



Turntable decoder LocoNet/RailCom RB 5510



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Application:

RB5510 is a decoder designed to control model turntables in H0, TT and N scales manufactured by Roco® / Fleischmann® (6052, 6651, 6652, 9152, 6152, 6154, 35900 and 42615).

Basic Functions:

- Up to 24 individual turntable positions.
- Two dedicated outputs for controlling the turntable bridge and control booth lighting.
- Possibility of connecting a speaker and playing sounds related to turntable operation.
- Automatic polarity switching of the turntable bridge.
- Intuitive configuration via the RailBOX: Railroad Control application ([details here](#)).
- RailCom® protocol support.
- LocoNet connector for transmitting information about bridge occupancy and the address of the locomotive located on the bridge.
- Possibility of uploading custom turntable sounds via the micro-USB port.
- Operation in basic or extended mode – the extended mode enables smooth control of bridge movement without the internal clicking sound.

Decoder Operating Modes:

1. **Mode for 5-wire turntable models** (green STS LED, CV112=0; change the value to 16 to control turntables with 24 positions) ([connection diagram here](#)).
2. **Mode for the ROCO® 42615 turntable model** (yellow STS LED; an adapter for connecting the ribbon cable to the decoder is included with the decoder) ([connection diagram here](#)).
3. **Extended operating mode using external feedback modules.** This mode allows the turntable to move between positions without clicks ([connection diagram here](#)).

Technical parameters:

- Decoder dimensions: 100 x 104 x 22 mm.
- Power supply (PWR): AC / DC 12-24 min 2A
- Power supply (DCC): 12-24V
- Maximum bridge current consumption: 3A
- Maximum motor current consumption: 2A





- Bridge occupancy sensor sensitivity: 2.2 mA
- LED output voltage: supply voltage (~16V), built-in 1k Ohm resistor
- DC consumption: 0.05 A (max 1.5 A)
- Micro USB Port (audio recording only)
- Speaker: 8 Ohm, max 3W

Decoder STS LED light color interpretation:

Important: Below is a description of the STS LED indication, which for convenience is shown separately for the upper and lower STS LEDs.

Decoder modes (upper STS diode):



GREEN SOLID-decoder mode for 5-wire turntable models.

Decoder's operation can be set during the procedure of automatic assigning of the decoder in the Railbox Railroad control application or changed manually in CV 112



YELLOW SOLID-decoder mode for ROCO® 42615 turntable model.

Decoder's operation can be set during the procedure of automatic assigning of the decoder in the Railbox Railroad control application or changed manually in CV 112



WHITE SOLID – mode for assigning base address to the decoder. To enter this mode, press the PROG button on the decoder briefly. After successful assignment of the address, the LED will automatically switch to indication of the decoder's mode of operation.



WHITE BLINKING - position calibration mode. To enter the mode, press and hold for 2 seconds. PROG button until the upper STS LED starts blinking. The LED blinks when the bridge moves or stays solid after writing the current position. When the motion resumes, the LED starts blinking again. When you have finished configuring positions, press and hold the PROG button again until the LED switches to indication of the decoder's operating mode.



PURPLE SOLID (lower STS diode) - position erase mode. To enter this mode, briefly press the PROG button while in position calibration mode (white blinking). After the purple lit up, you need to select the position you wish to delete, the LED then automatically switches to the indication of the position calibration mode.

Turntable status (lower STS led):



GREEN SOLID – the turntable moves in a clockwise direction.



GREEN BLINKING - single short blinking of the LED means passing one position (step) of the turntable



YELLOW SOLID – the turntable moves counterclockwise.



YELLOW BLINKING - one short blinking of the LED means that one position of the rotor is passed





Bridge occupancy status (lower STS led):



BLUE SOLID – occupancy of turntable bridge tracks by locomotive with address decoder via RailCom® protocol



RED SOLID - occupancy of turntable bridge tracks by the locomotive without indicating the address of the decoder.

Indication of incorrect decoder states:



DOUBLE BLINKING RED – no DCC signal



BLUE SOLID (upper LED) + RED BLINKING (lower led) – incorrect configuration of the turntable in extended mode. No external feedback modules connected.



BLINKING RED (lower led) - no record in the decoder of the current position, which briefly appears after switching position

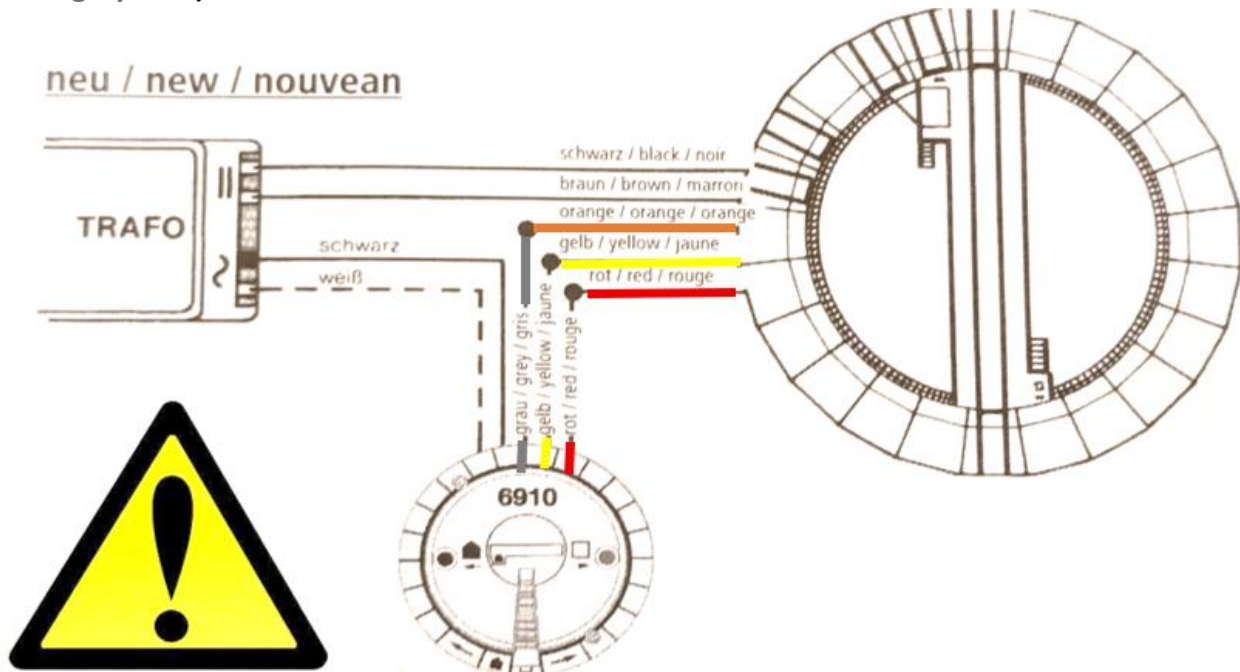


Connection

The decoder can be powered directly from the DCC track, which is done by mounting the yellow jumpers to the PIN connectors next to the DCC input, however, it is recommended to use an external power supply to avoid a possible bridge stop between the positions in the event of DCC power loss.

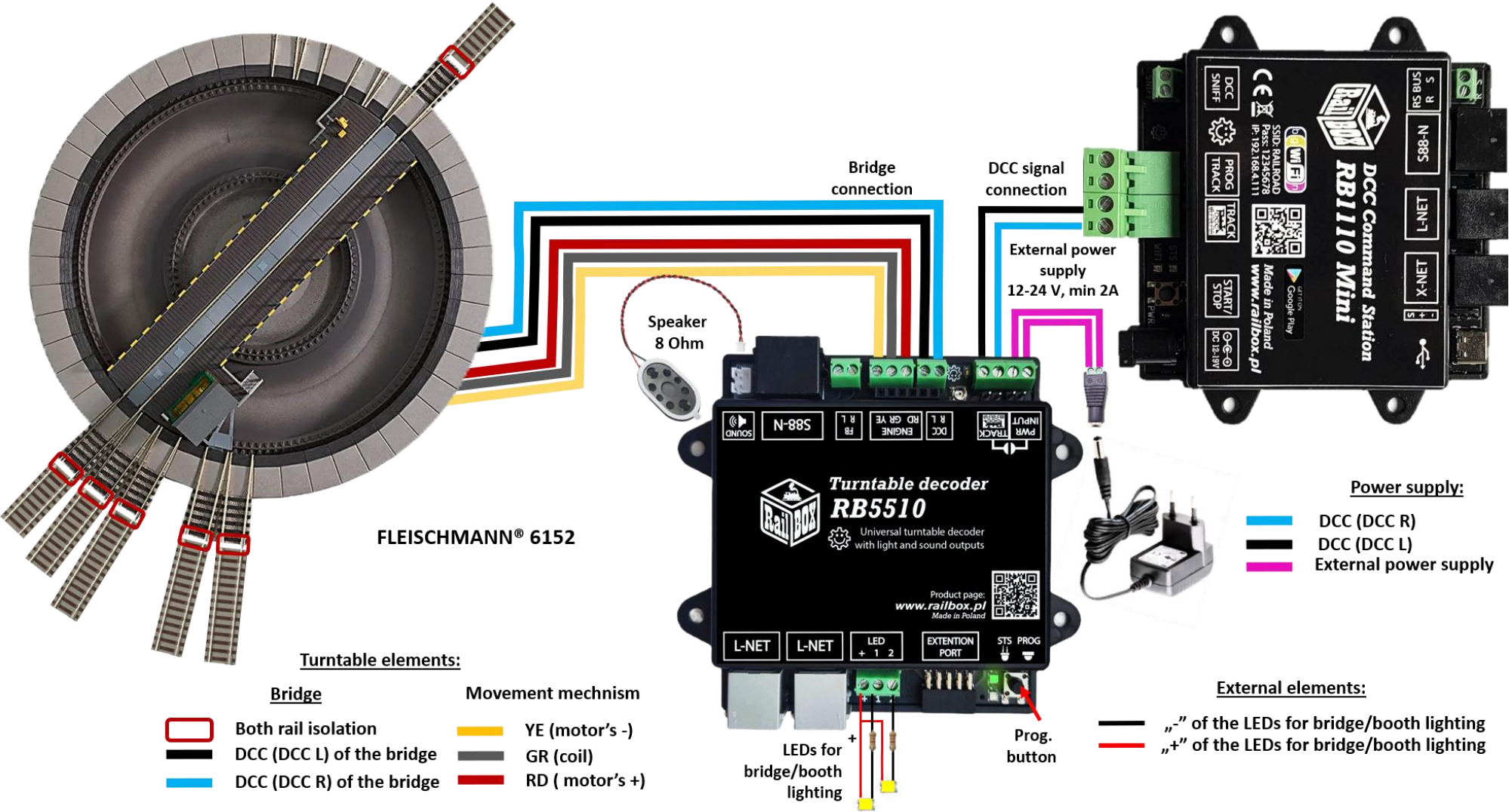
Note: Before connecting the turntable to the decoder, it is recommended to check its proper operation in factory (analog) mode. Make sure that the turntable mechanism moves smoothly in both directions, performs a full rotation and stops correctly in different positions. It is recommended to check the operation of the turntable several times in the entire range of its movement. If there is resistance, jamming, incorrect stopping or no movement in some position, you must correct the cause of the problem or contact the turntable manufacturer before connecting the decoder.

Below are examples of connection diagrams for different models of turntables. For models of 5-wire turntables, you need to pay attention to the colors and order of the tape wires (some versions have **orange** instead of **gray** wire)





Connecting the 5-wire turntables



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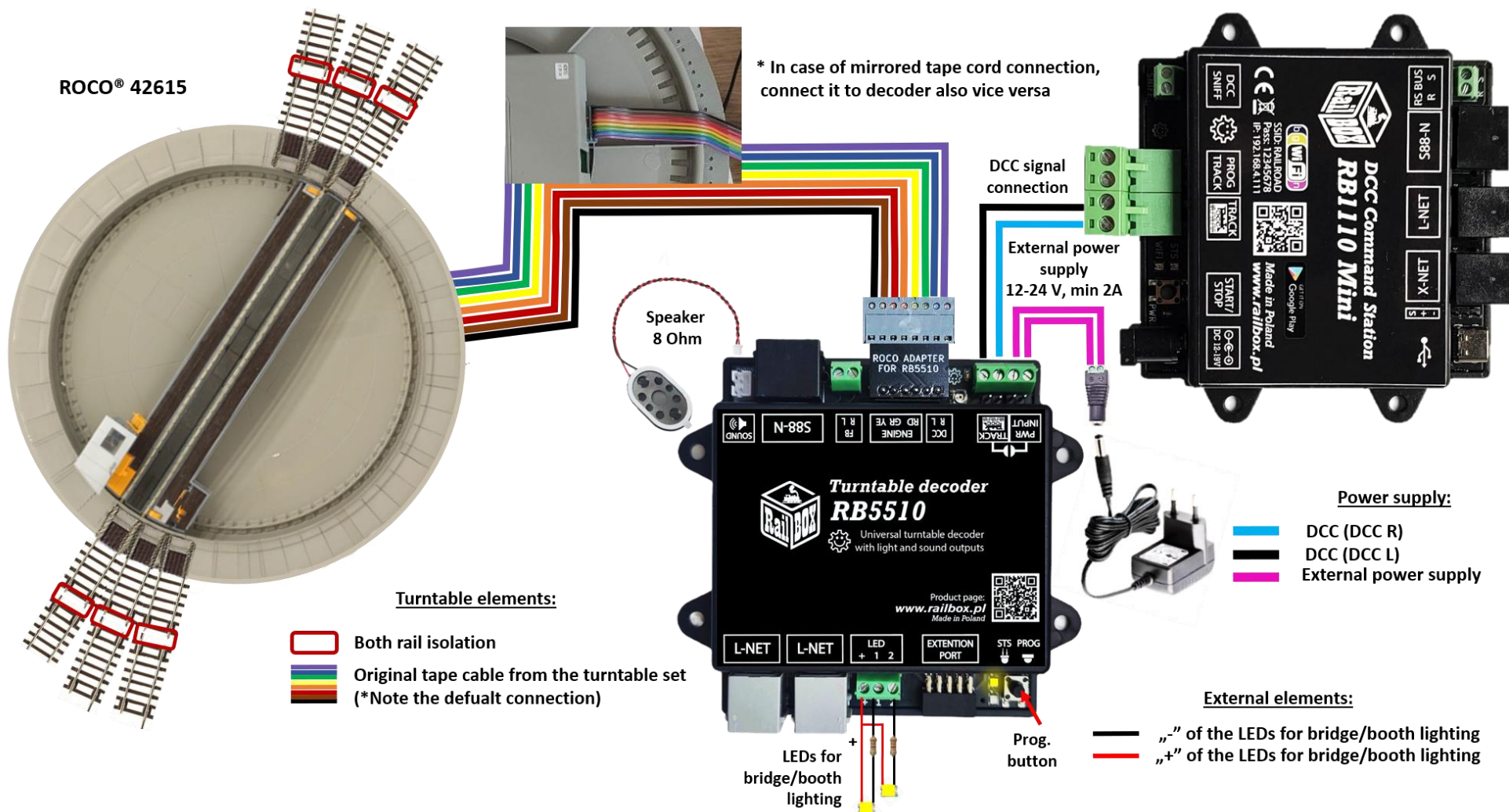
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[Download the application](#)
[RailBOX. Railroad Control](#)





Connecting the ROCO® 42615 turntable



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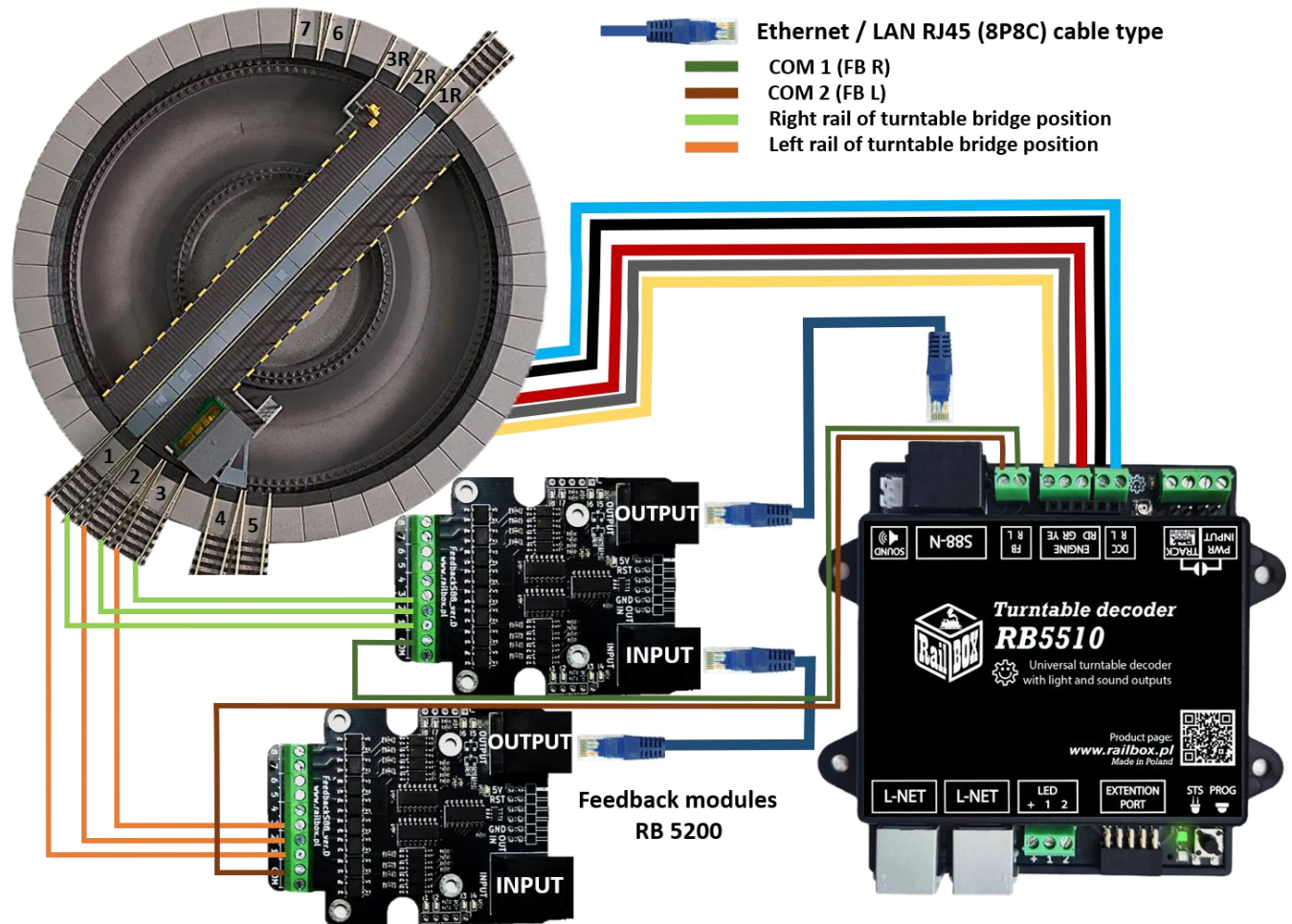
Extended mode connection using external feedback modules

Important: The Extended Mode allows you to move the platform of the Fleischmann® turntable models between its positions without clicks.

According to the presented schemes, additional S88 feedback modules (for example, RB5200) are needed. Each of the track sections of the turntable position must be isolated from the other tracks on the layout on both rails.

The left rail of each exit from the turntable must be connected to a separate input of module No. 1, and the right rail, on the other hand, to module No. 2. COM module connectors respectively to FB R and L connectors of the turntable decoder. Thus, two additional RB5200 modules allow you to connect, up to 8 positions of the turntable (or up to 16, if all 8 have a mirrored position on the other side - 1R, 2R, 3R). The decoder automatically recognizes the mirrored position, and the bridge turns to the corresponding side.

"Mixed" connection is also possible, in which part of the positions will not be connected to the feedback modules (4, 5, 6, 7 in the diagram) in this case, moving the bridge only to these positions will be done with "counting the steps of the turntable" – clicking (this can be useful when the number of positions exceeds 8(16)).





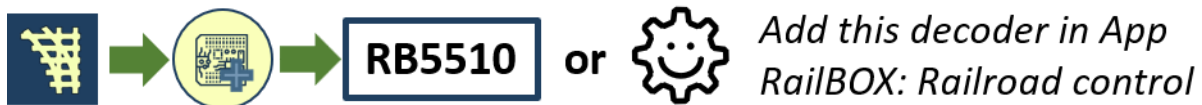
Decoder programming and configuration

Programming the base address of the decoder

To configure the base address of the RB5510 decoder, the user must perform the following steps:

- Briefly press the decoder programming button (PROG)
- Within 30 sec. when the upper white STS diode is lit, send an accessory command from the DCC with the required address (e.g. arrow buttons on MultiMaus in turnout mode or via the RailBOX Railroad control application), the White STS LED will automatically return to the decoder operation mode indication after successful address assignment.

Connection to the RailBOX: Railroad Control application



This symbol means easy configuration. All RailBOX products with this symbol on the board or sticker on the casing enable two-way communication (Railcom® protocol) with command stations that have a Railcom® receiver: Automatic detection of new decoders connected to the tracks and the ability to automatically determine the address of the decoder (only with control panels, e.g. Wi-Fi Control RB 1110) Ability to read and write configuration variables 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 address programming for accessory decoders and Railbox wagons and locomotive 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 RailBOX: Railroad Control application, a new locomotive or accessories will automatically appear with the already established address. In the case of turnouts/semaphores, you will only have to move them to the appropriate location on the map in the RailBOX application: Railroad Control

For more information on easy configuration  see here

Important: if you do not have an RB 1110 Control Panel and/or there is no symbol on the decoder, you can also quickly add the decoder to the map in the RailBOX: Railroad control application. Connect your own control panel with the decoder connected to it to our smartphone/tablet app and follow the instructions below.

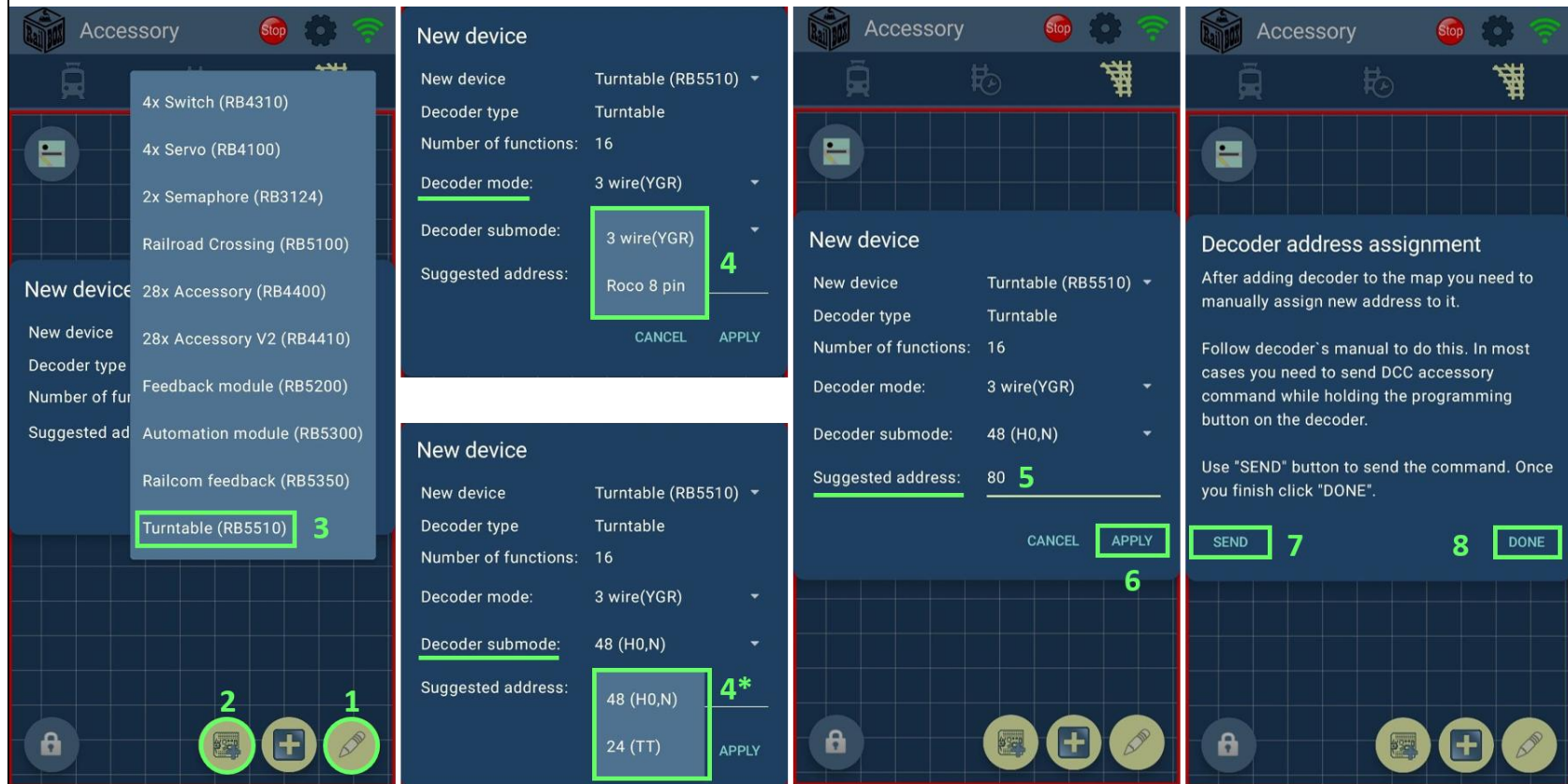
Adding a decoder in the Railbox Railroad control application is possible in two ways: **manually adding a decoder to the map** or adding it using the automatic detection procedure - **easy configuration** . Below is a detailed step-by-step description for each method.





1 method-manually add the decoder to the map in RailBOX Railroad control (any DCC command station)

- 1-Enter the map editing mode by pressing the pencil symbol
- 2-Select option „Add decoder“
- 3-In the appeared window, select the decoder from the list
- 4-Also select the operating mode of the decoder depending on the turntable model, *and the number of positions (for 5-wire turntables)
- 5-Set the desired address, which will be the base address of the decoder
- 6-Click "APPLY"
- 7-Press the PROG button on the decoder until the upper white STS LED lights up, and click "SEND" in the app
- 8-To assign the selected address and add graphic elements to the map, press "DONE"



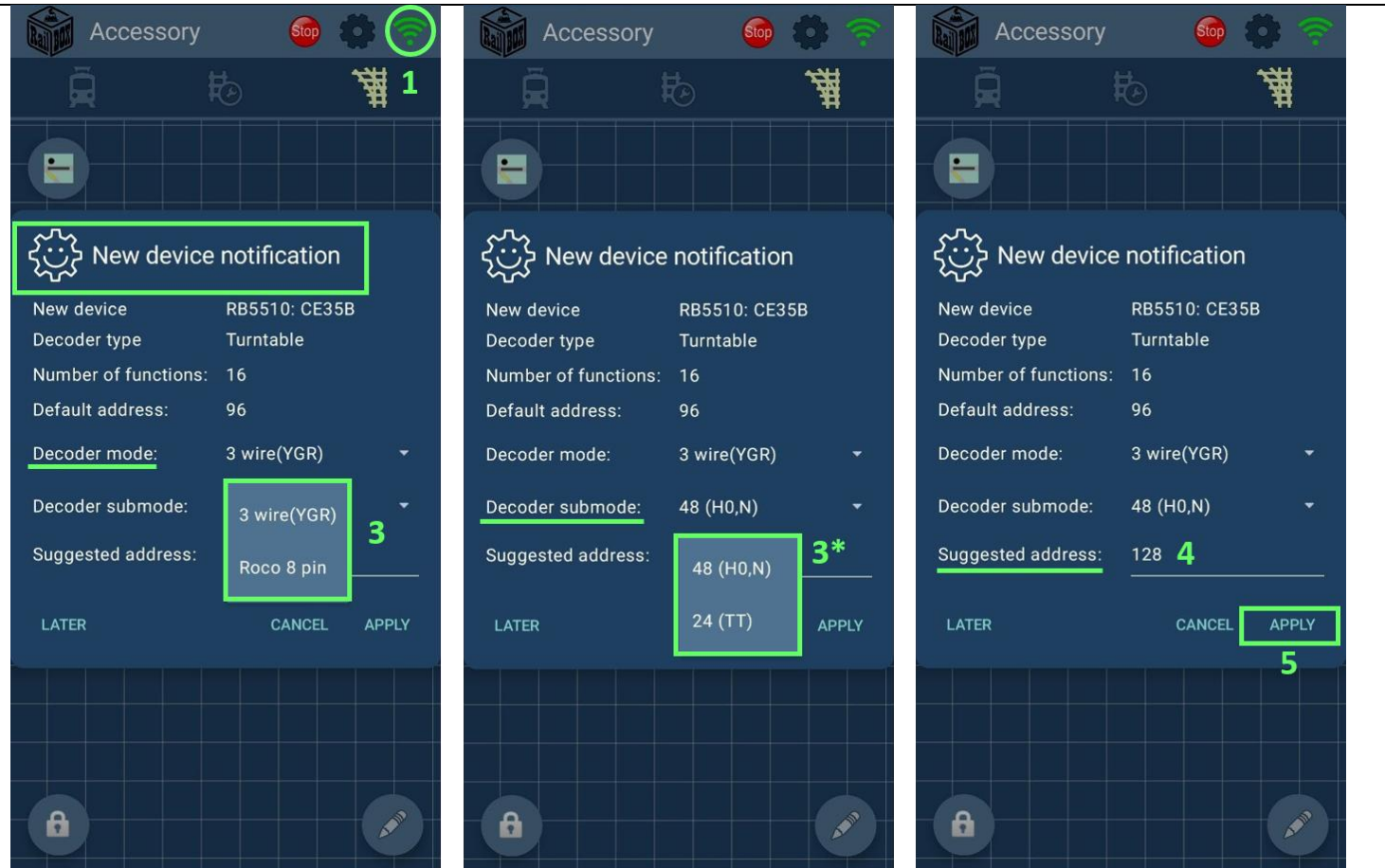
Note: If you added the decoder to the map before connecting the actual setup, you can assign the base address by switching the "button" graphic element while in address programming mode





2 method – Easy configuration in RailBOX application (with Railbox RB1110 Command station)

1-Connect RB1110 Command station to Railbox application via Wi-Fi
 2-Connect the RB5510 turntable decoder to the DCC Command station
 3-In the "New device notification" window that appears, select the operating mode of the decoder depending on the turntable model,
 *And, if necessary, the submode too
 4-if you wish, set the desired address, which will be the base address of the decoder
 5-Click "APPLY" and all the graphic elements of the turntable will be automatically added to the map



NOTE: Pressing the button **LATER** in this window will delay assigning in automatic mode until the next time you enter the application.

Pressing **CANCEL** will skip the automatic assignment option; you can reactivate it by pressing



Calibration of turntable bridge position via Railbox Railroad control

1 - After assigning the base address, on the map in the application enter the map editing mode by pressing the pencil symbol

2-Press on the center of the turntable element and go to editing.

3-Press the "EDIT CV" button

4-After, go to the turntable position configuration menu.

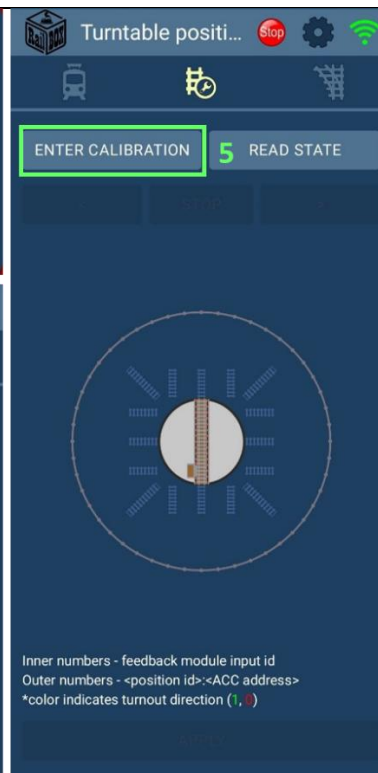
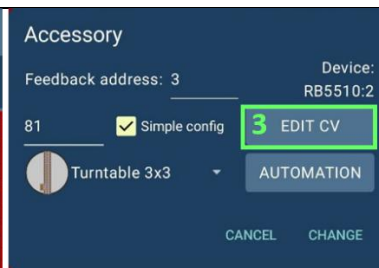
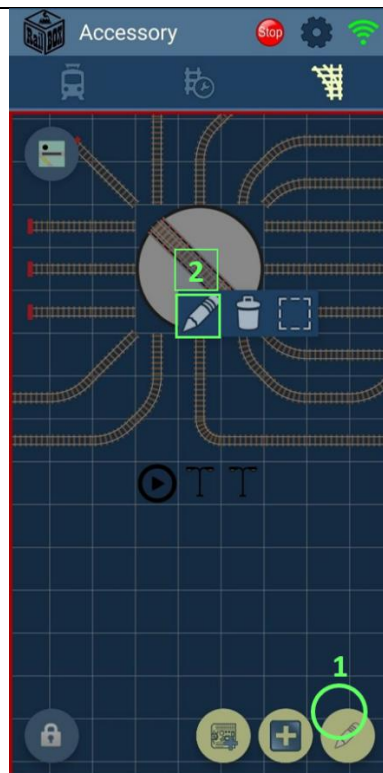
5-To start press "ENABLE CALIBRATION" – the white LED on the decoder will start blinking

6-Use the direction and STOP buttons to move and stop at the desired bridge position.

7-click the track element to assign a position; Repeat steps 6 and 7 for all desired positions.

8 - After calibration is complete, press "READ STATE" to check the set positions

9 - Exit calibration mode by pressing "APPLY" and return to the map



NOTE: If you want to remove any of the positions, while in calibration mode, tap on the track item of that position - >Remove position? - >OK. To remove all positions together, do CV8=2 programming

- Basic position
- Position in extended mode - straight
- Position in extended mode - mirrored
- Current position





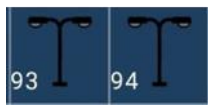
Table control via Railbox Railroad control

1 - After assigning the base address to the decoder, move all the graphic elements of the turntable and connect to the tracks on the map in the desired way

- The graphic element "button" is responsible for the base address of the decoder (Green Address), in the edition of which the software update option is available, if necessary.



- Elements in the shape of lanterns, on the other hand, are used to control the lighting of the turntable (booth/platform).



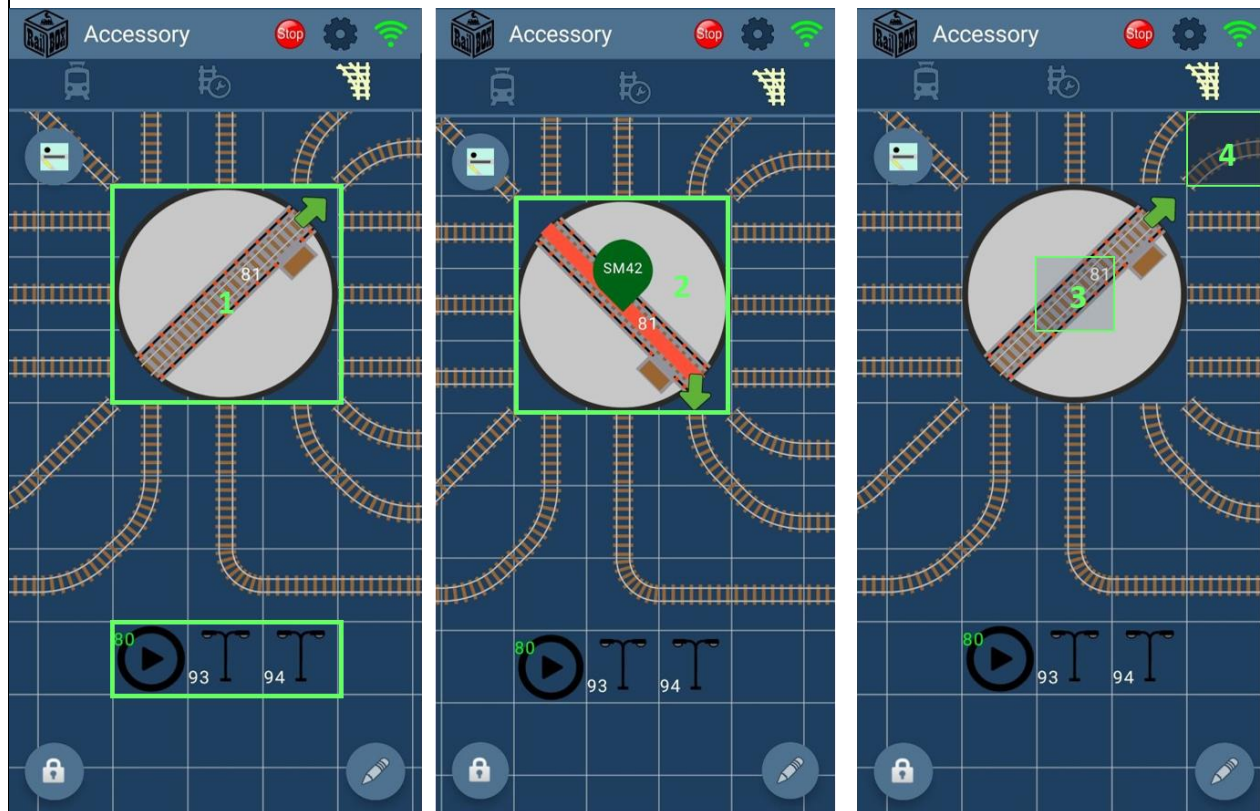
- The sound of the turntable turns on automatically with its movement, by default in the sequence: 1-Warning Signal, 2-movement sound, 3-Warning signal. If you want to disable it, you need to configure CV44

- The "arrow" → element each time indicates the current position of the bridge.

2 - When the bridge is occupied by a locomotive, it turns orange, if the decoder of the locomotive passes the address information via RailCom, then a drop-shaped icon appears in the middle of the platform with the address/name of this locomotive

3-To start the movement, press on the center of the turntable element on the map in the app

4-Then press one of the track sections around the turntable element that corresponds to the desired position of the actual turntable bridge





Bridge position calibration using manipulator or via non-RRC application

Note: Before you start configuring the turntable, make sure that the base address of the decoder has been assigned. The decoder takes up 16 DCC addresses. 1 - base address, 2-13-bridge positions (two for each address: "turnout" forward position and turn position), 14,15-bridge/booth lighting, 16-sound.

- Enter position calibration mode: press and hold for 2 sec. programming button on the decoder, the upper white STS programming LED will start blinking.
- Configure the locomotive with the address 9999 in the manipulator/application and make sure that all functions are disabled
- Use the locomotive speed change configured above to start controlling the movement of the turntable.
- When controlling the turntable bridge, stop it in the desired position.
- Switch the appropriate accessory address (turnout)
- Move the bridge to the next position and repeat the above steps
- To exit calibration mode and keep changes, press and hold the programming button on the decoder until the upper white STS led switches to the decoder's operating mode indication.
- Check the configured positions by switching the appropriate accessory addresses.

Uploading your own sounds

The RB5510 decoder allows you to replace factory sounds with your own audio files. The sound module inside the decoder is responsible for the playback of sounds.

The USB Port for uploading files is located on the left side of the decoder case. Use the appropriate micro USB cable to connect the decoder to your computer.

Note: To protect the decoder and the USB port from damage, it is mandatory to disconnect the decoder from the external power supply or use a special USB isolator that allows you to connect devices with external power.

Assigning audio files

The decoder recognizes sounds based on their numbers. For the sounds to be played correctly, you must keep the appropriate file numbering:

File	Funkcja
001.mp3	The main sound of the turntable - played during the movement of the bridge.
002.mp3	A sound preceding the start of the bridge movement, e.g. a warning signal, a release sound or a bridge unlocking sound.
003.mp3	A sound associated with the end of a movement, e.g. the sound of setting a lock or a signal confirming the stop of the bridge.

Important: Do not change the file numbering, even in the absence of any of the types of sounds. If you save a sound under a different number, it may not be played correctly by the decoder.

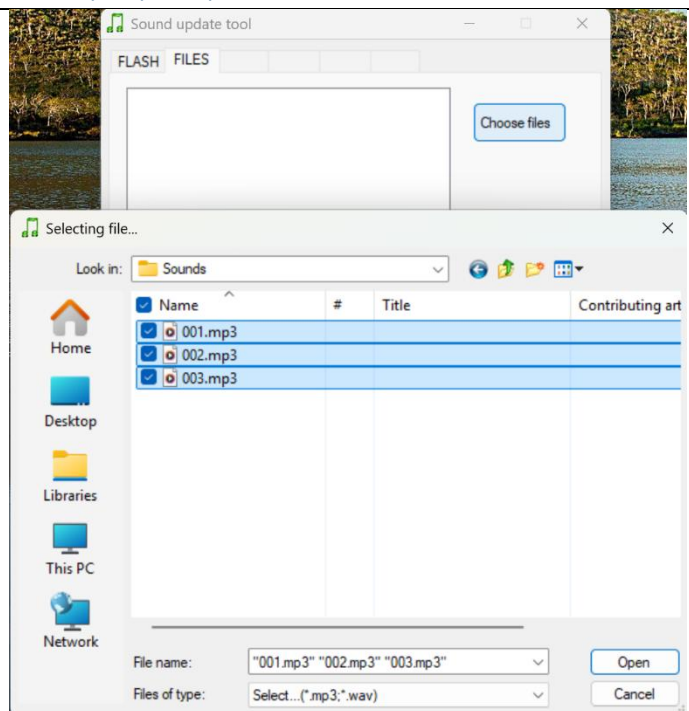


Program for recording sounds

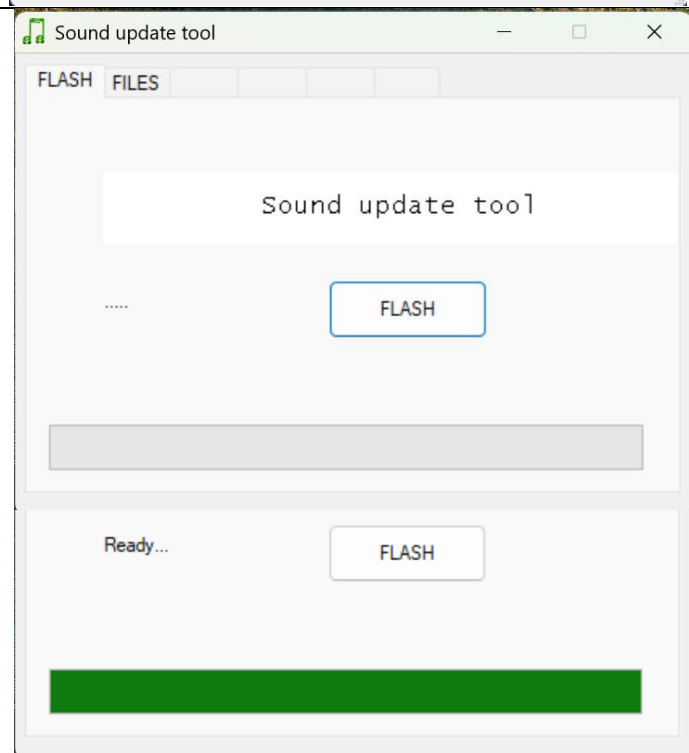
To save files in the memory of the sound module, the program for updating it [SOUND UPDATE EN.exe](#) is required. This is a tool designed to transfer audio files to the internal memory of the module. The program can be downloaded from the decoder's page [here](#)

Upload files step by step

1. **Disconnect the decoder from the command station and rest of the setup!**
2. Connect the decoder to the PC with a micro USB cable (the port is located on the left side of the decoder case and is intended only for recording sounds)
3. Run previously downloaded [SOUND UPDATE](#) program
4. In the program, select the **"FILES"** tab



1. Press the "Choose files..." button and add all the properly prepared files:
 - 001. mp3
 - 002. mp3
 - 003. mp3
2. Go to the **"FLASH"** tab.
3. Start the recording process by selecting the **"FLASH"** button.
4. Wait until the program finishes uploading files. **Do not disconnect the USB cable while recording.** The process will be completed only after the update has been confirmed.
5. When the recording is complete, close the program and disconnect the USB cable. Connect the decoder to the installation and check the operation of all three sounds.





CV configuration table

CV	Value	Default value	Description
1	1..255	0	Address (lower byte): Decoder address (CV1 and CV9)
3	1..100	30	Acceleration time: Acceleration time (100 = 1s, 50 = 2s)
4	1..100	30	Deceleration time: Same as CV3
5	1..100	40	Maximum speed: Maximum speed (Steps/s / 10)
6	1..100	40	Base position calibration speed
7	0..255		Decoder software version
8	0..255	172	Manufacturer code / Reset: Manufacturer code. Writing 1 resets decoder to factory defaults. Writing 2 remove all saved positions from the memory.
9	0..255	0	Address (higher byte): Decoder address (CV1 and CV9)
110	0..100	55	Product code 1: Product code 1, read-only. X value of product code in RBXXYY format
111	0..100	10	Product code 2: Same as CV110
112	0..16	0	Decoder mode: Decoder mode: 0 = 5-wire turntable (48 positions), 1 = Roco 42615; Enter 16 for controlling turntable with 24 positions
113	0..255	0	Feedback address: Feedback module address for rotating table
28	bit		RailCom configuration
	1	1	Enable second channel CH2: 0-off, 1-on
	7	1	Enable automatic identification system: 0-off, 1-on
29	bit		Decoder configuration 1
	3	1	RailCom: 0-off, 1-on
	6	1	Address type: 0-Not supported, 1-Output address
	7	1	Accessory decoder: 0-Not supported, 1-yes
33	0..120	16	Light effect, output O1: 0: Bulb 1: Flash (frequency from CV41) 2: Flash (inverted) 8: Bulb (inverted) -- Additional effects -- +16 enables smooth switching with time from CV42
34	0..120	16	Light effect, output O2: Same as CV33





CV	Value	Default value	Description
37	0..255	255	Brightness adjustment, output 1
38	0..255	255	Brightness adjustment, output 2
41	0..255	45	Flash period 1: Flash period 1 (value x 10 ms)
42	0..255	10	Smooth switching time
43	0..30	25	Volume
44	bit		Sound module operating mode
	0	1	General enable: 0-off, 1-on
	1	1	Start-of-movement sound: 0-off, 1-on
	2	1	End-of-movement sound: 0-off, 1-on
62	0..255	50	Coil activation time
63	0..255	15	Engine release time: Delay before releasing the engine (value x 100 ms)
64	0..255	12	Minimum position change time: Minimum time between position changes (value x 100 ms)
65	0..255	50	Back-EMF voltage threshold
66	0..100	30	Coil hold duty cycle
67	0..100	100	Coil duty cycle: Coil activation duty cycle (%)
68	0..100	30	Engine start duty cycle: Motor starting duty cycle (%)
2	0..100	15	Minimum motor voltage
70	1..50	50	S88 clock frequency: S88 clock frequency (value x 1000 Hz)
71	0..16	2	S88 module count: Number of connected 8-input S88 modules
45	bit		Limit switch configuration
	0	0	Swap limit switches: 0-off, 1-on
	1	1	Invert limit switches: 0-off, 1-on
	2	0	Turntable mode (no stopping): 0-off, 1-on
46	bit		Motion configuration
	0	0	Calibrate 'zero' at power on: 0-off, 1-on
	1	0	Invert movement direction: 0-off, 1-on
	2	1	Bridge stop on DCC signal loss: 0-off, 1-on





CV	Value	Default value	Description
48	0..255	0	Departure step count: Motor control algorithm ensures approach always from same side to eliminate mechanical inaccuracies. This value sets number of steps needed for "departure" movement when positioning from wrong direction.
49	0..1	0	Working length calibration: Working length calibration. Distance in motor steps between limit sensors. Writing '1' starts calibration. After completion value returns to zero.
56	0..255	100	PID proportional gain: Motor controller proportional gain (Kp)
57	0..255	0	PID integral gain: Motor controller integral gain (Ki)
58	0..255	2	PID derivative gain: Motor controller derivative gain (Kd)
59	1..255	80	PID period: Motor controller period (value x 100 us)
60	0..255	6	Back-EMF measurement time
61	0..255	90	Maximum back-EMF value
121	0..255	30	Address hold time: Address hold time (value x 100 ms)
122	0..1	0	LocoNet command type: LocoNet command type: 0 = default, 1 = long

