

Post-box Monitor

Mathieu Coustans

Or “Has the postman been yet?” This project was born out of the idea of avoiding having to go out to the post-box on a rainy day to see if the postman has been. Whereas in the UK the letterbox is often a slot in the front door, very remote road-side post-boxes are common in other countries.

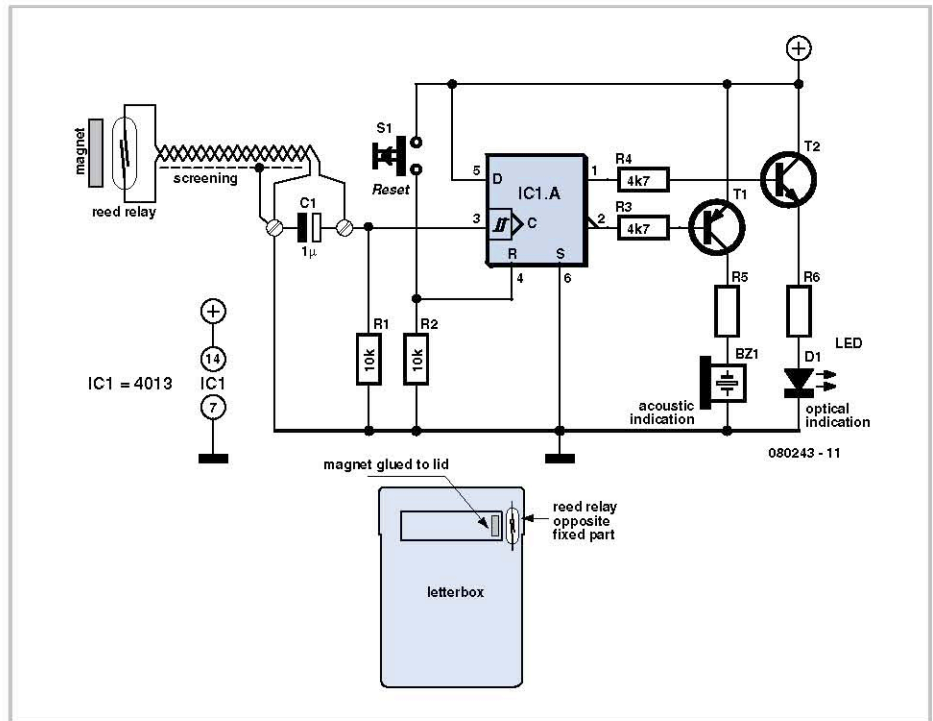
Of course, it rains a lot less in Summer, but it does still happen — and always just when you’re expecting an important letter; what’s more, not everyone is on holiday, and loads of people go straight indoors without checking their post-box.

It would be nice to have some way of displaying the status of the post-box.

Until very recently, this type of (luxury) accessory was the privilege of private villas fitted with CCTV systems, the rest of us mere mortals not really feeling the need to spy on the postman using a CCTV camera. So the author decided to build a little circuit which is ridiculously cheap to build — in its most basic version, it ought not to cost more than about £ 3.

The author’s project was built on prototyping board (perfboard) and uses only very standard components, the object of the exercise being to produce a simple but effective circuit. In its basic version, the circuit in question remembers if the postman has been (it doesn’t actually detect the postman, but any kind of post slipped into the post-box by lifting the flap protecting the opening) and can indicate this ‘event’ visually (an LED) or audibly (buzzer or vocal alarm based on the ISD25xx). However, that the author soon ruled out the latter option because of the noise pollution it generates and the noticeably higher current consumption compared with just an LED.

Those readers who are keen to provide their system with a vocal-type alarm at any cost can take a look at the author’s website, where he describes the system he used



CL	D	R	S	Q	\bar{Q}
Low>High transition	0	0	0	0	1
Low>High transition	1	0	0	1	0
High>Low transition	x	0	0	Q	Q
Immaterial	x	1	0	0	1
Immaterial	x	0	1	1	0
Immaterial	x	1	1	1	1

from the following supplier, before abandoning it. Conrad Electronics sell a module the size of a chewing-gum leaf for around £ 6 [1].

A glance at the circuit shows how staggeringly simple it is. The central component is a CD4013 logic IC (sequential logic), a D-type flip-flop with reset and priority set to ‘1’, active high. You can find the truth table for the flip-flop in the inset. It’s more complicated than it seems at first sight (CL = Clock, D = Data, R = Reset, S = Set, Q = Q output and $\bar{Q} = \bar{Q}$ output).

You can see that this is only triggered once on a rising edge.

This edge is generated by the magnetic leaf switch, since the latter is sensitive to any significant variation in the magnetic field: the simple fact of opening the hinged flap of the post-box to put the post in can be used to produce a change of state in the reed switch. The diagram illustrates the respective positions of the reed switch and magnet.

The author has all sorts of potential developments in mind for his circuit. If the subject intrigues you, why not drop by his blog [2] from time to time, to see how things are developing? — a basic knowledge of French is required, though.

(080243-1)

Web Links

[1] Author’s website:
<http://ludvol.free.fr/articles.php?lng=fr&pg=211>

[2] Author’s blog:
<http://lespace-electronique.blogspot.com>