range of options to monitor motion and position in your next project. The range includes accelerometers, gyroscopes, and compasses as well as distance, motion and proximity sensors. There's even a GPS receiver which is compatible with any microcontroller with a spare serial port (Arduino, Raspberry Pi etc.). If your next project needs to keep track of where it is and where it's going then take a look at the **Grove** add-on modules.



Type	Order code	1+
Accelerometer	<b>75-0439</b>	7.21
Accelerometer (±1.5g)	<b>75-0458</b>	6.27
Accelerometer (±1.5g)	<b>75-0458</b>	5.97
Accelerometer (±1.5g)	<b>75-0458</b>	6.27
Accelerometer (±16g)	<b>75-0454</b>	5.55
Accelerometer (±16g)	<b>75-0454</b>	5.55
Accelerometer (±16g)	<b>75-0454</b>	5.28
Collision sensor	<b>75-0473</b>	7.10
Digital gyro	<b>75-0450</b>	14.52
Electromagnet	<b>75-0470</b>	7.50
GPS receiver	<b>75-0435</b>	18.86
I2C Motor Driver	<b>75-0432</b>	16.34
IR distance sensor	<b>75-0468</b>	3.54
PIR Motion Sensor	<b>75-0433</b>	6.49
PIR Motion Sensor	<b>75-0433</b>	6.18
PIR Motion Sensor	<b>75-0433</b>	6.49
Reflective sensor	<b>75-0465</b>	3.97
Ultrasonic ranger	<b>75-0427</b>	3.00
Vibration motor	<b>75-0466</b>	2.20

560346

**No minimum order value  
UK mainland only**

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for offers and new product information



### Grove Button with Momentary Action and Pull-Down Resistor

- Easy to use momentary ON/OFF button
- Ready for use
- Button signals the SIG wire
- Uses Standard 4-pin Grove Cables
- Configured with a pull-down resistor
- Dimensions 24 x 20 x 10.8mm



Type	Order code	1+
Grove button	<b>75-0533</b>	1.50

560649



### 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	<b>75-0430</b>	9.12
125KHz RFID reader	<b>75-0434</b>	9.64
Relay board	<b>75-0436</b>	2.19
Thumb joystick	<b>75-0457</b>	2.77

560313



### Studio - Grove Light Sensor v1.2 with Onboard LM358

- Easy to use since it is interfaced with Grove port
- High reliability and sensitivity
- Small footprint
- Wide spectrum
- Includes Grove cable



Technical Specification:  
Operating voltage 3 to 5V  
Operating current 0.5 to 3mA  
Response time 20 to 30ms  
Peak wavelength 540nm  
Photodiode GL5528  
Dimensions 20 x 20 x 18mm

Type	Order code	1+
Grove light sensor	<b>75-0535</b>	2.30

560660



### Mini Vibration Motor 3V Rectangular

The Mini Vibration Motor from Seeed Studio operates from 3V DC and vibrates constantly when energised. The motor is not sensitive to the polarity of the voltage applied.

- Operating Voltage: 2.2 to 3.6V DC
- Rated Voltage: 3.0V DC
- Rated Speed: 12,000 @ 2,500rpm
- Rated Current: 90mA max
- Stall Current: 120mA max
- Starting Voltage: 2.0V DC max
- Mechanical Noise: 50db(A) max
- Weight: 2g approx.
- Dimension: 12 x 4.6 x 4.6mm



Type	Order code	1+
Vibration motor	<b>75-0417</b>	1.87

560352



### Relay Shield For Arduino V3.0

The **Arduino Relay Shield** from Seeed Studio gives you 4 relays that will switch 7A at 35V DC each, easily enough for most applications. 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 Arduino can control the board via 4 digital output pins giving you the opportunity to control multiple relay boards. PCBs with high voltage electricity can be dangerous, please take precautions to prevent shocks and short circuits. It is recommended that you apply two layers of insulating tape to the top of the Arduino's USB connector to prevent short circuits.

- 4 x relays with 1 x NO and 1 x NC contacts each
- 4 digital outputs used for each board
- LED indicators on each relay
- Screw terminals for switched devices



Type	Order code	1+
Relay shield	<b>75-0397</b>	15.13

560361



### 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	<b>75-0392</b>	3.33

560364

## DFRobot



### LattePanda Windows 10 Mini PC



The LattePanda is a complete Windows 10 single board computer. It has everything a regular PC has and can do anything that a regular PC does. It is compatible with almost every gadget you know: printers, joysticks, cameras and more. Any peripherals that work on your PC will work on a LattePanda.

The LattePanda can run powerful tools such as Visual Studio, NodeJS, Java, Processing, and more. With existing APIs, you can develop your own software and hardware projects on a LattePanda just like you would on a normal PC - C#, Javascript, Ruby etc. Say goodbye to your bulky laptop!

The LattePanda also includes an integrated Arduino compatible co-processor, which means it can be used to control and sense the physical world! Whether you are a Windows developer, IoT developer, DIY fanatic, interactive designer, robotics whizz, or maker, a LattePanda single-board computer can aid your creative process!

#### Specification:

- Intel Cherry Trail Z8350 Quad-Core processor
- Operating system: Windows 10 Home Edition
- GPU: Intel HD Graphics, 12 EU @200-500MHz, single-channel memory
- USB 3.0 x 1, USB 2.0 x2
- Wi-Fi 802.11n 2.4G
- Bluetooth 4.0
- Integrated Arduino Co-processor: ATmega32u4 (Arduino Leonardo)
- Video output: HDMI and MIPI-DSI
- Onboard touch-panel overlay connector
- Supports 100Mbps Ethernet
- Intel processor GPIO x6
- ATmega processor GPIO x20
- Gravity interface connectors x6
- Voltage: 5V@2A
- Board dimensions: 88 x 70mm
- Weight: 55g
- **RoHS, FCC and CE Compliant**

Type	Order code	1+
2GB/32GB	<b>75-0244</b>	119.29
4GB/64GB	<b>75-0245</b>	200.11

568335



### DFR0100 Beginner Kit for Arduino (Best Starter Kit)

The Arduino 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 you through 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	<b>75-0114</b>	41.48

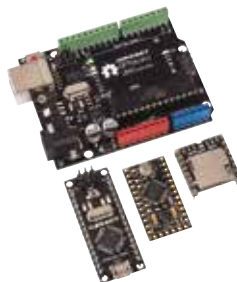
568377



### DFRduino

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

- **DFRobot type:**  
**DFRduino**

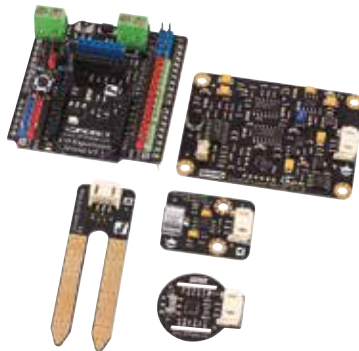


Type	Order code	1+
DFRduino R3	<b>75-0173</b>	15.30
DFRduino mini 3.3V	<b>75-0175</b>	8.94
DFRduino mini 5V	<b>75-0183</b>	2.66
DFRduino nano	<b>75-0184</b>	10.26
DFRduino shield	<b>75-0187</b>	13.35

568385



### Gravity Expansion Shield and Sensors for Arduino



The DFRobot Expansion Shield introduced to the market the famous colour-code for sensors and actuators input and output. The 3-pin format for Signal, Voltage and Ground is extremely useful, especially when used altogether with the

increasingly large range of modules, sensors and devices that just simply plug in.

The board includes power input for salvaged power supplies or laboratory power supplies and an Xbee socket for multipurpose wireless connectivity such as RF, wireless, Bluetooth. This version includes a hardware voltage setting, via a jumper, to allow compatibility with a larger range of components operating at 3.3V like Raspberry pi, Due and others.

It also includes a Servo external power output with a protective diode, enabling you to control a large range of servos from your Arduino. This version also features a convenient switch that lets you program your ATmega328 boards like UNO, while you have another serial device connected like an Xbee. Switch it, program it and get it back up and running with another switch. You don't need to disassemble your hardware or wiring.

#### Features:

- Compatible with the new Arduino Due
- 3.3V / 5V operating voltage select
- Switch for wireless communication & program
- More easily recognisable interfaces
- Colourful headers for identifying digital or analogue pins
- Immersion gold surface

#### Specification:

- Input voltage: 7 to 12V, PWR\_IN
- 4.8 to 6V, SERVO\_PWR, depending on your servo
- Compatible module voltage: 5V / 3.3V
- Support interface: I2C, SPI, Xbee (Xbee pro), Bluetooth, APC220

Type	Order code	1+
Gravity IO expansion	<b>75-0247</b>	7.07
Soil sensor -capacity	<b>75-0246</b>	5.29
Soil sensor -resistor	<b>75-0257</b>	2.36
Sound sensor	<b>75-0248</b>	5.41
Sound level meter	<b>75-0268</b>	32.78
pH sensor	<b>75-0249</b>	20.40
pH sensor V2	<b>75-0269</b>	24.89
IoT module	<b>75-0256</b>	4.46
IoT module	<b>75-0256</b>	4.46
IoT module	<b>75-0256</b>	4.46
Heart rate monitor	<b>75-0258</b>	12.86
Conductivity sensor	<b>75-0259</b>	65.77

568394



### 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	<b>75-0204</b>	14.24

568391





## KIT0131 Gravity: KnowFlow Basic Kit - 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	<b>75-0113</b>	157.27

568376

## Pricing

Pricing correct at time of going to press.  
For up-to-date pricing visit  
[www.rapidonline.com](http://www.rapidonline.com)



## KIT0111 Gravity: Starter Kit for Arduino

The Gravity Arduino Starter kit is 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	<b>75-0111</b>	47.39

568375



## 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 widely 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	<b>75-0109</b>	62.66

568374



## 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	<b>75-0104</b>	2.01

568371



## 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 microcontroller selection guide to get more information.

Type	Order code	1+
Romeo V1+motor driver	<b>75-0171</b>	22.00
Romeo V2+motor driver	<b>75-0167</b>	27.36
Romeo BLE	<b>75-0169</b>	30.92
Romeo BLE mini	<b>75-0168</b>	20.33

568384



## BBC micro:bit Pocket Sized Codable Computer V2

Only

**£11.41**

Order code 75-0153

[www.rapidonline.com](http://www.rapidonline.com)







### KIT0090 Insectbot Hexa -An Arduino Based Walking Robot Kit For Kids

This six-legged Insectbot Hexa has 3 high quality 9g micro servos and takes four AAA batteries, giving it the power to walk steadfastly no matter where it goes.

It's clever too, with advanced code that makes it smarter in motion, and gives it excellent capability in obstacle avoidance. However, that doesn't mean the code is more difficult to read - you can still program your Insectbot with the graphical language, Ardublock, and spend time tweaking it from head to toe. Improvisations and hackings are warmly welcomed - we'd love to see more diversified Insectbots!

The heart of Insectbot is the 'world's smallest Bluno', a.k.a. Beetle. Deriving its core notion from minimalism without compromising functionality, Bluno Beetle comes with an Atmel Atmega328 @16MHz clock time and has several interfaces: 4 digital pins and 4 analog pins.

To make it even more user-friendly, it is compatible with Micro USB so that direct programming and testing is no longer a headache. Select 'Arduino UNO (tools > board > Arduino UNO)' in Arduino IDE. The ATmega328 comes pre-burned with a bootloader that allows you to upload any new code that is applicable to Arduino UNO.

- Ideal educational 'weekend' project or novelty gift

#### Kit includes:

- 1x MCU module (Bluno Beetle+Bluno Beetle shield)
- 3x 9g micro servo
- 1x GP2Y0A21 IR range sensor
- 1x IR sensor bracket
- 2x holder for 2x AA batteries
- 1x components package
- 1x USB cable
- 1x assembly manual
- DFRobot type KIT0090

Type	Order code	1+
Walking insectbot	75-0164	29.64

568382



### TOY0060 4-Soldering Light Chaser Beam Robot Kit

The DFRobot TOY0060 4-Soldering Light Chaser Beam Robot can help students and novice electronics enthusiasts to learn about subjects like soldering and the basics of an electronic circuit.

The robot, Mr Neon, is designed to look like a three-leg monster whose eyes or tentacles glow in accordance with ambient light level. The stronger the light is, the faster he moves. There is no programming involved and all soldering is intuitive and rookie-friendly, so it is perfect for the novice electronics enthusiast. The kit includes a supply of stickers so Mr Neon's face can be changed to give him various expressions.

#### Kit includes:

- 1x Light Chaser PCB
- 1x CR2032 battery
- 1x battery clip
- 1x On/Off switch
- 2x transistor
- 2x vibration motor
- 2x photodiode
- 4x 20kΩ resistor
- 1x plastic paper
- 1x plastic tubing
- 1x adhesive sticker
- 1x base sticker
- 1x face sticker set

Type	Order code	1+
Light chase robot kit	75-0161	12.37

568380



### DFR0299 DFPlayer Mini MP3 Player for Arduino

The DFPlayer Mini is a small and low cost MP3 module player with a simplified output that connects directly to the speaker. The module can be used as a stand-alone module with attached battery, speaker and push-buttons, or used in combination with an Arduino UNO or similar, with RX/TX capabilities.

The DFPlayer perfectly integrates a hard-decoding module, which supports common audio formats such as MP3, WAV and WMA. It also supports a TF memory card with either a FAT16 or FAT32 file system. Through a simple serial port, you can play your music without any other tedious underlying operations.

- Ideal for automatic voice announcements

#### Specification:

- Supported sampling rates (kHz): 8/11.025/12/16/22.05/24/32/44.1/48
- 24-bit DAC output, support for dynamic range 90dB, SNR support 85dB
- Fully supports FAT16, FAT32 file systems
- Maximum TF card size: 32G, support 32G of U disk, 64M bytes NORFLASH
- Variety of control modes, I/O control mode, serial mode, AD button control mode
- Advertising sound waiting function: music can be suspended for announcement then continue
- Audio data sorted by folder, supports up to 100 folders, each folder can hold up to 255 songs
- 30-level adjustable volume
- 6-level adjustable equaliser

Type	Order code	1+
MP3 player	75-0189	6.88

568390



### LattePanda Windows 10 Mini PC

The LattePanda is a complete Windows 10 single board computer. It has everything a regular PC has and can do anything that a regular PC does. It is compatible with almost every gadget you know: printers, joysticks, cameras and more. Any peripherals that work on your PC will work on a LattePanda.

The LattePanda can run powerful tools such as Visual Studio, NodeJS, Java, Processing, and more. With existing APIs, you can develop your own software and hardware projects on a LattePanda just like you would on a normal PC - C#, Javascript, Ruby etc. Say goodbye to your bulky laptop!

The LattePanda also includes an integrated Arduino compatible co-processor, which means it can be used to control and sense the physical world! Whether you are a Windows developer, IoT developer, DIY fanatic, interactive designer, robotics whizz, or maker, a LattePanda single-board computer can aid your creative process!

#### Specification:

- Intel Cherry Trail Z8350 Quad-Core processor
- Operating system: Windows 10 Home Edition
- GPU: Intel HD Graphics, 12 EUs @200-500MHz, single-channel memory
- USB 3.0 x 1, USB 2.0 x2
- Wi-Fi 802.11n 2.4G
- Bluetooth 4.0
- Integrated Arduino Co-processor: ATmega32u4 (Arduino Leonardo)
- Video output: HDMI and MIPI-DSI
- Onboard touch-panel overlay connector
- Supports 100Mbps Ethernet
- Intel processor GPIO x6
- ATmega processor GPIO x20
- Gravity interface connectors x6

- Voltage: 5V@2A
- Board dimensions: 88 x 70mm
- Weight: 55g
- RoHS, FCC and CE Compliant

Type	Order code	1+
2GB/32GB	75-0244	119.29
4GB/64GB	75-0245	200.11

568393



### Beetle Microcontroller, BLE and Beetle

The Beetle-ESP32 Microcontroller is only 35 x 34mm (1.38 x 1.34in.) in size and is a simplified version of FireBeetle-ESP32, specially designed for electronic engineering fans and DIY lovers. It is equipped with 4 analogue ports, 4 digital ports, UART and I2C interfaces, making it a perfect replacement for many physically larger boards.

The microcontroller enables users to directly burn programs via the on-board USB interface and has Bluetooth and WIFI integrated in the microcontroller for supporting more applications.

#### Features:

- Small size: only 35 x 34mm
- Directly download and debug programs via Micro USB without a programmer
- Large-scale I/O ports with gold plating, easy to twist wire on it or sew on to clothes with wires, no need to solder
- A group of gold plated power interfaces of honeycomb type, convenient to use
- Integrated WIFI and Bluetooth

#### Specification:

- USB supply voltage: 5.0V
- V<SUB>IN</SUB> supply voltage: DC 3.5 to 6.5V
- Processor: Tensilica LX6 dual-core processor (One for high speed connection; one for independent programming)
- Frequency: 240MHz
- SRAM: 520KB
- Flash: 16Mbit
- Wi-Fi standard: FCC/CE/TELEC/KCC
- Wi-Fi protocol: 802.11 b/g/n/d/e/i/k/r (802.11n, high speed can reach to 150Mbps), converge A-MPDU and A-MSDU, supporting 0.4us protecting interval
- Frequency range: 2.4 to 2.5GHz Bluetooth protocol: complies with BR/EDR/BLE standard of Bluetooth v4.2
- On-chip Clock: 40MHz crystal and 32.768kHz crystal
- Digital interface: D2, D3, D4, D7
- Analogue interface: A0, A1, A2, A3
- I2C: 1
- Serial port: 1
- Dimensions: 35 x 34mm

Type	Order code	1+
Beetle ESP32	75-0217	12.60
Beetle BLE	75-0218	11.66

568392



### 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	17.66
Bluetooth 2.0 Bee	75-0209	17.33

568390



## 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	3.06

568388



## KIT0126 Bone Sound Conduction Kit

Bone conduction is a method of sound transmission. Sound is converted into different frequencies of mechanical vibration and transmitted through human skull to the bone labyrinth, inner ear lymphatic transmission, helix, auditory nerve and auditory centre.

This kit consists of a bone conduction speaker, a speaker driver board and accessories. It is intended to help understand the principles of bone conduction technology, making hearing aids or bone conduction headphones.

The speaker driver board is based on the MAX9814 microphone amplifier and PAM8406 amplifier. The kit includes a potentiometer which has a power switch function making the kit easy to control.

- Operating voltage: 3 to 5.5V DC
- Board wiring pitch: 2.54mm
- Phone cable: 1m



- Speaker cable: 300mm
- Headphone size: 13mm diameter x 5mm height
- Board dimension: 50 x 20mm
- Weight: 36g
- Supplied complete with bone conduction speaker, speaker driver board and 3.5mm earphone cable
- DFRobot type KIT0126

### Technical Specification:

Components	Description
Volume switch	3 to 5.5V
Power input	Plugged: AGC OFF, Unplugged: AGC ON
AGC switch	
Input	Audio
Output	Audio output (Left/Right)
Gain	Gain = VDD, gain = 40dB
	Gain = GND, gain = 50dB
	Gain = vacant, gain = 60dB
A/R	Activate/release ratio, control the AGC activate/release time ratio:
	A/R = GND: activate/release ratio = 1:500
	A/R = VDD: activate/release ratio = 1:2000
	A/R = vacant: activate/release ratio = 1:4000

Type	Order code	1+
Bone conduction kit	75-0203	19.99

568386

## Adafruit



## 938 OLED 1.3in 128x64 White Graphic Display SSD1306 I2C or SPI

This 1.3" OLED display has a very high contrast, giving excellent readability. The display is 128 x 64 and, because the display makes its own light no backlight is required, reducing power usage and increasing performance.



- Driver chip communicates via I2C or SPI
- OLED requires 3.3V power supply and 3.3V logic levels for communication
- Includes a 3.3V regulator
- All pins are fully level shifted to use with 5V devices

Learning tips and tutorials can be seen at [www.rapidonline.com](http://www.rapidonline.com).

Type	Order code	1+
Graphic display	75-0503	21.55

568266



## INA169 Analog DC Current Sensor Breakout - 60V 5A Max

The Adafruit INA169 Analogue DC Current Sensor Breakout sits between a load and the positive supply terminal to measure the current flowing through the load. This is referred to as high side current measuring. Suitable for measuring currents up to 5A and with supply voltages up to 60V DC, it uses a 0.1Ω shunt resistor and an internal 10kΩ to provide a voltage output of 1V per Amp. It's up to you how you use this output, you could simply connect a multimeter and read it directly or attach a microcontroller's analogue input and broadcast it across the Internet.



Supplied as an assembled and tested current sensor board plus a strip of 0.1in. header pins and a 2-way screw terminal block for you to solder on as required. If you want to change the measurement ratio, it's possible to cut the tracks to the load resistor and add your own. Please see Figure 1, "Basic Circuit Connections" in the datasheet for a handy table of values, or the supporting text for the formula.

- Measure currents of up to 5A at 60V DC
- Output sensitivity of 1V per A as standard
- Adjustable sensitivity by replacing the load resistor
- Adafruit part no.: 1164

Type	Order code	1+
DC current sensor	73-5398	10.23

563268



## 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	12.90
MAX31855K	73-5329	16.15

563259



## 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+
SL1145	73-5395	8.54
TSL2591	73-5410	5.98

563265

## STEAM resources

Visit our STEAM lab for project ideas

[www.rapidonline.com/steam-lab](http://www.rapidonline.com/steam-lab)



## MicroSD Card Breakout Board

The **Adafruit MicroSD card breakout board** will let your next project store up to 2Gbytes of data using just 4 x pins on your microcontroller. Its onboard 5V to 3V regulator means it can supply up to 150mA to demanding SD cards. The board is 3 or 5V compatible and the level shifting has been done with a chip which makes it more reliable and allows faster read/write access. Adafruit have a free tutorial on all things micro-SD. Supplied as a fully assembled board plus a 1 x 8-pin 0.1in. pitch male header strip for you to solder in as required.

- Supports FAT and FAT32 cards
- Level shifter for 3 to 5V compatibility Uses 3 or 4 x digital IO lines
- Dimensions 31.85 x 25.4 x 3.75mm (1.25 x 1.00 x 0.15in.)

Type	Order code	1+
Micro-SD breakout	<b>75-0574</b>	6.12



## 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 0.1in. header pins for you to solder on as required. Adafruit provide a free tutorial and software library to help get you started.

- Humidity accuracy  $\pm 3\%$
- Temperature accuracy  $\pm 1.0^{\circ}\text{C}$
- Barometric pressure accuracy  $\pm 1\text{hPa}$
- Altitude accuracy  $\pm 1\text{m}$
- 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	<b>73-5287</b>	17.13



## DS3231 Precision RTC Real Time Clock Breakout Boards

The **Adafruit DS3231 Precision RTC Real Time Clock Breakout boards** are cleverly designed to compensate for thermal drift making them some of the most accurate RTCs available in a small package. The timing crystal is inside the chip and there's a temperature sensor right next to it so that clock ticks can be added and removed to maintain accuracy. A simple CR1220 coin cell can keep the clock ticking for years.

Supplied as a fully assembled board plus a strip of 0.1in. header for you to solder on as required.

- One of the most accurate RTCs in a small package
- Communicates using I2C, only 2 x GPIOs
- Dimensions 23 x 17.6 x 7.2mm (0.9 x 0.7 x 0.28in.)
- Adafruit part no.: 3013

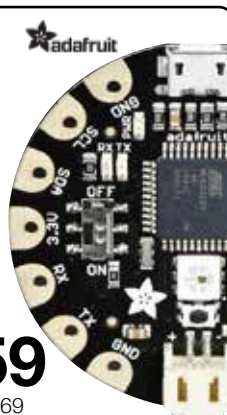
Type	Order code	1+
Real time clock	<b>73-5259</b>	11.99

## 659 FLORA Wearable Electronics Board Arduino Compatible

Only  
**£13.59**

Order code 75-0569

[www.rapidonline.com](http://www.rapidonline.com)



## 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 included 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	<b>73-5436</b>	20.52



## 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
- Also available as a wearable (73-5314)

Type	Order code	1+
Bluetooth LE friend	<b>73-5296</b>	15.01
Wearable Bluetooth LE	<b>73-5314</b>	7.56





## FLORA Wearable Sensors, Modules and NeoPixels

The **Adafruit 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	<b>73-5353</b>	12.21
20 x RGB NeoPixels	<b>73-5369</b>	29.99
Wearable GPS module	<b>73-5376</b>	21.49
FLORA colour sensor	<b>73-5356</b>	6.82

563219



## 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	<b>73-5391</b>	3.24
LED sequins blue	<b>73-5392</b>	3.41
LED sequins red	<b>73-5390</b>	3.41
LED sequins white	<b>73-5393</b>	3.24

563202

## Conductive Thread 6m (Bobbin)

Only  
**£2.93**

Order code 87-6147  
[www.rapidonline.com](http://www.rapidonline.com)



**Light Stitches**  
E-Textiles for Education

561231

## Pricing

Pricing correct at time of going to press.  
For up-to-date pricing visit  
[www.rapidonline.com](http://www.rapidonline.com)



## 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	<b>73-5381</b>	4.26
RGB driver board	<b>73-5431</b>	10.73

563280



## 1083 4-channel ADC Analogue to Digital Converter I2C

These **Adafruit 4-channel ADCs** can be used as either 2 x differential or 4 x single ended channels, and have a programmable pre-amp (up to 16x). These little breakout boards have built-in noise suppression to keep the supply lines clean. They use one of four possible I2C addresses allowing you to run 4 x boards on the same 2-wire bus. Sample code is available for Raspberry Pi or Arduino.

Two ADC boards are available, 75-0562 which has 12-bit precision at up to 3300 samples per second and 75-0564 which has 16-bit precision at up to 860 samples per second.

- Supply voltage from 2 to 5.5V
- Programmable data rate
- 4 x single ended or 2 x differential channels
- Programmable gain amplifier for small signals
- Uses I2C addresses 0x48 to 0x4B, jumper selectable

Type	Order code	1+
12-bit	<b>75-0562</b>	8.54
16-bit	<b>75-0564</b>	15.38

561231



## Analogue 2-axis Thumb Joystick with Select Button

The **Adafruit Analogue 2-axis Thumb Joystick with Select Button** makes it easy to add console-like joystick control to your next project. This neat kit has 2 x potentiometers which you can connect to 2 x analogue inputs on your microcontroller for precise control. It also has a click down switch just like a console controller.

Supplied as a bare PCB, the joystick unit and a soft touch rubber hat; assembly requires a small amount of soldering.

- 2-axis analogue stick with 1 x digital switch
- Uses 1mA at 5V DC
- Assembled dimensions: 38 x 38 x 32mm (1.5 x 1.5 x 1.25in.)
- Adafruit part no.: 512

Type	Order code	1+
2-axis joystick	<b>73-5330</b>	6.45

563233



## Vibrating Mini Motor Disc

The **Adafruit Vibrating Mini Motor Disc** is simplicity itself to use, apply power and it buzzes, remove power and it stops. They will work from 2 to 5V with stronger vibrations from the higher voltage and the drive circuit can be as simple as a battery and switch. If you want to drive it from a microcontroller such as an Arduino then you will need a series resistor to limit the current draw. Please see the technical specification for details of the current draw at various input voltages. If you want to take the load off the microcontroller then pop in a 2N2222 transistor to handle the current.

Supplied as a tested disc motor only, no assembly required.

- Motor vibrates when voltage is applied
- 11,000 rpm at 5V
- Dimensions 10mm diameter x 2.7mm thick (0.4 x 0.11in.)
- Adafruit part no.: 1201

Technical Specification:

Input voltage (V DC)	Current draw (mA)
5V	100
4V	80
3V	60
2V	40

Type	Order code	1+
Mini motor disc	<b>73-5414</b>	1.68

563236



## 9-DOF Absolute Orientation Inertial Measurement Unit IMU Breakout Board

The **BN0055** is a nine degrees of freedom (9-DOF) sensor that fuses and processes the plethora of data associated with a 9-DOF sensor. The board can output the vectors of absolute orientation (Quaternion and Euler vector), angular velocity, acceleration, magnetic field strength, linear acceleration, gravity, and temperature. The data can be read over an I2C interface.

- Sensor mounted on its own breakout
- 3.3V Onboard regulator
- Logic level shifting for Reset and I2C pins
- External 32.768kHz crystal
- Fully assembled and tested

Type	Order code	1+
9-DOF Board	<b>75-0494</b>	28.56

559279



### Sensiron SHT31-D Temperature & Humidity Sensor Breakout I2C



The Adafruit Sensiron Temperature and Humidity Sensor Breakouts highly accurate with  $\pm 2\%$  relative humidity and  $\pm 0.3^\circ\text{C}$  thanks to the SHT31-D sensor at its core. This versatile chip is factory calibrated, and linearised and has on-chip temperature and supply voltage compensation. Add I2C operation up to 1MHz with 2 x user selectable addresses and 3 to 5V logic and power compatibility and you can see why Adafruit chose to make a breakout board with it.

Supplied as a fully assembled and tested sensor board plus a strip of 0.1in. header pins for you to solder on as required. Adafruit provide a free tutorial to help get you started.

- Accurate, factory calibrated temperature and humidity sensor
- 3.3 to 5V logic and power compatible
- I2C up to 1MHz
- Dimensions 12.7 x 18 x 2.6mm (0.5 x 0.7 x 0.1in.)
- Adafruit part no.: 2857

Type	Order code	1+
Sensiron SHT31-D	<b>73-5279</b>	11.41

563271



### USB Micro B Breakout Board



The Adafruit USB Micro-B breakout board is for those projects that must have micro-USB but sometimes they're just too tricky to solder or perhaps you aren't at the PCB stage yet. Most small devices have adopted the micro-USB as the go to connector which is a great relief as we all have the cables to hand. These sockets are fully soldered for reliability and let you talk to your USB enabled microcontroller or simply provide 5V DC.

Supplied fully assembled with a 1 x 5-pin strip of 0.1in. male header pins.

- Micro-USB to breadboard or wire connections
- All signal (x5) brought out to breadboard friendly solder pads
- Dimensions 10 x 20 x 4mm (0.4 x 0.8 x 0.2in.)

Type	Order code	1+
USB breakout	<b>75-0583</b>	1.63

561301



### 1083 4-channel ADC Analogue to Digital Converter I2C



These Adafruit 4-channel ADCs can be used as either 2 x differential or 4 x single ended channels, and have a programmable pre-amp (up to 16x). These little breakout boards have built-in noise suppression to keep the supply lines clean. They use one of four possible I2C addresses allowing you to run 4 x boards on the same 2-wire bus. Sample code is available for Raspberry Pi or Arduino.

Two ADC boards are available, 75-0562 which has 12-bit precision at up to 3300 samples per second and 75-0564 which has 16-bit precision at up to 860 samples per second.

- Supply voltage from 2 to 5.5V
- Programmable data rate
- 4 x single ended or 2 x differential channels
- Programmable gain amplifier for small signals
- Uses I2C addresses 0x48 to 0x4B, jumper selectable

Type	Order code	1+
12-bit	<b>75-0562</b>	8.13
16-bit	<b>75-0564</b>	15.38

561281



### TB6612 1.2A DC / Stepper / Solenoid Motor Driver Breakout Board



The Adafruit Solenoid / Stepper Motor Driver Breakout Board is a versatile high current driver able to control 2 x bidirectional DC motors, 1 x stepper motor or 2 x solenoids. It uses a TB6612 dual H-bridge chip that can supply 1.2A, which isn't that high in real terms but it's a huge current compared to the recommended 20mA output from an Arduino GPIO pin for example. The chip has built-in flyback diodes to prevent damage due to inductive kick-back and Adafruit have added reverse polarity protection on the motor power input as well. The H-bridges are disabled at power-up to prevent twitching when power is applied. All the logic inputs are 3.3 to 5V compatible so you can run the driver board from an Arduino or Raspberry Pi, while the motor power has a separate input from 4.5 to 13.5V DC. There's a separate PWM input on each H-bridge so that you can control the motor speed.

Supplied as a fully assembled and tested board plus a strip of 0.1in. header pins for you to solder on as required. Adafruit supply a free tutorial to get you started. An ideal board for those times when you just want to get something working quickly.

- Dual H-bridge breakout board
- Flyback diodes and reverse motor power protected
- Motors disabled on power up
- 2 x bidirectional DC motors, 1 x stepper motor, 2 x solenoids
- Up to 1.2A drive current per motor
- 3.3 to 5V logic and power compatible
- Separate motor power from 4.5 to 13.5V DC
- Adafruit part no.: 2448

Type	Order code	1+
Breakout board	<b>73-5310</b>	4.26

563235



### 1871 Adafruit 20mm Coin Cell Breakout with On Off Switch (CR2032)



The Adafruit CR2032 Coin Cell breakout board is a quick and simple way of adding primary or backup power to your projects; it's even sewable for your next wearable project. The four output pins are on a 0.1in. pitch for breadboarding and provide 2 x GND, 1 x 3V, and 1 x switched 3V.

Supplied fully assembled and tested but without a battery. We stock plenty of suitable CR2032 batteries.

- For low-power or battery backup projects
- 0.1in. pitch breadboard friendly breakout pins
- On-off switch
- Battery available separately

Type	Order code	1+
CR2032 breakout board	<b>75-0566</b>	4.91

561283

## Technical specifications and datasheets

Technical specifications and datasheets  
can be found at

[www.rapidonline.com](http://www.rapidonline.com)

[sales@rapidonline.com](mailto:sales@rapidonline.com)

## GENIE Microcontrollers

124561

# GENIE



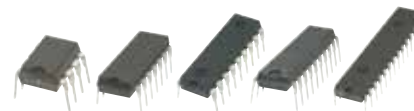
GENIE is a low-cost microcontroller programming system designed exclusively for schools and colleges. The free, user-friendly flowchart software allows you to add intelligence and control to your new and existing design projects. No separate programmer is required and downloading is via a USB or serial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

The heart of the GENIE microcontroller system is the microcontroller 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.

*Note: The GENIE Design Studio software is free to download directly from [www.genieonline.com](http://www.genieonline.com).*



### Microcontrollers Version 1



The chips are designed to work with the GENIE flowchart programming software for Microsoft Windows&#153; and there are free online resources and community website at [www.genieonline.com](http://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

For technical specialisation visit [www.rapidonline.com](http://www.rapidonline.com)

Type	Order code	1+
Genie Download Cable	<b>13-6023</b>	14.72
GENIE C08 IC	DIL-8	<b>13-6001</b> 3.57
GENIE C14 IC	DIL-14	<b>13-6002</b> 2.87
GENIE E18 IC	DIL-18	<b>13-6004</b> 3.00
GENIE C20 IC	DIL-20	<b>13-6003</b> 1.00
GENIE E28 IC	DIL-28	<b>13-6005</b> 5.62

62990





Don't forget  
your soldering  
equipment ...

www.rapidonline.com



## Microcontrollers Version 2



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

The 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](http://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.*

For technical specialisation visit [www.rapidonline.com](http://www.rapidonline.com)

Type	Order code	1+
GENIE 08 MCU	<b>13-6040</b>	2.17
Genie Download Cable	<b>13-6023</b>	14.01
GENIE 14 MCU	<b>13-6041</b>	2.68
GENIE 18 MCU	<b>13-6042</b>	2.78
GENIE 20 MCU	<b>13-6043</b>	2.85
Genie Download Cable	<b>13-6023</b>	14.72

552004



## 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

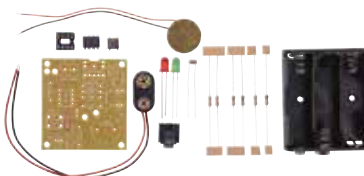
For technical specialisation visit [www.rapidonline.com](http://www.rapidonline.com)

Type	Order code	1+
GENIE Serial LCD kit	<b>13-6026</b>	16.76

20010



## 8-pin Microcontroller System Kits



**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.

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](http://www.genieonline.com).*

For technical specialisation visit [www.rapidonline.com](http://www.rapidonline.com)

Type	Order code	1+
GENIE C08 Activity kit	<b>13-6009</b>	5.21
GENIE C08 Project kit	<b>13-6011</b>	5.11
GENIE C08 Jukebox kit	<b>13-6012</b>	5.01
GENIE L08 Activity PCB	<b>13-6020</b>	1.29
GENIE C08 Project PCB	<b>13-6021</b>	1.36
GENIE C08 Jukebox PCB	<b>13-6022</b>	0.50

82991

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[education@rapidonline.com](mailto:education@rapidonline.com)



## C08 Light Kit

**GENIE** is a low-cost microcontroller programming system designed exclusively for schools and colleges. The **GENIE** C08 Light Kit is an ideal project kit for introducing students to simple lighting projects, such as an electronic die, a wearable badge or a night-time warning system. The kit is based around the **GENIE** C08 8-pin microcontroller and the **GENIE** Design Studio flowchart programming software for Microsoft Windows™.



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

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

*Note: The GENIE Design Studio software is free to download directly from [www.genieonline.com](http://www.genieonline.com).*

For technical specialisation visit [www.rapidonline.com](http://www.rapidonline.com)

Type	Order code	1+
GENIE C08 Light kit	<b>13-6029</b>	4.79
GENIE Light kit PCB	<b>13-6035</b>	1.01 0.848 0.776

517918



## 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

For technical specialisation visit [www.rapidonline.com](http://www.rapidonline.com)

Type	Order code	1+
GENIE 14 Audio kit	<b>13-6046</b>	5.50
GENIE 14 Audio PCB	<b>13-6044</b>	0.871
GENIE 14 Loudspeaker	<b>13-6045</b>	0.667

552407



### 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**

For technical specialisation visit [www.rapidonline.com](http://www.rapidonline.com)

Type	Order code	1+
GENIE 14-pin project kit	<b>13-6013</b>	4.16
GENIE 14-pin PCB	<b>13-6030</b>	1.42

124895



### 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](http://www.genieonline.com), or for convenience to buy from Rapid in CD-ROM format; see **13-6024**

For technical specialisation visit [www.rapidonline.com](http://www.rapidonline.com)

Type	Order code	1+
GENIE 20-pin project kit	<b>13-6017</b>	4.69
GENIE 20-pin PCB	<b>13-6034</b>	1.11

124897

## Free Delivery\*

on all orders over £30 (excl. VAT)  
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\* See Terms & Conditions for full details - [www.rapidonline.com/terms](http://www.rapidonline.com/terms)



### 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](http://www.genieonline.com).

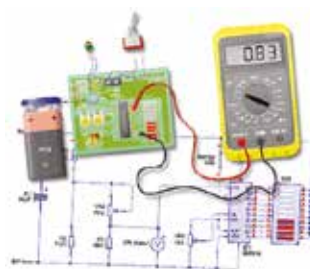
For technical specialisation visit [www.rapidonline.com](http://www.rapidonline.com)

Type	Order code	1+	5+	25+
GENIE 18-pin activity kit	<b>13-6014</b>	6.57		
GENIE 18-pin project kit	<b>13-6015</b>	4.27		
GENIE 18-pin motor kit	<b>13-6016</b>	11.98	11.34	10.10
GENIE activity kit PCB	<b>13-6031</b>	1.26		
GENIE project kit PCB	<b>13-6032</b>	1.87		
GENIE motor kit PCB	<b>13-6033</b>	1.79		

124896



### 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 student distance learning licence
- Supports latest (v2) **GENIE** microcontrollers
- Incorporates a suite of powerful CAD/CAM tools
- Full support for Microsoft Windows 10

For technical specialisation visit [www.rapidonline.com](http://www.rapidonline.com)

No. of licences	Order code	1+
5 User	<b>13-6047</b>	333.58
10 User	<b>13-6048</b>	445.14
15 User	<b>13-6049</b>	530.19
20 User	<b>13-6050</b>	668.27
25 User	<b>13-6051</b>	779.83
Site licence	<b>13-6052</b>	916.40
Home user	<b>13-6053</b>	333.58

552306

No minimum order value  
UK mainland only

## PICAXE Microcontrollers

77549



### 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](http://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.

For technical specialisation visit [www.rapidonline.com](http://www.rapidonline.com)

Type	Order code	1+
PICAXE-08M2	<b>13-5022</b>	3.04
PICAXE-14M2	<b>13-5024</b>	4.02
PICAXE-18M2	<b>13-5026</b>	4.41
PICAXE-20M2	<b>13-5028</b>	3.83
PICAXE-28X1	<b>13-0862</b>	8.73

79671





## 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](http://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+
PICAXE USB Cable	<b>13-0849</b>	24.77

77630



## 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

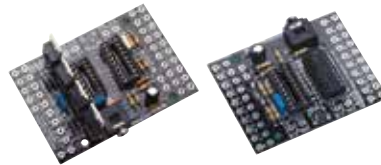
For technical specialisation visit [www.rapidonline.com](http://www.rapidonline.com)

Type	Order code	1+
T4 PICAXE trainer x5	<b>13-1546</b>	292.53

526012



## 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	<b>13-0855</b>	9.81
High power board	<b>13-0860</b>	12.13

77547

## ST Development Boards



### STM32 Nucleo Development Boards 64-Pin Arduino Compatible

The **STM Nucleo development boards from ST are highly affordable and flexible Arduino compatible** development boards that allow you to try out new ideas, create prototypes and refine designs using any STM32 microcontroller. The range of boards let you choose a combination of performance, power consumption and features that suit your development requirements.



The boards feature **Arduino Uno V3 connectivity support, and ST morpho** headers extend the functionality of the Nucleo open development platform via a wide choice of specialised shields. The inclusion of the ST-LINK/V2-1 debugger and programmer means that the boards do not require external probing. To aid you in getting started there is a comprehensive software HAL library, together with various packaged software examples, as well as direct access to the ARM mbed online.

- Features STM32 MCU in a QFP64 package
- Arduino Uno V3 and ST morpho connectivity
- ARM mbed
- Onboard debugger/programmer
- Power via USB, VBUS or external supply
- LED Status indication
- User and reset pushbuttons
- USB re-enumeration capability
- Support for a wide choice of IDEs

Type	Order code	1+
F401RE	<b>75-0773</b>	10.67
F103RB	<b>75-0774</b>	8.91
F446RE	<b>75-0775</b>	12.07
F411RE	<b>75-0777</b>	11.67

565320



## STM32 MCU Discovery Kits



These STM32 microcontroller Discovery boards provide a comprehensive and cost effective solution for the evaluation of the outstanding abilities of STM32 MCUs. The boards have the necessary architecture to allow users to develop and share applications with STM32 Series microcontrollers based on the ARM Cortex-M7 core. A HAL library and comprehensive software examples further enhance the evaluation and development experience.

The discovery kits enable a wide diversity of applications, benefiting from audio, multi-sensor support, graphics, security, video and high-speed connectivity features. The Arduino connectivity support provides unlimited expansion capabilities with a large choice of specialized add-on boards.

The kits on offer are:

The **STM32F769I** discovery kit ( 75-0767) allows users to develop and share applications with STM32F7 Series microcontrollers based on the ARM Cortex-M7 core.

The **STM32F429I** discovery kit ( 75-0768) leverages the capabilities of the STM32F429 high-performance microcontrollers, to allow users to easily develop rich applications with advanced Graphic User interfaces.

The **STM32F0308** discovery kit ( 75-0769) enables the discovery of the STM32F030 Value Line Cortex-M0 features, and to develop your applications easily. It includes everything required for beginners and experienced users to get started quickly.

The **STM32L476G** discovery kit ( 75-0770) helps users to develop and share applications with the STM32L4 ultra-low-power microcontrollers. The discovery kit combines STM32L476 features with LCD, LEDs, audio DAC, sensors (microphone, 3 axis gyroscope, 6 axis compass), joystick, USB OTG, Quad-SPI Flash memory, expansion and probing connectivity. It includes an embedded ammeter which measures the MCU consumption in low power modes. An external board can be connected thanks to extension and probing connectors.

The **STM32F407G** discovery kit ( 75-0779) leverages the capabilities of the STM32F407 high performance microcontrollers, to allow users to easily develop applications featuring audio.

For further details please see individual product pages, as linked.

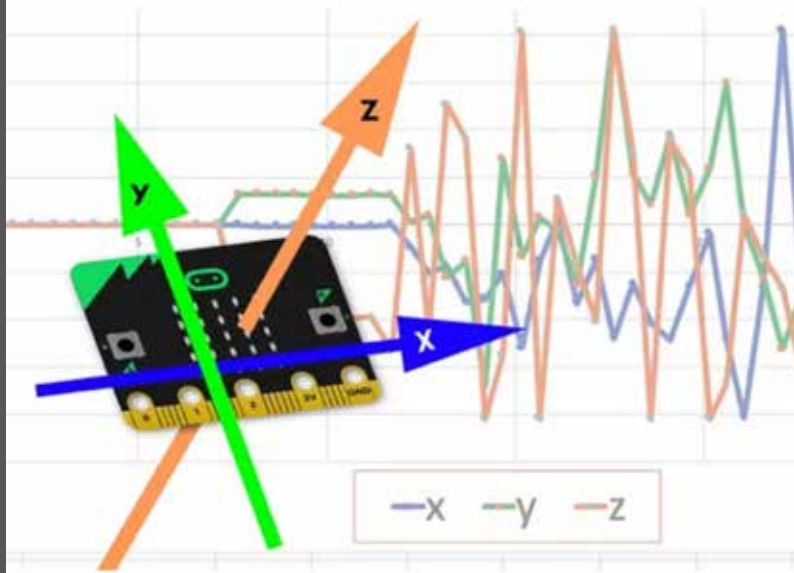
- Ideal for prototyping
- Extension connectors give access device I/O
- Integrated debugger/programmer
- On-board ST-LINK/V2-1
- Mbed-enabled
- SAI audio codec
- Audio line in and line out jack
- Stereo speaker outputs
- Five power supply options
- Voltage output for external applications 3.3 or 5V
- Arduino Uno V3 connectors
- Comprehensive free software
- Supported by a wide choice of IDEs

Type	Order code	1+
STM32F746G	<b>75-0766</b>	44.89
STM32F769I	<b>75-0767</b>	52.59
STM32F429I	<b>75-0768</b>	22.96
STM32F0308	<b>75-0769</b>	7.68
STM32L476G	<b>75-0770</b>	19.30
STM32F407G	<b>75-0779</b>	19.09

565319

# PYTHON DATA LOGGER

micro:bit project

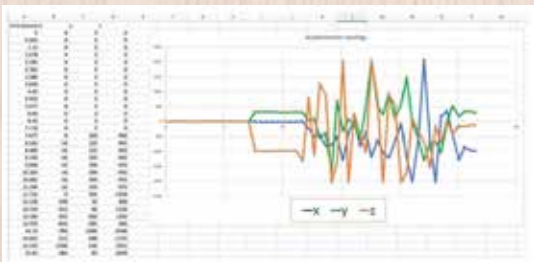


Use micro:bit as a wireless data logger recording readings from its sensors.

## TASK 1 – HOW IT WORKS

### How it works

- Flash the transmitter program onto a micro:bit with battery pack and either attach it to something that moves (like the inside of a salad spinner) or get ready to play catch with it. The program takes constant accelerometer readings of the forces in 3 dimensions (x, y and z axes) and transmits them by radio.
- Connect the receiver micro:bit to a computer by USB and flash the logger program on to it using the Mu Python editor app.
- This micro:bit receives the accelerometer data and send as serial data to your computer. Click on the 'Plotter' button in Mu and you should see graphs of the live data readings appear on the screen.
- Place the sensor micro:bit on each side and see how the readings in each axis change. Throw it in the air, spin it in a salad spinner: what do you see?
- Mu saves the numerical data as a CSV (comma separated values) file in your computer's home folder. Look in 'mu\_code' and then the 'data\_capture' folder.
- You can open the CSV file in a spreadsheet program to analyse. If you delete the second and third time columns, leaving only the first, you can plot the data on a scatter graph in your spreadsheet showing how the forces change over time.



### What you need

- 2 micro:bits and one battery pack
- Laptop or desktop computer to record data on
- Mu Python editor app: <https://codewith.mu/>
- Optional salad spinner

## TASK 2 – CODE IT

### Sensor/transmitter:

```
1 from microbit import *
2 import radio
3 radio.config(group=99)
4 radio.on()
5
6 while True:
7     sleep(20)
8     radio.send(str(accelerometer.get_values()))
9
```



### Receiver/logger

```
1 from microbit import *
2 import radio
3 radio.config(group=99)
4 radio.on()
5
6 while True:
7     message = radio.receive()
8     sleep(20)
9     print(message)
10
```



Video of how to  
create a data logger with  
Python is available here  
<https://youtu.be/iKja2eHqeu4>

## TASK 3 – IMPROVE IT

- Record other micro:bit sensor readings remotely this way, such as temperature, light or magnetic compass readings.
- Conduct a physics experiment into the forces acting on a micro:bit as it spins in a salad spinner (centrifuge). Do you see what you expect? (Bear in mind that the accelerometer on the micro:bit can only read forces up to 2g, twice the force of the Earth's gravity – if you spin it fast it may experience forces that are too large for it to register.)



find more projects at <https://microbit.org/projects/make-it-code-it/>