

## Loco-Decoder 75 520



### Digital decoder for the Märklin-Motorola Format with load compensation for dc-motors

Suitable for dc-locos by Bemo, Brawa (Life-Like), Fleischmann, Gützold, Liliput, Lima, Piko, Märklin-Hamo, Rivarossi (Atlas), Roco, Trix. *Not suited for coreless instrument motors!*

#### Properties

Locos with dc-motors can be operated digitally by using the 75 520 decoder. This decoder operates on both the old and the new extended Motorola data formats. It features a load-compensated motor output and two direction-dependent lamp outputs that are controlled by the ,function/off' keys. When using the new Motorola data format, two additional ancillary decoder outputs, a switcher (shunter) speed range, an alternate address, and momentum can be called up or off by depressing the appropriate function keys.

Uhlenbrock decoders can be programmed by Intellibox or Märklin Control 80f. Decoder address, acceleration/braking rates, as well as starting and maximal motor voltage can be set and altered at every time.

#### Digital Operation

When running in digital mode, the loco works according to the parameters set by the user. These, as well as speed and direction settings, are permanently stored. This means that a loco will retain its settings and will continue to operate as before after the track power has been reestablished. Therefore, a loco can be run in standard automatic block systems.

When crossing over into an analog powered section, it will retain its speed and direction settings provided the track voltage is high enough. Changing of direction or speed is not possible though.

#### Analog Operation

In analog mode the decoder acts like a standard reverser. Loco will run at full speed when entering a digital section.

#### Setting the Operation Mode

Switching over from digital to analog mode is done as described in the programming instructions. A value of 01, analog code, is assigned to programming mode's function 08. Factory set code value is 02 for digital operation.

Important: Lamp state set in digital mode will be retained in analog mode, i. e. when lamps should light in analog mode, they must have been switched on in digital mode.

A decoder can be set back to digital when in analog mode, by holding the transformer's control knob in overvoltage position for at least 16secs.

#### Assignment of Function Keys

The new Motorola Format allows for two additional ancillary outputs, switcher (shunter) speed range, an alternate loco address, and cutting in/out of momentum, accessible by the F1-F4 keys. The code value of programming mode's function 05 determines assignment.

The decoder is factory set to F1 controlling A1, F2 controlling A2, F3 void, F4 controlling momentum.

Important: Dip switch #2 on back of Märklin Control Unit 6021 must be set to "ON" in order to transmit the new Motorola format.

#### Compatibility

The decoder is compatible to Märklin's accelerating/decelerating circuit for their C90 decoder. This circuit was published in Märklin-Magazin 4/93 and 5/93.

# Fitting the 75 520 Decoder

## Connection of the unit

Remove the shorting plug or the old reverser of the loco and insert the interface plug into the socket.

Should the headlights be lit in the wrong direction, the plug must be turned by 180°.

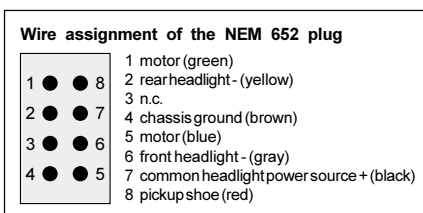
## Caution

Most of the models suitable for ac-operation are already equipped with 19V-lamps that are also compatible with digital operation. Should you find lamps for a lower voltage, replace them before changing over to digital operation.

## Auxiliary Outputs

Outputs A1 and A2 may switch a smoke generator or interior lighting. Their wires have to be soldered to the decoder's pcb as shown in the adjacent sketch. Common return is the black lead.

Default setting is key f1 controlling A1 and f2 controlling A2. Changes are exerted by programming function 05's code value.



## Brush Noise Countermeasures

Should your loco run at wrong speed or even change direction abruptly, the data transmission to the decoder is corrupted by brush noise. The motor must be retrofitted with appropriate suppression elements, such as Uhlenbrock's #71500 suppressor set.

A capacitor of 100 nF must be soldered directly across the motor terminals and two 10 µH chokes must be inserted into the motor leads.

## Fastening the Decoder

The decoder's size is such as to directly replace the original reverser and a hole is provided for the original fastening screw. Use the included adhesive tape in case this is not possible.

## Putting into Operation

Check all connections with an ohmmeter or a wiring tester.

Take extra care that no short between decoder and loco's shell and chassis may occur! Make sure that no cabling is caught when fitting the loco's superstructure.

**A short circuit from motor brushes or ancillary outputs to pickup shoes, frame, or wheels may destroy the device!**

## Programming of Uhlenbrock Decoders by Intellibox

The most comfortable way to program a decoder is offered by the Intellibox. A menu-driven programming mode in plain english is provided. Programming is carried out by selecting the menu for load-compensated decoders (755/756, 75200, 75520 or 75530).

You find exact instructions in the Intellibox handbook.

## Programming of Uhlenbrock Decoders by LOKTOOL

This computer routine is used to program Uhlenbrock decoders by applying a Märklin central unit in connection with a Märklin interface. See reverse for a brief description.

# Programming of Uhlenbrock Decoders with load compensation by a Märklin Central Unit

**Follow exactly these steps when programming the decoder.  
Do not push any other keys.**

<b>1.</b>	<b>Preparation</b> <ul style="list-style-type: none"> <li>▶ Connect a Märklin central unit together with a control 80/80f or a control unit to the track where the loco sits.</li> <li>▶ Switch off power supply for at least ten seconds, then switch on again. <i>All digital signals that may possibly interfere have died away.</i></li> <li>▶ Key in decoder address. <i>Every new decoder is set to 01.</i></li> <li>▶ Hold knob in direction reversal position for at least 8 secs. <i>Decoder changes over to programming mode.</i></li> </ul>	
<b>2.</b>	<b>Calling up the Programming Functions</b> It does not matter whether a single function or several at a time are called up. Functions not called up remain unaltered. The loco's lamps will flash four times in acknowledge of a properly programmed step.	Default setting
	<b>2.1 Main Address</b> <ul style="list-style-type: none"> <li>▶ Call up function: Key in 01 and shortly push knob to reverse – <i>a lamp will flash</i></li> <li>▶ Set address: Key in 01-80 and shortly push knob to reverse – <i>a lamp will flash</i></li> </ul>	01
	<b>2.2 Minimal Speed</b> (min. speed for speed step 2) <ul style="list-style-type: none"> <li>▶ Call up function: Key in 02 and shortly push knob to reverse – <i>a lamp will flash</i></li> <li>▶ Set value: Adjust knob to desired minimal speed. <i>Depress ,function' and ,off keys consecutively when loco is moving - it will stop and a lamp will flash</i></li> </ul>	-
	<b>2.3 Maximal Speed</b> (max. speed for speed step 15) <ul style="list-style-type: none"> <li>▶ Call up function: Key in 03 and shortly push knob to reverse – <i>a lamp will flash</i></li> <li>▶ Set value: Adjust knob to desired maximal speed. <i>Depress ,function' and ,off keys consecutively when loco is moving - it will stop and a lamp will flash</i></li> </ul>	-
	<b>2.4 Assignment of f1-f4 Keys</b> (determines which function can be controlled by them) <ul style="list-style-type: none"> <li>▶ Call up function 05: Key in 05 and shortly push knob to reverse – <i>a lamp will flash</i></li> <li>▶ Set code value: f1 controls A1, f2 - A2, f3 - void, f4 - momentum - key in 16 and shortly push knob to reverse.                      f1 controls A1, f2 - A2, f3 - switching (shunting) speed range, f4 - alternate addr. - key in 28, push knob.                      f1 controls A1, f2 - momentum, f3 - switching speed range, f4 - alternate addr. - key in 29 and push knob.                      f1 controls A1, f2 - A2, f3 - switching (shunting) speed range, f4 - momentum, key in 20 and push knob.                      f1 controls A1, f2 - A2, f3 - void, f4 - void - key in 80 and shortly push knob to reverse.</li> </ul>	16
	<b>2.5 Acceleration</b> <ul style="list-style-type: none"> <li>▶ Call up function: Key in 06 and shortly push knob to reverse – <i>a lamp will flash</i></li> <li>▶ Set code value: Key in 01-32 and shortly push knob to reverse – <i>a lamp will flash</i>  <i>01 = no momentum, 32 = maximal momentum; a value of 10 will render a realistic impression.</i></li> </ul>	01
	<b>2.6 Deceleration</b> <ul style="list-style-type: none"> <li>▶ Call up function: Key in 07 and shortly push knob to reverse – <i>a lamp will flash</i></li> <li>▶ Set code value: Key in 01-32 and shortly push knob to reverse – <i>a lamp will flash</i>  <i>01 = no momentum, 32 = maximal momentum; a value of 10 will render a realistic impression.</i></li> </ul>	01
	<b>2.7 Operation Mode</b> <ul style="list-style-type: none"> <li>▶ Call up function: Key in 08 and shortly push knob to reverse – <i>a lamp will flash</i></li> <li>▶ Set code value: Analog mode - key in 01 and shortly push knob to reverse – <i>a lamp will flash</i>                      Digital mode - key in 02 and shortly push knob to reverse – <i>a lamp will flash</i></li> </ul>	02
	<b>2.8 Reset</b> <ul style="list-style-type: none"> <li>▶ Call up function 10: Key in 10 and shortly push knob to reverse – <i>a lamp will flash</i>  <i>Decoder is reset to factory default values: Address 01, acceleration/braking 01, digital mode.</i></li> </ul>	-
	<b>2.9 Alternate address</b> <ul style="list-style-type: none"> <li>▶ Call up function 11: Key in 11 and shortly push knob to reverse – <i>a lamp will flash</i></li> <li>▶ Set address: Key in 01-80 and shortly push knob to reverse – <i>a lamp will flash</i></li> </ul>	02
<b>3.</b>	<b>Leaving Programming Mode</b> <ul style="list-style-type: none"> <li>▶ Key in 80 and shortly push knob to reverse. <i>Decoder returns to its normal operating mode.</i></li> </ul>	

## Important

If a decoder will not react after a programming cycle, most probably its address has been altered inadvertently. Try all address settings, or Intellibox's or Loktool's address search function. Wrong settings may be corrected by resetting the decoder using programming function 10.

## Technical Data

Address range: 1-255, accessible by Intellibox  
1-80, when employing another central unit

Max. motor current: 1.2 amp

Max. surge: 2 amp

Ancillary outputs: 4 x 0.9 amp

Total load: max. 1.2 amp

Size: 26.5 x 15 x 5 mm (1 1/16" x 19/32" x 3/16")

Factory set default values are: Extended Motorola format, primary address 01, alternate address 02, f1 controls A1, f2 controls A2, f3 void, f4 momentum.

## Accessories

Item no. 71 500 Motor-Interference Suppressor Set

## Loktool 2.0 for Windows (TM)

contains these features:

**Programming of decoders** - comfortable input of all parameters, store in decoder profile database.

**Address search function** - for all decoders using the Märklin-Motorola data format.

**Controller screen** - six controllers are shown on a screen display.

**Hardware requirements:** A Märklin central unit and 6050/6051 interface connected to a PC. Programm will run on all PCs from 386-25 on under Win 3.x, 95/98 and NT.

## www.uhlenbrock.de

Be it most recent information about Intellibox, a pricelist or a listing of authorized dealers, plus various publications to download, our website warrants your visit in every case.

## Warranty Statement

Every item is fully tested for functioning before shipment. If a defect occurs within two years after purchase, the item will be repaired free of charge against presentation of purchase proof. Damages caused by overload or improper treatment are not covered by this warranty.

## For EU only

Please note that decoders may only used in models carrying the EC conformance label.

## Uhlenbrock Elektronik

**These are your advantages:**

**Two years' warranty**

from date of purchase

**Service**

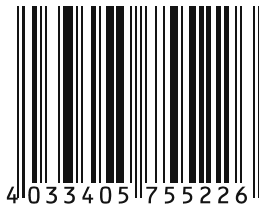
In case of an eventual failure please return the defective item to us for repair. Please include purchase proof and a short description of defect, as well as stating the decoder's address setting.

**Hotline**

In case of questions, we are ready to answer them for you!

Directly contact our technician: **(49) 2045 858327**

Mo - Fr except Wed 14:00-16:00 hrs CET, Wed 16:00 - 18:00 hrs CET



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Made in Germany



*The figure 2 at the end of the item no. means that this article is delivered with an english discription.*

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