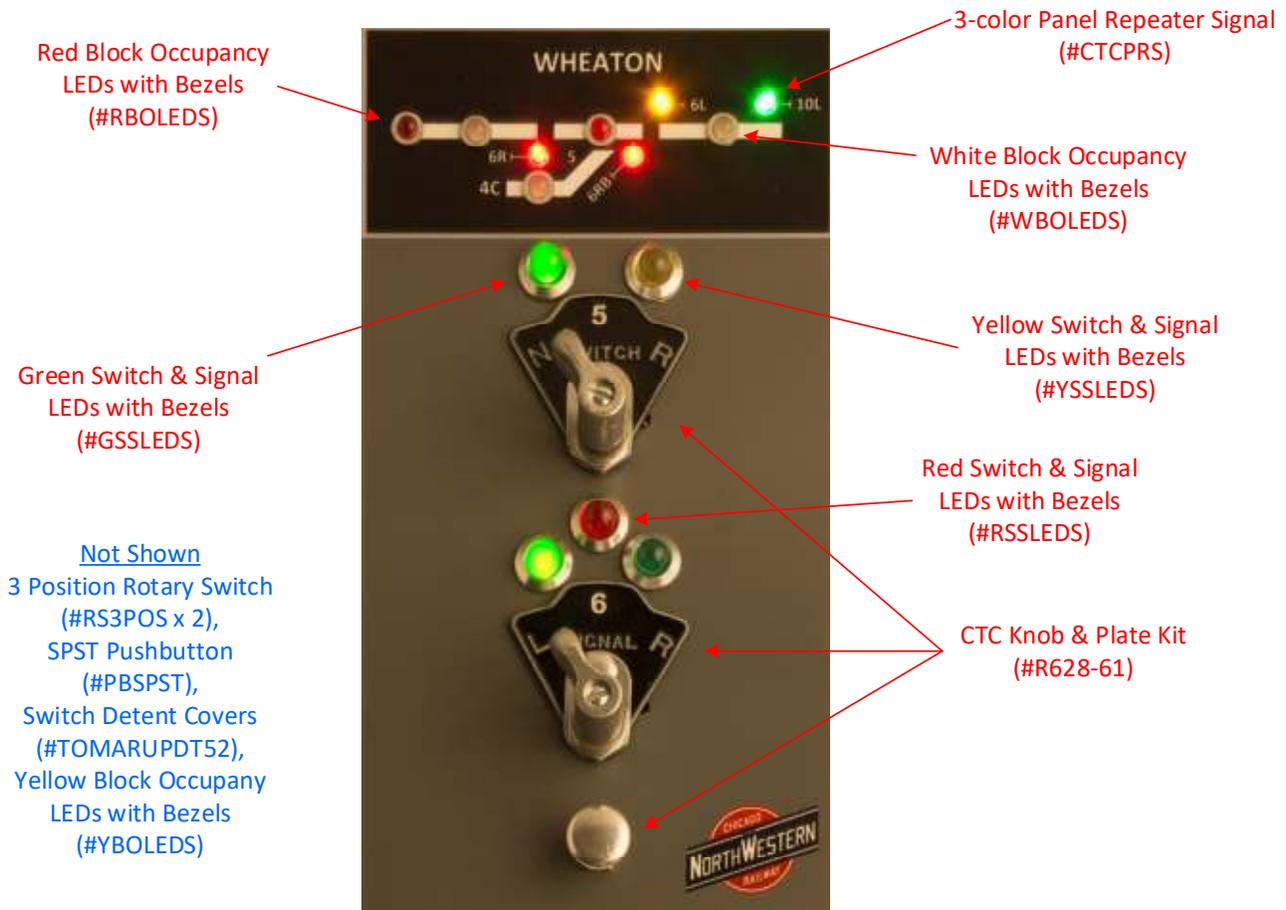


Getting started

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

Block occupancy indicators serve an important role on a model railroad CTC panel or general track diagram panel. Knowing where trains are located assist operators and dispatchers. Below is a picture of example usage on a CTC panel managed by a dispatcher. Other CTC panel items we carry are also designated. Many prototype CTC panels used a white indicator for intermediate block sections. These are shown in the panel below.



This package includes the following items:

- 2 white LEDs (5 mm diameter commonly called T1-3/4 size)
- 2 chrome-painted, plastic mounting bezels
- Current-limiting resistors

LED Technical Specifications

The white LED has the following technical specifications:

Parameter	Value
Current – typical (maximum)	20 (30) mA
Applied DC Voltage – typical	3.2 V
MINIMUM current limiting resistor @ 5V supply voltage	100 Ω, 1/4W
MINIMUM current limiting resistor @ 12V supply voltage	470 Ω, 1/4W
RECOMMENDED current limiting resistor @ 5V supply voltage	2.2K Ω, 1/4W
RECOMMENDED current limiting resistor @ 12V supply voltage	10K Ω, 1/4W

NOTE: the MINIMUM current limiting resistor values will insure that you do not exceed the LED's limits. In our opinion these white LEDs are too bright when using those values. So, we have included two each of the RECOMMENDED value

resistors from the table above. You can certainly use any value greater than the MINIMUM value to suit your brightness liking.

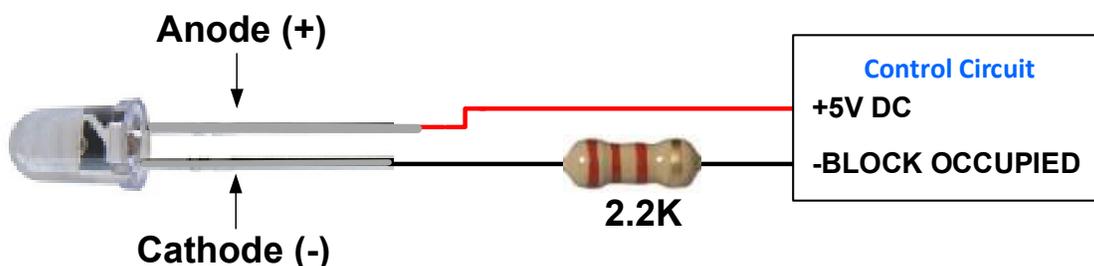
Resistor value	Resistor band colors
2.2K Ω	Red-Red-Red-Gold
10K Ω	Brown-Black-Orange-Gold

Mounting

The mounting bezels require a 0.25" mounting hole. It can be installed in a panel with maximum thickness of 0.100". After drilling the hole and cleaning up any debris carefully push the mounting bezel into the panel from the front of your panel. **Make sure your fingers are clean and free of any oils or grime as this will harm the chrome-painted finish!** Do not use any adhesive at this time!

Wiring for the LED

Choose the appropriate resistor depending upon the DC voltage you'll be using to control the LED. Following the example diagram below connect the resistor in series with shorter lead (cathode/negative). Note: you can elect to wire the resistor to the longer lead (anode/positive) if you prefer; we recommend that whichever approach you take you do it consistently with all panel LEDs. If you're also installing our CTC Panel Repeater Signal you'll see that you must install the resistors on the cathode/negative of each LED element. Please use color coded wires or good labeling! In this wiring example we assume the control circuit will provide +5V DC to LED and has a Block Occupied output which is "active low."



Installing the LED

Once you have made the appropriate connections to the LED you can carefully insert it into the back of the mounting bezel using counter pressure around the front ring of the mounting bezel to keep it in place. Next test the LED illumination using your control circuit. Once you are satisfied that it is operating properly you can secure the LED and mounting bezel from the rear using a non-permanent adhesive. We recommend canopy glue or any similar glue.

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.
- 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 (\$6.00 inside U.S./\$10.00 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 the preceding instructions are sufficient for answering any questions you might have about the installation of this product. However, technical support is available should you need it. You can reach us via phone, email or mail.