

# FD410Multi – Function Decoder



## User Manual



[www.brelec.eu](http://www.brelec.eu) – [support@brelec.eu](mailto:support@brelec.eu)



## General Properties of the decoder

Multiprotocol (Märklin® Digital en DCC systems).

Maximum current: 300mA.

Dimensions (11,5mm x 19,0mm x 2,7mm).

## Operating Modes

Our function decoders are true multi-protocol decoders with automatic operating mode detection. The decoder analyses the track signal and filters out the necessary parts. The decoders has also an analogue operation mode for DC and AC. Changing from digital to analogue and back represents no problem.

## Protection

The decoder has an overcurrent protection of 300mA. The inrush current from lamps and capacitive loads at power up is much higher. It may happen that the decoder seems to stop responding. Repowering the device will solve this problem. Please reduce load off the decoder. If the output current is not sufficient, one can use the amplifier module VE100.

## Remarks

Read this manual carefully. Damage to the products by not following the instructions voids the warranty to the product. We are not responsible for subsequent damages arising therefrom. This product is not a toy! Not suitable for children under 14 years. By non correct use a risk of injury is possible! Keep this manual in a safe place.

## Wiring diagram

The red (rail +) and black (rail -) wire are connected with the rails. The blue wire is the common wire (positive polarity) for the outputs. White, Yellow, Green and Purple are respective connected with out 1, 2, 3 en 4. For the allocation to the functions see Table 1.

A maximum load can rise the temperature to a critical value. Avoid therefore as much as possible contact with plastic parts.

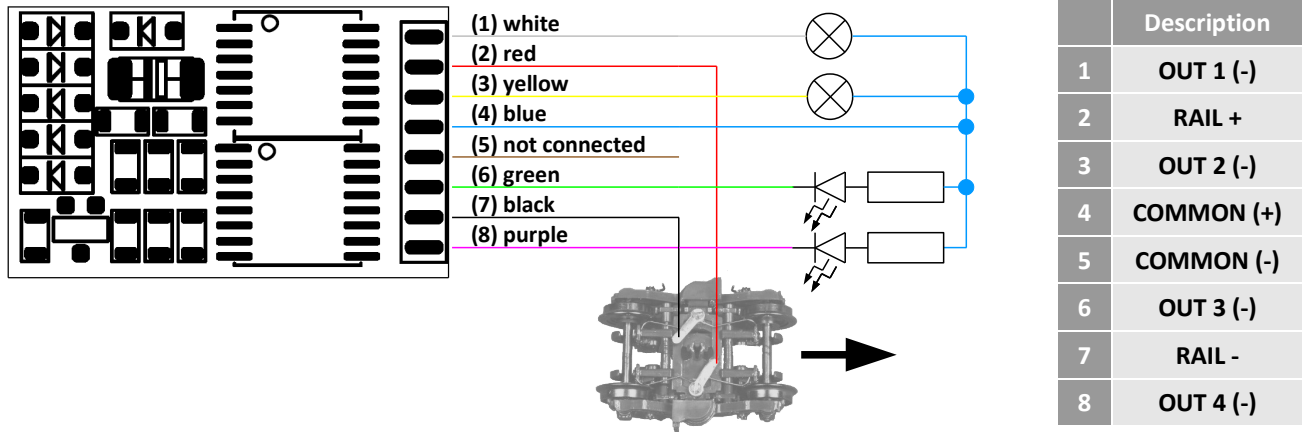


Figure 1: Wiring diagram.

# Programming

## Märklin 6020/6021

- Switch off the power from the 6020/6021 for a few seconds and switch on again.
- Select lokaddress <80>Turn and hold the speed button for five seconds totally to theleft direction (until on hears a click).
- The decoder is now in programming mode. All outputs will go on.
- Choose a CV by entering the CV number as address. To confirm, change one time off direction The outputs will flicker three times.
- Enter the value to write in this CV as new address. Change again off direction. The outputs will flicker three times but slower the the previous time.
- The new value is written into the decoder. An other CV can be programmed or on can go back to the normal mode by entering address <80> and change one time off direction.

## DCC systems (Lenz, Intellibox, ... )

This decoder is works with the NRMA standard for Direct Mode programming, Paged Addressing. It is also possible to program the decoder on the main track.

## Available CVs

Table 1 will give the available CVs. For some Cvs the bits will have a separate meaning. The final CV value is the sum of the values of the second kolum of the description.

CV	Name	Description	Range
01	Primary Address	Address of the decoder	0-127
07	Version Number	Version number of the decoder	-
08	Manufacturer ID	Reset decoder: write 08 to this CV	31
17 18	Extended Address	Long address (CV29.5 = 1). This option is only available for DCC users.	0-255
29	Configuration	Normal drive direction / Inverse drive direction	0 / 01
		14-27 speed steps / 28-128 speed steps	0 / 02
		Analogue mode off / Analogue mode on	0 / 04
		Short address (CV1) / Long address (CV17 + CV18)	0 / 32
33	FL(f) front head	Output Matrix. Only one function can be applied to an output.	0-15
34	FL(r) rear head	No output	0
35	F1	Out1	1
36	F2	Out2	2
37	F3	Out3	4
38	F4	Out4	8
39	F5		0-15
40	F6		0-15
41	F7		0-15
42	F8		0-15
43	F9		0-15
44	F10		0-15
45	F11		0-15
46	F12		0-15
49	Flashing Frequency	$CV49 = [1 / (0,016384 \times f(\text{Hz})) - 1]$ with f(Hz) the required frequency.	0-80
50	Settings Out1	Dimmer off / on	0 / 01
52	Settings Out2	Flashing off / on	0 / 04
54	Settings Out3	Remember the last output state off / on	0 / 32
56	Settings Out4		
51	Settings Out1	Voltage of the output. The higher the value (max 31), the more light the lamps will give.	0-31
53	Settings Out2		0-31
54	Settings Out3		0-31
57	Settings Out4		0-31

Table 1: CV table of the available CVs

# Warranty

## 24 months warranty form date of purchase

Congratulations on purchasing this Brelec product. This quality product was manufactured applying the most advanced production methods and processes and was subjected to stringent quality checks and tests.

### Warranty conditions

1. This warranty is valid for all Brelec products that have been purchased from an authorised dealer.
2. No claims will be accepted without proof of purchase. The filled in warranty certificate together with your dealer's receipt serves as proof of purchase. We recommend keeping the warranty certificate together with the receipt.
3. In case of claim please describe as detailed and precise as possible the fault description and return it with your faulty product.

### Extend of warranty / exclusions

This warranty covers free of charge repair or replacement of the faulty part, provided the failure is demonstrably due to faulty design, manufacturing, material or transport. Please use the appropriate postage stamps when shipping. Any further claims are excluded.

### The warranty expires

1. In case of wear and tear due to normal use
2. In case of conversions of Brelec - products with parts not approved by the manufacturer.
3. In case of modifications of parts.
4. In case of inappropriate use (different to the intended use as specified by the manufacturer).
5. If the instructions as laid down in the user manual by Brelec were not adhere to.

Due to liability reasons any inspections or repairs can only be carried out on products that are not installed. There is no extension of the warranty period due to any repairs or replacements carried out by Brelec. You may submit your warranty claims either at your retailer or by shipping the product in question with the warranty certificate, the receipt of purchase and fault description directly to:

Brelec BVBA – Groenstraat 32 – B 3650 Dilsen-Stokkem – Belgium

## WEEE-Declaration (Europe only)



Disposal of obsolete electrical and electronic equipment (as practised in the European Union and other European countries with dedicated collection systems). This mark on the product, the packaging or the relevant documentation indicates that this product must not be treated like household waste.

Instead this product should be disposed of at a suitable collection point for recycling of electrical and electronic appliances. Thus you contribute to avoid negative impact on the environment and people's health that could be caused by inappropriate disposal. Recycling of materials contributes to preserve our natural resources. For more information regarding recycling of this product, please contact your local administration, your waste collection service or the dealer / shop where you purchased this product.