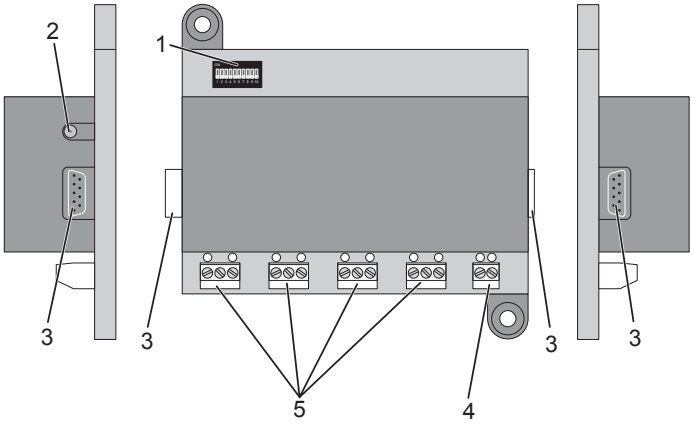
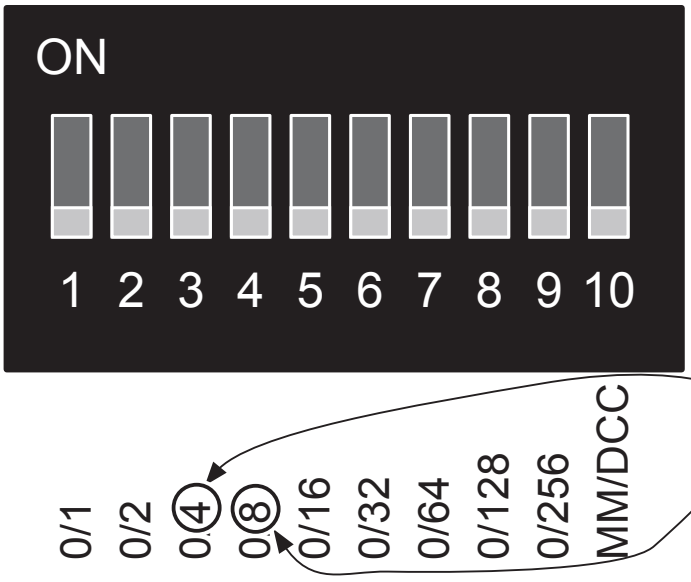
Safety Notes

- The m83 decoder is designed for use for digital model railroads with the Motorola, mfx, or DCC digital systems.
- The operating instructions are a component part of this product and must therefore be kept safe as well as passed on with the product to third parties.
- Voltage for the m83 comes exclusively through track connections or from the 66361/66365 switched mode power pack (only in conjunction with 60822).
- Connections to the m83 decoder may only be done with no voltage is present.
- **IMPORTANT!** The m83 has sharp edges and points due to its function.
- The housing may not be opened.
- The m83 decoder is designed for use in dry areas only.



1 Dip switches for setting the address
2 Connection socket for 66361/66365 (only in conjunction with 60822)
3 Plugs and sockets for direct connection of several m83/m84 decoders
4 Set screw terminals for connections to the track
5 Set screw terminals for the turnouts to be controlled

Up to 4 turnouts can be controlled independently of each other in digital operation with the m83 turnout decoder. To do this the decoder needs an address. This can be set either with the externally accessible dip switches or with programming from your controller. We strongly recommend setting the address with the dip switches.



Setting the Address with the Switches

Up to 4 turnouts can be connected to the m83 turnout decoder. The address is set for the first turnout. The other 3 turnouts automatically receive the corresponding consecutive addresses.

There are 10 individual dip switches. The address is set with switches 1 to 9 (switch 10 is for selecting the digital protocol MM / DCC). The number value set with these switches gives the address for the first turnout connected to the decoder.

The table on page 19 shows the switch settings for addresses 1 – 160.

Note: There must be no current present in the decoder before changing the dip switch settings. This means that any external current supply connected to the decoder must be turned off.

Example:
Switches 3 and 4 are ON, all of the others are off:

(4) + (8) = 12	Adding the values of the switches -> Turnout Group Address 12
12 x 4 - 3 = 45	Calculating the individual turnout addresses -> Individual Turnout Addresses 45 – 48

The 4 turnouts connected to the decoder have the individual turnout addresses 45 to 48.

Electrical Connections

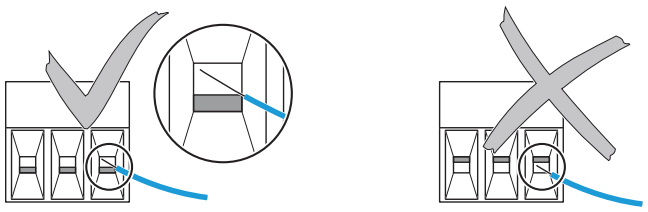
The m83 decoder only needs to be connected to the track current and to the turnouts to be controlled. The decoder can also be connected to the 66361/66365 switched mode power pack (only in conjunction with 60822) (here power is not taken from the track and the power demanded from the track is thereby less).

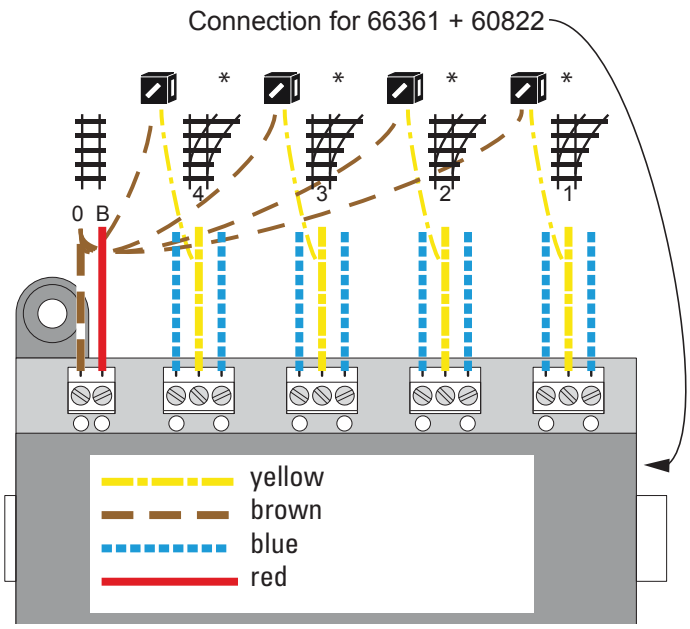
The ends of the wires must be stripped and twisted but **not** tinned for electrical connections to the decoder and from turnouts to the decoder. The set screws on the terminals must be loosened before connecting the ends of the wires to them.

Several m83/m84 decoders can be plugged together with the side plug contacts. No extension or connecting wire may be used for this. All of the decoders plugged together are supplied with power from the power connections (power supply or track connections) made to the first turnout decoder. No other track connections may be made.

Monitor Lights

- If the m83 is connected correctly, a monitor light will blink.
- The second monitor light blinks briefly one time when the decoder is addressed, i.e. when it is switched or programmed.
- If both monitor lights at the connections blink rapidly, then the red and the brown wires were mistakenly swapped.
- The monitor lights at the switching outputs display the current status of the circuit being switched.





* Not included with the decoder as delivered.
Turnout lanterns for C Track: 74470
Turnout lanterns for K Track: 7547

Operation with MM (Motorola)

Dip switch 10 must be set at “OFF“ for operation of the m83 with MM.

The turnouts connected to the m83 can now be addressed and activated with the addresses previously set. The monitor lights on the decoder will display the switched status of the turnouts (green / red).

Advanced Functions

Programming can be used to set additional functions on the m83 turnout decoder.

These programming parameters must be done at the programming track. Different parameters can be set using address 80. The two corresponding monitor lights will blink as a check feature during the data transfer.

The turnout to be programmed must be switched with the Keyboard before the programming. After that, change the parameters immediately with the Control Unit or with the CV configuration on the Central Station. After you have completed the programming process, immediately switch the programmed turnout again with the Keyboard. The programming has not been accepted and is not effective until now.

The procedure for programming with the 6021 Control Unit is analogous to the programming for locomotives (www.maerklin.de -> Tools & Downloads -> Technische Informationen).

Parameters / CVs for MM

CV	Description	Value
8	Reset	8
34	Automatic turnout circuit output 1&2 2 x two-way turnout Three-way turnout Double slip switch	 0 1 2
35	Automatic turnout circuit output 3&4 2 x two-way turnout Three-way turnout Double slip switch	 0 1 2

The function “Automatic Turnout Circuit“ can be used to link 2 outputs on the decoder together and switch them together for a three-way turnout or a double slip switch.

Additional settings are possible with DCC, and these settings also influence operation with MM.

The 60821 control electronic circuit is also required for control of a motor.

Operation with DCC

Dip switch 10 must be set at “ON“ for operation of the m83 with DCC.

The turnouts connected to the m83 can now be addressed and activated with the addresses previously set. The monitor lights on the decoder will display the switched status of the turnouts (green / red).

Advanced Functions

Programming can be used to set additional functions on the m83 turnout decoder.

Most CVs can be set “in operation“ (POM).

The address on which the **first** turnout is set for the decoder to be programmed must be called up in order to program the CVs.

If the address itself is to be changed by means of programming, then the turnout decoder must be connected to the programming track and dip switches **1 to 9 set to “OFF“** – the decoder can then be programmed by means of the address previously set or programmed.

In addition to general settings for the decoder, it is also possible to do settings at individual decoder outputs. Possible switching functions of this kind can be found in the separate table on page 22.

The 60821 control electronic circuit is also required for control of a motor.

Basic Settings

CV		Meaning	Value
1		Address (lower part)	0 – 63
8		Reset	8
9		Address (upper part)	0 – 7
34	POM	Automatic turnout circuit output 1&2 2 x two-way turnout Three-way turnout Double slip switch	 0 1 2
35	POM	Automatic turnout circuit output 3&4 2 x two-way turnout Three-way turnout Double slip switch	 0 1 2

Programming an Address

Two CVs (CV1; CV9) must be set in order to program an address in DCC. The turnout group address is set. The individual turnout addresses are generated in the same way as when setting the address with the dip switches.

Turnout group address = CV1 + (CV9 x 64)

Example:

CV1 = 15, CV9 = 3 ->

Turnout group address: 15 + (3 x 64) = 207

Individual turnout addresses: 207 x 4 - 3 = 825

Turnouts have the individual turnout addresses 825 to 828.

Individual Turnout Addresses	Dip Switches								
	1	2	3	4	5	6	7	8	9
1 – 4	1	—	—	—	—	—	—	—	—
5 – 8	—	1	—	—	—	—	—	—	—
9 – 12	1	1	—	—	—	—	—	—	—
13 – 16	—	—	1	—	—	—	—	—	—
17 – 20	1	—	1	—	—	—	—	—	—
21 – 24	—	1	1	—	—	—	—	—	—
25 – 28	1	1	1	—	—	—	—	—	—
29 – 32	—	—	—	1	—	—	—	—	—
33 – 36	1	—	—	1	—	—	—	—	—
37 – 40	—	1	—	1	—	—	—	—	—
41 – 44	1	1	—	1	—	—	—	—	—
45 – 48	—	—	1	1	—	—	—	—	—
49 – 52	1	—	1	1	—	—	—	—	—
53 – 56	—	1	1	1	—	—	—	—	—
57 – 60	1	1	1	1	—	—	—	—	—
61 – 64	—	—	—	—	1	—	—	—	—
65 – 68	1	—	—	—	1	—	—	—	—
69 – 72	—	1	—	—	1	—	—	—	—
73 – 76	1	1	—	—	1	—	—	—	—
77 – 80	—	—	1	—	1	—	—	—	—

Individual Turnout Addresses	Dip Switches								
	1	2	3	4	5	6	7	8	9
81 – 84	1	—	1	—	1	—	—	—	—
85 – 88	—	1	1	—	1	—	—	—	—
89 – 92	1	1	1	—	1	—	—	—	—
93 – 96	—	—	—	1	1	—	—	—	—
97 – 100	1	—	—	1	1	—	—	—	—
101 – 104	—	1	—	1	1	—	—	—	—
105 – 108	1	1	—	1	1	—	—	—	—
109 – 112	—	—	1	1	1	—	—	—	—
113 – 116	1	—	1	1	1	—	—	—	—
117 – 120	—	1	1	1	1	—	—	—	—
121 – 124	1	1	1	1	1	—	—	—	—
125 – 128	—	—	—	—	—	1	—	—	—
129 – 132	1	—	—	—	—	1	—	—	—
133 – 136	—	1	—	—	—	1	—	—	—
137 – 140	1	1	—	—	—	1	—	—	—
141 – 144	—	—	1	—	—	1	—	—	—
145 – 148	1	—	1	—	—	1	—	—	—
149 – 152	—	1	1	—	—	1	—	—	—
153 – 156	1	1	1	—	—	1	—	—	—
157 – 160	—	—	—	1	—	1	—	—	—

Configuration of the Outputs

(For switching functions, see page 22)

CV		Meaning	Value	Comment
112	POM	Switching Function Turnout 1, red	0 – 18	Switches the “red“ output for the first turnout
113	POM	Pulse Width	0 – 255	255 = 100 %
114	POM	Period	0 – 255	Time interval between the pauses; 1 = 0.05 sec.
115	POM	Switching Function Turnout 1, green	0 – 18	Switches the “green“ output for the first turnout
116	POM	Pulse Width	0 – 255	255 = 100 %
117	POM	Period	0 – 255	Time interval between the pauses; 1 = 0.05 sec.
118	POM	Switching Function Turnout 2, red	0 – 18	Switches the “red“ output for the second turnout
119	POM	Pulse Width	0 – 255	255 = 100 %
120	POM	Period	0 – 255	Time interval between the pauses; 1 = 0.05 sec.
121	POM	Switching Function Turnout 2, green	0 – 18	Switches the “green“ output for the second turnout
122	POM	Pulse Width	0 – 255	255 = 100 %
123	POM	Period	0 – 255	Time interval between the pauses; 1 = 0.05 sec.
124	POM	Switching Function Turnout 3, red	0 – 18	Switches the “red“ output for the third turnout
125	POM	Pulse Width	0 – 255	255 = 100 %
126	POM	Period	0 – 255	Time interval between the pauses; 1 = 0.05 sec.
127	POM	Switching Function Turnout 3, green	0 – 18	Switches the “green“ output for the third turnout
128	POM	Pulse Width	0 – 255	255 = 100 %
129	POM	Period	0 – 255	Time interval between the pauses; 1 = 0.05 sec.

CV		Meaning	Value	Comment
130	POM	Switching Function Turnout 4, red	0 – 18	Switches the “red“ output for the fourth turnout
131	POM	Pulse Width	0 – 255	255 = 100 %
132	POM	Period	0 – 255	Time interval between the pauses; 1 = 0.05 sec.
133	POM	Switching Function Turnout 4, green	0 – 18	Switches the “green“ output for the fourth turnout
134	POM	Pulse Width	0 – 255	255 = 100 %
135	POM	Period	0 – 255	Time interval between the pauses; 1 = 0.05 sec.

We recommend the following pulse widths und periods for our turnout mechanisms:
C Track turnout: 30%, 250 milliseconds
K Track turnout: 75%, 500 milliseconds
M Track turnout: 75%, 1000 milliseconds

Automatic Turnout Circuits (CV 34 & CV 35)

Value	Name	Comment
0	2 turnouts	Two outputs, one for each turnout, are switched in turn
1	Three-way turnout	4 outputs are linked together for a three-way turnout with 2 mechanisms
2	Double slip switch	4 outputs are linked together for a double slip switch with 2 mechanisms

Possible Switching Functions

Value		Name	Comment
Touch-	Switch-		
0	128	Everything off	
1	129	Dimmer	
2	130	Blinking light 1	
3	131	Blinking light 2	Parallel blinking light to blinking light 1
4	132	Flash 1	Flashing blinking light
5	133	Flash 2	Double flashing blinking light
6	134	Random task / flickering light	Random sequence of pause/pulse
8	136	Zoom	Soft turning on/off
9	137	Mars	Specific blinking light
10	138	Gyra	Specific blinking light
13	141	Tubes	Simulates fluorescent tube lights
14	142	Low energy lamp	Simulates energy-saving lamps
16	—	Max. switching	“Period“ indicates the max. switching time
17	—	Min. switching	“Period“ indicates the min. switching time
18 *	—	Min. switching with end switch	Switching time is “period“ or until the end position is reached

* Factory setting