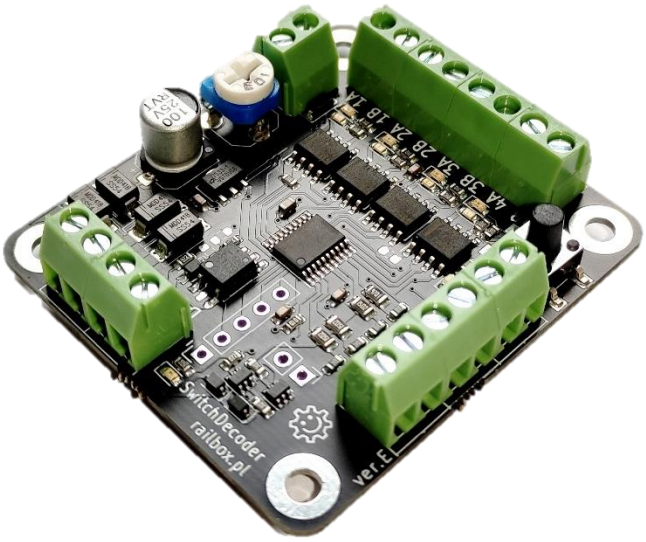
Switch decoder RB4310



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Introduction

RB 4310 is a universal DCC accessory decoder designed for controlling turnouts using bipolar motor drivers (e.g. Conrad 2201977), motor drivers for polarized crossovers, MTB motor drives, and coil motor drivers for controlling turnouts (Roco®, PIKO® and others) or semaphore signals (e.g. Viessmann 4500). The latest versions of the decoder (versions E and above) have a constant mode of switching on the outputs most convenient for lighting your model railroad.

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Note: Before connecting the decoder, turn its potentiometer to adjust the maintenance time of the output to the left (minimum) to keep the decoder and/or the motors connected to it from being damaged.

Basic functions:

- **Supports up to 4 motor drivers.**
- **Power supply-directly from the tracks (DCC).**
- **Acts as an accessory decoder (turnouts and semaphore signals)**
- **Possibility of constant switching on the outputs in the lighting mode (version E and above)**
- **Easy configuration via RailBOX: Railroad Control ⚙ (see more here)**
- **Safe motor driver switching (e.g. the turnout cannot get stuck in the middle position)**
- **Outputs for 2-position manual switches (analog mode)**
- **Supports Railcom®protocol**

Technical parameters:

- **Decoder dimentions - 50 x 45 mm.**
- **Power supply - 12 - 20 V AC/DC or DCC.**
- **Current consumtion per output - 25 mA (max 2A)**

Connector description and connection of the decoder

Note: The motor drivers on the schematics have an exemplary appearance and can be any bipolar motor drivers, **MTB motor drivers (some MTB motor drivers with two modes (e.g. MP5) are best to use as bipolar motor drivers (look at Conrad connection),** and coil drivers for turnouts (Roco®, PIKO) or semaphore signals (Viessmann), and strips or LEDs for organizing lighting on the model railroad (lighting mode). The potentiometer on the pcb is used to adjust the maintenance time of the output (the time for which the output is powered on in one or another polarity), and to adjust the brightness in the lighting mode. Please read this manual and manual of the driver's manual carefully before connecting it.

Connection in DCC mode

Note: It is recommended to use an additional external power supply (12-24V) to avoid excessive load on the DCC command station, or do the bridging according to the diagram on the package of the decoder. For MTB drivers, it is recommended to set the **maximum maintenance time of the output** to get the motors running properly. For coil drivers, on the contrary, set the **minimum time**. For the other motors, use the potentiometer to determine the travel time appropriate for the selected drivers.

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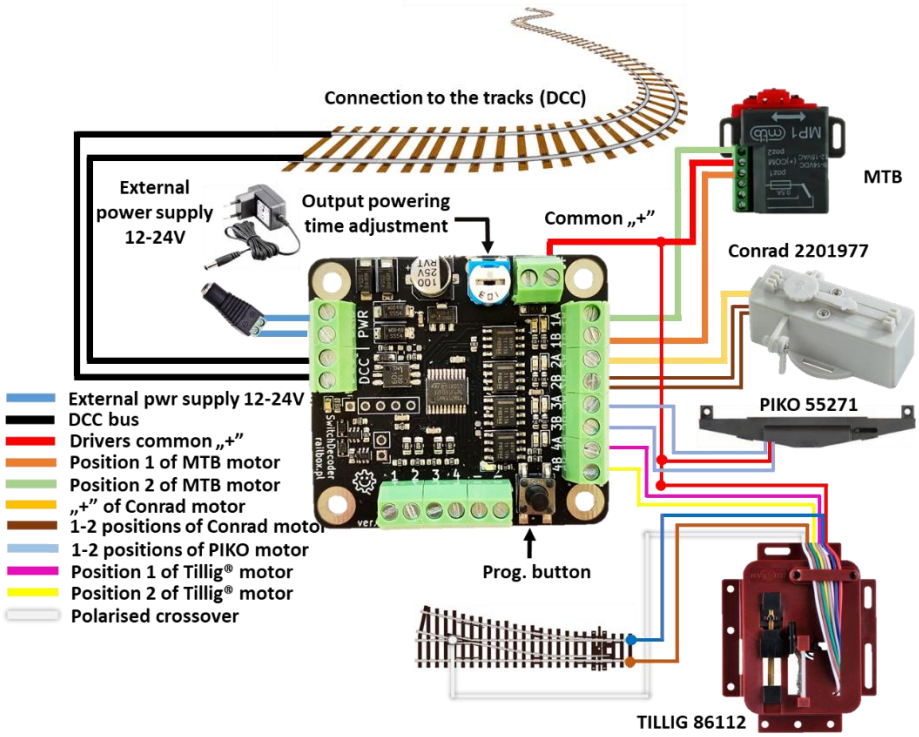
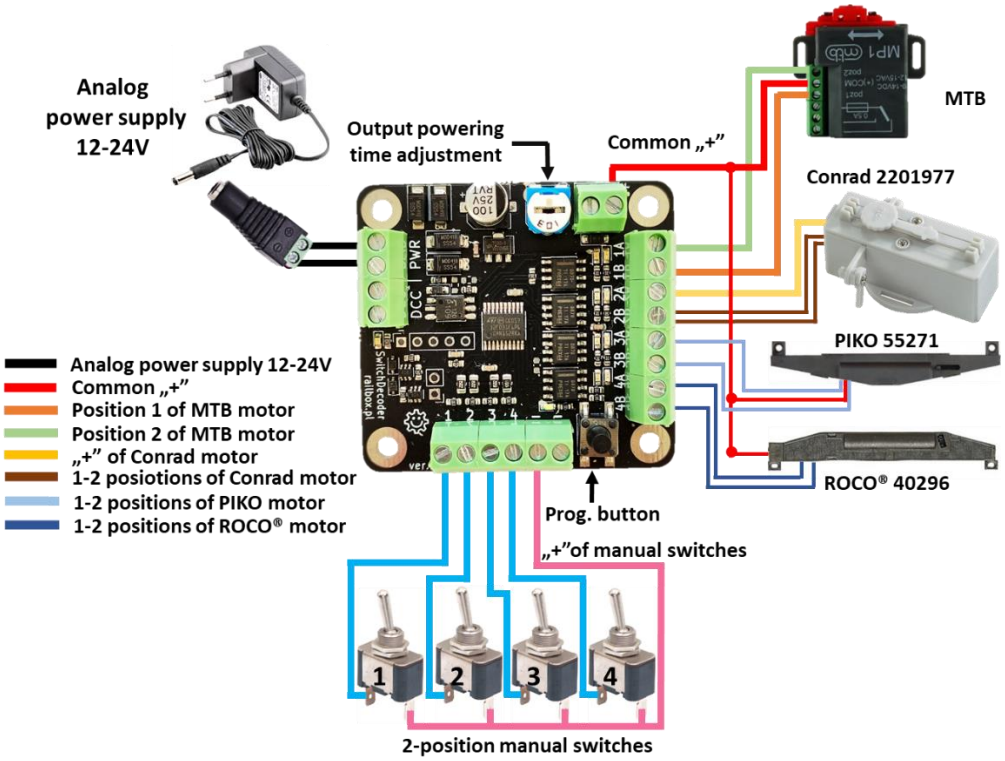


Connection in analog mode (power supply 12-24V)

Note: When using the decoder in analog mode, connect 1-4 two-position manual switches to the outputs according to the number and positions of the connected motors. Use a 12-24V power supply to power up the decoder.



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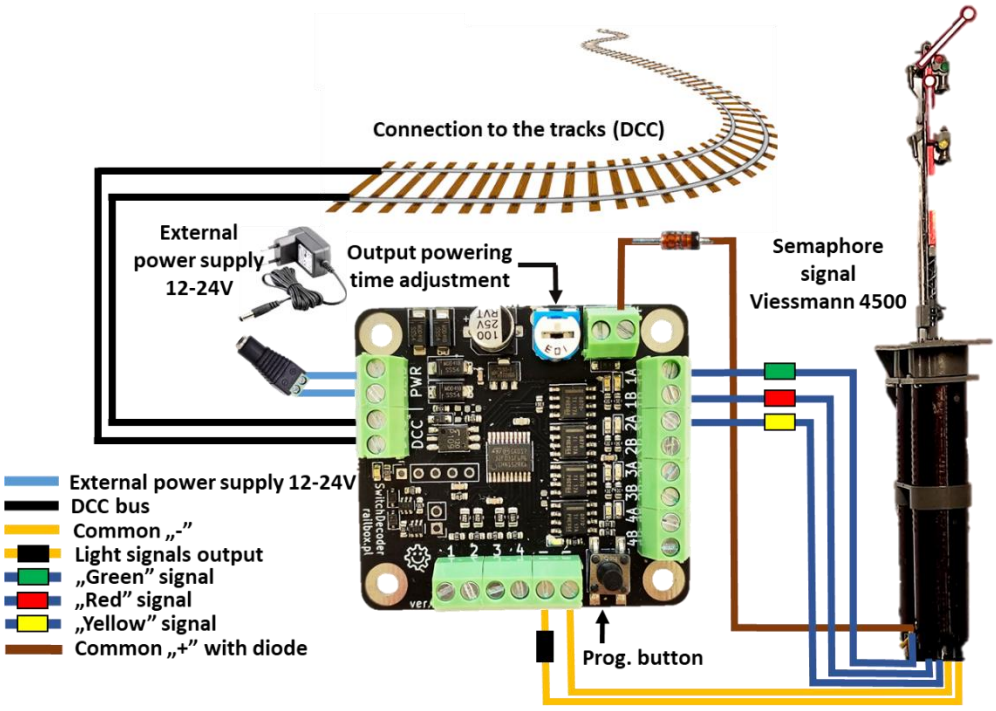
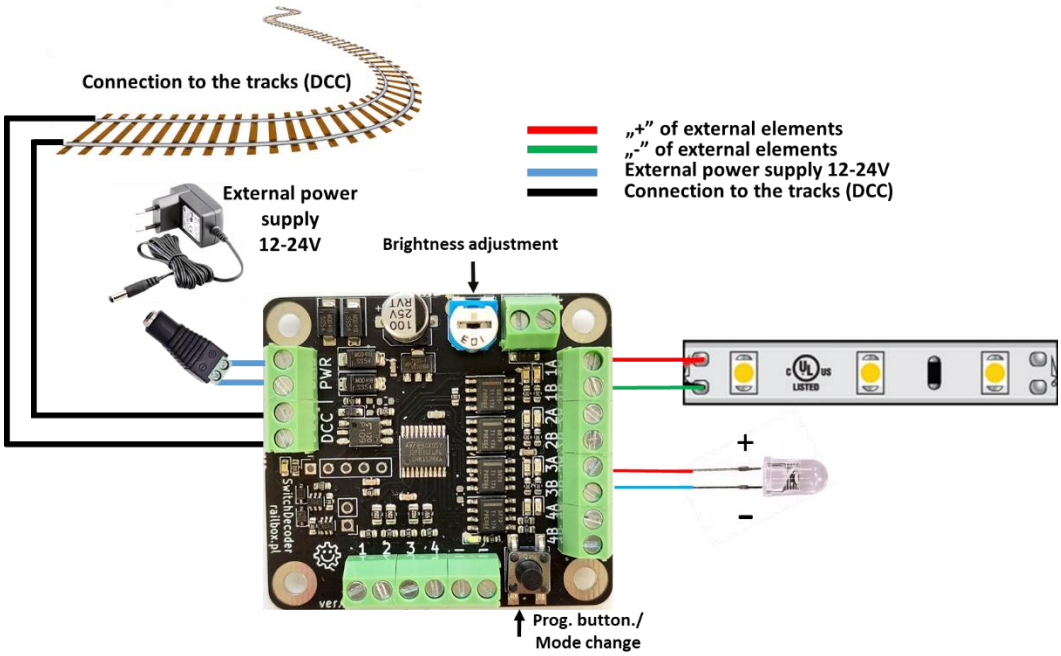
Connection of semaphore signals

Note: Viessmann semaphore signals (any scale) operate via coil drivers, nevertheless time should be set close to maximum and adjusted during configuration of the accessories.



Connection in lighting mode

Note: To change the mode, use the programming button – press and hold it for a few seconds until the LEDs on the outputs light up indicating a successful change of the decoder's mode.



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Decoder address programming

To configure the DCC address of the decoder, the user must perform the following steps:

- **Press the decoder programming button briefly**
- **Send an accessory command from DCC command station with the required address (e.g. arrow buttons on MultiMaus in turnout mode), the decoder will temporarily turn on output #1A indicating a change in the position via the output LED, also white programming LED will blink briefly.**
- **Other outputs will be assigned in sequence automatically**

List of addresses assigned to outputs:

- **Base address (off): Motor #1 position 0**,
- **Base address (on): Motor #1 Position 1**,
- **Base address+1 (off): Motor #2 position 0**,
- **Base address+1 (on): Motor #2 Position 1**,
- **Base address+2 (off): Motor #3 position 0**,
- **Base address+2 (on): Motor #3 Position 1**,
- **Base address+3 (off): Motor #4 Position 0**,
- **Base address+3 (on): Motor #4 Position 1**.

Connection with RailBOX: Railroad Control mobile app

This symbol means "Easy configuration". All RailBOX products with this ⚙ symbol on the board or sticker on the case allows two-way communication (Railcom ® protocol) with command stations with a Railcom ® receiver:

- **Automatic detection of new decoders connected to the tracks and the ability to automatically assign the address to the decoder (only with ⚙ Command station, e.g., WiFi Command Station RB 1110)**
- **Ability to read and write configuration variables (CV) at any time on the main track (PoM)**

Owners of RailBOX decoders with the symbol ⚙ and the RB 1110 Command station no longer have to worry about manual address programming for RailBOX accessory, wagons and loco decoders, just connect a new device to the tracks and the system itself will automatically find the next free address and assign it to the decoder. After that, in the mobile app RailBOX: Railroad Control will automatically appear a new loco, or accessory already with the specified address. In the case of semaphore will only need to move them to the appropriate place on the map in the mobile app RailBOX: Railroad Control. More information about this system **see here**

Note: If you do not have the RB 1110 Command station and/or there is no ⚙ symbol on the decoder, you can also quickly add the decoder on the map in RailBOX: Railroad control mobile app. Connect your own command station with attached decoder to it to our mobile app and follow the instructions as on above image and further instructions in the app.

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CV configuration table

CV values can be modified on the programming track or on the main track (POM).
Configuration table:

CV	Value	Default value	Description
1	1..255	0	Address (lower byte): Decoder address (CV1 i CV9)
7	0..255		Software version
8	0..255	13	Manufacturer ID / Decoder reset: Manufacturer code / Write value 1 to reset decoder to factory settings
9		0	Address (higher byte): Decoder address (CV1 i CV9)
28	bit		Railcom Configuration
	1	1	Enabling the second channel CH2: 0-off, 1-on
	7	1	Enable automatic detection system: 0-off, 1-on
29	bit		Decoder configuration 1
	3	1	RailCom: 0-disabled, 1-enabled
	6	1	Address type: 0-Not supported, 1-Output address
	7	1	Accessory decoder: 0-Not supported, 1-yes
45	0..255	255	Output voltage, output 1A
46	0..255	255	Output voltage, output 1B
47	0..255	255	Output voltage, output 2A
48	0..255	255	Output voltage, output 2B
49	0..255	255	Output voltage, output 3A
50	0..255	255	Output voltage, output 3B
51	0..255	255	Output voltage, output 4A
52	0..255	255	Output voltage, output 4B
72	0..255	10	Turnout driver moving time: Turnout driver moving time (*10 ms). Set this value greater than the actual moving time for proper operation. Default value 100ms

Configuration table for the Easy Configuration System (Railcom):

CV	Value	Default value	Description
28		130	Feedback communication configuration (Railcom) Bit0 - transmission of the address of the decoder in the first channel CH1

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			Bit1-switching on the second channel CH2Bit7 – Activation of the automatic recognition system
29			Partial description of this Railcom CV Bit3-Enabling Railcom
257	0..127	„SWITCH”	CV257-CV264 – Short decoder name in ASCII symbols
265	0.255	0	Lower byte of image number
266	0.255	0	Higher byte of image number
268		0	Bit4-7: Decoder symbol number: 0- Turnout 1- Semaphore 2- Turntable 3- Light