

Decod12/13 (revised)

MERG Decoder with back-EMF feedback and 'stealth' mode.

This is the latest in the MERG DIY decoder line and follows on from Decod10 and Decod11. It has a significantly improved specification and performance over the previous designs but retains the constructional principle of being on single sided PCB which can be 'folded' to make either a long thin design or a short fat design. The absence of any 'through holes' in the PCB makes for easier DIY construction but not the smallest possible format.

What's new in Decod12

Long addressing as well as short.

Function setting now in accordance with the NMRA recommended practice.

User settable acceleration and deceleration rates.

Slow down and speed up on direction reverse.

Page mode and direct (bit) mode programming.

Full back EMF feedback control which can be set on or off with a CV.

Two non-feedback motor modes

1. Low frequency PWM (88Hz non-adjustable)
2. HF PWM (DC equivalent) at 15625Hz

Two feedback modes

1. Low frequency PWM (88Hz non adjustable)
2. HF PWM (15625Hz) with special low speed control.

The feedback uses a PDFF algorithm. The integral gain (K_i), the proportional gain (K_p) and the filter factor (K_f) are all adjustable with CVs so the feedback can be tuned to the motor. When used in the HF mode it is ideal for coreless (Escap / Faulhaber) motors but is equally suited for standard 'can' motors where the usual buzz is non-existent. Another advantage of HF PWM is both the motor and decoders run much cooler.

The code on the website is the latest version written by Gil Fuchs. (called dec131). This has been fully tried and tested in a number of different locos and seems to perform well. The full provision of RP9.2.4B has not been implemented in this code version. In the absence of DCC it always reverts to analog running but has the advantage that it will run on very low analog voltages (about 3v minimum) so performance on non-DCC layouts is excellent. A fully compliant version is in development.

Mike Bolton

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