LOGIC RAIL™ TECHNOLOGIES

"Sophisticated Model Railroad Electronics"

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Signal Tester (ST-1)

Instructions

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Getting started

Thank you for purchasing a ***Logic Rail Technologies*** product! Please read all instructions prior to using this board.

The *Signal Tester* provides an easy way for you to test LED-based signals using a common 9V battery (not included). It can be used with signals wired in a common anode (positive) or common cathode (negative) configuration. Most commercial model railroad signals are wired with a common anode (e.g. Tomar, BLMA, Details West, NJ International) but a few use a common cathode (e.g. Atlas, Tomar searchlight signals). The *ST-1* includes current-limiting resistors to provide safe LED currents so it is meant to be used with model railroad signals that do NOT have resistors already attached (e.g. NJI signals typically come with resistors installed). The board has color-coded screw terminals for ease-of-use. In addition to simply testing the working condition of a signal, it is great for identifying the wires on signals constructed with magnet wire (e.g. BLMA). A mounting hole & a 3-position switch are provided so that you can temporarily mount a signal & cycle the colors.

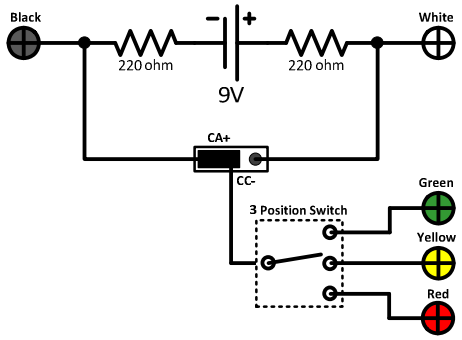
Specifications

The *ST-1* has the following technical specifications:

Input power:	Standard 9V battery
Integrated resistors:	220 Ω, ¼ W (qty 2)
LED current:	~15mA *

* Based on a new battery and an LED with an "on" voltage of 2.1V

The wiring schematic for the *ST-1* is shown below. As you can see it is quite simple, as it should be! The following sections will illustrate the various ways to use the *ST-1*.



Attaching the standoffs and connecting a battery

Insert one of the enclosed 4-40 bolts through one of the corner holes. Using your fingers screw on one of the enclosed standoffs from the underside. Repeat for the other 3 locations. The *ST-1* accepts a standard 9V battery. Carefully align the posts from the battery with the connector on the *ST-1*. You may want to put a finger or two under the board to support it and to minimize flexing. Figures 1a and 1b below show the *ST-1* before and after the battery has been installed.

Figure 1a – *ST-1* before battery installation

Figure 1b – *ST-1* after battery installation

"Stripping" magnet wire

Some model railroad signals are constructed with very fine wire ("magnet" wire) which can appear like bare wire! It actually has a very thin enamel coating on it for insulation. The wires should already be "stripped" to the bare conductor but if not, you can dip the wire tip into lacquer thinner or CAREFULLY burn it off with a soldering iron tip or lighter.

Identifying the common wiring scheme

As previously mentioned, most model railroad signals are wired in a common anode scheme. However, if you're not sure about your signal just GUESS! Use either of the approaches below in testing a single LED. If you assume common anode and the LED lights up then you've guessed correctly! If the LED doesn't light up, then reverse the common lead and "color" lead connections; if the LED then lights up then you know that the signal has a common cathode. In either case, label those wires!

Testing one LED

Figure 2a illustrates the connections you need to make to test a single LED in a signal wired with a common anode (positive). Note the position of the little jumper (circled below). The common wire should be easily identified by the manufacturer. For example, in BLMA's signals the common is red whereas the "color" leads are all the same silver-looking color! Use the *ST-1* to test AND label the signal wires!

Figure 2b illustrates the connections you need to make to test a single LED in a signal wired with a common cathode (negative). Note the position of the little jumper (circled below). The common wire should be easily identified by the manufacturer. Use the *ST-1* to test AND label the signal wires!

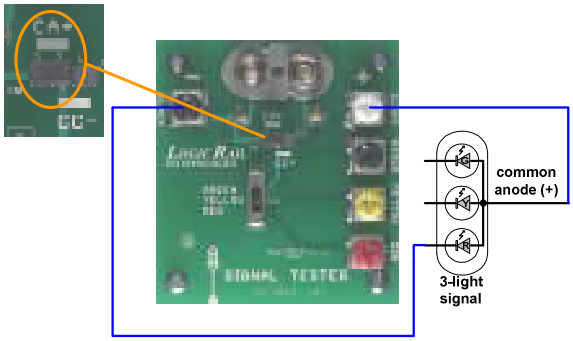


Figure 2a – Testing one LED with a common anode (positive)

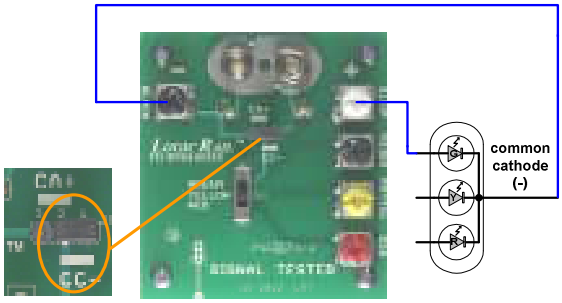


Figure 2b – Testing one LED with a common cathode (negative)

Mounting and wiring a signal

The *ST-1* provides a mounting hole so that you can temporarily mount a signal. The hole is just to the left of the 3 position slide switch. Do NOT enlarge the hole as this will void your warranty! Fold any labels and insert the signal wires through the hole and then connect them to the appropriate terminals on the top of the *ST-1* (refer to Figure 3a or 3b accordingly). You can temporarily "tack" the signal to the *ST-1* using a bit of poster mounting putty (available at Walmart, etc).

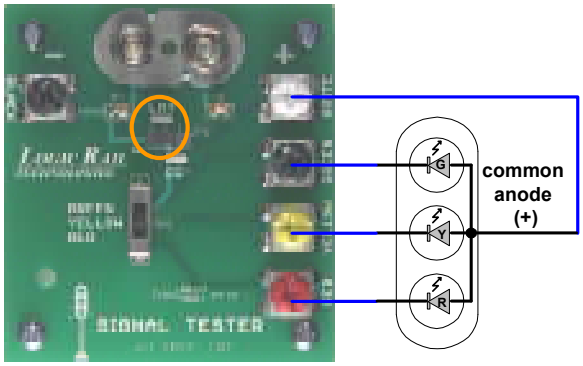


Figure 3a – Wiring a common anode (positive) signal

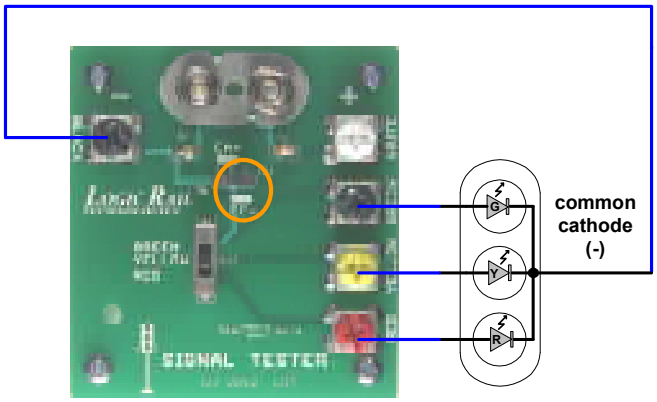


Figure 3b – Wiring a common cathode (negative) signal

Cycling the signal colors

The *ST-1's* on-board switch provides a way for you to cycle through the various signal colors. Once you have the signal wired, according to the previous section, you simply move the slide switch to the desired color! To conserve battery power just remove the little black jumper and place it over any one of the 3 posts. Replace it exactly as before to power on again.

Warranty

This product is warranted to be free from defects in materials or workmanship for a period of one year from the date of purchase. ***Logic Rail Technologies*** reserves the right to repair or replace a defective product. The product must be returned to ***Logic Rail Technologies*** in satisfactory condition. This warranty covers all defects incurred during normal use of this product. This warranty is void under the following conditions:

1) If damage to the product results from mishandling or abuse.
2) If the product has been altered in any way (e.g. soldering to the board).
3) If the current or voltage limitations of the product have been exceeded.

Requests for warranty service must include a dated proof of purchase, a written description of the problem, and return shipping and handling ($6.50 inside U.S./$15.00 outside U.S. - U.S. funds only). Except as written above, no other warranty or guarantee, either expressed or implied by any other person, firm or corporation, applies to this product.

Technical Support

We hope these instructions are sufficient for answering any questions you have about the use of this product. However, if you need technical support we would ask that you first contact your place of purchase for assistance. If you still need further assistance then please contact us via phone, mail or email; our contact information can be found on the top of page 1.