05

TEXTILES & CRAFT

SECTION CONTENTS

Why not add some sparkle to a textiles or resistant materials project with our range of gems. The gems are a great value for money. This allows excellent effects to be achieved for only a few pence per student.

The gems have a 'hot melt' backing that is activated when heated using the 'Gem Master' tool. The adhesive backing allows the gems to be attached to many types of textiles, plastics, wooden materials, etc.

GEM MASTER TOOL

The 'Gem Master' tool from Antex is perfect for using with our range of gems. It has 5w and 10w power settings and a wide range of tips for gems and studs of various shapes and sizes.

Description	Code	1+
Gem Master tool	2644	

HEAT ADHESIVE RHINESTONES

Rhinestones or gems are made from a glass like material and are available in several colours, bags of 500.

	Colour	Pack Quantity	Size	Code	1+
	Clear	500	3mm	4401	
	Red	500	3mm	4402	
	Green	500	3mm	4403	
	Blue	500	3mm	4404	
	Yellow	500	3mm	4405	
	Clear	500	4mm	4406	

PYRO MASTER TOOL

This entry level, dual temperature, pyrography tool is ideal or creating simple designs on wood or leather.
The Pyro Master has 15W and 30W power settings and comes complete with 19 tips, a key ring, and a leather fridge magnet to get you started.

Description	Code	1+
Pyro Master, dual temp 15/30W	2651	

AN INTRODUCTION TO OUR E-TEXTILES RANGE

ELECTRO FASHION. ®

Amidst the hype surrounding wearable technology, we, too, have been deeply inspired by the craze. As a result, we have designed our own range of E-Textiles parts in a bid to help lessen the gap between Electronics and textiles: Electro-Fashion. Discover just how easy it is to conduct your own E-Textiles project using our Electro-Fashion range and be a part of this global infatuation with fashionable electronics.

ELECTRO-FASHION PARTS

With our Electro-Fashion range, students can **easily introduce LEDs to textiles projects**. The system works by using conductive thread, which sews like normal thread but conducts electricity like wire. To light an LED, the conductive thread must be firmly attached to a cell holder, sewn through the fabric, and connected to an LED. Using a new piece of conductive thread, the other side of the LED must be connected to the cell holder. Slide the cell into the holder to light the LED.

Switches may also be introduced to the E-Textile circuit: LED(s) can be activated by the push of a button, a slide of a switch, a magnetic connection, a gentle tilt, or, even, as darkness is detected. See **pages 81 & 82**.

TUTORIALS

In addition to supplying the fundamental parts of any E-Textile project, we also offer a selection of online E-Textiles tutorials and resources with step-by-step guidance and cutting pattern templates.

EXAMPLE TUTORIAL: HOW TO MAKE A ROCKET TORCH KEY RING LED TORCH

1 MATERIALS AND COMPONENTS NEEDED FOR THIS PROJECT

2 PREPARE THE ROCKET BODY
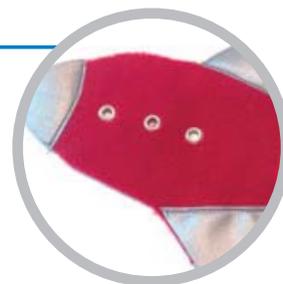
3 CREATE THE E-TEXTILE CIRCUIT

4 STITCH THE ROCKET LAYERS TOGETHER, LIGHTLY STUFF, & PUSH TO ACTIVATE!

For more tutorials, visit www.kitronik.co.uk/etextilestutorials

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CONDUCTIVE THREAD 45M BOBBIN

Conductive thread is perfect for hand sewing and can be used on the bottom bobbin of a sewing machine (this will require the thread to be wound on to the smaller bottom bobbin first). Reels of conductive thread are, 50 yards/ 45m. Conductive thread can be used like conventional sewing thread, however it electrically conducts allowing electronics to be integrated into textiles.

Description	Code	1+	4+
Conductive thread - 45m bobbin	2722		

CONDUCTIVE THREAD 2M/6M T-SHIRT

We now offer 2m or 6m of conductive thread (approximately), which is bound around a funky pink Electro-Fashion t-shirt emblem that can be used as a key ring!

Description	Code	1+
2m (approx) Conductive thread	2724	
6m (approx) Conductive thread	2727	

CONDUCTIVE RIBBON

A great addition to any wearable electronic project, this easy to use conductive ribbon has three separate conductive strands woven into it, allowing you to transmit power, ground and signal. You can solder it provided you don't have the soldering iron too hot, and it is quite flexible and durable. It has very little (negligible) resistance and is made of 68% stranded tinsel wire and 32% polyester.

Approx. size 0.9m x 5mm.

Description	Code	1+
Conductive ribbon	2739	

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CONDUCTIVE FABRIC

Conductive fabric can be used to make a soft switch. Only a small amount is required per switch, so this sheet goes a long way. This is a conductive knit fabric for use in e-textiles, similar to a nylon ripstop material. It is highly conductive with a low surface resistivity.

Description	Code	1+
Conductive fabric - ripstop - 305 x 330mm	2716	
Conductive fabric - stretch - 305 x 330mm	2717	

CONDUCTIVE HOOK & LOOP (VELCRO) STRIP

This is a 10cm long strip of conductive hook & loop (Velcro). This conductive strip is perfect for E-Textile projects where you need to make a complete circuit by simply forming a connection between the hook and loop pieces. The strip is 2.5cm wide by 10cm long. The surface resistance for both the hook and the loop is 1Ω per centimeter.

Description	Code	1+
Conductive hook & loop strip - 2.5 cm x 10 cm	2740	

ELECTRO-FASHION - DISCOVERY PACK

This pack is a great way of getting started with E-Textiles. The pack contains a selection of the popular products from our 'Electro-Fashion' range.

1 x White sewable PCB LED - pack of 10.
1 x Sewable coin cell holder with built in power switch.
1 x Sewable push switch.
1 x Sewable slide switch.
1 x Sewable tilt switch.

1 x Electro-Fashion sewable coin cell holder, 2m thread and colour changing LED.
3 x Electro-Fashion sewable coin cell holder.
1 x Small conductive thread bobbin (6m).
1 x Blue sewable PCB LED - pack of 10.
1 x CLN coin cell, CR2032, strip of 5.

Description	Code	1+
Electro-Fashion - Discovery Pack	2715	

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SEWABLE LED KITS

Kits are packed ready for student use and include a coin cell holder, a coin cell, 2m of conductive thread and either two flashing LEDs or one colour changing LED. They allow lighting effects to be added to textiles designs without soldering.

Description	Code	1+	10+
Flashing blue sewable LED kit	2702		
Flashing green sewable LED kit	2703		
Flashing red sewable LED kit	2704		
Flashing yellow sewable LED kit	2705		
Colour changing sewable LED kit	2706		

^ Project Example

ELECTRO-FASHION - 60 STUDENT BULK PACK

The bulk pack offers great value for teaching larger groups of students.

Pack includes: 60 x sewable coin cell holders.   10 x colour changing LEDs.
60 x CR2032 coin cell batteries.   25 x each of blue, red, yellow
180m of conductive thread, 3m per student.   and green flashing LEDs.

Description	Code	1+
Sewable LED - 60 student bulk pack	2707	

ELECTRO-FASHION KITS WITH FLAT LEDS

These kits are ready-packed with all of the parts needed for students to make a simple E-Textiles circuit. The kit includes two flat LEDs that are marked up with + and – markings, making them smaller and easier to use than LEDs with leads. As well as the two flat LEDs, the kit also includes a 2m t-shirt of conductive thread, a sewable coin cell holder and coin cell.

Description	Code	1+
Sewable LED kit with blue flat LEDs	2735	
Sewable LED kit with green flat LEDs	2736	
Sewable LED kit with red flat LEDs	2737	
Sewable LED kit with white flat LEDs	2738	

^ Project Example
(requires extra LEDs)

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> www.kitronik.co.uk   > sales@kitronik.co.uk

ELECTRO-FASHION CAT KIT

This cat kit contains all the items you need to make the cat (except for a pair of scissors and a needle). To make the cat the felt is cut into three pieces following the lines marked on the pre-printed design. The LED eyes, battery holder and a switch are sewn on to a piece of felt following the stitch lines. The cat is then sewn together and stuffed with wadding. Pop the battery in and **when the cat's ear is pressed the eyes will light.**

Kit contents:

- 1 x Printed felt.
- 2 x Sewable green slim LEDs.
- 1 x Sewable push button switch.
- 1 x Sewable coin cell holder.

- 1 x CR2032 coin cell.
- 2 x Conductive thread.
- 8m Embroidery thread.
- Wadding.

www.kitronik.co.uk/cat

Code	1+
2725	

PROJECT EXAMPLES - ELECTRO-FASHION SEWABLE LEDs

^ Examples of conductive fabric used on the hands of puppets.
When these are touched together, the circuit is completed and the LED lights up.

ELECTRO-FASHION FLASHER CONTROLLER, LEDS & THREAD
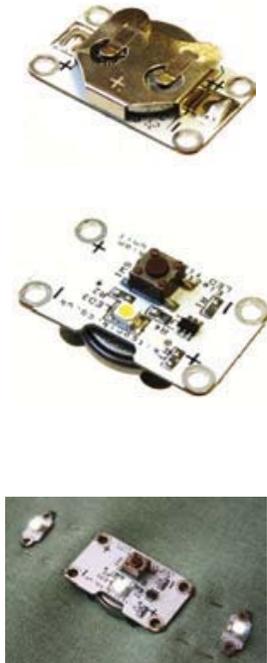
This unit offers a simple way of adding 'flashing' white LEDs to a textiles project. The unit is programmed with a number of flashing patterns that are selected by a push button on the main PCB. Pressing this button cycles through the following patterns: all LEDs constantly on, slow flash (all on, all off), fast flash (each in turn), and turned off. The device features auto off, which turns the unit off after 30 minutes to preserve battery life. Depending upon flash pattern the battery lasts for approximately two days of constant use.

This kit is supplied 'pre-built' so requires no soldering. Each kit comprises three small PCB's. The largest of the three PCB's holds an LED plus the control electronics, battery and a push button. On both of the remaining PCB's there is an LED, which are connected to the main board with conductive thread.

ℹ Includes approximately 2m of conductive thread.

🔍 Dimensions: L34 x W20 x H9mm.   🔋 Includes a CR2032 battery.

Description	Code	1+	10+
Flasher controller and LEDs	2719		

ELECTRO-FASHION MAGNETIC SWITCH & MAGNET
This magnetic switch can turn on LEDs when the magnet is placed near the switch.

Description	Code	1+	10+
Magnetic switch & magnet	2720		

ELECTRO-FASHION LIGHT SENSOR

This board allows LEDs to be turned on automatically when it is dark. On one side of the board is the coin cell holder, which takes a CR2032 coin cell as well as a small on off slide switch. On the other side of the board is the light sensor. The design means that it is possible to cut a small hole in the front of the product for the light sensor to detect the light level, whilst also being able to get to the back of the board to change the battery and turn the board off. When turned off any connected LEDs will be off. When turned on the connected LEDs will be off in day light but come on in the dark.

Description	Code	1+	10+
Electro-Fashion - Light sensor	2721		

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LITHIUM 3V COIN CELLS

Description	Code	1+	10+
3V CR2032 - 200mA/h - 5 pack	2262		
3V CR1220 - 40mA/h - 5 pack	2269		

SWITCHED COIN CELL HOLDER

This specially designed coin cell holder has large connection points for the conductive thread. These are clearly marked to show the battery polarity. The unit also has a small power switch so that you can turn the power on and off.

Accepts CR2032 battery.

Dimensions: L44 x W20 x H4.5mm.

Code	1+	10+
2711		

SEWABLE COIN CELL HOLDER

The specially designed coin cell holder has large connection points for the conductive thread and are marked to show the battery polarity. It is available on its own, to incorporate into your own designs.

Accepts CR2032 battery.

Dimensions: L34 x W20 x H4.5mm.

Code	1+	10+
2701		

MINIATURE COIN CELL HOLDER

This specially designed coin cell holder has large connection points for the conductive thread. These are clearly marked to show the battery polarity.

Accepts CR1220 battery.

Dimensions: L22 x W12.5 x H4mm.

Code	1+
2718	

SEWABLE PUSH SWITCH

This push button switch will allow LEDs to light whilst the switch is pressed.

Dimensions: L18 x W8.5 x H6mm.

Code	1+	10+
2708		

SEWABLE SLIDE SWITCH

This two position miniature slide switch allows LEDs to be turned on or off in textiles projects.

Dimensions: L18 x W8.5 x H4mm.

Code	1+	10+
2709		

SEWABLE TILT SWITCH

When horizontal this switch is off. When tilted 10° from horizontal the tilt switch is on.

Dimensions: L26 x W6.5 x H7mm.

Code	1+	10+
2710		

SEWABLE PCB LEDS

These ultra slim, pre-mounted LEDs are illuminated continuously. They have connections to which the conductive thread can be connected. These are clearly marked with '+' and '-' to indicate which is the positive and which is the negative connection.

The PCBs are double sided making the thread connection very reliable. They are supplied on a small panel and the LEDs can easily be removed by snapping them out.

Dimensions: L15 x W6.5 x H3mm.

Description	Colour	Code	1+	10+
LED board - 10 pack	Red	2712		
LED board - 10 pack	Blue	2713		
LED board - 10 pack	White	2714		
LED board - 10 pack	Green	2723		
LED board - 10 pack	Sakuru (lilac)	2726		

5MM FLASHING LED

These flashing LEDs can be used with the Electro-Fashion coin cell power boards. 5mm flashing LEDs in red, green, yellow and blue. The LEDs flash at around 2Hz when connected to a 5V supply.

Colour	Code	1+	10+	100+	1000+
Red	3538				
Green	3539				
Yellow	3540				
Blue	3545				

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FREE TO DOWNLOAD RESOURCES

To help people new to Electro-Fashion get started we have worked with Julie Boyd to develop some free online resources. These give detailed step by step explanations of how to make a product.

There are guides on adding an LED to a hat (both a standard LED and a slim line LED), making a zippi doll with light up eyes & adding three LEDs to a bag. We are always working on more resources so it's worth keeping an eye on the website.

www.kitronik.co.uk/fashionresources

LilyPad is a wearable e-textile technology. Each LilyPad was creatively designed to have large connecting pads to allow them to be sewn into clothing. Various input, output, power, and sensor boards are available. They're even washable! The LilyPad system is programmed using the freely available Arduino programming environment. Minimum requirements to get started are: LilyPad USB board, micro USB cable and a 2V-5V power supply (such as the Polymer Lithium Ion battery).

POLYMER LITHIUM ION BATTERY

These are very slim, extremely light weight batteries based on the new Polymer Lithium Ion chemistry. Each cell outputs a nominal 3.7V at 1000mAh.

Code	1+
4652	

LILYPAD USB BOARD (ATMEGA32U4)
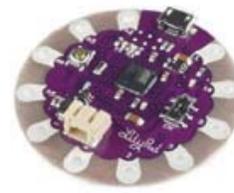
Control devices such as LEDs and buzzers using this LilyPad USB board. Programming is done using the Arduino programming language.

Code	1+
4653	

LILYPAD LED MICRO

A LilyPad Micro LED is a smaller version of our sewable LED boards. They use a smaller LED mounted in a different orientation which makes them very small. They look great in elegant designs or on sheer fabrics.

Colour	Quantity	Code	1+
White	5	4654	
Red	5	4655	
Blue	5	4656	
Green	5	4657	

LILYPAD BUZZER

This small buzzer is for the LilyPad system. Use 2 I/O pins on the LilyPad main board and can create different noises based on the different frequency of I/O toggling. Loud enough to hear inside a pocket but not obtrusively loud.

Code	1+
4638	

LILYPAD ACCELEROMETER
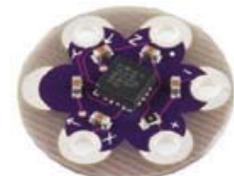
This is a three axis accelerometer for the LilyPad system. Based on the ADXL335 accelerometer from Analog Devices, the LilyPad Accelerometer can detect joint movement as well as inclination and vibration.

Code	1+
4639	

MICRO USB CABLE

This is a USB 2.0 type A to micro-B 5-pin cable.

Code	1+
4125	

LIGHT SENSOR

The light sensor allows your LilyPad to respond to various light levels.

Code	1+
4641	

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LILYPAD DEVELOPMENT BOARD

Consisting of a LilyPad Simple Board, a buzzer, vibration motor, RGB LED, a button, switch, five LEDs, a light sensor, and a temperature sensor, this board lets you dive right into wearable electronics. Once you've learned how to program the LilyPad Arduino Simple Board, break apart the components ready to be sewn into your textiles design using conductive thread (included) and explore the power of the LilyPad platform. Requires a mini USB lead to program.
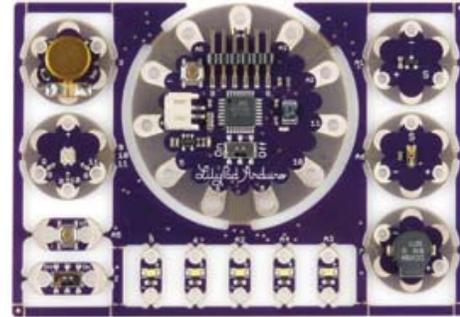
Description	Code	1+
ProtoSnap - LilyPad Development Board	4666	

LILYTWINKLE

Bring some sparkle to your project with this board. It includes the LilyTwinkle (programmed to twinkle the LEDs once the parts are connected), a coin cell battery holder with built-in switch, four white LEDs and conductive thread.
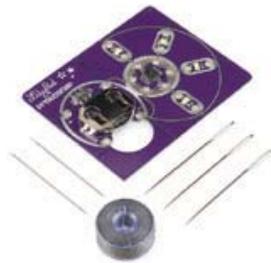
Code	1+
4667	

LILYPAD PIXEL BOARD

The LilyPad Pixel Board will light up in whatever colour you like. You can even chain several boards together to form a display or an addressable string for full effect.

Code	1+
4668	

LILYTINY

LilyTiny is a quick and easy way to add twinkling lights to a project without any programming or a bulky Main Board. Simply sew on 4 LEDs and connect a battery and the LEDs will each blink or fade differently.

Code	1+
4662	

LILYPAD VIBE BOARD

Apply 5V and be shaken by this small, but powerful, vibration motor. It works great as a physical indicator without notifying anyone but the wearer.

Code	1+
4663	

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