

## Installing the Talking Defect Detector for Display

Your **TrainBoss™ Talking Defect Detector** can be installed and configured to support two visual display options with no voice reporting. This guide describes how to do that.

### 1. *Trackside or Remote Visual Display (1940s – Today)*

Starting in the 1940s, railroads began to automate train defect detection without recorded voice reporting. In this “between” era, a trackside detector either alerted a remote operator (who alerted the train crew) or the detector alerted the train crew directly, typically with a flashing light.

Once the train stopped, either: 1) the remote operator identified the defective car/axle to the train crew, 2) the train crew checked the detector for the identified car/axle, or 3) the train crew walked the train to find the defect.

Your Talking Defect Detector can be configured to directly notify train crews of a defect, or to signal a remote operator. Two independent outputs can drive trackside or remote LEDs, semaphore motors, or railroad electronics such as C/MRI. The Defect Detector’s LED display identifies the defect and car/axle.

**Figures 1 and 2** show two options for locating the Defect Detector’s circuit board and Alerting LEDs. The circuit board can be up to 100 feet away from the Axle Sensors for remote operators as shown in **Figure 1**. In **Figure 2**, train crews directly read car/axle information from the Defect Detector. Pressing the **Report** push button displays/repeats the message.

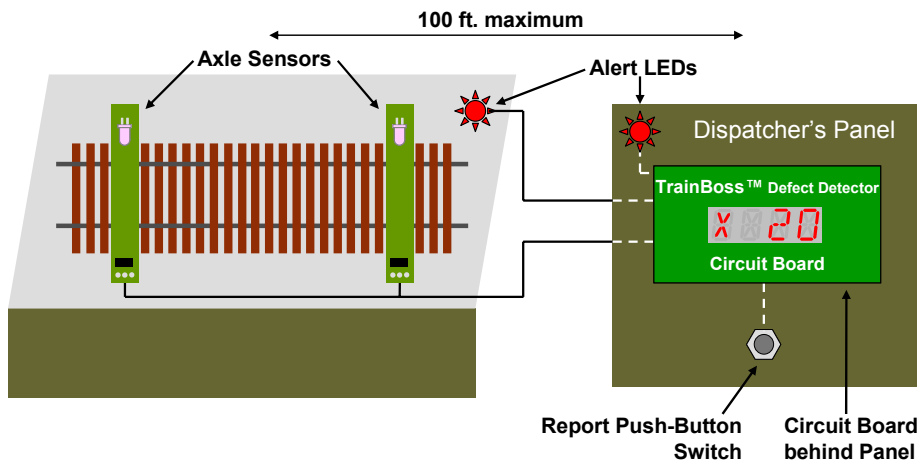


Figure 1: Remote Display Installation

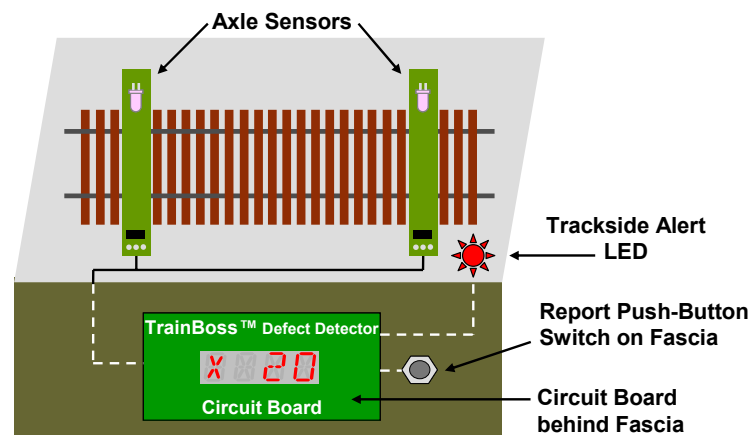


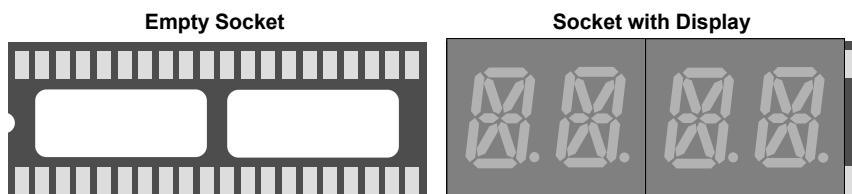
Figure 2: Trackside Display Installation

## 2. Installing the Circuit Board

For Visual Display you must move the Display components from the front of the circuit board to the back before installing the circuit board:

1. Use a small flat-bladed screw driver to gently pry the Display components from their sockets on the front of the circuit board.
2. Straighten the Display component pins if necessary.
3. Insert the Display components into the sockets in the back of the circuit board with the orientation shown in **Figure 3**. The leftmost component pins must be in the leftmost socket holes.

Notice the notch on the left end of the empty socket, the decimal points of the components, and the empty socket holes at the right end once the components are in place.



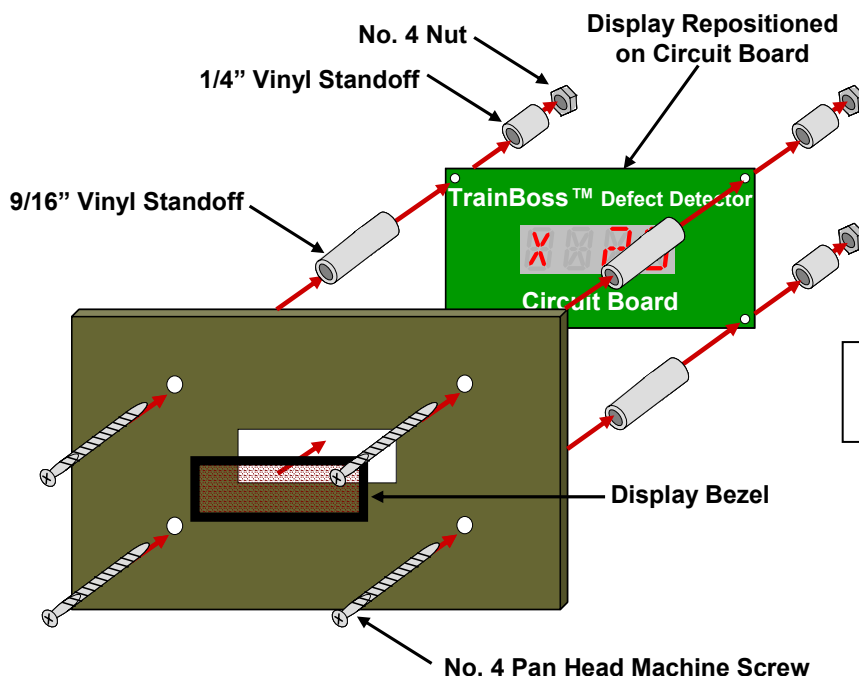
**Figure 3: Display Component Orientation**

Now install the circuit board:

4. Use the Fascia Template (included) to mark the screw and Display holes on your panel. You will need 3" clearance behind your panel or fascia.
5. Cut out the Display hole; drill the screw holes. Check Display Bezel fit.
6. Install the Defect Detector circuit board as shown in **Figure 4**. Slice 9/16" and 1/4" standoffs from the vinyl tubing provided. The screw holes in the circuit board are for No. 4 pan-head screws (not included).

**Warning: Do not enlarge the circuit board holes or over-tighten the mounting screws as this will damage the circuit board.**

7. Snap the Display Bezel (not included) into the Display hole.
8. Trim the 9/16" standoffs to move the Display close to the Bezel as necessary.



**Figure 4: Visual Display Installation: requires Display Bezel (not included)**

### 3. Wiring Instructions

Figure 5 shows how to wire your **TrainBoss™ Talking Defect Detector** for visual display reporting, along with key features on the circuit board.

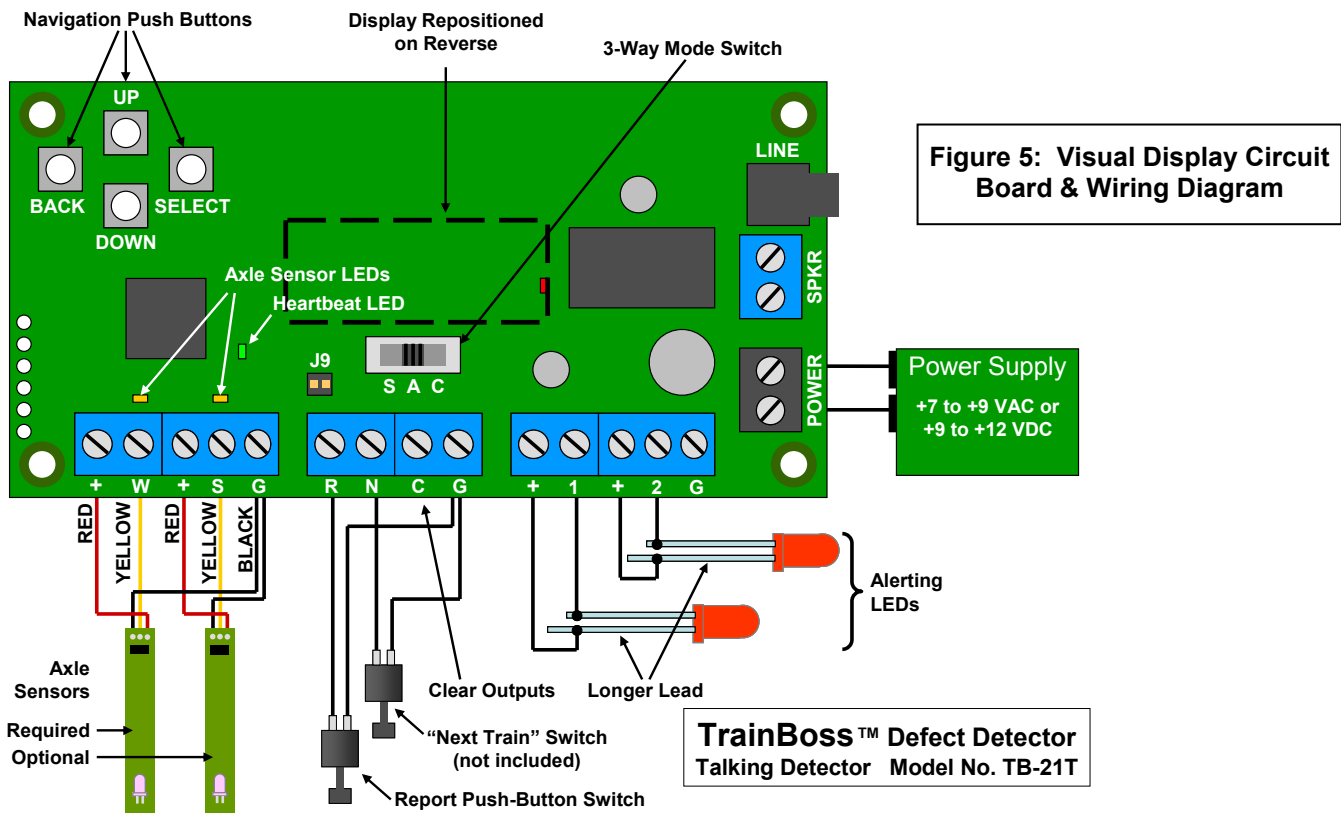


Figure 5: Visual Display Circuit Board & Wiring Diagram

1. Connect two wires from your power supply to the Defect Detector **gray** power terminals as shown in **Figure 5**. Polarity does not matter. The power supply must be 7 to 9 Volts AC or 9 to 12 Volts DC, with 250 mA capacity. Radio Shack sells an AC adapter (#273-314) that works well.

**Warning: Do not exceed 9 Volts AC or 12 Volts DC as this will damage the circuit board.**

2. Connect the RED, BLACK and YELLOW wires from the Axle Sensors as shown in **Figure 5**. If you are installing the speed/length Axle Sensor, **remove Jumper J9**.
3. You can wire single Alerting LEDs as in **Figure 5**. LEDs are polarity sensitive – connect the long and short leads as shown. Visit [www.bouldercreekengineering.com/manuals.php](http://www.bouldercreekengineering.com/manuals.php) for information on how to interface other electronics to these two Alerting outputs. (LEDs are not included.)
4. The **Report** Switch triggers or repeats a defect report. Connect the push button **Report** Switch (included) as shown in **Figure 5** and mount on your fascia.
5. The **Next Train** Switch forces a defect report on the next train when “on”, which is nice for testing. If desired, connect an SPST **Next Train** Switch (not included) as shown in **Figure 5**.
6. Grounding **Clear Outputs** will clear LED Outputs 1 and 2. Visit our website for information on how to interface other electronics to this input ([www.bouldercreekengineering.com/manuals.php](http://www.bouldercreekengineering.com/manuals.php)).

### 4. Testing Your Installation

1. Apply power to your **TrainBoss™ Defect Detector**. The Heartbeat LED should blink once every second. Check your power wiring if it does not.
2. Axle Sensor LEDs should be off. Check Axle Sensor alignment if not.
3. Set the 3-Way Mode Switch to “A”.
4. Break the infrared beam(s) by passing your finger along the track. The Axle Sensor LEDs should flicker. Check your wiring if they do not.

You will see a visual report on the LED Display.

5. Repeat Step 4 by running a train. If axle count is correct, glue your “W” sensor in place.

If axle count is not correct, check the alignment of the “W” Axle Sensor. The infrared beam should just clear the railhead as in **Figure 1** in your **Product Manual**.

If you receive a speed and length report, glue your “S” sensor in place. (Axle count, train speed, and train length are flashed – in that order – for Visual Display installations.) Be sure to program SV 7 (see **Section 8**).

If you do not receive a speed or length report, check the alignment of the “S” Axle Sensor. The infrared beam should just clear the railhead as in **Figure 1** in your **Product Manual**. Also check your wiring.

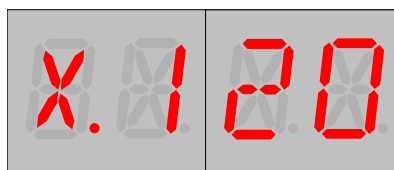
6. **Congratulations**, your Defect Detector is now operational!

### 5. Visual Display Operation

Set the 3-Way Mode Switch to the **A** position – the **C** position will not work. **Mute speech (SV 15) to speed up the displaying of train information.** Five seconds after a train passes, the Defect Detector will briefly display axle count, speed, length, and temperature – in that order – if there are no defects. In case of a defect, a one letter defect code is given as shown in the following table, along with the axle location. **Figure 6** shows a Hotbox on axle 120, north or east rail.

Please refer to your **Product Manual** for instructions on configuring your Defect Detector, Error Messages, and more.

Letter	Defect Type
X	Hot box
D	Dragging Equipment
S	Sliding Wheel
H	High Car
W	Wide Load
L	Shifted Load



**Figure 6: Axle 120 Hotbox, with north or east rail indicated by decimal point on Visual Display**