



# Rail-Built Buffer Stop

**4mm scale / 16.5mm gauge bullhead rail-built Buffer stop with realistic working red Oil lamp**

**Suitable for all 4mm scale layouts. Works with code 100, code 82/3, code 75 or BS95R bullhead rail. Available in 2-packs. Ready-to-use in OO & as a simple kit for EM1 or P4.**

Rail-built buffer stops were used in all regions and areas and as with most of the basic infrastructure did not change with the grouping, the post WW2 formation of BR or even privatisation. While styles varied a little area by area, examples similar to this nominally M.R. styled buffer stop can still be found on sidings, in yards and on the edges of railway stations across the United Kingdom.

## Easy to install.

When fixing in place, apply the glue sparingly. We think it is better to ally it to the rail to which the buffer stop will be secured and if you use only a little, it will be invisible. Use just enough to hold it in position.

**Bullhead rail:** If using copper-clad based track, simply locate the buffer stop in the correct position and glue. If chaired, remove the chairs and after securing it, apply chairs split in half from each side.

**Flat-Bottom Rail:** Code 75 and code 83 - Simply secure the Buffer stop in position. Code 100 may need the insides of each rail filing just a little to allow it to slip easily over the rail-head. Take your time and be careful, as this is a "dead scale" item and reasonably delicate.

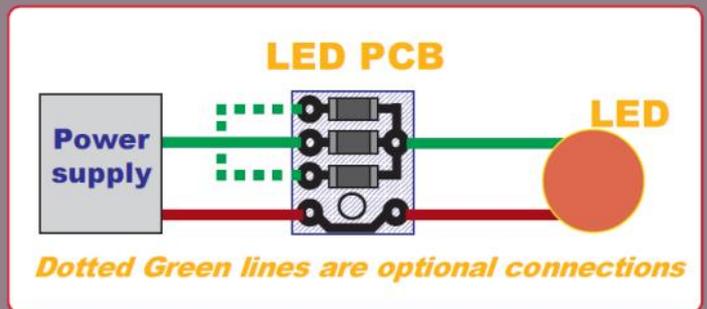
## Easy to wire...

The wire attached to the lamps is only 0.12mm thick so is easy to dress invisibly in the buffer stop.

We recommend you run it behind the cross-beam and down under and between the two rails. It can be securely held with superglue which works very well with both the lacquer on the wire and the polycarbonate of which the buffer-stop is made. Please do not use solvent based glues as they just may dissolve the insulating lacquer and create short circuits.

## Connection...

You may use DCC, AC or DC to power the red lamp. We recommend 6~12v DC or 9~15v AC. DCC track voltage is of course acceptable.



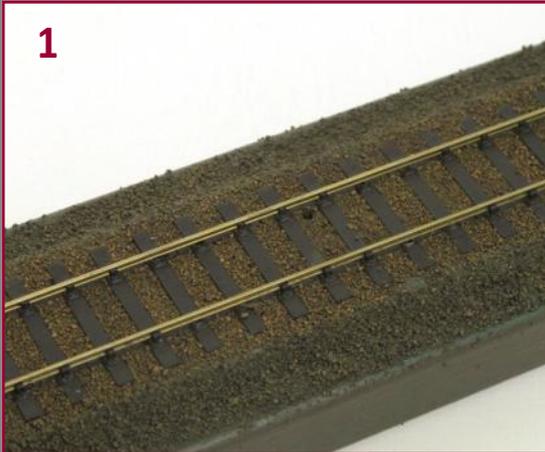
However **no matter what power source you choose** you must use the mini-PCB supplied OR a resistor of at least 1k ohms in one lead of the buffer stop, if you do NOT you will risk damage to the Micro-LED in the lamp.



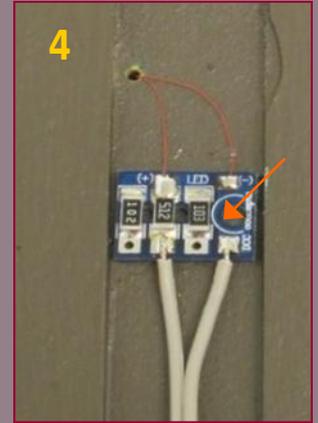


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## A Step by step installation and wiring guide



I can be powered  
with AC, DC  
or DCC  
(6~15v)



### Simple Installation Instructions:

(Please treat your Buffer stops gently - finer scale items can be fragile)

- Ballasting, painting/weathering of rails and basic buffer stop painting should be done before installation. We think final weathering is best done after installation - but that is up to you of course!
- STEP #1: if you are using chaired bullhead track, you'll need to remove chairs to allow the horizontal parts of the buffer to sit properly. (split chairs and add back either side after installing).  
With flat-bottom code 75/83/100 track it will sit in place with no need to remove spikes or rail clips.  
Once the position for the buffer stop is prepared, drill a small hole inside the rail on the left side (Left when facing the buffer—see photo 1)
- STEP #2: carefully feed the wires through the hole. Put a small amount of glue (CA is fine) each side of the rail where the buffer stop will be fitted. (transfer with a pin, not from the tube). Ease the buffer stop into place so the rails are flush with the track railhead and squeeze gently for several seconds to secure in place.
- STEP #3: Mount the small PCB supplied with the buffer stops as shown in image#4 above. We used double sided tape but the screw hole (arrowed) will accept a #4 / 3mm screw if you prefer.

The longer wire is Positive. Cut the wires to length, gently scrape away a little of the lacquer coating and solder them to the appropriate terminals of the PCB.. Solder the RH power supply wire to the small PCB and connect power. Watch the buffer stop light and then touch the second power supply light to each of the 3 resistor terminals. Make your choice of which light level you like then solder it in place.

NOTE: LEDs are polarity sensitive—if it does not light, reverse the wires.



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Being a little creative - Using decoders to turn them on and off, vary the light level and even add in some interesting variety to add "micro detail" to your layout.

Using a decoder to control things like our illuminated buffer stops can have some real advantages. It simplifies wiring and it is very, very economical as one 4 function loco decoder could give you control of quite a few buffer stops and a whole lot of yard lamps...

## Our suggestion.

Here is our suggestion to control all non-railway items in a marshalling yard or loco facility using only one 4 function decoder: We use lots of loco decoders for things like lighting as it reduces wiring for a building with several independent light functions to just two wires attached to our accessory bus! We reserve decoder numbers in the 1 to 99 range for this kind of accessory use so its easy to manage.

- Motor control to any yard office chimney to control a smoke unit (or, if used to switch a relay, several of them could be controlled)
- Function 1 to yard building internal lights
- Function 2 to yard lamps & building exterior lights
- Function 3 to most buffer stops.
- Function 4 to just a couple of lamps... Dimmed right down and set to flicker like a lamp that is badly in need of oil or trimming of the wick

The above is for Steam era modellers... Modern image can be accommodated too, as it is very easy to add flashing lights and strobes just by changing light function settings!

## Wiring it up is simple.

The diagram printed on the next page will give you the basics of wiring accessories via a decoder and the drawings that make up the balance of this page, along with current draw estimates for several items that might be used will give information you need to do it for yourself.

So... from now on, you can add a little "Interactive magic" to your layout any time you like, any way you like. You really are only limited by your imagination.

## Some tips for wiring:

- To remove the lacquer insulation from the fine wire scrape gently with a scalpel blade or use strong solvents such as acetone.
- The very fine copper wire is of course delicate so please secure the mini-PCB with a #4 wood screw (a hole has been provided) under the baseboard to prevent accidentally pulling on the wires.
- Consider using a 4 function decoder for a fan of sidings so they can be set up differently. Establish a light level by choosing the appropriate resistor, then adjust dimming on individual lamps with the decoder - you could even use "firebox flicker" to simulate a lamp that is badly in need of trimming!

(See following page for example & wiring diagram)

## Calculating Accessory current draw:

*LED Values indicated are max with 1k or more resistor. The motor drive should not be loaded above 500mA for a constant load (it will handle more but will warm up if load for motor and all functions is on all of the time).*

*Each of the 4 independently controllable active decoder functions can handle about 150mA (0.150 amps)*

*Use the values below to calculate how many of any item a function can manage comfortably. If you wish to add a load higher than is "safe", then you can use the function to switch a relay that will turn higher current items on and off.*

- \* DCCconcepts Buffer stops: 3mA (0.003 A)
- \* DCCconcepts loco lamps: 3mA (0.003 A)
- \* DCCconcepts Proto-white LED: 5mA (0.005 A)
- \* Standard red LEDs 3mA (0.003 A)
- \* DCCconcepts Station lamps 30~50Ma (0.05 A)  
(The actual value really depends on supply voltage)
- \* Seuthe smoke Units (average) 120mA (0.12 A)  
(The actual value really depends on supply voltage)



# Rail-Built Buffer Stop

Add some creativity to layout lighting control.  
Using a decoder makes it very simple indeed !

Smoke powered by  
Motor Drive



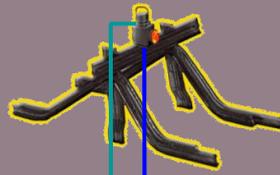
Building Lights  
F1 / White wire



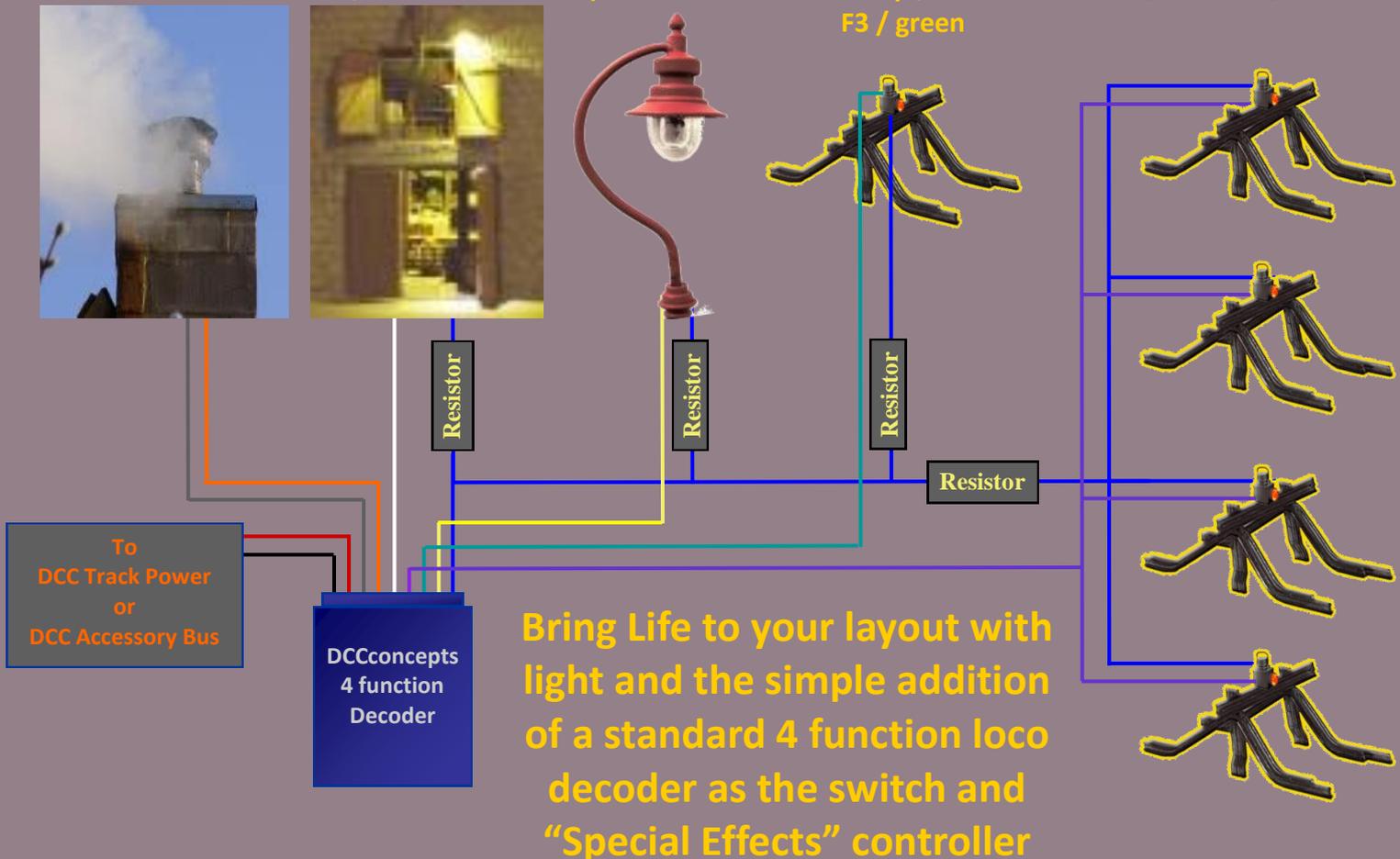
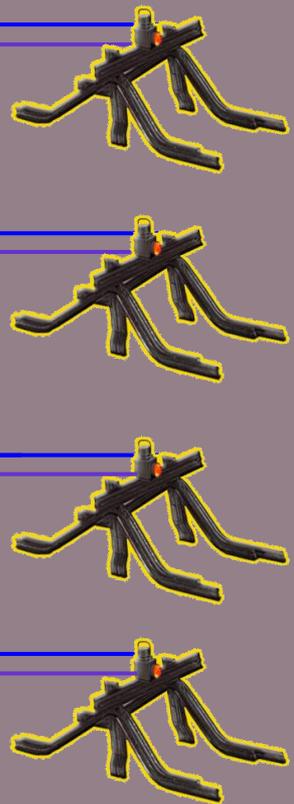
Yard Lamps  
F2 / Yellow wire



Buffer stop with  
dim lamp / flicker  
F3 / green



Yard Lamps with steady  
Lamps F4/ Purple wire



Bring Life to your layout with  
light and the simple addition  
of a standard 4 function loco  
decoder as the switch and  
“Special Effects” controller

## Choose the decoder address - Then use these CV Settings for this example:

### For MOTOR DRIVE:

To give quicker reaction when turned on, and still give you adjustment of smoke - try CV2 to 100, CV6 to 180 & CV5 to 250

For WHITE Wire: (F0 will turn it on)

To give constant light set CV49 to 32. (Start with resistor at 1k ohms / Adjust resistor value if you want to change light levels)

For YELLOW Wire: (F0 will turn lamps on)

To give constant light set CV50 to 32. (Resistor will depend on current draw. For DCCconcepts lamps use supplied resistance)

For GREEN Wire: (F1 will turn it on)

For random flicker set CV51 to 33. For a lower level experiment with resistors / small control PCB provided with the buffer stop.

For PURPLE Wire: (F2 will turn it on)

For steady light, you can leave CV setting as is (CV52 = 32)

Use the small control PCB provided please.

**NOTES:** For comprehensive setting advice in a really easy to read format use our Decoder Instruction cards - 52 colour coded cards that explain it all in simple and easy to understand language, ... Installation to tuning, function mapping & troubleshooting.