

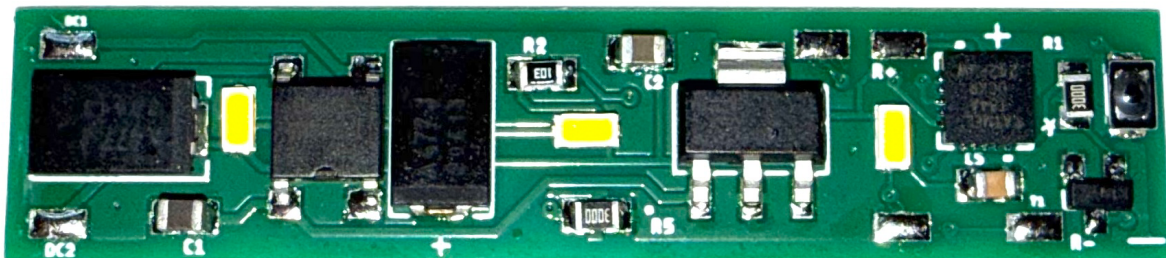


Model Train[™]
TECHNOLOGY

CABOOSE LIGHTING for DC Layouts N/HO OPERATIONS MANUAL

DC SERIES

Version 2.1a



INTRODUCTION

This Caboose board is design for DC layouts. It can also operate on DCC layouts. There is no difference in function or setup in either case.

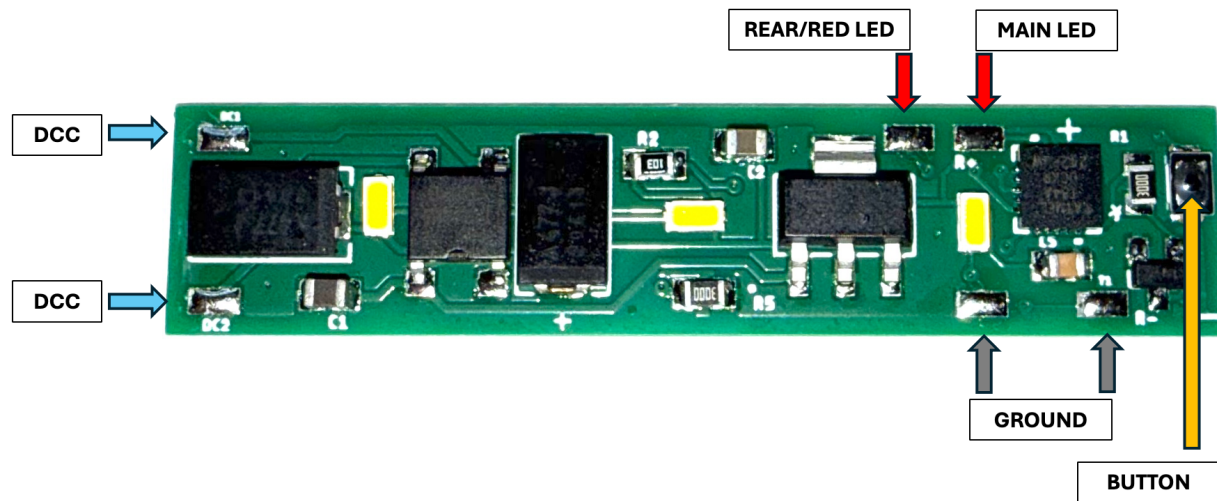
The MAIN LEDs are always on. The onboard circuit will come alive at approximately 4-5v DC. The Caboose board for DC has 2 SuperCaps which help with flicker control.

The main and rear LED brightness is adjustable via the onboard pushbutton. The rear LED has an option to blink at ½ second per blink.

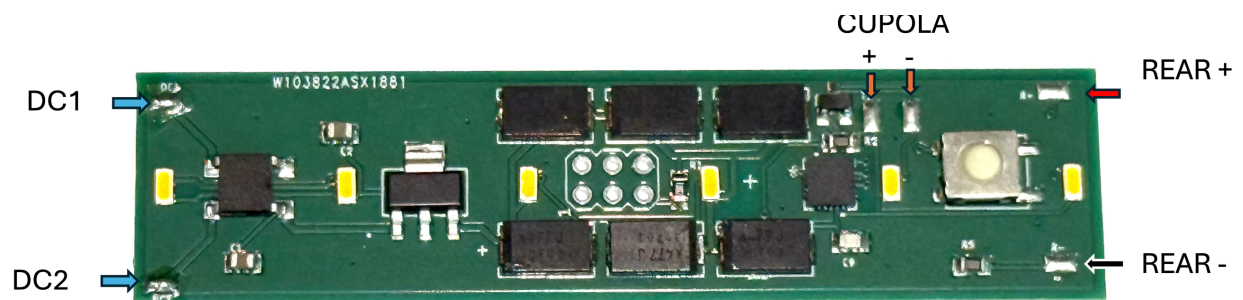
The onboard microprocessor will keep both the main and rear lights on at a steady brightness at and above 5V. Below 5-7v the brightness may fade up or down depending on the throttle voltage.

This board will safely operate at HO voltages up to 16V. It should NOT be operated at G scale voltages of 18v and above.

N SCALE DC CABOOSE:



HO SCALE DC CABOOSE:



SETTINGS

Adjusting the MAIN LED brightness

To adjust the brightness of the MAIN LEDs, press and hold the button. While holding the button, the LEDs will increase in brightness. Once you release the button, the current brightness setting is automatically saved.

If you press and hold the button again while the board is still powered, the lights will decrease in brightness down to the lowest level. When you release the button, that setting will be the new brightness level.

The direction of dimming toggles up and down with each subsequent press and hold. The direction is always up or increasing brightness when you first apply power.

Adjusting the rear red LED brightness

The technique for adjusting the rear LED is similar to the process used for the MAIN LEDs with one change. FIRST, press the button twice. Within 1 second the LED connected will flash twice. THEN, within 2 seconds of seeing the LED flash, press and hold the button. You will see the rear red LED brightness goes up or down depending on what that last direction for the light adjustment was. When you release the button, the brightness setting of the rear LED will be automatically saved.

Turning the rear(red) LED on and OFF

To activate the rear LED, press the button three times. This feature is a toggle so pressing the button again three times turns the LED off

Activating the FLASHING MODE for the rear LED

To activate or deactivate the Flashing Mode of the rear LED, press the button four times. This feature is toggled on and off with subsequent three presses of the button

RESET

To reset the board to factory default settings, press the button 8 times. When complete, the blue LED will flash 8 times.

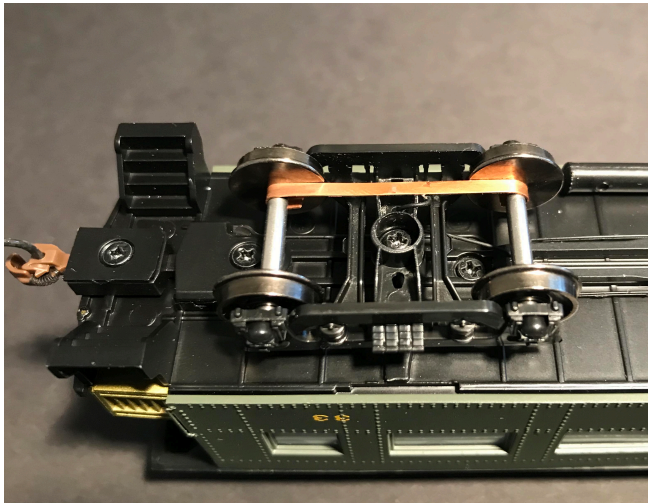
Functions Summary:

FUNCTION	BUTTON
Main LED adjust	Press and Hold
Read LED adjust	2+, blink, then hold
Read LED on/Off	3
Read Flashing On/Off	4
Reset to defaults	8

FLOATING BRASS WHEEL PICKUPS

We have had the good results with KATO® passenger cars largely because they come with wheel pickups. One of the reasons we made these boards is that the rest of the KATO® lighting system is very “wimpy”. With KATO® we have found that the best hook up is to solder the wires to the very end of each of the two long copper strips that make contact with the wheel pickups. We tried to use a variation of the copper strip that slips inside and makes contact with the longer metal strips – it “sort of” works. Depending on the version of the board you purchased, you may have as many as 8 capacitors that are designed to reduce the flicker effect that comes from the physical “noisy” pickup and the wheels. In testing we found that this was still not enough to overcome a bad connection to the long metal strip. Soldering the two board wires directly to the long metal pickup improved the overall performance dramatically.

For all other cars that are not pre-configured with electrical pickups, we recommend our “floating” brass strips. A single 1mm or 2mm piece of brass is wrapped around each axle of the truck at either end of the car. Then, a 36AWG stranded wire (supplied) is soldered to the brass and connects to the DC1 and DC2 on the board. The reason we call this “floating” is that it is NOT fastened to the wheel truck. This allows it to shift with the movement of the axle and doesn’t bind the wheel. ALL the other types we tried required you to fasten their metal contact to the truck with a screw or by glue. This tends to put extra pressure on the wheel or axle and causes it to pinch inside the truck wheel holder. It also adds friction that cause the car not to roll freely.



The width of the board is 11.5mm. In a few situations you may have a better fit at about 11mm. For example, this was the case for the Amtrak Skylight car. It's perfectly ok to sand down the edge of the board up to a total of about 1mm. Use your good judgement on this. The underside of the board is ground (GND), and you can see that it starts a little bit away from the edge of the board. I know it's hard to see but wiggle the board under a light to see the reflective difference. Consider up the edge of the GND a safe zone for filing and sanding. I use a piece of 220 grit paper on a flat surface and slide the edge of the board over it. The PCB material is fairly soft so don't go overboard!

These boards are NOT designed to be shortened lengthwise. We have two lengths available for N Scale: 124mm (4 7/8") and 144mm (5 5/8") . If this doesn't fit your requirement, contact us to see if we can include a custom sized version in one of our manufacturing runs.

ELECTRONICS AND STATIC ELECTRICITY

The circuit board and components are exposed. Static electricity can cause component failure. Scuffing along a carpet and then touching one of the component connectors can cause a static spark. These components are fairly rugged – some designed for the automotive industry. Just be mindful of the risk. The current on the board will not harm you if the board is powered as per the instructions.

ONE YEAR MANUFACTURER WARRANTY: We warrants this **product** to be free from defects in workmanship and materials, under normal residential use and conditions, for a period of one (1) year for the original invoice date. Shipping and handling fees are to be paid for by the customer.

LIMITATION OF LIABILITY

UNDER NO CIRCUMSTANCE SHALL COMPANY OR ITS AFFILIATES, PARTNERS, SUPPLIERS OR LICENSORS BE LIABLE FOR ANY INDIRECT, INCIDENTAL, CONSEQUENTIAL, SPECIAL OR EXEMPLARY DAMAGES ARISING OUT OF OR IN CONNECTION WITH YOUR USE, OR INABILITY TO USE THE PRODUCT, WHETHER OR NOT THE DAMAGES WERE FORESEEABLE AND WHETHER OR NOT COMPANY WAS ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. WITHOUT LIMITING THE GENERALITY OF THE FOREGOING, COMPANY'S AGGREGATE LIABILITY TO YOU SHALL NOT EXCEED THE AMOUNT OF THE PRODUCT. THE FOREGOING LIMITATION WILL APPLY EVEN IF THE ABOVE STATED REMEDY FAILS OF ITS ESSENTIAL PURPOSE.



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Version 2.1a

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