

Using the offset-register to set CV values greater than 79

CV-values greater than 79 can only be programmed by employing the offset-register. This is CV 65. It holds a value offset that will be multiplied by 4 and added to all CV values keyed in.

When leaving the Motorola** programming mode, the contents of CV 65 (offset-register) resets automatically to zero.

Example

Consider CV 49 to be programmed for a value of 157. First CV 65 must be set to a value of 25. Now CV 49 must be set to a value of 57. The decoder will hold 157 in CV 49, because the offset of CV 65 will be multiplied by 4 (=100) and added to 57.

Märklin Braking Section

The decoder reacts to a Märklin braking section (brakes with analogue current on the track). If CV 29 Bit 2 and CV 49 Bit 7 are set to 1 (factory setting 1 and 0).

Delivery State

On delivery the decoder's operating mode is set at DCC/Motorola **. It switches automatically between the two formats. In addition the decoder can be operated with a DC throttle or an AC adapter (Märklin* System) on conventional two or three conductor layouts.

Technical Data

Address range: 1-9999 (extended DCC address)
 Max. motor current: 1 A
 Ancillary outputs: 1 A each
 Total load: 1 A
 Size: 19,5 x 15,5 x 5 mm

Factory Default Settings

The factory settings are address 03, operating and programming with DCC format with 28 speed steps, and Motorola**-format. The decoder automatically recognizes DCC- and Motorola**-formats.

As delivered the decoder automatically recognizes DCC/Motorola**. Moreover the decoder can be operated on conventional 2-rail DC or 3-rail AC (Märklin*) layouts.

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 be used in models carrying the EC conformance label.

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* Märklin is a trade mark of Gebr. Märklin & Cie. GmbH, Göppingen

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Hotline

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

Directly contact our technician: (49) 2045 858327

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

Decodertype: **76 320**

56122 Multiprotocol-decoder "Hobby"

Digital Operation on Layouts using either DCC- or Motorola**-Format for Locos with DC-Motors.

Properties

- Compensating multiprotocol-decoder for DCC or Motorola** data format
- Suited for permanent-magnet and can motors of up to 1 amp current consumption
- Quiet running due to 18,75 KHz chopper
- 14, 27, 28, 128 speed steps, dependent of data format used
- Short (1-127) und extended (128-9999) addressing modes
- NIMRA compatible
- Setable minimal, intermediate, and maximal speeds
- Programming on the main (DCC only)
- Switching speed (half maximum) activated by F3 function
- Acceleration/Deceleration activated by F4 function
- Direction-dependent, dimmable headlights activated by F0 function
- Braking invoked by DCC braking signal or sections fed by DC
- All outputs are short-circuit protected
- Conventional DC or AC operation with automatic changeover to digital or analog mode possible
- All CVs may be programmed by DCC- or Motorola**-compatible control units
- All DCC programming modes (register, CV, or direct) accessible
- Flash-memory controller can be updated any time

Description

It is a powerful, small-outline, multi-protocol-decoder. It can be used in DCC- or Motorola**-systems as well as in analog DC-mode or AC-operation using the overvoltage pulse for reversal (Märklin*-System).

The decoder employs a chopper frequency of 18,75 KHz and is therefore not only suited for all standard DC-motors, but also for instrument motors such as Faulhaber, Maxon or Escap, drawing up to 1 amp continuous current. Surges of short duration are also tolerated.

The speed characteristics are either set by the minimal, intermediate, and maximal speed CVs.

The load compensation parameters can be trimmed to match the individual loco's properties.

The decoder features two direction-dependent headlight outputs.

The function keys F3 und F4 may activate switching mode with an extended slow-speed range, and acceleration/deceleration.

The decoder can be programmed by PIKO Digi-Power-Box / Intellibox, or any DCC or Märklin*/Motorola** control unit. All CVs can be accessed.

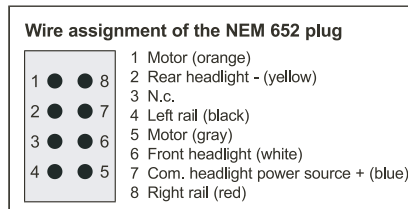
By default, the decoder recognizes DC, AC, or digital operation and adjusts itself automatically. The operation mode can be manually selected, too.

Fitting of the loco-decoder

Connection of the unit

Remove the shorting plug from the loco socket and insert the decoder plug into the loco socket. Should the headlights be lit in the wrong direction, the plug must be turned by 180°.

Important: 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.



Fixing the unit in the model

Use the supplied adhesive pad for fixing where there is room for the unit. The pad keeps the unit insulated and fixed in its position.

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!

Digital and Analog Operation

Digital operation is possible for both DCC- and Motorola**-formats. DCC operation is preset for 28 speed steps.

On conventional layouts the decoder can be run with DC or AC (Märklin*). All operating modes are automatically recognized.

Programming

The base of all possible settings are the CVs as defined in the DCC standard. The decoder can be programmed by PIKO Digi-Power-Box / Intellibox, DCC central-units, or Motorola** central-units.

Programming by PIKO Digi-Power-Box / Intellibox

Regardless of the format which is to be used later, we recommend that you use the programming menu for DCC decoders to program the decoder.

The PIKO Digi-Power-Box / Intellibox provides a convenient input menu to help you to program DCC decoders. Long addresses do not have to be calculated laboriously, they can be input directly. The PIKO Digi-Power-Box / Intellibox automatically calculates the values for CV17 and CV18. For the precise procedure please read the relevant chapter in the PIKO Digi-Power-Box / Intellibox manual.

Special case: loco addresses 80 to 255 in Motorola data format with the Intellibox

The Intellibox supports an address range up to 255 in the Motorola data format. The addresses 1 to 80 can also be programmed with DCC programming without any problems. If however loco addresses above 80 are to be used, the loco address must always be programmed as described in the chapter “Programming with a Märklin control center”.

After programming in this way the CV1 contains the value 0 and the decoder uses the Motorola address above 80.

Programming by DCC Central Unit

Employ the programming menu of your unit to program the CVs in the mode it specifies. It is also possible to program on the main.

Use the exact procedure as specified in the operating manual.

Programming of extended addresses without menu

Should your central unit not support extended address programming, you have to calculate the values of CV17 and 18 yourself. Here is an example of how to calculate these values for address 2000.

- Divide the address by 256 (2000:256 = 7 remainder 208).
- Add 192 to the quotient (7).
- Insert the result (199) in CV 17.
- Insert the remainder (208) in CV 18.
- **Important:** Bit 5 of CV 29 must be set to 1 in order to activate extended address operation.

Calculating the configuration variables' values

CVs 29 and 49 are used to configure your decoder.

The value is the sum of the desired functionalities per CV-table.

Example

Normal direction	Value = 0
28 speed steps	Value = 2
autom. analog-/digital recognition	Value = 4
Speed table by CV 2, 5, 6	Value = 0
Short address	Value = 0
The sum is 6.	

This value is the factory setting of CV 29.

Bit	Configuration CV 29	Wert
0	Normal direction Inverted direction	0 1
1	14 / 27 speed steps 28 / 128 speed steps	0 2
2	Digital mode only autom. analog-/digital recognition	0 4
4	Speed table by CV 2, CV 5, and CV 6 Speed table by CV 67-94	0 16
5	Short address (CV 1, Register1) Extended address (CV 17 and 18)	0 32

Programming by a Märklin* Central Unit

A Märklin* central unit can only program, but not read, any CV.

1. Switch off and back on.
2. Select decoder's address and switch on the headlights.
3. By a stopped loco (speed step 0) move control knob to reversing position five times until headlights go off.
4. Set speed to zero. Rear lights will slowly flash four times.
5. Key in the CV number like a loco address.
6. Again, shortly move control knob to reversing position. The rear lamps will quickly flash four times.
7. Key in the CV value like a loco address.
8. Again, shortly move control knob to reversing position. Rear lights will slowly flash four times.

Repeat steps 5 - 8 for any other CV you want to program.

Finish the programming procedure by switching the central unit to „STOP“ or key in address „80“ and shortly move control knob to reversing position.

Notice: Because a Märklin* central unit accepts only inputs between „01“ and „80“, a value of zero must be keyed in as „80“.

Using the page-register to access CV addresses greater than 79

CV-addresses greater than 79 can only be accessed by the page-register. This is CV66. It holds the address offset that will be added to any address keyed in when programming CVs.

Example

Consider CV82 to be programmed for a value of 15. First CV66 must be set to a value of 1. Now CV 18 can be set to a value of 15. The decoder will be programmed at CV82, as the offset held in CV66 will be automatically added to the CV address selected.