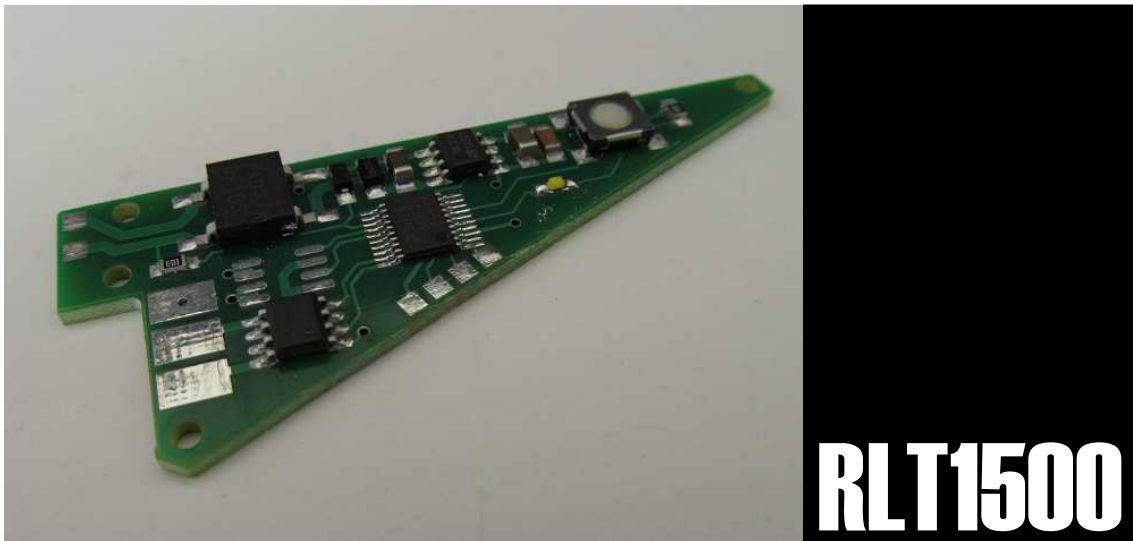




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RLT1500

Decoder for Märklin Turnout

Document's History

Author	Rev.	Description	Date
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How to use this manual

Even if you have no technical training, this manual provides step by step instructions to ensure proper installation and operation of this decoder. Before you begin, please read the entire manual, including on the safety chapter and frequently asked questions. Keep this manual if you want to give this decoder to another person.

Intended use

This decoder is designed to be installed in Märklin motorized turnout can be use in C truck as well as in M truck. Only recognizes the Motorola digital data format . These data is normaly sent by Digital Central Device and will control the motor of the turnout. Any other use or misuse voids the warranty.



Please note that the integrated components and circuits used in this decoder are sensitive to static electricity. Before handling the decoder please discharge yourself touching any metal object (radiator, etc).

Security Instructions

Mechanical Risks

Be careful to cut the wires, the cutting tools may have sharp edges and can cause serious injury. Visibly damaged tools can cause unpredictable damage.

Electrical Risks

When you connect the decoder must take special care to avoid :

- Short circuit.
- Connect the decoder to a different voltage than that specified.
- High humidity. Condensation can cause serious injury from electrical shock. You must installing the decoder only in dry clean rooms.
- Connect high current devices to the decoder outputs.
- Only use transformers and welders in approved outlets installed by a licensed electrician.
- Respect the needs of cable diameter.

Fire Risks

Touching flammable materials with a hot soldering station can cause fire, which may result in injury or death from burns or suffocation. Connect the welding or soldering station only when needed. Never leave a hot soldering without paying enough attention.

Burns Risks

A hot welder accidentally touching your skin can cause burns:

- *Always place the soldering station on a suitable support.*
- *Remove the tin from the soldering tip with a wet cloth or a thick sponge.*

Operating details

The decoder is designed to operate with the format of the Motorola and can be configured with one of the 320 possible addresses. Evaluate the digital data send by the central Unit and process only the ones that have the configured adress . This data is used to control the motor turnout.

Instalation

Content

Verify the content and check that you have the following elements:

- 1 Decoder
- 1 Quick installation guide

Tools and hended materials

Before start be, sure that you have the following tools and materials ready to use:

- An electronic soldering (30 W max.) With a fine tip.
- One foot for soldering
- A sponge tip for cleaning
- A small wire cutter
- A pair of tweezers
- Tin (preferably 0.5 mm in diameter)

The righth Welding



ATTENTION: Welding incorrectly can cause fires and burns. Avoid these dangers by following the instructions contained in this section.

Use a small soldering iron of maximum of 30 watts. Keep clean soldering iron tip so that heat is transferred in proper form to the tin and perform an effective welding. Use specific electronic tin SN / preferably PB 63/37 with flux, this type of tin due to its characteristics of solidification prevents the "cold welding". To make a good welding the soldering iron must be clean and free of rust, preferably using a ceramic tip. Clean the soldering tip with a damp cloth or a piece of cloth. Weld quickly, maintaining the soldering iron the board longer than necessary can damage components and / or copper tracks. Apply the soldering tip to heat the cable and the track simultaneously, just in that moment add tin (not too much). As soon as the tin becomes liquid over the track and cable, remove it slowly. Keep the soldering iron in place for a few seconds, to let the tin flow around the cable / contact, then remove the soldering iron. The cable / contact must remain together approximately 5 seconds after removing the tin. Welds should be shiny, this indicates that the procedure was successful. After checking the welding (preferably with a magnifying glass), check that there are no unwanted shorts circuits. Inadequate or faulty welding may cause damage to the decoder or cause faulty operation. You can remove the excess of tin in the contacts putting the soldering in place you want to correct, let the tin will become liquid again and can remove excess.

Installing the decoder into the turnout.

Before installing the decoder into the turnout be sure that the total motor consumption doesn't exceed the maximum admissible value of 1000mA. The decoder can be damaged if it's exposed for a long time to high currents that exceed the specified value.

Diagrams

Look carefully the follow color diagram of Figure 1 and the Image 1, paying attention to the colors of the cables and the positions where they are placed.

RED	Conection to the central rail
BROWN	Connection outer to rail
YELLOW	Connection to the coil (Common point)
GREEN	Connection to the coil (Left movement point)
BLUE	Connection to the coil (Right Movement point)

Figure 1 – Cable color schema

The follow image shows the basic elements of a C turnout, look the numbers for the installation and programming procidier.

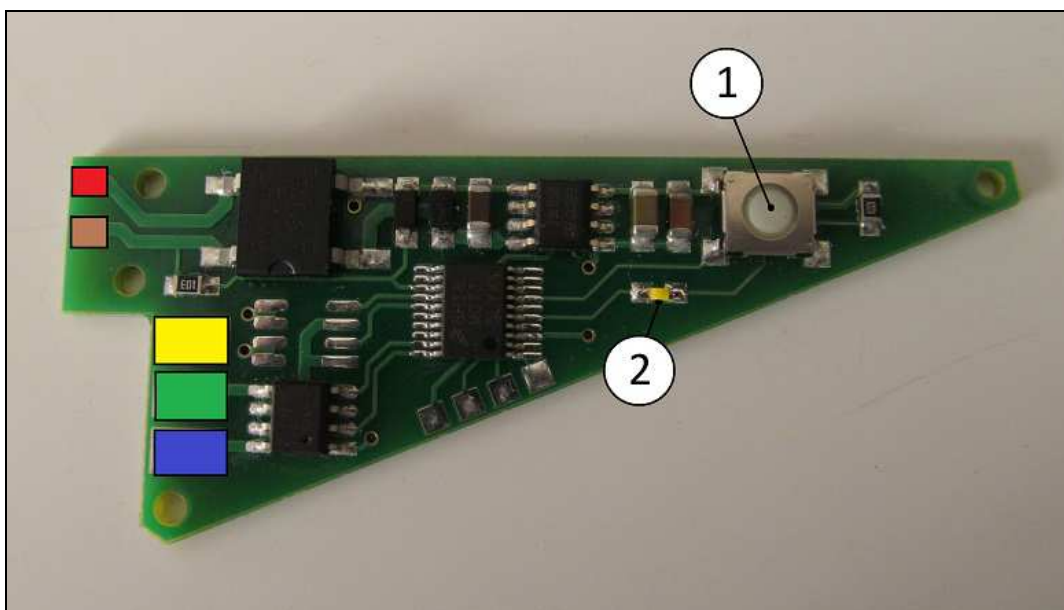


Image 1– Decoder parts

Preparing the turnout

Verify the proper operation of the turnout moving the lever and noting that moves normally. Install the motor following the instructions provided by the manufacturer.

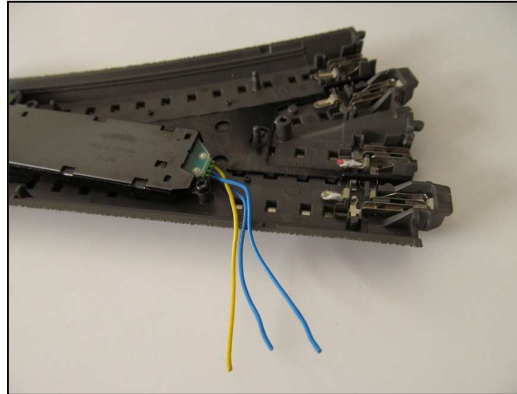


Image 2– Turnout ready to install the decoder

Connecting the decoder to the motor

Solder the red wire to the center rail and the brown wire to the tracks. Then solder the motor wires to the decoder, the yellow wire from the engine to yellow pad welding decoder, one of the blue motor wires to solder pad blue decoder, and finally, the remaining blue wire engine welding pad green decoder. For reference see Figure 1. Take care of the length of cables to perform a correct installation . At this point it is very important to test the decoder, is factory programmed with address 1. Configure the Digital Central to use this address and check that the decoder operate the correctly the motor

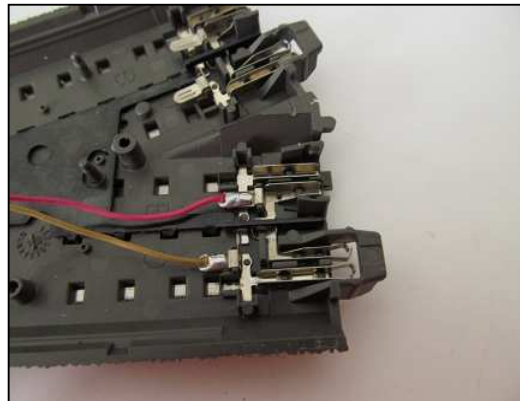
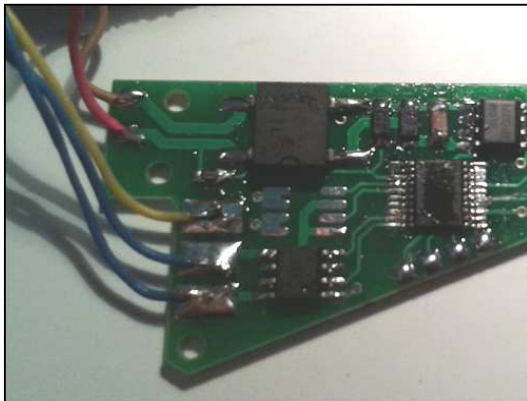


Image 3– Soldering the decoder to the track.

Fixing the decoder into the turnout

The decoder is ready to be attached to the turnout but it is recommended to read the section on programming (below) that will be useful to choose the direction of the decoder. The turnout C has three guides that match with the holes in the decoder. Press gently while the decoder is introduced into the guides completely and then fix it with soft glue.

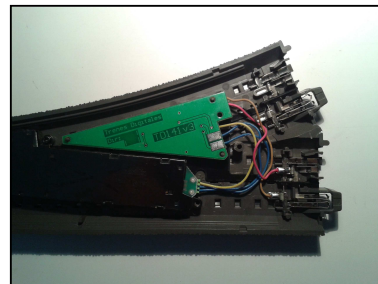


Image 4– decoder correctly placed into the turnout

Programming

The decoder can be programmed “On Track” holding the button (1) while press the turnout command button in the Central Station.

Programing with Central ECOS, Central Station 1, Central Station 2, and Mobile Station 2

The first step is to create the turnout into the central (take a look to the manual of the central) or select one (for MS2). To program the address, you need to hold the button (1) in the decoder while you press the turnout command button in the central station. The decoder will read and storage this address for future use. The decoder LED (2) will blink several times and then will turn it off to show you that the programming was correct.

Programming with the Central 6040

To program the address, you need to hold the button (1) in the decoder while you press the button in the 6040 central. The decoder will read and storage this address for future use. The decoder LED (2) will blink several times and then will turn it off to show you that the programming was correct.

Frequently asked questions

The decoder is really hot or is smoking.

Remove the power from the decoder immediately!

Possible cause : One or more connections are wrong ,please recheck the connections.

Possible cause: Short circuit . Remove the cover and take a look to find if some cable or the decoder are touching the frame or the chassis .

Waranty Conditions

All products are tested during production. This product is guaranteed for one year months. The warranty includes the correction of faults that are due to a defect in material or manufacturing. We guarantee the compliance of the technical specifications if the decoder was installed and connected according to the manual. We are not responsible for damages or consequential damages during the connection of this product. We reserve the right to make improvements, supply spare parts or return the purchase price.

The following invalidate the warranty:

- Misuse of soldering or tin.
- If the damage is caused by failure due to not following the instructions in this manual.
- If the module has been altered.
- If copper or copper tracks are lifted.
- If damage occurs due to an overload of the module.
- If you connected the decoder to a wrong voltage or over current.
- If it is damaged by negligent use or abuse.
- If it is damaged by electrostatic discharge on components.

Technical Specification

Digital Data Format: *Motorola II*

Power: *12-24 V*

Unload consumption: *6mA*

Attention, the current consumption of all the decoder functions including motor can't be greater than 1200 mA.

Usage Temperature: *0 a 45 C*

Humidity: *85 %*

Dimensions: *35 x 18 x 5 mm*

Weight: *2,1 g*