

Reed Relays, latching and otherwise

On one of the first Sunday 'Zoom' sessions Davy Dick discussed reed relays, and their applications. They are relatively small, easy to camouflage or hide, and can handle sufficient current to be useful input devices for model railways. They can also be single open/close or changeover, and, as Davy demonstrated, they can be made to latch by the expedient of adding a simple biasing magnet over and above the magnet used to actuate the switch.



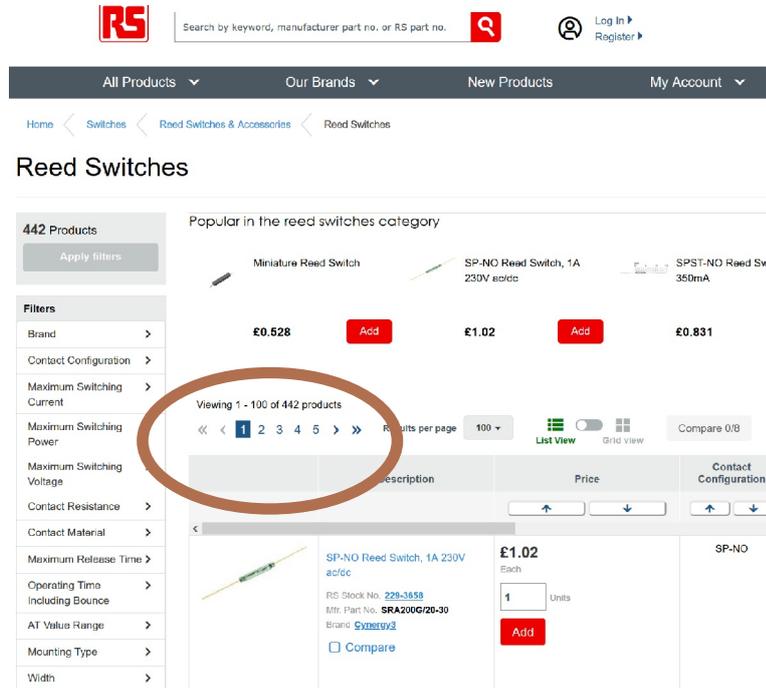
You can buy latching reed relay switches at considerable expense, or you can use a simple cheap reed relay element and set a bias magnet a few mm away to turn it into a latching relay.

There are lots of applications, If a north pole actuating magnet is attached below the front of a train, and a south pole actuator below the end, then a latching reed relay in the track will only be 'on' when the train is actually over the reed.

One of the few downsides of reed relays is that they can be fragile. They are invariably made of glass, and quite fine glass at that. And they are circular in section, which means they are not always easy to orient. And they don't have a means of mounting to or below the layout, the smooth glass shape designed to slip inside a wire bobbin in an old fashioned telephone exchange, is tricky to screw to a baseboard.

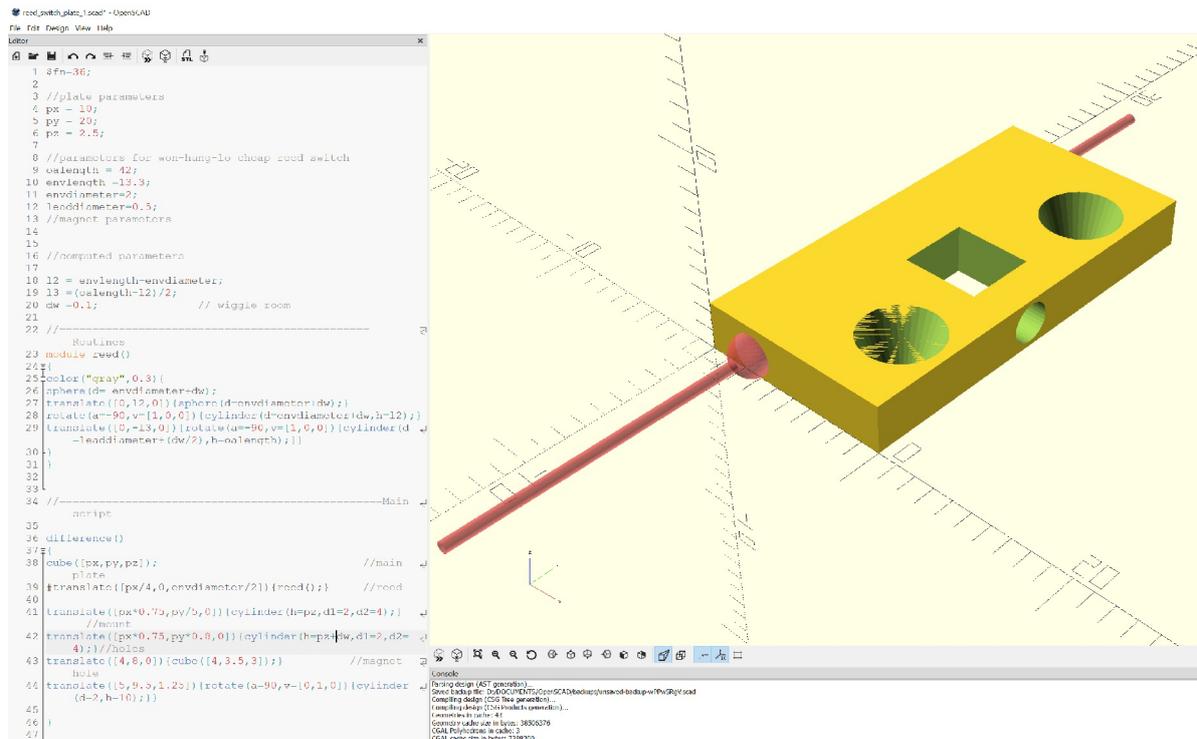
To try to solve some of these problems, we have designed a reed switch mount. This wonder of the age holds the switch in one of two orientations, for operation either from the side or from above/below, it also provides mounting holes to allow the device to be screwed to the surface, and a optional mobile section allows a bias magnet to be inserted to make the switch latching.

Having designed it we then discovered that reed switches typically come in at least three different sizes, and so the design was revisited. Actually there are quite a few different sizes. RS, a company not known for their huge profusion of switchgear options, offer over 440 different reed switches!



The screenshot shows the RS website's product page for reed switches. The page title is 'Reed Switches' and it displays 442 products. A search bar at the top allows searching by keyword, manufacturer part no., or RS part no. The navigation menu includes 'All Products', 'Our Brands', 'New Products', and 'My Account'. The breadcrumb trail is 'Home > Switches > Reed Switches & Accessories > Reed Switches'. The main content area shows 'Popular in the reed switches category' with three featured products: 'Miniature Reed Switch' (£0.528), 'SP-NO Reed Switch, 1A 230V ac/dc' (£1.02), and 'SPST-NO Reed Sw 350mA' (£0.831). Below this, a pagination control shows 'Viewing 1 - 100 of 442 products' with a red circle around the page numbers (1, 2, 3, 4, 5). The product list below shows the 'SP-NO Reed Switch, 1A 230V ac/dc' with its RS Stock No. (229-3658), Mfr. Part No. (SRA200G/20-30), and brand (Syrtronic).

We can use a 'parametric design' model that allows parameters to be set to change the design for each different switch, or we could use a more complex design that accommodates any of the three sizes, though the problem of suitably placing the bias magnet on the 'fits all' version was more problematic. In the end the design was settled on the one to fit the standard switches and bias magnets that Davy has sourced from our friends in the East. An aperture is left to allow a magnet to be added for biasing, and a lateral hole allows a screw to adjust the setting of the bias magnet. You can either pack the magnet with non magnetic material (a bit of rubber band works) or you could epoxy the adjusting magnet to the adjustment screw. Because of the reluctance of ferrous metals, better results will be obtained if both the mount screws and the adjustment screw are non magnetic. (Brass mount screws and a nylon adjuster work well)



But please know that the other designs for big or small reeds are here if you need them, or if you would like the STL or OSCAD files to let you produce your own, better mounts.

If you are modelling something that is a bit odd and needs a magnetic sensor mounted 'oddly' just let myself, Davy or some of the usual suspects know and we'll do what we can to help.

Just don't tell the Faller Road system people or I'll never get any time to myself again!

Stay Safe and Well

Chic