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Signal Animator
- Infrared versions
Instruction Supplement

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Introduction

This supplement shows you how to do the following with the ***Signal Animator***:

- Interlock (i.e. force to red) a single head signal with turnout position (use with any IR version of the ***Signal Animator***)
- Interlock a dual head signal with turnout position (use with any IR version of the ***Signal Animator***)
- Control 2-light LED-based signals (using the SA-1-IR version of the ***Signal Animator***)
- Implement a semi-prototypical block signal setup using one ***Signal Animator***, two sets of IR components and two signals.

General Theory of Operation (Interlocking signals)

To have more prototypical signal behavior you can interlock your signals with the position of a turnout(s). As such a signal head will display red since a turnout cannot be aligned for multiple routes simultaneously! When a sensor input terminal is connected to ground (GND) the ***Signal Animator*** will be tricked into thinking that a train is reflecting the IR beam and will thus display red on the signal. When a sensor input terminal is no longer grounded the ***Signal Animator*** will resume normal operation based on sensor activity.

Wiring diagrams in this supplement show connections IN ADDITION to the standard sensor wiring described in the *Signal Animator* instructions!

Interlocking a single head signal with turnout position

Figure 1 shows how you can use the auxiliary contacts on a switch machine/motor to accomplish interlocking. Many switch machines/motors have one or more sets of "SPDT" (single pole double throw) contacts that you can use. Basically all that is needed here is an "SPST" arrangement. You simply want to "ground" the ***Signal Animator's*** PC terminal when the turnout is thrown for the diverging route (the terminal labeled COM makes contact with the terminal labeled N.O. (Normally Open)).

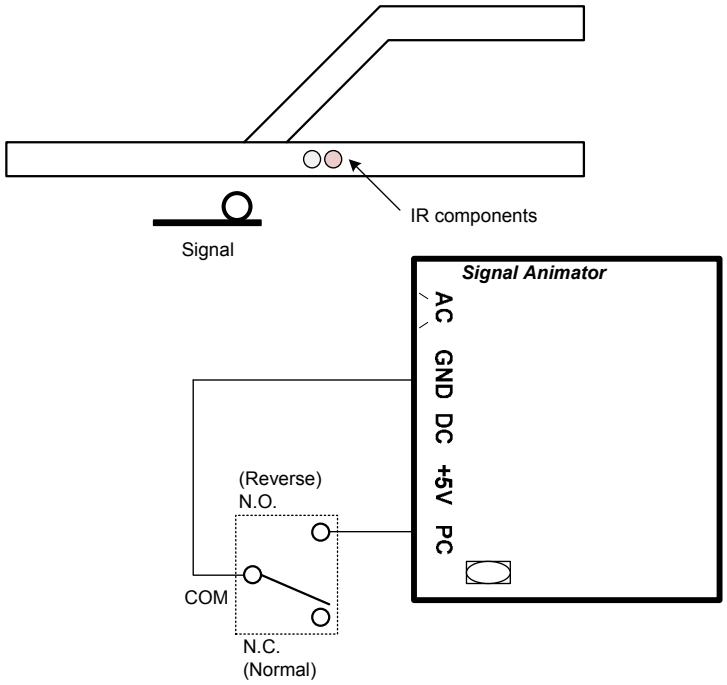


Figure 1

Interlocking a dual head signal with turnout position

If you want to have an even more prototypical signal arrangement near a turnout then you can use a dual head signal along with two ***Signal Animators***. One head or the other will display red since the turnout cannot be aligned for both routes simultaneously! Figure 2 shows how you can use the auxiliary contacts on a switch machine/motor to accomplish this. You will need one set of "SPDT" (single pole double throw) contacts. The PC terminal for the diverging route will be grounded on its ***Signal Animator*** (#2) when the turnout is thrown for the main route (the terminal labeled COM makes contact with the terminal labeled N.C. (Normally Closed)). Similarly, the PC terminal for the main route will be grounded on its ***Signal Animator*** (#1) when the turnout is thrown for the diverging route (the terminal labeled COM makes contact with the terminal labeled N.O. (Normally Open)). In this circuit the two ***Signal Animators*** MUST be supplied with DC power and have their power inputs wired together also shown in Figure 2.

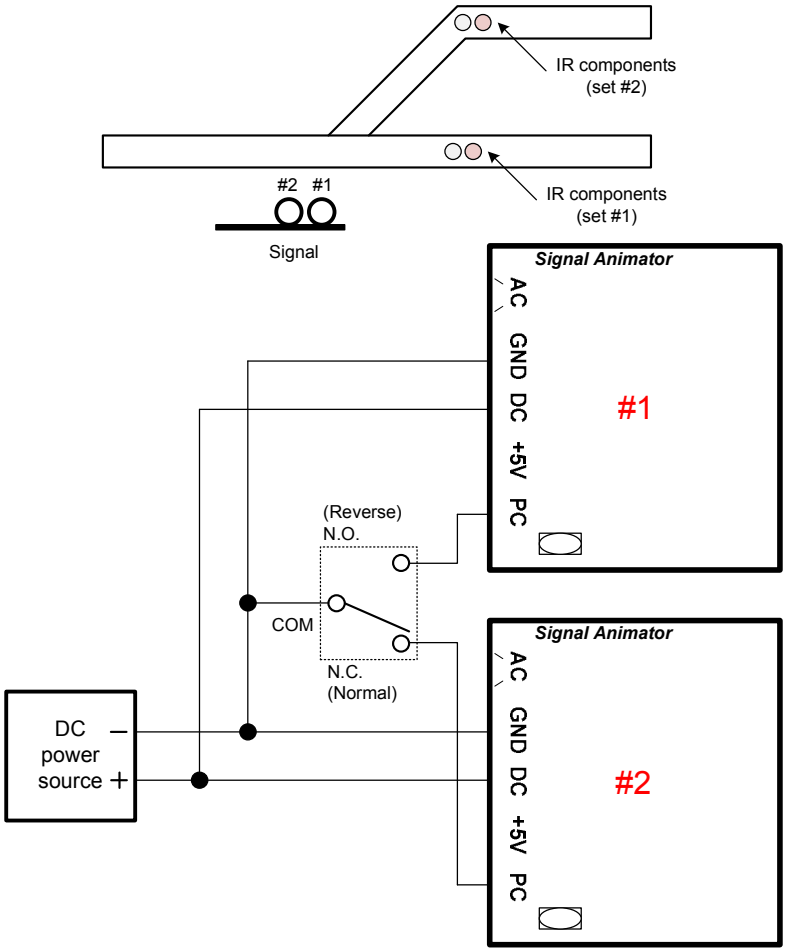


Figure 2

2-light LED-based signals

When using 2-light LED-based signals you will need to add the following circuit to the outputs of the ***SA-1-IR***. Note that lower value current limiting resistors are shown (compared to the 150 ohm resistors that come with the ***SA-1-IR***); these may be necessary in order provide acceptable brightness (offsetting the voltage drop resulting from the diodes).

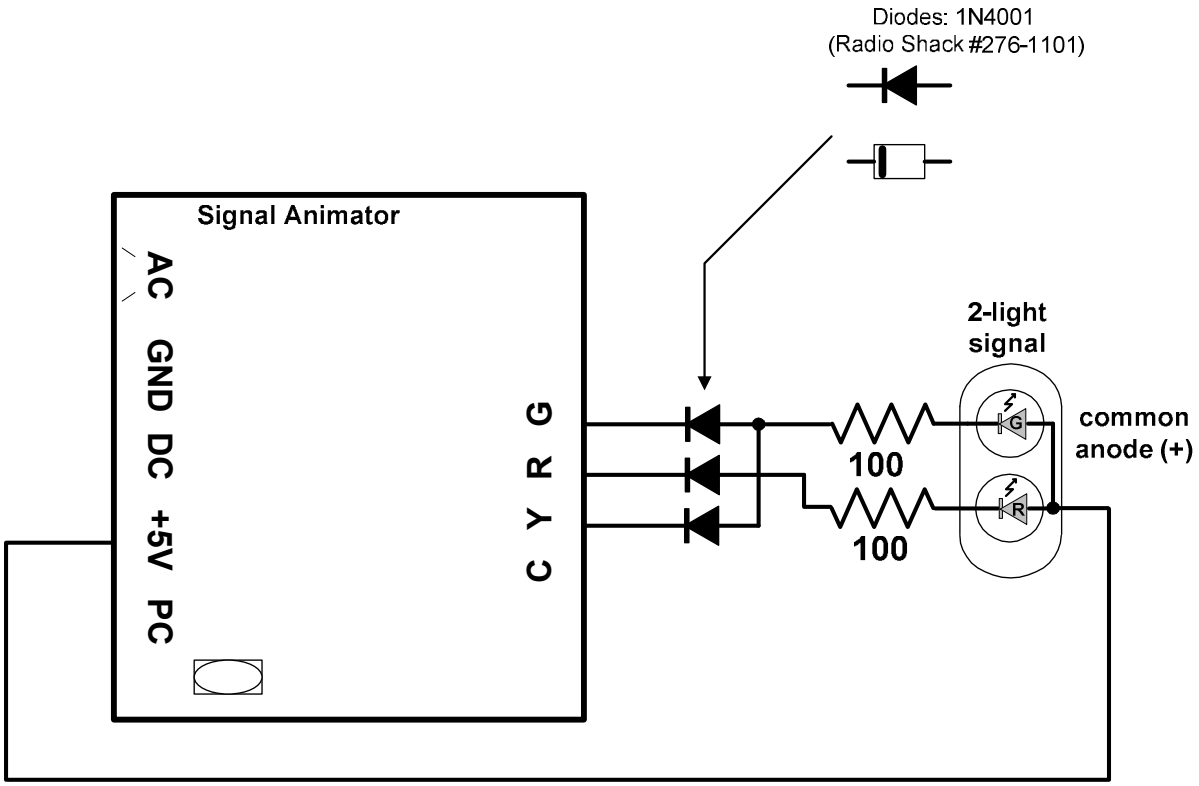
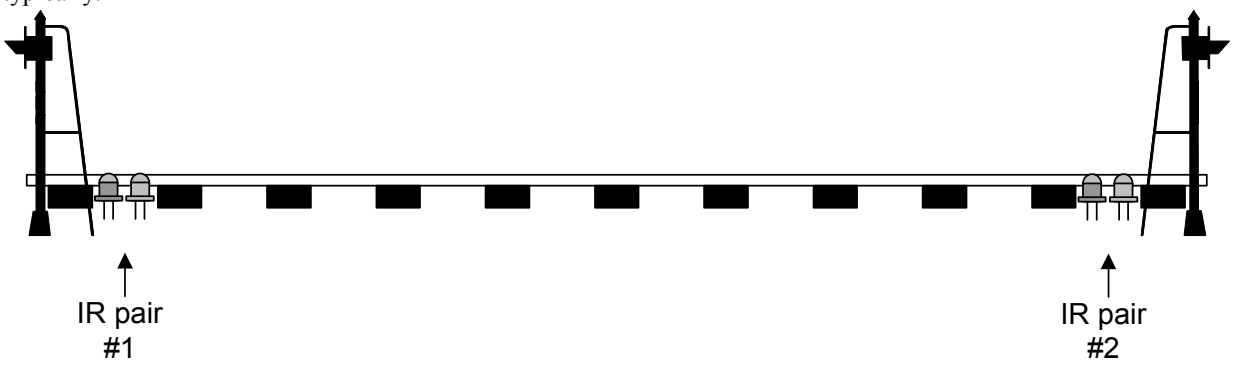


Figure 3

Implement a semi-prototypical block signal setup

It is possible to use a single ***Signal Animator*** to mimic a conventional block signaling setup. As shown in the drawing below this requires a second set of infrared components for train detection and a second signal. As shown you will locate one set of IR components and one signal at each end of the block. In operation when either IR beam is reflected by a train BOTH signals will turn red. Once NEITHER IR beams are reflected by a train the circuit will begin its selected time delay (10 or 30 seconds). As long as neither IR beam is reflected before the time delay expires BOTH signals will turn yellow. Again the circuit will begin another time delay and as long as NEITHER IR beam remains un-reflected then BOTH signals will turn green at the end of the second time delay. This signal behavior is categorized as "semi-prototypical" because of the behavior of the second signal that the train passes. In a truly prototypical signal system when the train travels towards the direction the signal is facing the signal would change from red (because the block it was protecting was just occupied by the train!) to green because the block is now clear. The simplistic design of ***Signal Animator*** is such that both signals operate in unison and thus one of them appears to cycle prototypically (i.e. red -> yellow -> green) while the other one appears to cycle semi-prototypically.



The block can be whatever length you decide is appropriate. However, consider the following operational scenario: your shortest train enters the block and reflects the first IR beam causing the signals to turn red, once it clears those IR components it must be able to reach (i.e. cover) the second set of IR components at the other end of the block BEFORE the time delay has expired. If it does not do so then the signals will turn yellow and the circuit will begin its second time delay. If this delay expires before the train reaches the second set of IR components then the signals will turn green. Then once the train finally reaches the second set of IR components the signals will immediately turn red again and cycle through the behavior described in the first paragraph above. Obviously this is not the most desirable signal behavior so space your sets of IR components appropriately to avoid this scenario!

The drawing below shows the wiring for this setup. Although the drawing is based upon version ***SA-1-IR*** of the ***Signal Animator*** and 3-light LED-based signals, you can use any version of the ***Signal Animator*** along with the appropriate signal types. Note that for some versions of the ***Signal Animator***, such as the ***SA-1-IR***, it is necessary to adjust the value of the current limiting resistors when connecting two signal heads together; refer to the specific instructions for the version of the ***Signal Animator*** you'll be using.