CT SL51-4 Extended Function Mapping

The Purpose of Function Mapping

There is an NMRA standard for mapping decoder functions to buttons in DCC, and these are supported by the SL51-4 too. However, the NMRA standard only defines how the first few functions can be mapped, as it was developed before any decoders appeared on the market with many more functions. The SL51-4 provides 8 physical function outputs which can be used for things like lighting, smoke units, couplers/decouplers and just about any other electrical device you can dream up which could fit in the train.

The SL51-4 provides 4 function outputs ready-wired so you can just attach the wires directly to your lighting etc. as well as a further 4 function outputs provided via solder pads. A total of 8 function outputs is *very* respectable, and is the most I've come across to date on a decoder of this scale and price range - most decoders have just 4, such as the LokSound 3.5 decoders, and Zimo's MX640 has 6.

On top of these 8 physical function outputs, you also have the sound effects which you may want to control with the press of a button. There are 7 auxillary sound effects available for this purpose on the SL51-4, plus you need a button to switch the main running sounds on and off. So, in total if you used all the functions and all the sounds, you might want up to 16 function buttons (8 outputs + 7 sounds + main sound)! This means CT have had to provide some non-standard CVs to allow for a wider mapping range.

CV(s)	Purpose	Comments
33-46	NMRA standard function mapping	These CVs follow the standard NMRA guideless for how CVs should be mapped.
163-176	CT extended function mapping	A combination of CVs from 33-46 and 163-176 provides full mapping of all the SL51-4's 8 function outputs and sound effects, as well as shunting mode and main running sounds. You really need to calculate the values for both ranges of CVs at the same time to map the functions properly.

To help you calculate the correct values for the desired function mapping, you can use the table below. Each Function Key has 2 CVs associated to it, and by setting the corresponding bits in each of those 2 CVs you can define which functions/sounds that key controls. A single function key could control multiple actions if you wanted it too, such as synchronising a firebox light with the sound of coal shovelling.