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Design for Märklin Light Signals

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Märklin's light signal Type 74391 (blocking signal) for size HO model railway sets is fairly new and, at 10 euros (£7·00), reasonably affordable. There is, however, a little problem in that its operation requires the use of signal keyboard Type 72750, which makes the setup not only more expensive but also inflexible. There is, fortunately, another solution, simpler and much more economical,

which requires just a switch and two diodes. It is based on the fact that, seen from en electronics point of view, the light signal consists of two anti-parallel-connected LEDs with dropping resistors.

The lower section at the right of the diagram, Da, Db, Ra and Rb represents the typical inner circuit of such a light signal. When the output voltage of the light power source is applied to the circuit, both LEDs light. However, since only a

red or green signal is wanted, the voltage is simply applied via diodes D3 and D4. Change-over switch S1 then determines which colour will be seen. Surely a very economical solution.
If in more complex setups it is required to have direct control over which colour the light signal on the track is to be, it suffices to add two further anti-parallel-connected LEDs, D1 and D2, in the connection between switch S1 and the light signal. So far, so good. But now for a few spe-

cial aspects. Typically, a light signal contains a standard green LED, whereas the red LED is usually a low-current type. Therefore, the dropping resistors have different values. In the present circuit it is therefore necessary for D2 also to be a low-current type. Unfortunately, recent Märklin light signals are already fitted with two low-current LEDs. This can be ascertained by temporarily connecting the present circuit to the light signal and measuring the direct current for the two switch positions. Standard LEDs draw more than 10 mA, whereas low-current types draw not more than 5 mA.

If D3 and D4 are Type 1N4148, it is possible to use the circuit with about five light signals fitted with standard LEDs or with up to twenty fitted with low-current LEDs. If Types 1N4001 are used, up to 1 A can be drawn.

With railway tracks for analogue operation, which normally use 16 V AC power sources, Märklin light signals may be connected directly or via D1/D2. In case of digital tracks that use higher supply voltages, correspondingly higher-value
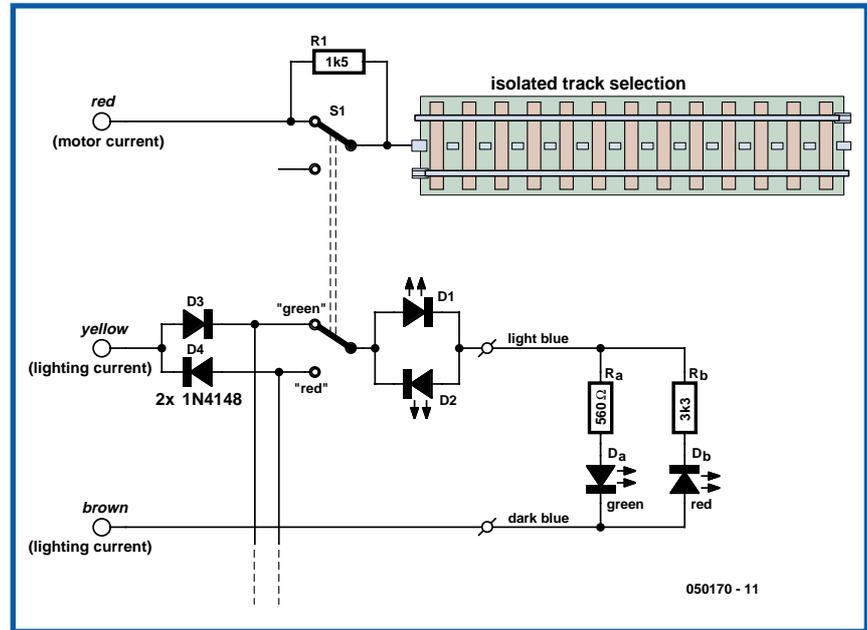
dropping resistors (or an additional one in series with D1 and D2) must be used. Finally, a tip that is as simple as it is practical. To retain the superb facility of analogue tracks whereby the train does not drive on when the signal is red, but stops automatically, isolate the power line to the

last rail before the light signal and power this rail via the second contact of S1 — as already shown in the circuit diagram. Many other hints and advice for model railway enthusiasts may be found on the author's web site: www.koerber-home.de