

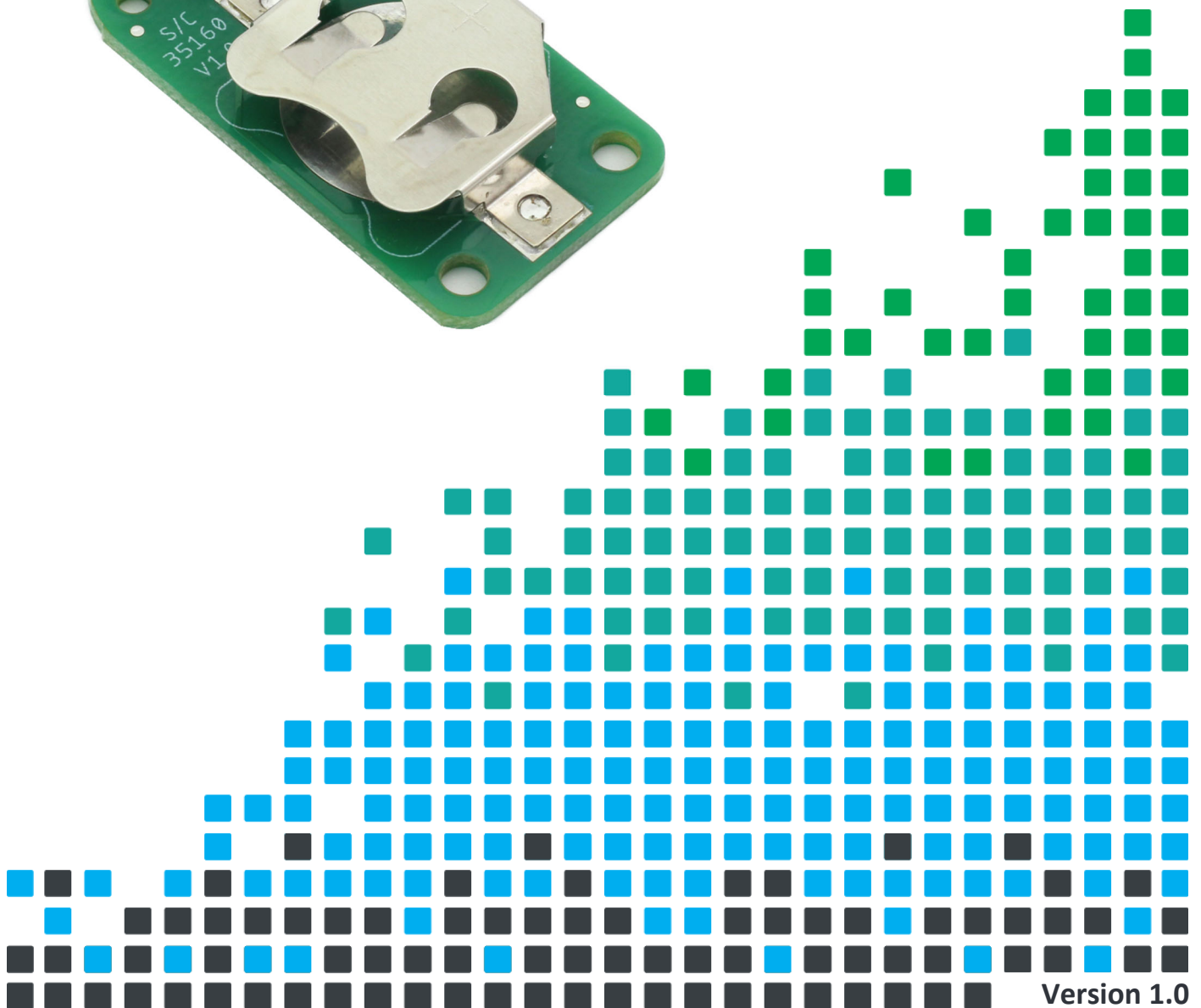
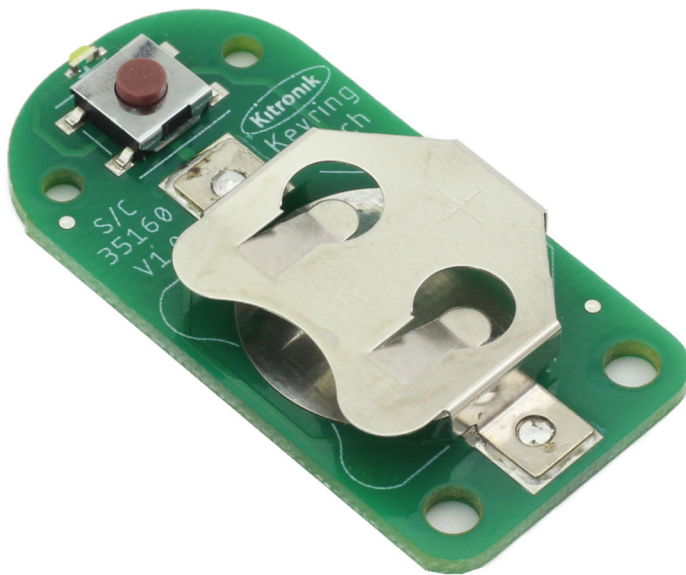


ESSENTIAL INFORMATION

DESIGNING THE ENCLOSURE
MECHANICAL DETAILS
HOW THE KIT WORKS
EXAMPLE ENCLOSURE

LEARN ABOUT SIMPLE LIGHTING CIRCUITS WITH THIS

WHITE LED KEYRING TORCH



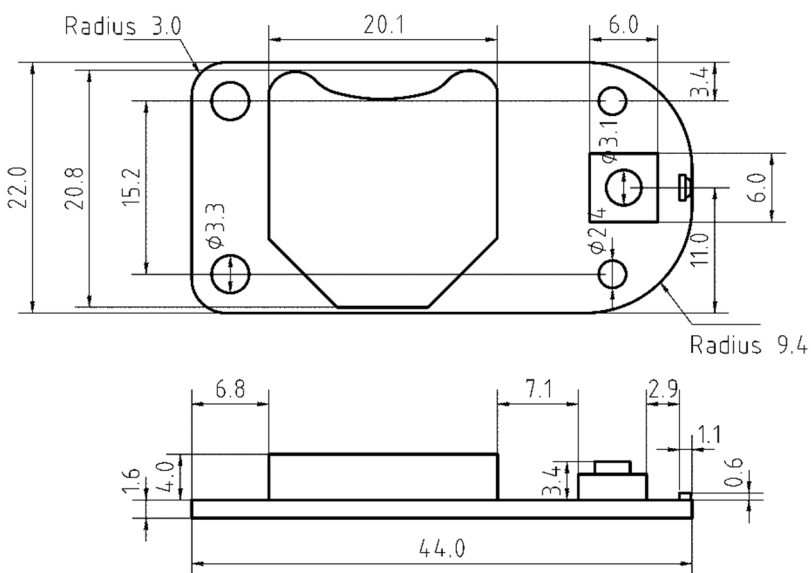
Version 1.0

Designing the Enclosure

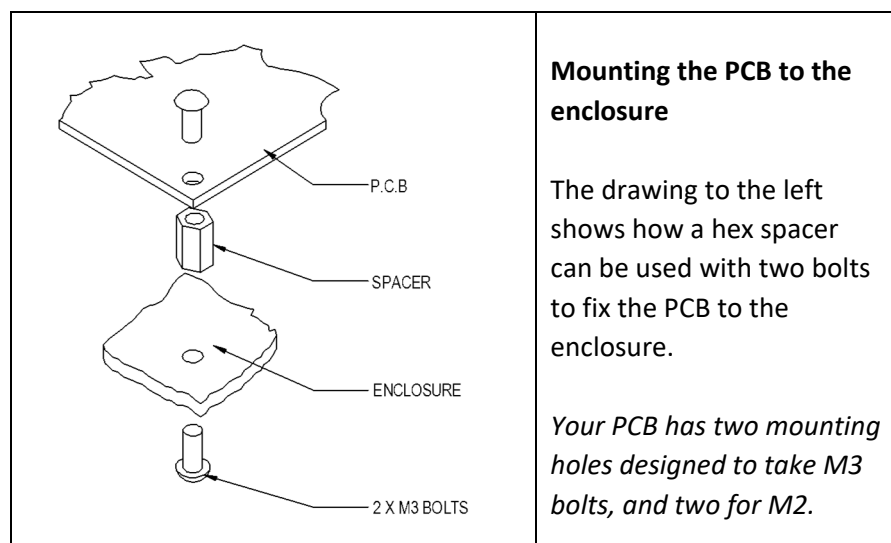
When you design the enclosure, you will need to consider:

- The size of the PCB.
- Where the LED is mounted.
- Where the power button is mounted.
- There are two 3.3mm (M3) holes at the back of the torch and two 2.4mm (M2) holes at the front which can be used to secure the PCB to your enclosure.
- Depending on your design, you could attach the torch to a keyring – using one of the 3.3mm holes or an external hole on the enclosure.

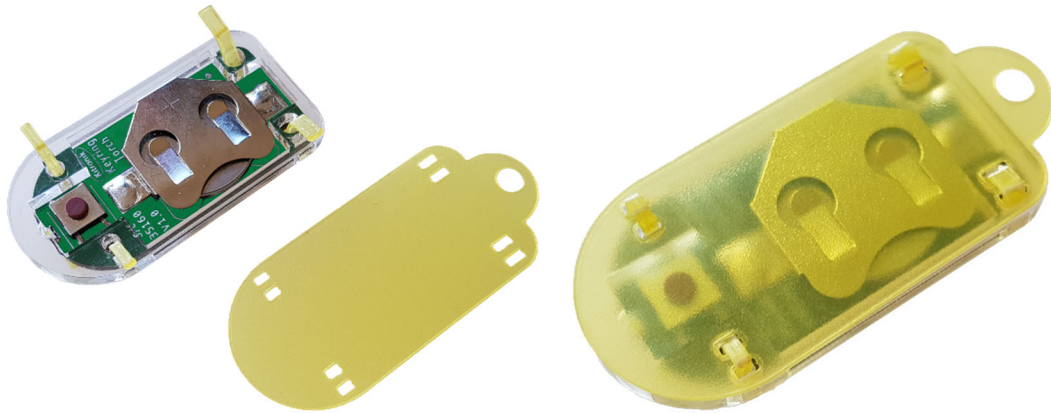
This technical drawing of the torch PCB should help you to design your enclosure.



All dimensions in mm.



Example Enclosures



The images above show an example enclosure for the torch. A combination of polypropylene and acrylic have been used to form a layered case around the torch PCB – the thinner polypropylene top and bottom and the 3mm acrylic in the centre. The acrylic layer has cut-outs to fit around the components and completely surrounds the torch to make sure everything is protected. The flexibility of the polypropylene means that it can be pressed through to activate the push button. Simple tabs through the PCB mounting holes keep the layers held together. The tab at the rear of the case with the large hole allows the torch to be attached to a keyring.



In the second example, the case uses laser cut rubber to create a complete shell around the torch, with a slot at one end to allow the LED light to shine out. The case is made up of segments which are glued together and then slotted over the torch PCB.

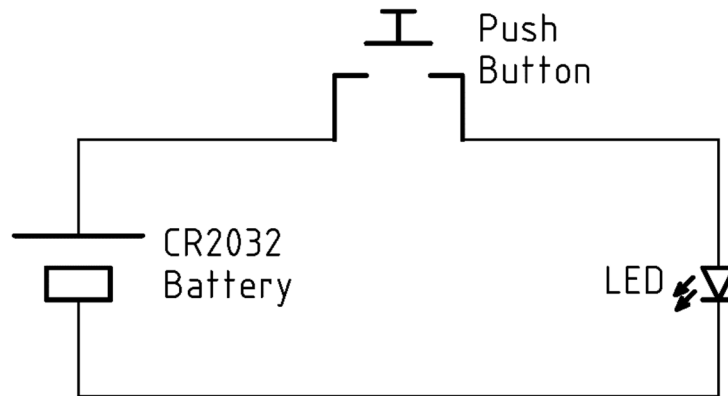
Due to the different cross-sectional shape of the torch at different points along its length, the cut-out section in the middle of each rubber segment needs to be carefully matched to its position in the case (the central cut-out section can be seen in the right-hand image). The segments are formed into two larger sections to allow the torch to be removed from the case, thereby meaning the battery can be changed. In the area above the push button a depression has been cut into the rubber to make it easier for a user's finger to find and press the button to turn the torch on. At the rear of the case, an extra wide segment has been included with a large hole which means the torch could be attached to a keyring.

The design files for both example cases can be found here:

www.kitronik.co.uk/35160



How the Torch Works



The circuit diagram for the torch is shown above. It is a very simple circuit, powered by a CR2032 coin cell battery.

LEDs often need to have the current supplied to them limited, however, as this circuit uses a 3V coin cell (which only provides a low current) and the forward voltage of the LED is around 3V, the LED will only draw a max of 22mA, which is below its limit of 25mA. This also means that the LED will be nice and bright.

Finally, the push button allows the circuit to be opened, when the LED will be off, or completed, when the LED will be on.



Online Information

Two sets of information can be downloaded from the product page where the kit can also be reordered from. The 'Essential Information' contains all of the information that you need to get started with the kit and the 'Teaching Resources' contains more information on soldering, components used in the kit, educational schemes of work and so on and also includes the essentials. Download from:

www.kitronik.co.uk/35160

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