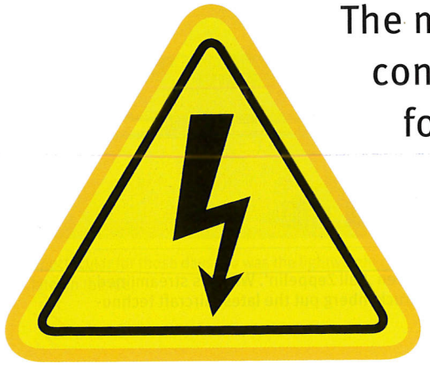
NEW M84 DIGITAL DECODER, PART 1

A case for m84



The m84 decoder is a universal control unit which thanks to its four switches solves every problem, from traction power to lighting to the DC motor. Further extras included.

For three decades, there was a clear division of tasks in digital technology. The k83 decoder was the answer for all solenoid-operated items switched by a brief impulse. Turnouts and the old signals of the 70xx and 72xx series were integrated into the digital world of Märklin with the k83. First choice for continuous current by contrast was the k84. No matter whether it was traction power into a staging yard, house lighting or power to a mill wheel, the k84 decoder was the ideal answer for such switching circuits.

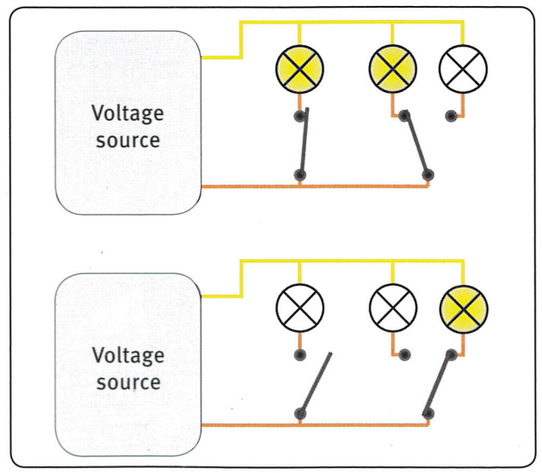
Since the new m83 decoder can now be programmed for the control of continuous current, the question arising for the Märklin digital railroader is whether they still need the m84 decoder at all. The answer is a clear "yes". Indeed, we give below details of a number of applications where the use of an m84 decoder is absolutely essential.

A glimpse at the function of this decoder permits us to have a preview of its possibilities. In technology there are many types of switch with which electric power can be switched on and off. The classic case is the simple ON/OFF switch (see illustration 1 above). The changeover switch is a special form of this (see illustration 1 below), in which either user A or user B is supplied with electricity. A typical application of this switch is a two-aspect color-light signal which shows either red for 'stop' or green for 'proceed'.

Both types of switch can be used with the m84 decoder. Altogether, the decoder has four changeover switches which are completely independent of one another. If the second output of a changeover switch is not used, it functions like a simple ON/OFF switch, and it is used as a 'normally closed' or 'normally open' switch. This means that on operating it, an electric user is switched on, or possibly off. Safety switches which have to be operated are an example of such a normally-closed switch.

Impressive: Night-time scenes on the layout. Lights are easy to switch with the m84 decoder.

However, the major difference between the m84 decoder and the m83 is in the type of current they can switch. With the m83 decoder, the only users which can be continuously supplied with power are those which can be operated on the supply voltage of this decoder – this is more or less a direct current. If it is required to apply any other supply voltage, a switch is needed which is completely isolated from any other potential, and this is exactly the case with the four changeover switches in the m84 decoders. It doesn't matter whether it's to switch on or off a digital traction current, the analog AC current for the lighting or any other voltage which differs in type and/or voltage from other power circuits, this decoder will answer your requirements. Nor does the m84 decoder's digital supply voltage have to match the digital voltage to be switched. While the decoder itself receives its information for instance from the Central Station, at switch outputs 1 and 2 the traction voltage is controlled by a 60174 booster and at outputs 3 and 4, the traction voltage by a further booster. →



On-off (top) and changeover switch (below): The m84 offers four changeover switches, which can also be used as ON/OFF switches.

→ None of these three supply systems is connected via this decoder in any way at all. Theoretically the m84 decoder can be simulated by adding four 7244 universal relays to an m83 decoder, but the costs of doing this are correspondingly high, and this alternative is really only interesting if you only need one additional switch. From two switched circuits upwards, the m84 decoder will normally be the more interesting alternative.

Setting the addresses is done in a similar way to the m83. The m84 decoder is also suitable for optional operation either with the Märklin digital system (MM) or DCC. This is also specified by setting the tenth switch on the coding switches accessible externally or by taking it apart. Procedure for setting the addresses is as shown in issue 1/2014. →

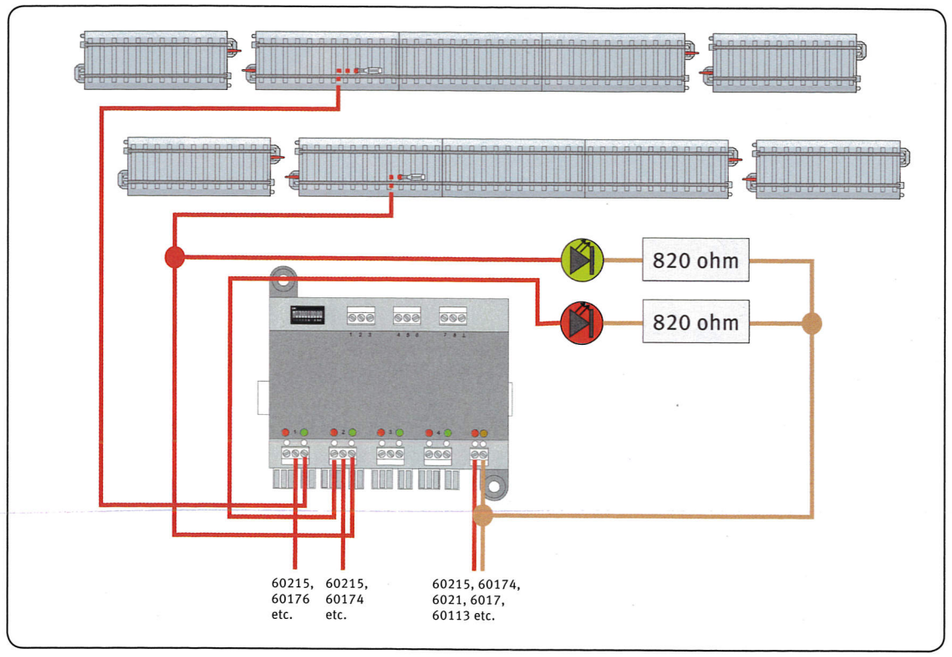


Illustration 2: In hidden areas, the m84 can replace the functionality of signals.

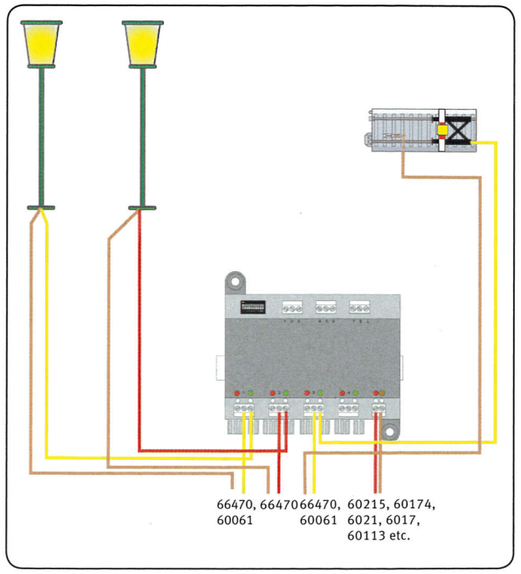


Illustration 3: The m84 switches not only street-lights and track bumper lights, with a transformer it even acts as a dimmer.

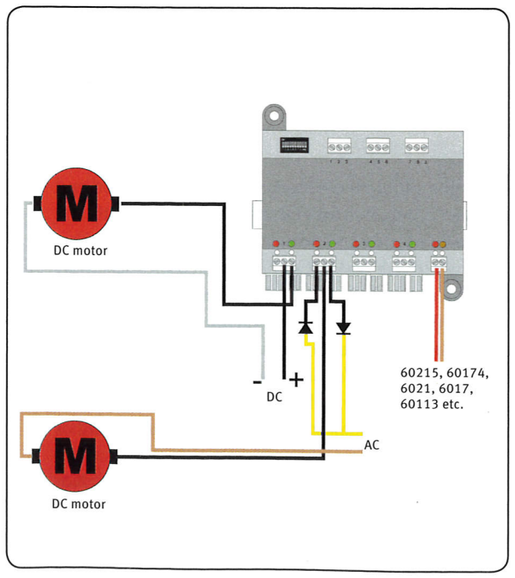


Illustration 4: The m84 can even control DC motors. If you want to reverse the direction, put two diodes in circuit.

Today, staging yards are a standard application for traction current switching. The m84 helps here.

Whether street-lighting, house lighting, platform lighting or the movement of a portal crane, the m84 decoder can control up to four electric circuits on its own.

The m84 can also be used to control DC accessories like lumber mills, such as the Faller item 130229, without any problem.

Motorized accessories of all types are suitable for control by the m84. The rotation of a motor can easily be reversed.

Now here are a few concrete examples for connections.

1. Switching traction current

Particularly in concealed areas, the model railroader is glad not to have to use signals, though he doesn't have to do without their basic train control capabilities. The m84 decoder output is used as an ON/OFF switch for this purpose. It is switched in such a way that when the green key on the keyboard is pressed, the signal section is supplied with traction power, while when the red key is pressed, this section is dead and the incoming trains stop. With the Central Station, you can use a signal symbol for switching this section. Then the programmed functionality will at least be shown correspondingly in the layout. If preferred, this position of the switch outputs can also be shown with two indicator lamps. At output 2 of the decoder in illustration 2, we have shown this as an example. According to setting, either the red or the green LED lights up – both of which are protected by a protective resistor. With an LED for a voltage drop of 2 V at the LED and an operating current of 20 mA, this would be a conventional 820 ohm resistance.

2. Switching building lighting

One of the classic applications is lighting of houses. For this application, anyone who uses an older transformer (e.g., 6647 or 66470) for lighting houses has an additional option. Apart from the lighting power at 16 VAC, this controller supplies the traction current as well, which on digital layouts is normally no longer required. If you use this traction current to light the houses instead of the lighting power, by adjusting the speed control, you can vary the intensity of light and match the brightness to lighting conditions on the layout. In illustration 3 at output 1 the lighting is being constantly supplied from the lighting output. At output 2 by contrast, the traction current is controlled by a transformer 66470 and at output 3, the track bumper stop lights are switched. Of interest in this switching arrangement is the common return, represented by the rails for the digital signal and for this supply route the bumper lighting. Technically, this presents no problem, but the supply unit of the Central Station, the track box of the Mobile Station and the booster 60174 must never have a direct connection to ground.

With its universal fittings, the m84 decoder can even keep a fairground (e.g. Faller item 140424) moving.

3. Control of accessory motors

Many accessories such as water-wheels, chair-lifts and so on work on DC motors. These can also be switched on and off with the m84 decoder without any problem. In illustration 4, an example is shown at output 1. With two simple diodes, for which the power loading has to be matched to the maximum current through the user, this motor can also reverse its direction of rotation.

The m84 decoder will also continue to play an important role in our digital series here in the Märklin Magazin. But first, starting with the next issue, we will be addressing the new possibilities of the Central Station 60215. Until then, have fun with your Märklin or Trix digital system.

Text: Frank Mayer; photos: Claus Dick, Faller, Märklin

All the articles in this series can be found to download in the Internet under www.maerklin-magazin.de

The Märklin Number

Even when on the production line, a model goes through many hands before it's ready.

312 working stages

... are needed before the new VT 95 rail bus can start on its way to the retailer. It's a long way from the first drawing to the finished and packaged model.

Thanks to new manufacturing techniques, models are coming closer to their prototypes the whole time. At the latest during final assembly it can be seen clearly just how delicate the work is all along the line. It really has precision manufacturing character when the gear-wheels are pressed into the cast chassis with bearing pins and axles – here it all has to be right to a tenth of a millimeter, otherwise the rail car will not run smoothly along the track. The superstructures too demand a steady hand. If an end window is incorrectly positioned, the windscreen wiper will not sit correctly. Especially fiddly: the window frames are finely printed, as is the body; making sure there is no line broken can only be done with a magnifying glass.