Dead Strips

Dead strips have a number of advantages compared to other sensing methods that are used with counting/timing systems. There does not have to be a light bridge over the track and you do not have to worry that dirt might obstruct sensors on the track surface. The depth of a car's guide flag is not a factor and only cars that are actually in the slot will be counted. As with any type of sensor it is best to locate dead strips where the cars are least likely to come off. Ordinary dead strips do have several disadvantages, for one thing they will only work properly with the cars running in one direction, if you like to run your track in both directions special precautions must be taken. A second disadvantage to ordinary dead strips is that track voltage can get fed to a computer's port and cause it to burn out. Once again there are ways to minimize or eliminate this problem. Finally of course if you stop your car on the dead strips it will not run! Strips two to four inches long can be used.

With any sensing system a count is triggered when there is a change of state. In the case of dead strips with nothing across the strips there is a voltage present. When a car crosses the strips they are nearly shorted out and the voltage goes almost to zero, that is the change of state. Here is where the problem of polarity comes in, when a car is coasting across the dead strips the motor is acting as a generator. A Scalextric motor turning at 20K RPM puts out 8 volts. If that voltage is the wrong polarity the voltage across the dead strips will not go to zero and the count will be missed. If the dead strips work when they are shorted with a pair of pliers, but only count when a car is going slowly that is a sure sign that the polarity is wrong and that the wires to the computer need to be reversed.

If you like to run your track in both directions you can add a Double Pole Double Throw switch in the wiring to the sensors for each lane.
One way to minimize the chance of track voltage cooking your computer’s port is to have guard strips on either side of the dead strips.

**Dead Strip With Guard Strips**

There is another way of eliminating the threat and that is to put zener diodes across the dead strips. Unlike other diodes, Zener diodes normally only conduct in one direction, the difference is that they also conduct in the other direction once a certain voltage is present and thus they act like a voltage regulator. Zener diodes are available with different voltage ratings, in order to select the correct one you have to measure the open circuit voltage across your dead strips and pick ones that are closest in value. If you are using reversing switches with your dead strips you have to put the Zener diodes in the right place. It is necessary to include a resistor in the circuit or the Zener could burn out. The resistor value would depend on the track voltage, but it probably should be at least 1K ohm.

**Dead Strip Polarity Reversing Switch with Zener Diode**

Several new dead strip arrangements have been developed that eliminate the polarity and track voltage issues. The first of those is what I call an inline dead strip.

**Inline Dead Strip**
This type of dead strip will work well with cars that have braided pickups, with HO cars that mostly have pickup shoes there could be missed counts. Since only one of the car's braids is used the motor is not in the circuit, thus eliminating the polarity issue. In order for the port to see track voltage there would have to be a short between one rail and one of the dead strips and at the same time there would have to be a short between the other track rail and the other half of the dead strip, which is quite unlikely. The computer ports do not really like having a short across them, so adding a 150 ohm resistor for
each lane is necessary to prevent damage. Several people have tried this arrangement and found it is important to keep the gap between the two halves very short. The second type of improved dead strip is used in England and is really not a dead strip at all, a car that stopped on it would still be able to run.

Split Rail Dead Strip

Once again only one braid is needed to complete the circuit, cars with pickup shoes may not always count properly and a resistor should be included for each lane.

My own track has plain standard dead strips with no guard strips. In the past I used a TrikTrax counter/timer, now I have Trackmate with the dead strip option that includes zener diodes. A further option with built in reversing switches is also available.
Here is the pin arrangement for a DB-9 connector:

**Top row pins 1-5**

Bottom row pins 6-9

For a serial connection there is usually a male DB-9 connector on the computer, sometimes there are two and older computers may use a male DB-25 connector. With a DB-9 connector pin 5 is common, pin 1 is lane 1, pin 9 is lane 2, pin 6 is lane 3 and pin 8 is lane 4.

With a DB-25 connector for a serial connection pin 7 is common, pin 8 is lane 1, pin 22 is lane 2, pin 6 is lane 3 and pin 5 is lane 4.

For a parallel (printer) connection a female DB-25 connector is used on the computer. Pin 23 or 25 can be the common, pin 10 is lane 1, pin 11 is lane 2, pin 12 is lane 3 and pin 13 is lane 4. In order to make the connection you will need a male DB-25 connector.

Before you connect your dead strips to the computer you can avoid a certain amount of frustration if you test the ports before you do anything else. First boot up the software that you are going to use. You may have to go into the setup part of the program to select the type of sensor that you are using and you also need to tell the computer what ports to use. For Windows go to Start, Control Panel, Hardware and Sound, then Device Manager. If you are testing the parallel port the connector on the computer is female, you can plug one end of a 150 ohm resistor into one of the common pins, usually pin 25, and plug the other end into pins 10 thru 13 to see if counts are triggered. If you are testing a DB-9 serial port that will have a male connector. You will have to plug a serial cable into that and do the test at the other end of the cable using pin 5 as the common and pins 1, 9, 6 and 8 for the lanes.

It is best to run a separate common wire back to the connector that will make up with the computer, even though they all will connect to the same pin.

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