

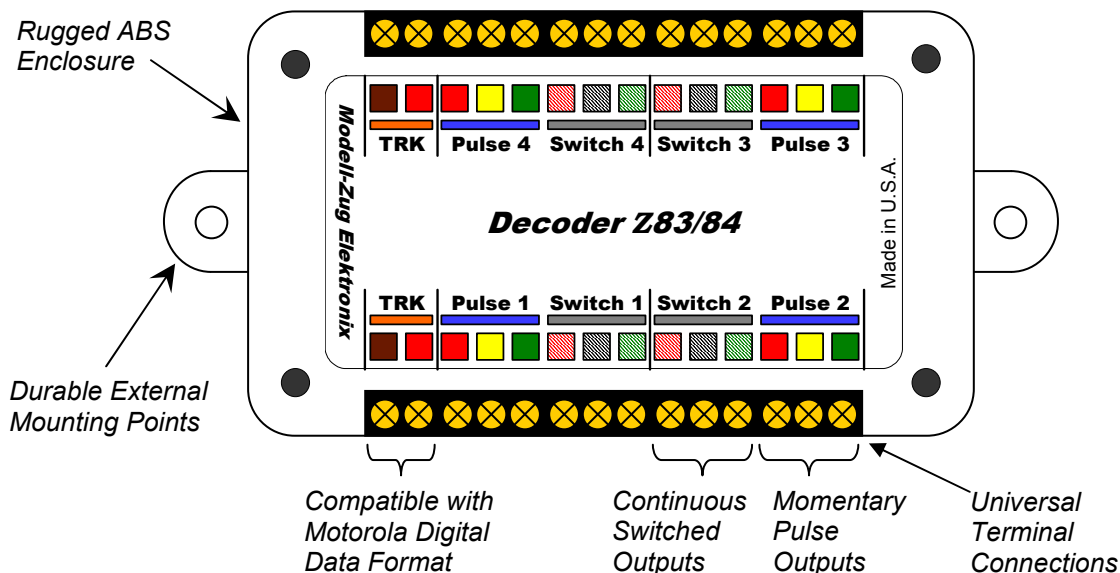


## Decoder Z83/84

### 1. Introduction

Thank you for purchasing this *Modell-Zug Elektronik* product. The *Decoder Z83/84* was specifically designed as an all-in-one digital accessory decoder to provide maximum versatility in the control of model railroad accessories. Each of the decoder's four channels contain both momentary pulse outputs for controlling signal or turnout solenoids *and* continuous switched outputs for supplying power to sidings, lighting circuits, or other accessories. In this way, each independent channel of the decoder may be used in any one of three modes: Switch only, Pulse only, or Switch & Pulse. This allows for various combinations of output types to fit the specific needs of a given layout area without requiring multiple decoder types. And, since the *Decoder Z83/84* utilizes the industry standard Motorola digital data format, it is compatible and interchangeable with products from major manufacturers such as Märklin, Uhlenbrock, Viessmann and others. Please study the following manual in its entirety to gain full utility and enjoyment from this *Modell-Zug Elektronik* product.

### 2. Overview of Features



### Mechanical Specifications

Dimensions: W 5.37 in.; D 2.63 in.; H 1.26 in. (inc. mounting flanges)  
 Weight: 5 oz.

### Electrical Specifications

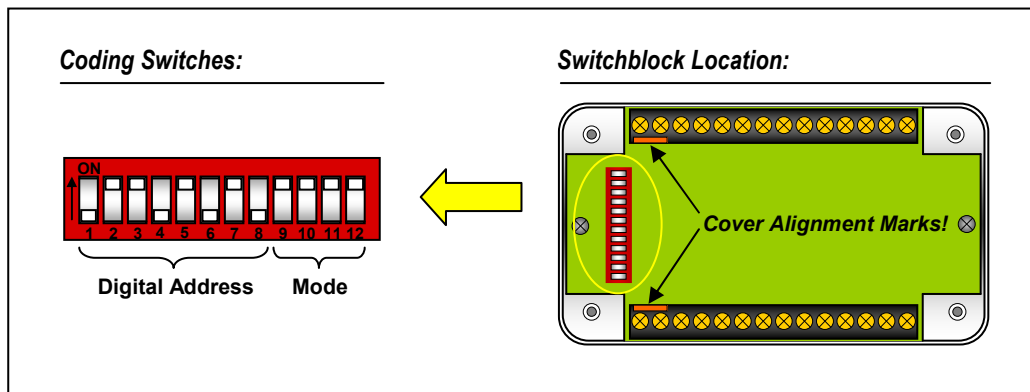
Power Consumption: 0.1W typ.; (1W max. w/Pulse Output active)  
 Input Voltage Range:  $\pm 22V$  typ. ( $\pm 28V$  max.)  
 Input Data Type: 9600 bps (Motorola Trinary Data Format)  
 "Switch" Output Ratings: 2A max.; 30V max.  
 "Pulse" Output Ratings: 1.2A typ. (1.5A max.); 19V typ. (20V max.)

### 3. Operating the Decoder Z83/84

#### **MZE** 3.1 Setting the Digital Address of the Decoder

A unique Digital Address identifies each decoder in the digital system. This allows the central unit to broadcast an entire set of digital commands to all decoders in the system, and for each decoder to execute only those commands that match its own internal Digital Address. By default, the Digital Address of each Z83/84 decoder is set to "01", and must be changed if your application requires more than one decoder. It is not recommended to configure two decoders to the same Digital Address, as it may cause excessive electrical loading of the Central Unit or Booster. For these reasons, it is important that each decoder is set to its own unique address. The Digital Address of the Z83/84 may be changed by resetting the eight coding switches located inside the decoder housing, as outlined in the following procedure.

1. Remove the top cover of the decoder housing, which is held in place by four cross-head screws.
2. Once the top cover has been removed, the switchblock is located on the lefthand side of the decoder board as shown in *Figure 1* below.



**Figure 1. Address & Mode Coding Switches**

3. Set the coding switches 1-8 in accordance with the settings listed in *Table 1* below to achieve the desired Digital Address. The Digital Address code is listed in the lefthand column; the righthand column contains the numbers of the switches that are turned ON for that address. (*Note: A small flat-blade jewelers/hobby screwdriver works well to slide the switches.*):

**Table 1. Digital Address Switch Settings**

01	-23-5-7-	17	----67-	33	1--5--8	49	-2-4---8
02	--3-5-7-	18	1-3---7-	34	-2--5--8	50	---4---8
03	1--45-7-	19	-23---7-	35	----5--8	51	1-----8
04	-2-45-7-	20	--3---7-	36	1-3--6-8	52	-2-----8
05	---45-7-	21	1--4--7-	37	-23--6-8	53	-----8
06	1---5-7-	22	-2-4--7-	38	--3--6-8	54	1-3-5---
07	-2--5-7-	23	---4--7-	39	1--4-6-8	55	-23-5---
08	----5-7-	24	1----7-	40	-2-4-6-8	56	--3-5---
09	1-3--67-	25	-2---7-	41	---4-6-8	57	1--45---
10	-23--67-	26	-----7-	42	1---6-8	58	-2-45---
11	--3--67-	27	1-3-5--8	43	-2--6-8	59	---45---
12	1--4-67-	28	-23-5--8	44	----6-8	60	1---5---
13	-2-4-67-	29	--3-5--8	45	1-3---8	61	-2--5---
14	---4-67-	30	1--45--8	46	-23---8	62	----5---
15	1----67-	31	-2-45--8	47	--3---8	63	1-3--6--
16	-2---67-	32	---45--8	48	1--4---8	64	-23--6--



### 3.2 Setting the Output Mode of the Decoder Channels

Each channel of the Z83/84 decoder contains both momentary pulse and continuous switched output types. Although certain applications may require both output types of a given channel to be activated simultaneously, many basic applications will not. For this reason, each of the *Switch* outputs of the Z83/84 decoder may be individually enabled or disabled. This is made possible by the four Output Mode coding switches located inside the decoder. By default, all of these switches are set to “enabled.” If your application does not require the *Switch* output of a given channel, it is recommended that you disable it to avoid the unnecessary relay “click” when this channel is activated. (Note that the *Pulse* outputs of all channels remain enabled regardless of the Output Mode switch settings, but will not conduct electrical current unless a solenoid or relay is connected to them.) The Output Mode of each channel may be changed by following the procedure below:

1. With the top cover removed, the Output Mode coding switches are located on the lefthand side of the decoder board (see *Figure 1* above).
2. Switches 9-12 of the switchblock control the output modes of each channel in the decoder. To enable the *Switch* output of a given channel, the corresponding code switch must be set to “ON” as shown in *Table 2* below:

**Table 2. Output Mode Switch Settings**

Code Switch	ON	OFF
9	“Switch 4” Enabled	“Switch 4” Disabled
10	“Switch 3” Enabled	“Switch 3” Disabled
11	“Switch 2” Enabled	“Switch 2” Disabled
12	“Switch 1” Enabled	“Switch 1” Disabled

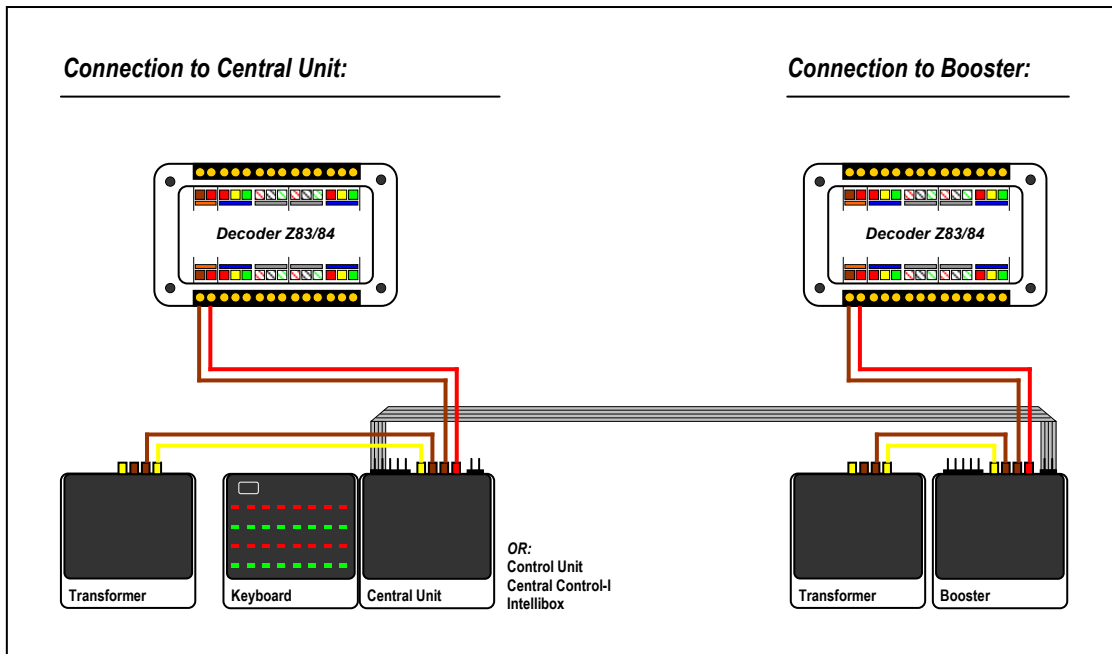
3. Once you have set the Output Mode switches, reinstall the top cover of the housing and the four cross-head screws. **IMPORTANT: Be sure to orient the top cover as in *Figure 1* so that the Orange connections marked “TRK” on the cover are aligned with the Orange marks on the terminals inside the decoder!!!**



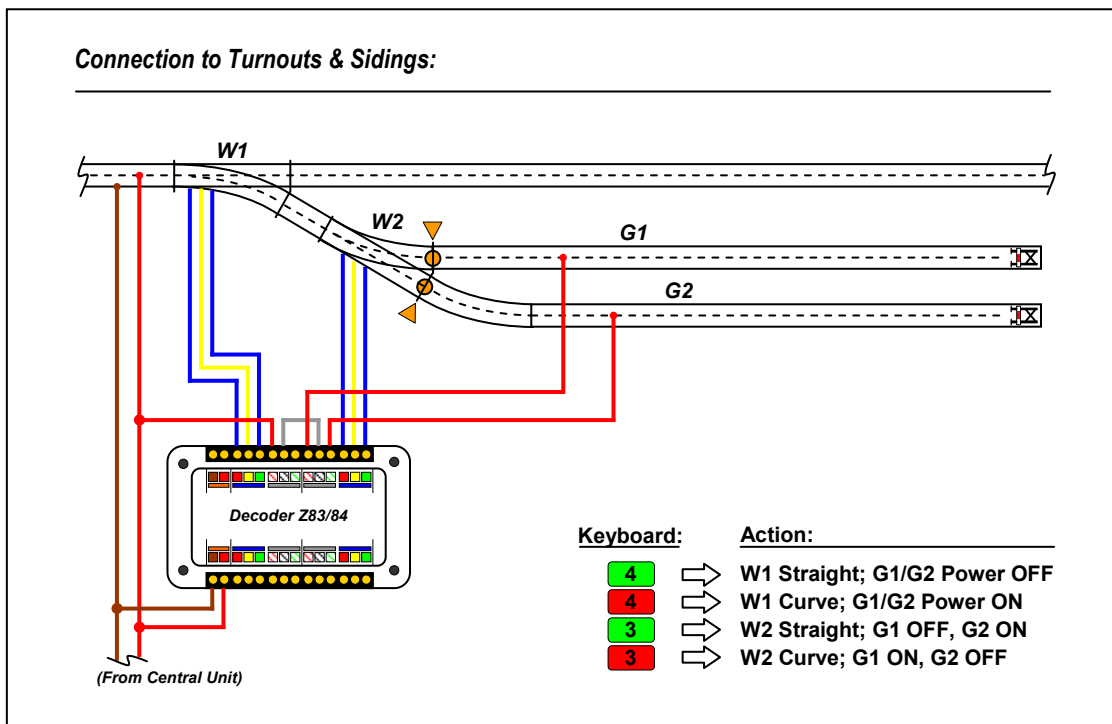
### 3.3 Installing & Connecting the Decoder

All of the connections on the *Decoder Z83/84* utilize setscrew-style terminal blocks to allow for universal compatibility without special connectors. These terminals will accept stripped or stripped & tinned wire of any gauge from 24 to 14 AWG. Each connection point is color-coded and clearly labeled on the top cover to make connections easier, even when the decoder is being installed under the layout. Several decoders can be connected to the digital system in series, or “bussed,” through the two sets of *TRK* connections on each decoder. Turnout solenoids, signal solenoids, and remote relays may be connected to the blue *Pulse* group of outputs. **IMPORTANT:** Do not connect multiple turnout solenoids to one *Pulse* output, as it will overload the Central Unit or Booster. Track sidings, lighting, or motorized accessories are connected to the grey *Switch* outputs. Various types of connections are illustrated in the diagrams and procedure that follow:

1. Be sure that all power to the layout is completely switched OFF before installing or making any connections to the decoder or any other piece of equipment.
2. Install the decoder in the desired location by drilling two small holes under the layout and mounting the decoder using wood screws through the decoder’s two external mounting points.
3. Once the decoder has been installed, refer to the following diagrams in *Figures 2-5* to find suggestions and examples of connections to match your application. (Note: The diagrams assume Decoder Address “01”.)
4. Before making any connections, wires should be carefully stripped to avoid damage to the conductors and the stripped end then retwisted to prevent splayed wire ends. Solder-tinning is also recommended.
5. Once all of the wires have been connected, double-check all connections for possible short-circuits, poor connections, or misconnections before turning on the layout power. If your application has switched track sidings powered by Boosters, be sure that these sidings contain appropriate pickup shoe lifters at the insulation point to prevent a short-circuit between different digital circuits (Booster and Central Unit).
6. Switch on the power and check that all accessories function correctly.
7. Enjoy operating your accessories digitally with the *Modell-Zug Elektronik Decoder Z83/84!*



*Figure 2. Connections to the Digital System*



*Figure 3. Connections in a Station/Yard Area (Simultaneous Turnout & Siding Control)*

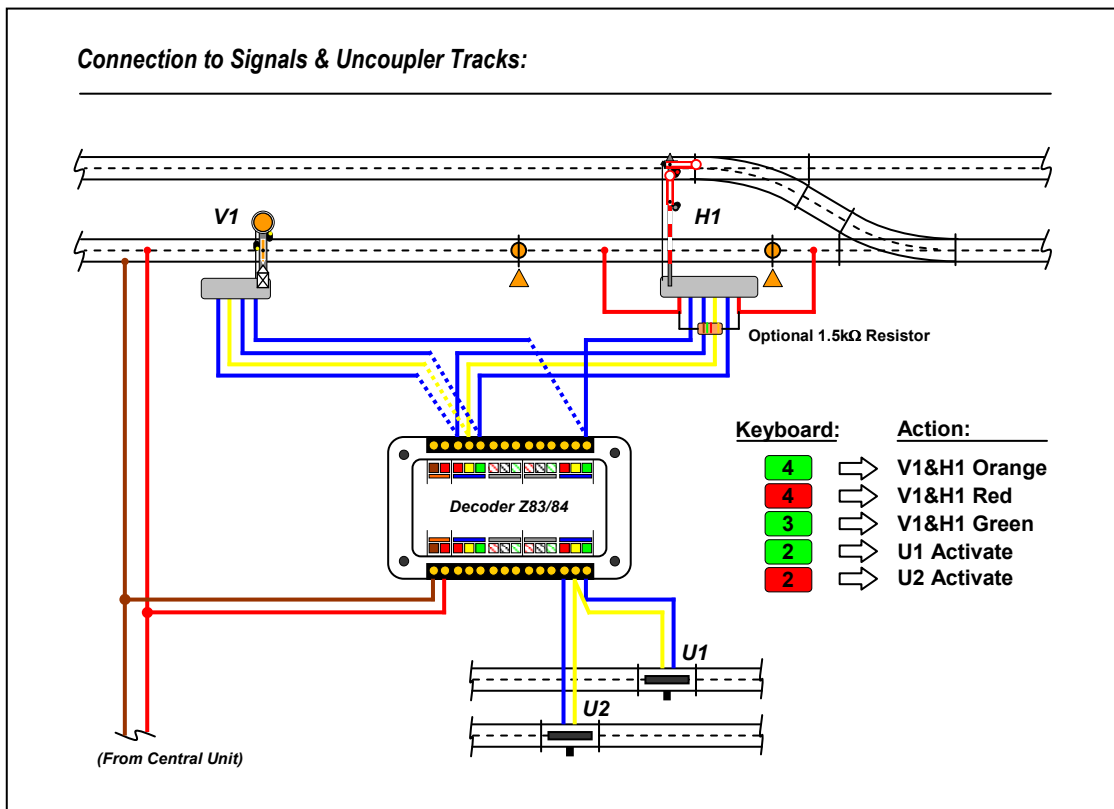


Figure 4. Connections to Solenoid-Driven Accessories

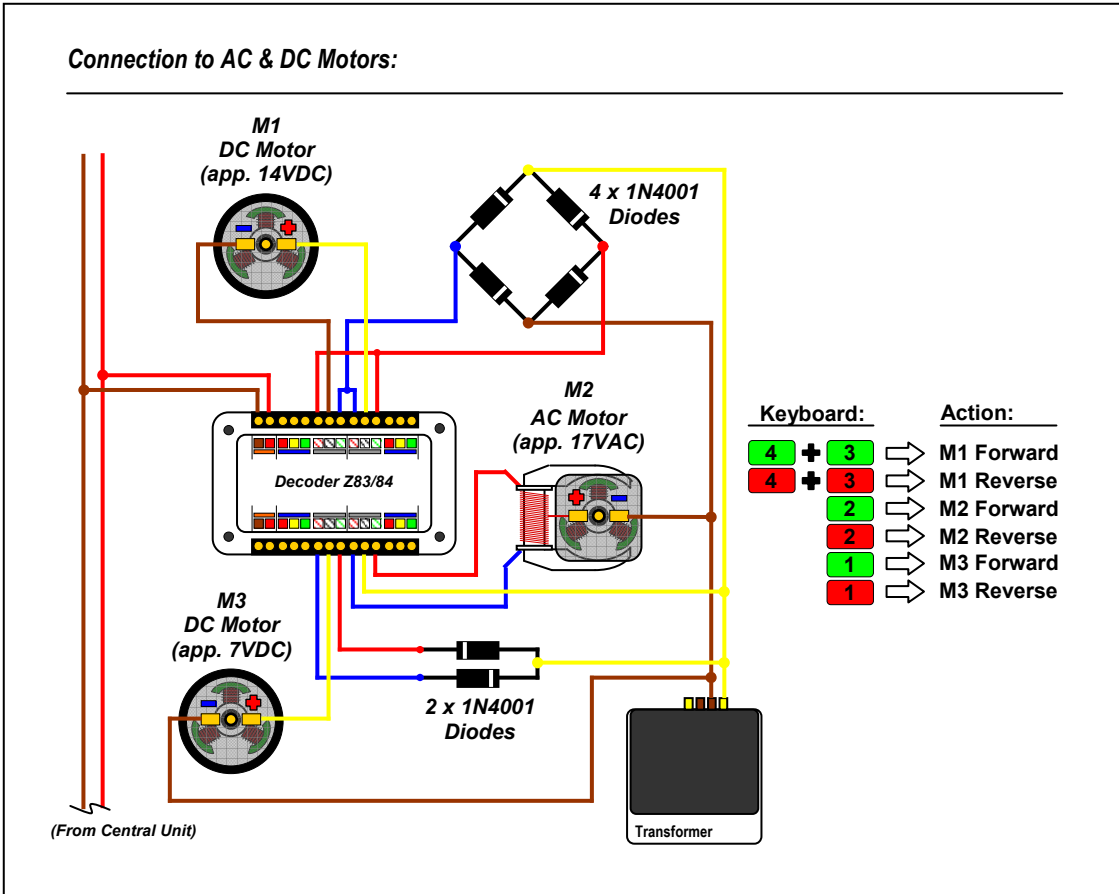


Figure 5. Connections to Motorized Accessories