



## Model Electronic Railway Group

### MERG DCC System Technical Note Software for the accessory decoders.

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This description covers accessory decoder code version 4.

Following from the various problems users have had with the MERG accessory decoders and Lenz systems, I have made some changes (with help from Rod Lancaster) to give a Lenz compatibility mode in addition to the original.

Rod had changed the PIC code so it could be programmed with a Lenz Compact and also with programmers that were limited to CVs upto 255. (Officially, accessory decoder CVs start at 513.) For Lenz compatibility, I have added another CV of CV545 (CV33 for low range programming).

The timing range is still in multiples of 10 milliseconds - 1 to 255 - or if set to 0 then is continuous on.

Programming modes available now are:

#### **1. Register mode**

Set register R6 to 0 (R6 is the page register)

R1 is decoder address (0 to 63)

R2 is time for output pair 1. (0 to 255)

R3 is time for output pair 2. (0 to 255)

R4 is time for output pair 3. (0 to 255)

R5 is time for output pair 4. (0 to 255)

R6 is the page register. Must be 0 for register mode.

R7 is the version number. Fixed at 4.

R8 is the manufacturer. Fixed at 165 for MERG.

#### **2. Page mode or direct mode** (will accept either)

CV513 or CV1 low address bits (0 to 63) Default = 1

CV514 or CV2 output on or off. (0 to 255) Default = 255 (all on)

CV515 or CV3 time for output pair 1. (0 to 255) Default = 5

CV516 or CV4 time for output pair 2. (0 to 255) Default = 5

CV517 or CV5 time for output pair 3. (0 to 255) Default = 5

CV518 or CV6 time for output pair 4. (0 to 255) Default = 5

CV519 or CV7 Version number set at 4.

CV520 or CV8 Manufacturer's ID set at 165.  
CV521 or CV9 high address bits (0 to 7) Default = 0.  
CV541 or CV29 Configuration (set to 128).  
CV545 or CV33 Lenz (toggle) mode. See notes below. Default = 15.

CV513 and CV521 together form a 9 bit binary address for the decoder giving a range from 0 to 511. (512 possible decoders).

CV545 (CV33) now gives the ability to set individual output pairs into a Lenz compatible toggle mode. Each of the low four bits of this CV, if set to 1, enables toggle mode for that output pair. The decoder actually has 8 outputs but these can be paired as 1a,1b - 2a,2b - 3a,3b - 4a,4b when used for point motors or dual aspect signals. When in toggle mode, an activate signal sent to 1a will automatically turn off 1b and vice versa. Further, as some Lenz systems seem to send continuous activate packets, the output will only give a single pulse (provided the time is not set to continuous) irrespective of subsequent activates. This prevents all possibility of point motor burn-out and allows the MERG CDU to recharge after each pulse. In this toggle mode, there is no need for any deactivate packets, their presence will be ignored.

Individual pairs can be set to toggle mode and others left in normal mode. In normal mode, each output is individually controlled with activate and deactivate packets. However, where an output needs to be on while a button is held down (continuous activates) you can set to normal mode with a time set to whatever is needed to avoid 'flicker'. This depends on how often the activate command is refreshed. The output will now cease when the button is released (plus whatever the pulse time is).

The default for the Acc4 PICs will be with toggle set on all outputs. They will then be compatible with the MERG accessory encoder and Lenz systems without modifying the CV545. Only where individual outputs are needed, as in signalling or lighting effects will CV545 need setting to normal mode.

Acc4 will work with both types of MERG accessory decoder, the CDU (pulse) type and the steady state (Tortoise) type. However, for a steady state output, the time CVs must be set to 0. The default is for pulses of 50 milliseconds to suit the CDU. I have tested the program with a computer simulation of a Lenz system.

## Updates

There is a new version of the code which allows a decoder to work in dual mode. This can give 8 separate outputs when used with a Lenz system (Acc5). The code is available for download as well as a description (acc5txt.pdf).

The late Stefano Curtarolo provided an alternative, this is also available for download. It supports the "Accessory decoder configuration variable access instruction". This instruction is similar to a OPS program mode for accessory decoders. NCE and SYS1 stations support this useful instruction and they make life much easier. The version for PIC16F628 is dbacc5. It should work with the PIC16F627 too. The F628 is supplied with the MERG kits.

Mike Bolton.