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# Remote control with reed switches

Electrical Impulses

Model Railroad Hobbyist | January 2020

1. With a latching magnetic reed switch, you can control the lighting in rolling stock such as a caboose with just with the pass of a magnet.

## THE *MRH* STAFF on using latching reed switches for hands-off on/off control ...

**BY USING A MAGNETIC REED SWITCH, YOU CAN** easily turn on or off lighting or other electrical functions in rolling stock just by swiping a magnet close to the car. This can be far simpler and cheaper than wiring up a DCC function decoder to do this action.

A reed switch typically can be activated with a strong magnet even when it is separated from the switch by a thick wall or roof. The form E bi-stable or latching reed switch is a special type that remembers how it was last set (on or off).

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On the other hand, a common form A reed switch is normally open, but closes when a magnet is brought near it, making the electrical connection. Upon removing the magnet the form A reed switch reverts to open again, it does not "latch" or maintain the closed (on) state after the magnet is removed. The magnet must be nearby to keep the form A reed switch closed.

Bringing a magnet near a form E latching reed switch will turn the switch on or off, and it will remain on or off even when the magnet is removed. Bringing the magnet close again can turn it back off or on. However, the magnet polarity (termed N for north and S for south) must be reversed for this switch to flip states.

2. A magnetic reed can also be used to control the lighting in a passenger car such as this GN business car.

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For more on the different kinds of magnetic reed switches, see the sidebar, "About reed switches."

## Working with a latching reed switch

With reed switches, if the triggering magnet is strong enough, you only need to bring the magnet close to trigger the latching action. This means you can hide the reed switch behind rolling stock walls. Very convenient!

3. You can use a latching reed switch to control the lighting in a special foreground building such as this one. *David Kilborn photo*

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Form E latching/bi-stable reed switches are not easy to find, and are available only from a few online stores. Smaller latching reed switches tend to come and go on the market, so when you see some you're interested in, stock up!

See the shopping list link at the end of this article for full details.

The bi-stable latching reed switch MK24-B-2-OE on the shopping list is extremely small [4] and has a specific polarity due to the magnet inside the package. Just place the reed switch near a trigger magnet and allow the reed switch to orient itself. It will self-align to the actuating polarity of the trigger magnet.

4. The DigiKey MK24-B-2-OE reed switch is less than ¼" long, seen here next to an HO bay-window caboose. This is small enough to be used even in N and Z scale.

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You control a reed switch with a magnet along its length. You can buy a small strong cylindrical magnet and epoxy it to the end of a 0.040" styrene strip to make a convenient control wand [5].

The shopping list includes a magnet that works well for this control wand.

It helps to label one side of the styrene handle as "ON" (same orientation as the reed switch actuating polarity as mentioned earlier) and the flip side as "OFF."

You activate the latching reed switch placing the control wand magnet close to it, and flipping it between the "on" and "off" sides.

5. By locating the latching reed switch inside the caboose bay below the window, it's easy to use the control wand to switch the lights on and off. In this caboose, it's installed in the bay closest to the roof lights as a reminder of where to pass the magnet.

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In [5] you can see the control wand magnet and the location of the reed switch behind the caboose wall in the bay window. Use the wand with the magnet oriented in the "ON" position to turn on the latching reed switch and flip it over to the "OFF" orientation to turn the reed switch *off*.

Using magnetic latch reed switches in this way is less expensive and simpler to install than a full-blown DCC function decoder. They provide great one-swipe on-off control of any low voltage circuit.

It's beyond the scope of this article to get into any specific circuits. Just wire the reed switch into your circuit like you would any on-off switch.

Do give magnetic reed switches a try. They work especially well for controlling lighting in rolling stock in a convenient hands-off manner. ☑

**SHOPPING LIST:** Find the latest shopping list for this article here: mrhmag.com/magazine/mrh2020-01/electrical-impulses.

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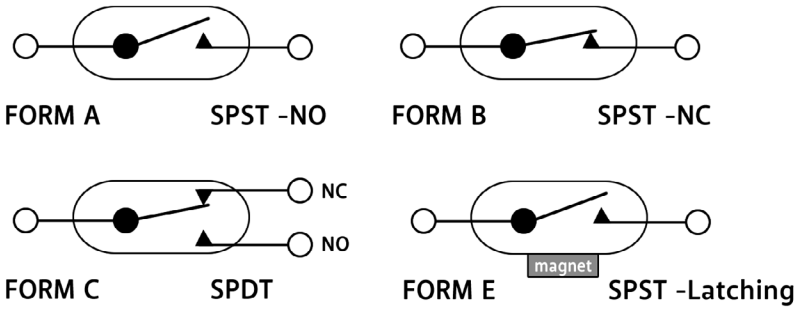
## ABOUT REED SWITCHES




**Types of reed switches**

**Form A:** Single-pole single-throw (SPST) normally open (NO) magnetic reed switch. Bringing a magnet close to the reed switch closes (turns on) the switch. Upon removing the magnet, the switch goes back to open (off). Note the closing is momentary.

**Form B:** Single-pole single-throw (SPST) normally closed (NC) magnetic reed switch. Bringing a magnet close to the reed switch opens (turns off) the switch. Upon removing the magnet, the switch goes back to closed (on). Note the opening is momentary.

**Form C:** Single-pole double-throw (SPDT) magnetic reed switch. One contact is normally closed (NC) and one contact is normally open (NO). Bringing a magnet close to the reed switch causes the open contact to close and the closed contact to open. Upon removing the magnet, the contacts go back to their original state. Note the switching of states is momentary. *... continued, pg 8* →

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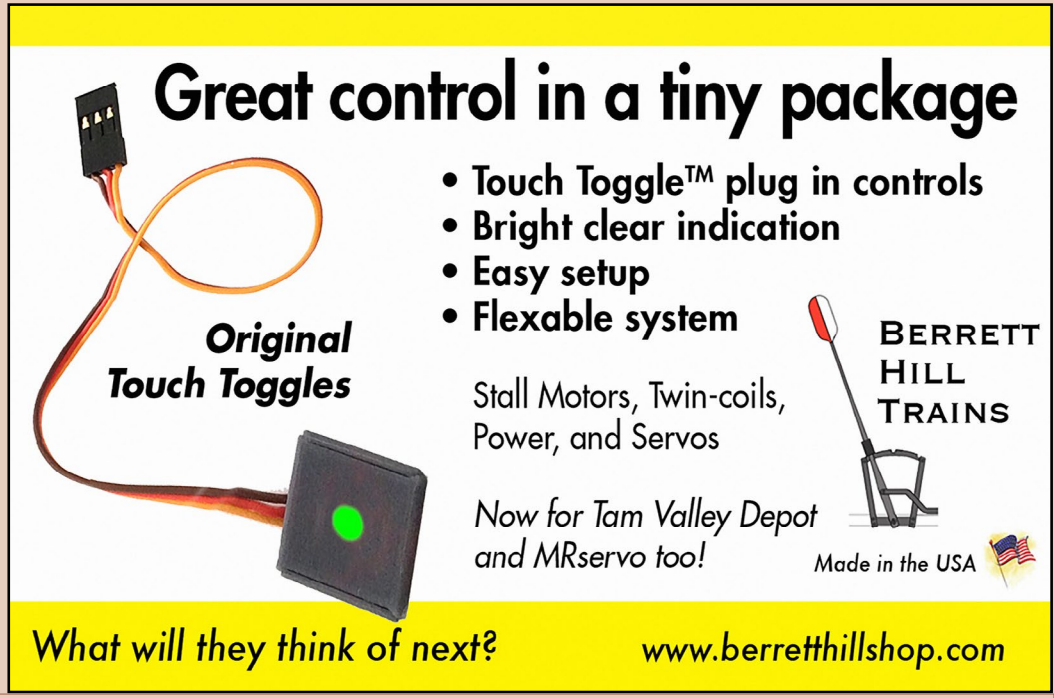

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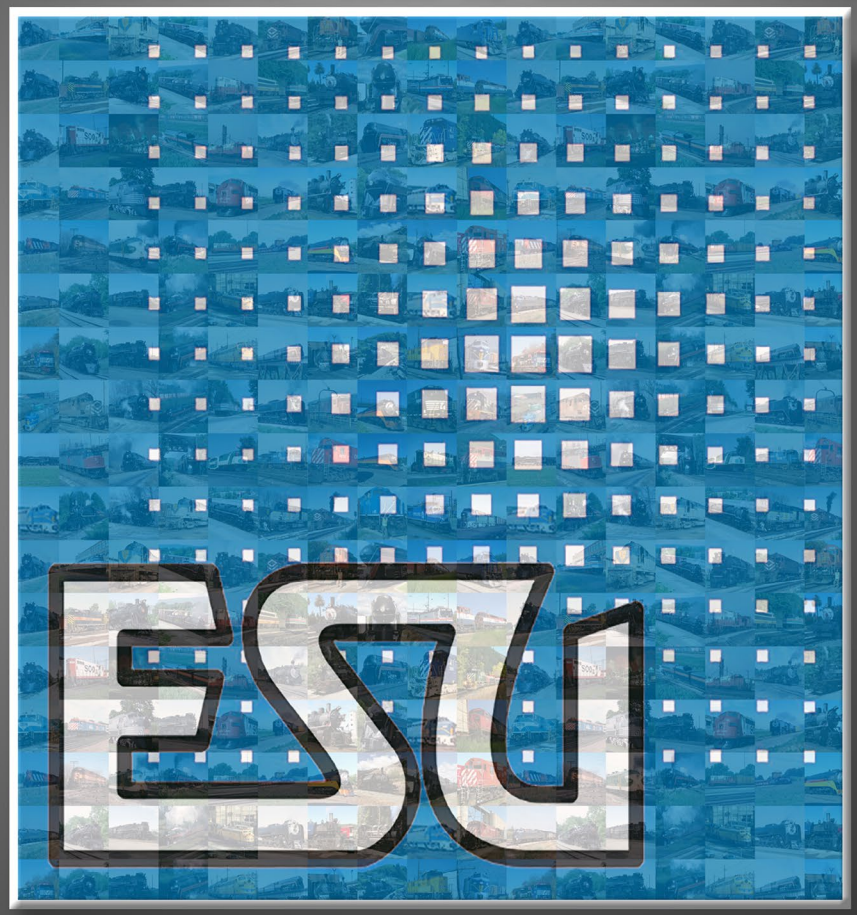


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## ABOUT REED SWITCHES, *... continued*

**Form E:** Bi-stable latching magnetic reed switch that typically starts normally open. Bringing a magnet close to the reed switch causes the state to flip, depending on the polarity of the magnetic field. One polarity causes the contacts to close, the other polarity causes the contacts to open. Upon removing the magnet, the reed switch remains in its last state, either closed or open. Note the switching of states is permanent until the magnet comes close again with reversed magnetic polarity.

A latching reed switch includes a tiny magnet on its glass tube, not strong enough to close the contacts itself. When bringing the control magnet close with its poles oriented in the same direction as the tiny magnet, the magnetic fluxes add up, and the contacts close. When the control magnet is removed, the tiny magnet holds the contacts closed.

To open the reed switch again, bring the control magnet close, but with its poles reversed. This time, the magnetic fluxes subtract, and the tiny magnet releases the contacts. Since the tiny magnet alone is not strong enough to close the reed switch, it now remains open. ■

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