## IMPORTANT - please read this sheet before running your locomotive

## Introduction

Thank you for your choice of this Bachmann Branchline locomotive with digital sound. The locomotive has a high quality DCC decoder to provide both the power to the motor and lights of the model and also the sound to the onboard loudspeaker.

The decoder incorporates back EMF monitoring for fine control of the motor at low speed. 'Back EMF' is the electromotive force that is generated by the rotation of the motor, against the supply of power to the motor. By continuous comparison of the value of the back EMF during operation the decoder can keep the motor turning smoothly at the desired speed.

The decoder settings have been tailored for best performance in conjunction with the sound settings but the handling may differ from that expected from a locomotive run with a DC controller. Please take time to familiarise yourself with the performance characteristics and how the speed controller setting affects the locomotive sound.

The decoder will become warm when in use because it contains an audio amplifier.

## Features

- ► High frequency 32Khz pulse power for quiet operation
- ► User configurable Back EMF control
- ► 4 function outputs to control functions (where fitted) on the locomotive (eg lighting)
- ► Function button controlled reduced shunting speed
- ► Function button selectable inertia
- ► Complies with NMRA DCC requirements
- ► Automatic detection of speed steps (14, 28, 128 steps)
- ► 2-digit and 4-digit addresses
- ► Overload protection on outputs
- ► Program on main or programming track
- ► Operable on DC controlled layouts
- ► Supports Lenz® brake sections

## Technical specification

| | |
|---|---|
| Current carrying capacity: | |
| Motor Output | 1.1A |
| Function outputs | 250mA each, 500mA total |
| Speed steps | 14, 28, 128 |
| Addresses | 1-9999 |
| Dimensions | 31 x 15.5 x 6.5 |

## Functions

The following features, both sound effects and decoder performance features, can be operated by the appropriate function button on the control unit.

| | | |
|---|---|---|
| F0 | Locomotive directional lighting | Latch |
| F1 | Sound on/off | Latch |
| F2 | Single horn | Trigger |
| F3 | Double horn | Trigger |
| F4 | Airbrake | Trigger |
| F5 | Notching up | Trigger |
| F6 | Notching down | Trigger |
| F7 | Shunting speed on/off Acceleration on/off | Latch |
| F8 | AUX 1 – eg cablights (if applicable) | Latch |
| F9 | | |
| F10 | | |
| F11 | Volume control Scrolls through 4 settings | Trigger |

Certain functions are triggered when the function output is turned on (eg horn sound); others are on for the whole period the function outputs (eg locomotive sound). When DCC equipment has function outputs that are latch-only the button must be pressed a second time to turn the function off before the horn can be sounded again with a subsequent function button press. Some DCC equipment (Eg Bachmann E-Z Command Dynamis) has function buttons that can be set to either latch or trigger according to the table above. Please refer to your DCC equipment instructions.

## Use of the model on DC

The default setting for this locomotive is that it will also run on a DC power supply but without sound. The use of use of PWM / Feedback controllers is not recommended with this model. Do not use the loco on a layout where an electronic high frequency track cleaner is connected.

## Hints for best results

The operation of the DCC sound decoder requires that the power to the model is not interrupted. Track, wheels and pickups should be kept clean and all railjoiners must give good connections between sections of track. Improved reliability of DCC performance may be obtained by deselecting DC operation of the model. This is controlled by CV29, Bit 2

## CV Programming

The *Configuration Variables* - CVs - hold values within the processor of the decoder which control its performance characteristics. They can be changed as many times as required using an appropriate DCC command unit or standalone programmer. This is an extremely sophisticated decoder with a large number of programmable features. The table overleaf contains an extract of some of the most commonly required. (The full CV list is available from www.bachmann.co.uk). The table shows the purpose of and the default value for the CV and the range of values it may hold. Some CVs can contain a value from a range (eg start voltage) whilst others use the individual 'bits' of the CV to act as on/off switches for features (eg direction of operation). **Inappropriate CV values may cause the decoder to operate incorrectly: If in doubt please take advice from your retailer or Bachmann Europe plc.**

## Operating the model

Some effects operate automatically; others are under the control of the operator.
"Notching" gives engine sound regardless of speed of the loco to allow the operator to achieve the desired effect on the layout: for example a slow moving loco could be either a light engine making little engine sound or be dragging a heavy train making lots of noise.

| | | |
|---|---|---|
| F5 | engine revs up | (unless your equipment can set functions to 'trigger' now press F5 again) |
| F6 | engine revs down | (unless your equipment can set functions to 'trigger' now press F6 again) |