AUTOMATIC FROG JUICER
FROGmini

Automatically Switches the Frog Polarity on DCC Layouts

Supplies power to the frog section of a set of points

- Automatically corrects the frog polarity for the route selected
- If a locomotive passes when the frog polarity is set incorrectly, the current is switched off and the polarity reversed
- Detects double-short circuits which would otherwise shutdown the booster.
- No mechanical moving parts or switch contacts to wear
- Suitable for outdoor use when appropriately boxed

There are many ways to set the frog polarity on a set of points, including adding microswitches to points motors, or using methods of operating points where there are additional contacts available. Where this is not the case, the juicer provides

another quick and easy method of automatically switching frog polarity, without the operator even needing to be aware of the polarity change.

The module works by monitoring the current flow to the frog. If the frog polarity is correct, there will either be no current flow (when the points don't have a train passing over them) or a small current due to a train. This current will usually be below 1A, but will depend on the scale of the model, speed the loco is travelling, and any accessories fitted.

If the frog polarity is set incorrectly when the train enters the points, a short circuit will occur. The juicer monitors the current flow and reacts quickly by switching off the current before reversing the polarity and returning the current to the frog. The response is so quick that the rest of the system is unaffected by the brief short.

If a short appears between both rails and the point's frog, the juicer will cut the current to the frog for 5 seconds, before automatically reapplying the current. This prevents the short-circuiting of the DCC feed and the FROG1 will continue trying to re-apply the current every 5 seconds until the short-circuit is cleared.

If you are interested in the speed of operation, the short circuit is detected within 5us (five microseconds) and the short circuit is removed within 1 to 2ms (one to two milliseconds).

These modules will not work with DC systems, Bachmann EZ-DCC or Sprog II, as none of these are able to provide the necessary tripping current. A minimum of 1.7A is necessary for the FROG1 to detect the short-circuit.

Points Modification

In general, the following modifications will be necessary to use electrofrog points for DCC:

1. provide insulated rail joiners between the frog and the main line rails.

2. remove the bonds on the underside of the points to isolate the frog from the inside mainline and diverging rails.

3. connect (solder) new wire links between the outside mainline rail and the inside diverging rail to restore power to the inside diverging rail.

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5. remove the wire providing power to the frog and extend to reach the frog juicer.

Connecting up

There are three terminals on the juicer, T1, F and T2.

Connect T1 and T2 to the DCC power bus or to the track. Either bus can connect to either terminal, the module will simply change over which feed it uses to power the frog automatically.
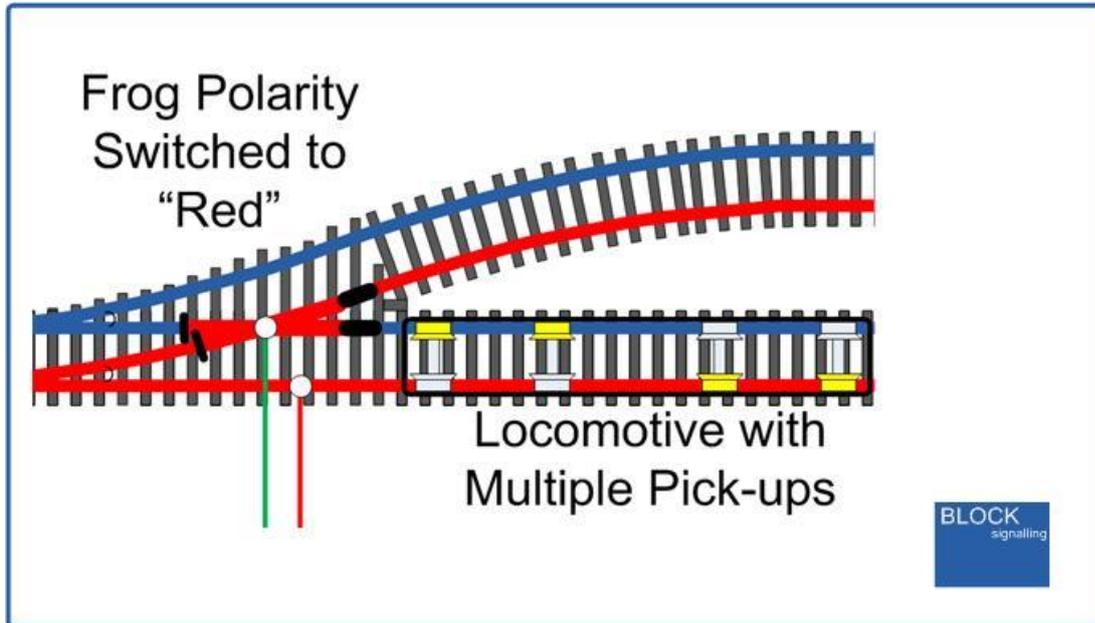
The middle terminal marked F connects to the frog.
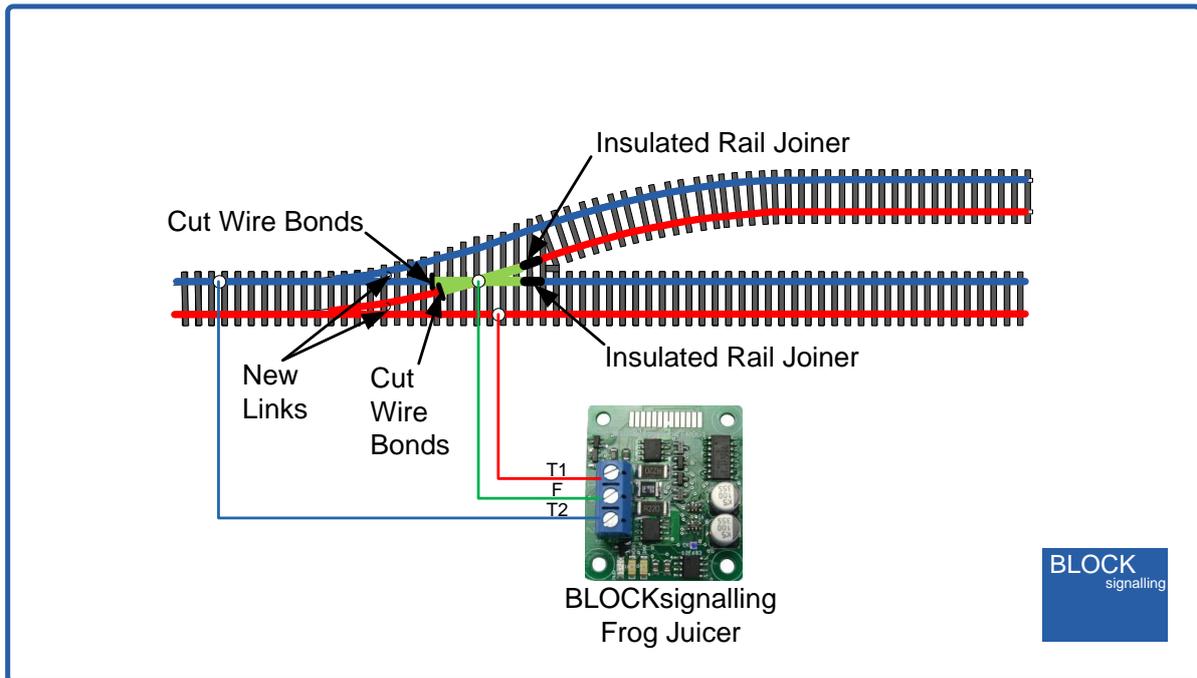
Operation

The frog can be of either polarity as a train approaches the points.

In the example below, the train on the left has two pairs of power pick-up on each bogie, shown yellow.

As the bogie enters the points, and makes contact with the frog, the two yellow pick-ups on the same bogie short out the "blue" rail and the "red" frog.

This is detected by the frog juicer, which automatically swaps the polarity of the frog to "blue".
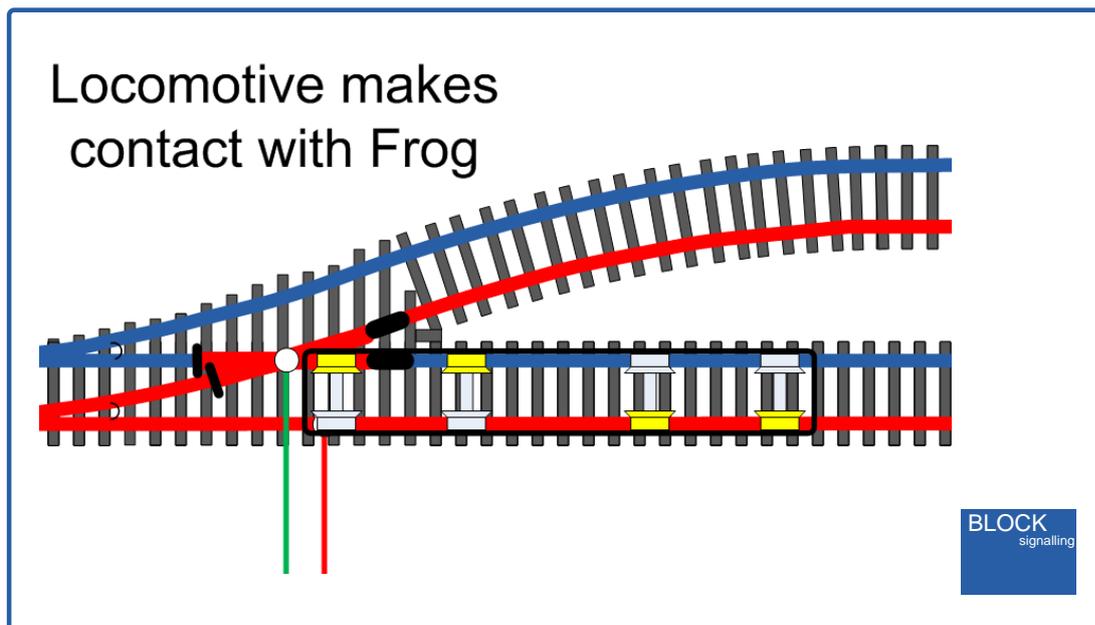
The locomotive can now proceed through the points, as the short circuit has been removed.