



**ND-ND51 DCC Digital decoder**

**Ver1.00**

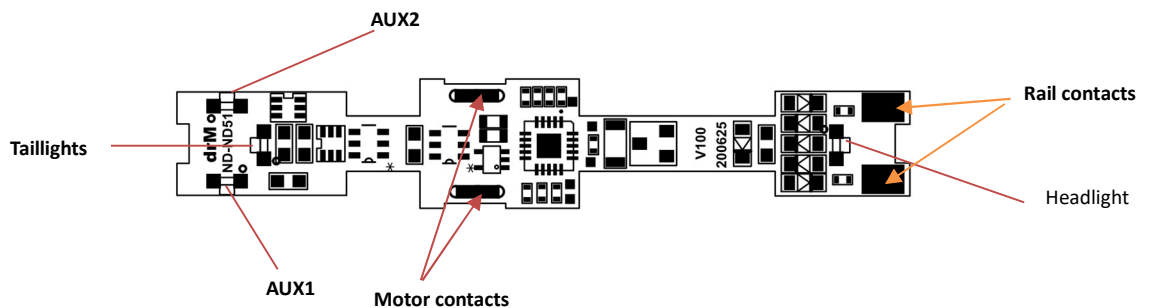
# ND-ND51

## Features

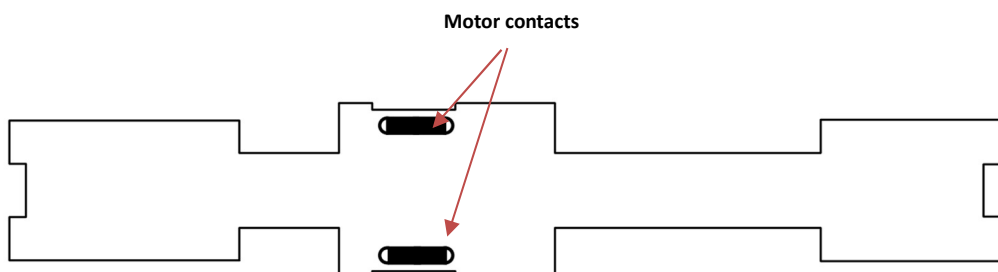
1. Use N scale.
2. The highest operating voltage to 18V.
3. 28/128 speed.
4. 0.8A motor current output, maximum peak 1.5A.
5. 4 function outputs, each output maximum 100mA.
6. 1~9999 address.
7. Function output has 6 kinds of light effect output.
8. Dimensions 59.8mm x 10.5mm x 2.35mm.

## Installation Notes

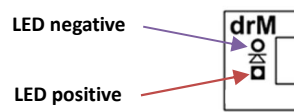
- Decoder top side



- Decoder bottom side



**1. LED contact**



- The picture above indicates the LED mounting pins for the headlights and taillights. If the LEDs are installed oppositely, the LEDs will not light.
- Headlights, taillights, AUX1 and AUX2 can be directly connected to LEDs with a size below 0805, without the need for series resistance.

**2. Decoder installation**

- After disassembling the vehicle, remove the analog circuit board on the vehicle and install the decoder directly according to the position of the analog circuit board.
- When installing the decoder, it is necessary to pay attention to the connection between the decoder rail power contact and the conductive copper sheet of the vehicle rail.
- Pay attention to the direction of the decoder when installing the decoder. The motor copper and the decoder motor contact must be connected.

**CV List**

CV	Introduction	Range	Reset
1	Short address	1-127	3
2	Minimum speed	0-255	0
3	Acceleration delay	0-255	5
4	Deceleration delay	0-255	7
5	Maximum speed	0-255	220
6	Mid speed	0-255	127
7	SW version		1
8	Reset / NMRA assigned manufacturer ID for drM : 164 (10100100)	8	164
17	Extended address, high byte	192 - 231	
18	Extended address, low byte	0 - 255	
19	Consist address	0 - 127	0
21	Consist function F1~F8		255
22	Consist function ( FF , FR )		255
29	Configuration Bit 0 - Vehicle direction Bit 2 - Analog operation Bit 4 - Speed curve table Bit 5 - Short/Extended:	0 = forward, 1 = reverse 0 = off 1 = on 0 = off, use CV # 2, 5, 6. 1 = on, use CV 's # 67 - 94 0 = short address 1 = extended address	6

33~42	<p>Functional output mapping</p> <table border="1"> <thead> <tr> <th>CV</th> <th>-</th> <th>-</th> <th>AUX4</th> <th>AUX3</th> <th>AUX2</th> <th>AUX1</th> <th>FR</th> <th>FF</th> </tr> </thead> <tbody> <tr> <td>33</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> </tr> <tr> <td>34</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> <td>0</td> </tr> <tr> <td>35</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> <td>0</td> <td>0</td> </tr> <tr> <td>36</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>37</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>38</td> <td>0</td> <td>0</td> <td>1</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>39</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>40</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>41</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>42</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> </tbody> </table> <p>CV33 Corresponding to F0 (headlight)  CV34 Corresponding to F0 (taillight)  CV35 Corresponding to F1  CV36 Corresponding to F2  CV37 Corresponding to F3  CV38 Corresponding to F4  CV39 Corresponding to F5  CV40 Corresponding to F6  CV41 Corresponding to F7  CV42 Corresponding to F8</p> <p>Example: When CV33 = 0x01, press F0 to move forward, the headlight will be on, if the modification value is 0x02, then press F0 to go backward, then the headlight will be on.</p>	CV	-	-	AUX4	AUX3	AUX2	AUX1	FR	FF	33	0	0	0	0	0	0	0	1	34	0	0	0	0	0	0	1	0	35	0	0	0	0	0	1	0	0	36	0	0	0	0	1	0	0	0	37	0	0	0	1	0	0	0	0	38	0	0	1	0	0	0	0	0	39	0	0	0	0	0	0	0	0	40	0	0	0	0	0	0	0	0	41	0	0	0	0	0	0	0	0	42	0	0	0	0	0	0	0	0		CV33: 0x01 CV34: 0x02 CV35: 0x04 CV36: 0x08 CV37: 0x10 CV38: 0x04 CV39: 0x00 CV40: 0x00 CV41: 0x00 CV42: 0x00
CV	-	-	AUX4	AUX3	AUX2	AUX1	FR	FF																																																																																														
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38	0	0	1	0	0	0	0	0																																																																																														
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40	0	0	0	0	0	0	0	0																																																																																														
41	0	0	0	0	0	0	0	0																																																																																														
42	0	0	0	0	0	0	0	0																																																																																														
56	<p>Head/tail lamp lighting effects, single digits are set for headlights, tens digits are set for taillights.  Example: 12, single digit 2 headlight effect single flash light, tens digit 1 tail light effect gradually lights up.</p> <ol style="list-style-type: none"> <li>None</li> <li>Gradual light</li> <li>Single flash</li> <li>Warning Light 1</li> <li>Warning Light 2</li> <li>Double flash</li> </ol>	0 - 55	0																																																																																																			
57	<p>AUX1 lighting effect, single digit setting for AUX1, tens digits are set for AUX2.  Example: 12, single digit 2 AUX1 effect single flash light, tens digit 1 AUX2 effect gradually lights up</p> <ol style="list-style-type: none"> <li>None</li> <li>Gradual light</li> <li>Single flash</li> <li>Warning Light 1</li> <li>Warning Light 2</li> <li>Double flash</li> </ol>	0-5	0																																																																																																			
59	Headlight brightness	0-15	15																																																																																																			
60	Taillight brightness	0-15	15																																																																																																			
61	AUX1 brightness	0-15	15																																																																																																			
62	AUX2 brightness	0-15	15																																																																																																			
67~94	28 step speed table																																																																																																					
107	Motor start setting	0-30	0																																																																																																			

## Reset decoder

If you want to reset the CV value of the decoder, write 8 to CV8 and power on again. All CV values will return to the factory settings.

## Decoder programming

The decoder editing can be used as the editing mode of each brand controller to read the CV value or write the CV value. For the controller CV editing method, please refer to the controller operating instructions.

For the content of CV value, please refer to the description of the CV value list. The factory position of the decoder is No. 3, and the decoder can be directly used to operate the No. 3 car number.

### Precautions

- Do not place any conductive substances (liquid, metal...) on the decoder.
- When installing, please install the vehicle with power off.
- Do not remove or replace any components under the decoder.
- Each function output should not exceed 100mA current.
- The overall output of the chip should not exceed 1000mA current.
- The above situation will cause the decoder to be damaged.
- This product is not a toy, please do not give it to 14-year-old children.