Important warning:
- Don't expose to wet and humid conditions and avoid mechanical force or pressure on the decoder
- Do not remove the heat shrink sleeve
- Never solder on the decoder, extend cables if necessary
- Never wrap the decoder in insulation tape, since this may cause overheating
- Always disconnect the circuit when installing the decoder
- Make sure that no wires are squeezed or cut when reassembling the engine

Installation requirements

The engine must be in good mechanical condition: Only an engine running smoothly in analogue mode should be modified for digital operation. Check and replace any wear and tear parts such as motor brushes, lamps etc.

Installation

LokPilot Basic is possibly supplied with an NMRA DCC 8-pin plug (Figure 1): Insert the decoder plug with pin 1 (the side with the red/orange wire) into the side of the socket that it usually marked with *****, **+**, **•** or **1**.

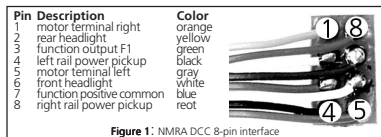Engines without interface: Disconnect any existing wi-

Pin	Description	Color
1	motor terminal right	orange
2	rear headlight	yellow
3	function output F1	green
4	left rail power pickup	black
5	motor terminal left	gray
6	front headlight	white
7	function positive common	blue
8	right rail power pickup	reot

Figure 1: NMRA DCC 8-pin interface
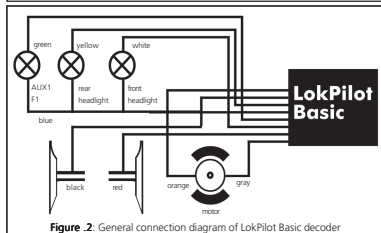
Figure .2: General connection diagram of LokPilot Basic decoder
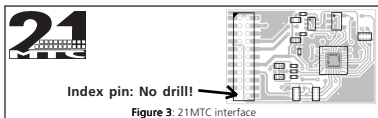
Index pin: No drill!

Figure 3: 21MTC interface

res within the locomotive and any connection to the chassis. Both motor contacts must be insulated, make sure there isn't any connection to the chassis or the wheels. The exact connection is shown in figure 2. Connect the second pole of the function outputs (the blue wires) to the blue wire. The blue wire must not be connected to the chassis!

Engines with 21MTC Interface: Simply plug in the decoder into the socket. Note the index pin to avoid wrong installation

Function outputs

Any load may be connected to the light and function outputs as long as it doesn't exceed the maximum current. Avoid short circuits. Although the output circuits are protected, a high voltage on the terminals or a short circuit may cause damage. Use only 16 V bulbs or higher and a maximum nominal current of 50 mA.

DCC operation

LokPilot Basic may be operated with any DCC compatible system, as long as every engines is decoder fitted.

The pre-set address is 03 using 28 speed steps

make sure the speed step settings of both your DCC system and the decoder do match: As the decoder is pre-set to 28 speed steps, the throttle must have the same settings, as otherwise the headlights will blink at each change of speed steps. You can re-program the decoder to 14 speed steps using CV 29.

Programming of the decoder

A comprehensive list of all supported CVs can be found below. There is no „one fits all" instruction for programming CVs with various DCC systems. Please refer to your DCC system's manual for instructions. LokPilot Basic supports *all* DCC programming modes.

Resetting to factory pre-set values

Write value 08 into CV 08.

CV	Name	Description	Range	Default
1	address	Short (2-digit) Address of engine	1 - 127	3
2	Start voltage	Sets the minimum speed of the engine	1 - 63	3
3	Acceleration time	This value multiplied by 0.5 is the time in seconds from stop to the maximum speed	1 - 63	8
4	Decelearation time	This value multiplied by 0.is the time in seconds from maximum speed to stop	1 - 63	6
5	Maximum Speed	Maximum sped of engine	1 - 63	63
7	Version number	Internal software version of LokPilot Basic Decoder (read only)	-	-
8	Manufacturer's ID	ID of ESU. Writing value 8 in this CV triggers a reset to factory values	-	151
17 18	Extended engine address (4-digit)	CV 17 contains the High Byte(Bit 6+7 always 1), CV 18 contains the Low Byte. Anly active, if switched on by setting CV 29, Bit 5	128 - 9999	192
29	Configuration register	Add the desired values for each function to get the needed value of CV29 Example.: 28 speed steps + Enable analogue operation = 2+4 = 6.	-	6
		function	value	
		Reverse: Change direction of travel (forward becomes reverse)	1	
		Enable 28 or 128 speed steps	2	
		Enable analogue operation (allow DC operation)	4	
		Enable Extended Engine address (4-digit address of CV17/18)	32	
49	BEMF control	Enables or disables BEMF (back emf, load compensation): BEMF Off=0, BEMF On= 1		0 / 11
51	Brake mode control	Defines what happens if the decoders detects DC with reverse polarity locomotive enters in DC mode = 0, locomotive will stop = 1	0 / 1	1
54	BEMF control parameter 2	Parameter 2 (K-component). Defines the effect of BEMF. The higher the value, the stronger the effect of BEMF control	0 - 63	32
55	BEMF control parameter 3	Parameter 3 (I-component). Defines momentum (inertia) of motor. The higher the momentum of the motor (large flywheel or bigger diameter), the lower this value has to be set.	0 - 63	24
63	Lamp brightness	Defines the brightness of the function outputs. The lower the value of this CV, the darker are the bulbs connected.	0 - 7	7