

Loco-Decoder 74 400

DIGITAL 2

Digital decoder for dc-motors for DCC-format

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!*

Specifications

These are specifications of the loco-decoder 74 400:

- can drive all dc motors (excluding coreless motors)
- can be used on all DCC-conforming layouts
- short (1-127) as well as long (128-9999) address
- 14, 27, 28 and 128 speed levels
- automatic conversion to analog operation
- supports all programming algorithms defined by the NMRA
- NMRA/DCC conformant
- 2 direction dependent function outputs, to be controlled through one of these keys of the Command Station: „function“ and „off“, „FL“, „F0“, „light“
- shunting speed (half speed) can be enabled through function „F3“
- acceleration and deceleration delay can be turned off or on through function „F4“
- accepts the „DCC brake“ signal generated by some „DCC brake units“ (like, e.g., the Uhlenbrock Power-3 Booster)

Analog mode features

The decoder can be used with an analog throttle on an analog layout. The dc power supply is automatically recognised by the decoder – as long as Bit #2 of CV #29 is set to the value 1.

In analog mode the two function outputs are always on and they change according to the loco driving direction (track polarity).

Technical Data

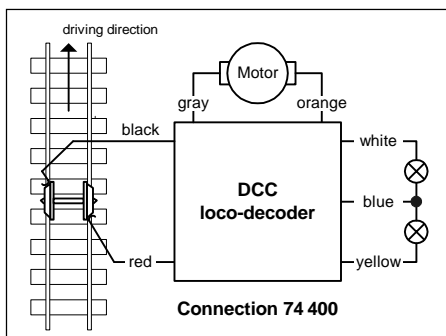
Max. motor current:	0.8 amp
Motor peak current:	2.0 amps
Auxiliary outputs:	2 x 0.9 amp
Total load:	0.9 amp
Size:	19 x 16 x 5 mm (3/4" x 5/8" x 3/16")
Address range:	1-9999

The decoder is factory preset to address 3, 14 speed steps and automatic recognition of a dc power supply.

Installation of the loco-decoder 74400

Motor connections

Connect the red wire to the loco current pickup which - when the loco is sitting on the rails - is in electrical contact with the right rail (right as judged by the "engineer's view": looking from inside the loco towards the loco front). Connect the black wire to the current pickup which is in electrical contact with the left rail. Connect the orange and the gray wire to the two brushes of the motor: the orange wire should go to the brush which, prior to decoder installation, was in contact with the right rail. The other brush (the "left" one) should be connected to the black wire.



Important: After installing the decoder all connections between rails and motor must be removed. The motor must only be connected to the decoder gray and orange wires. RF interference suppressors and capacitors should be retained.

Installation of an extra function

Connect the white and yellow leads to the front and rear lamps. The lamps return (common wire) must be connected to the blue lead. Should either the driving direction or the directional lighting come on wrong, then please swap, resp., the orange and gray leads on the motor or the white and yellow wires feeding the lamps. If both the driving direction as well as the lights are "wrong" - meaning that they agree with each other but they do not agree with what is shown to be "forward" on the Command Station - then one can simply change the value of Bit #0 of CV #29 (without having to resort to de/soldering).

Connect the white and yellow wires to each other if you wish them to work direction-independent - that is, if you wish for the lights to always stay on independently of the loco driving direction. The yellow and white wires can also be used to control other devices, e. g. a smoke generator.

Caution

Please take care to substitute any 12V lamp with a 19V one - or else lamps won't last long.

Fixing the unit in the model

Use the supplied adhesive pad for fixing the decoder in place within the loco. The pad keeps the unit insulated and fixed at its position.

In case the loco has a high current consumption, we recommend to fasten the decoder directly to the loco metallic frame using "hot glue" - all common brands are suitable for this. Please be careful not to make any electrical contact between the loco frame and the decoder!

Safety first

Check for proper wiring after installation using a wiring checker or an ohmmeter. Make sure that the shell will not touch the unit and that no wires can be "caught" (pulled, cut) when loco shell is placed back again on the loco frame.

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

Programming Uhlenbrock DCC decoders

Uhlenbrock DCC decoders can be programmed with every DCC Command Station featuring Register, CV (direct) or paged programming.

Programming DCC decoders with the Intellibox

The Intellibox features an easy to use menu for programming DCC decoders. This menu also supports the programming of long addresses without having to perform complicated computations „by hand“. In fact, one can directly type a long address and have the Intellibox automatically perform the computations needed in order to find out what values to write into CV #17 and CV #18. The Intellibox shall also write those values into CV #17 and CV #18, as well as enabling long addresses by setting Bit #5 of CV #29. Please refer to the corresponding chapter of the Intellibox manual for more information on this point.

How to compute the value to be programmed into CV #29 (Register #5)

CV #29 (Register #5) is used to configure the decoder. One can for example invert the loco driving direction (as well as its directional lights) or change the number of speed steps. It is possible to configure the decoder for digital-only operation or for „mixed“ (and automatic) analog/digital operation. Finally, one can tell the decoder to react to commands sent to either the short address (CV #1) or to the long address (CV #17/18).

You can use the „Value“ column of the following table in order to compute by summation the value to be written into CV #29 (or Register #5) in order to obtain the desired decoder configuration.

BIT	Function	Value
0	Normal driving direction opposite driving direction	0 1
1	14 / 27 speed levels 28 / 128 speed levels	0 2
2	Digital mode only Automatic analog or digital operation	0 4
5	Short address (CV #1, Register #1) Long address (CV #17 und CV #18)	0 32

Example (if not using Bit programming):

Normal driving direction value = 0
14 speed steps value = 0
autom. analog/digital value = 4
short address value = 0

The sum of all of these values gives 4.

This is the value to program into CV #29 (or Register #5) - and, this value happens also to be the factory default value for CV #29.

Programming a long address without using a menu

If you have to program the decoder for operation on a long address and you are *not* using a Command Station which makes this process automatically, then you have to compute what value to write into CV #17 and CV #18. We'll now show by example what to do using long address 2000.

- Divide the choosen long address by 256 (here $2000/256 = 7$ with a remainder of 208).
- Take the integer quotient of that division (7 in our example) and add 192 to it.
- Write the result of this addition ($7+192 = 199$) into CV #17.
- Write the remainder of the division (208 in our example) into CV #18.
- *Important:* make sure that Bit #5 of CV #29 is set to 1, so as to tell the decoder to react to commands sent to its long address (CV #17/18) and not to commands sent to its short address.

Register Table

Register-Nr.	Description	Allowed range	Value
1	Decoder (short) address	1-127	3
2	Minimum speed at speedstep 2	1-31	5
3	Acceleration delay 1 = no delay, 255 = max. delay	1-255	2
4	Deceleration delay 1 = no delay, 255 = max. delay	1-255	2
5	Decoder configuration <i>Check chapter on decoder configuration/CV #29</i>	see CV29	4
6	Page Register Used during ‚paged‘ programming	-	-
7	Maximum speed at highest speedstep	1-95	90
8	Manufacturer id for „Uhlenbrock Elektronik GmbH“	-	85

CV Table (Configuration Variables)

CV	Description	Allowed range	Value
1	Decoder short address	1-127	3
2	Minimum speed	1-31	5
3	Acceleration delay 1 = no delay, 255 = max. delay	1-255	2
4	Deceleration delay 1 = no delay, 255 = max. delay	1-255	2
5	Maximum speed	1-95	90
6	Not used	-	-
7	Decoder/software version number	-	1
8	Manufacturer id for „Uhlenbrock Elektronik GmbH“	-	85
17/18	Long address CV17 high byte (with top 2 bits = 1), CV18 low byte Bit #5 of CV #29 tells whether the short (0) or the long (1) address is active.	- -	199 208
29	Decoder configuration (see chapter on decoder configuration)	0-255	4

Important

If a decoder does not react to drive/function commands after a programming operation, then it is most probable that its address has been modified. Please read CV #1 in order to find out what the (short) address is - of course, had the long address (CV #17/18) been enabled (by setting Bit #5 of CV #29) then also those CV's should be inspected, either directly or, in case of the Intellibox and Fleischmann TwinCenter, by using the "long address" menu.

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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.

ForEU only

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



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Service

Bei einem eventuellen Defekt senden Sie bitte den Baustein zusammen mit dem Kaufbeleg und einer kurzen Fehlerbeschreibung unter Angabe der Decoderadresse zur Reparatur an uns zurück.

Hotline

Wenn Sie Fragen haben, wir sind für Sie da!

Ihr direkter Weg zum Techniker: **0 20 45 - 85 83 27**

Mo - Di - Do - Fr von 14 bis 16 Uhr und Mi von 16 bis 18 Uhr



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Item no. 74 402 09.02 Be