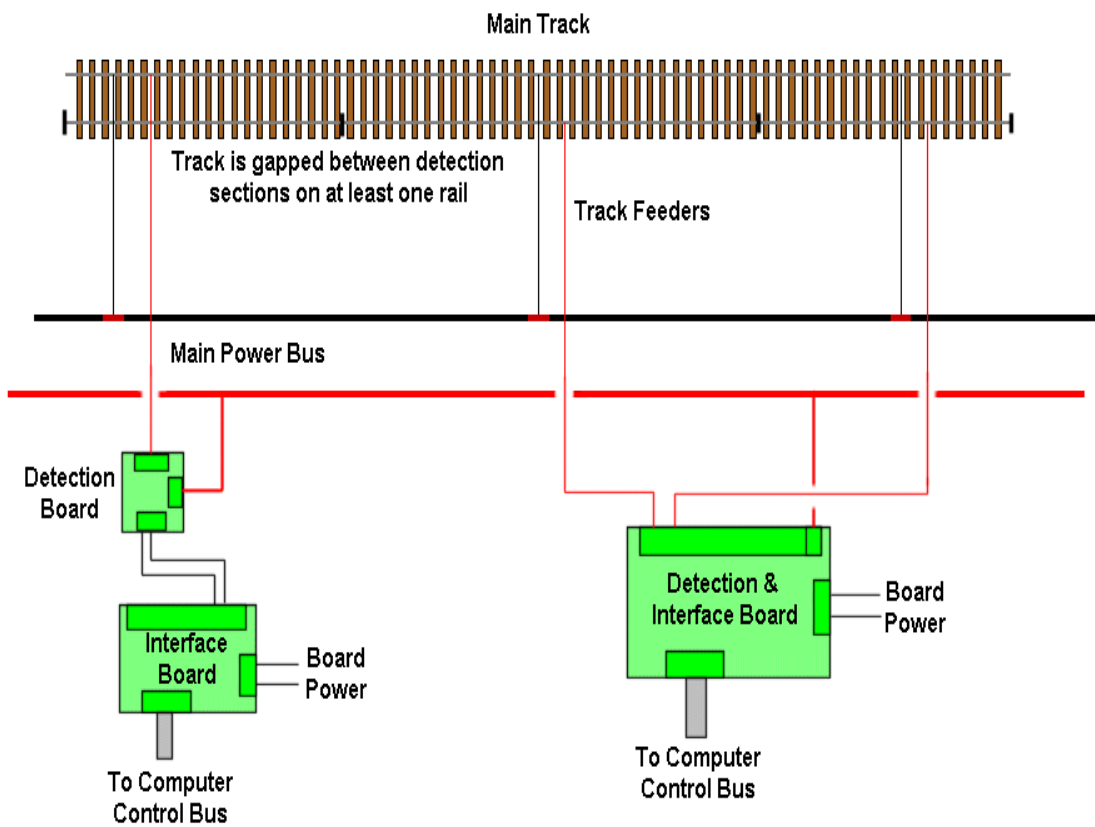# DCC Basics for MRR layouts

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Part 6   Other Systems

Block Detection

Block detection is another special situation that not all model railroads using DCC for control need. Unlike a DC layout, a DCC layout is divided into blocks only when you want to do something special, like detecting when a train is in a certain section of track. This can be used for hidden staging, or signals. The most common is for signals.
There are two basic types of track or block detection. One is current type detection and the other is optical type detection.   For current type detection, the track must be gaped on one or more rails, according to what the block detector manufacturer advises for their system. For block detection that uses photo-cells or IR type devices, the devices must be placed in such a way that when the train passes, they block light. The most common way is to mount the cells between the track rails. There are different types to choose from and each manufacturer has their own version and style, so some research is in order to see which one will work with the DCC system that you have.
Once a train is in a block, some type of indication should be made available. This can be as simple as lighting an LED on a control panel, or sending a signal to a computer.
The type of detection you use and the indication desired is up to you and what you want to do with it. The block detection drawing shows two different types of current detectors. As was said before, there are various types of detectors, so you should do some research to determine what type will work for the application that you have in mind.

Main Track

Track is gapped between detection
sections on at least one rail

Track Feeders

Main Power Bus

Detection
Board

Interface
Board

Board
Power

To Computer
Control Bus

Detection &
Interface Board

Board
Power

To Computer
Control Bus

Two Types of Block Detection Systems

Signals

There are different degrees of signal system complexity for model railroads. The simplest being a signal that changes colors when a turnout is thrown. The more complicated are the ones that need a computer to tie together block occupancy and turnout direction. And there are signal systems that fall in between. The systems that utilize a computer are the most realistic, and the most expensive. If you want to add a signal system controlled by a computer, your DCC system should be capable of connecting to the computer also. Some beginner or entry level DCC systems can not be connected to a computer, but most of the advanced systems can be. Be sure to check your system before purchasing parts that you may not be able to use.

Another consideration of the type of signal system to choose is your ability to understand electronics and wiring.   If you have a problem setting the clock on a VCR or DVD player, or if you still do not understand your own DCC system, stay with the simplest type of signal system, one that does not require a computer.
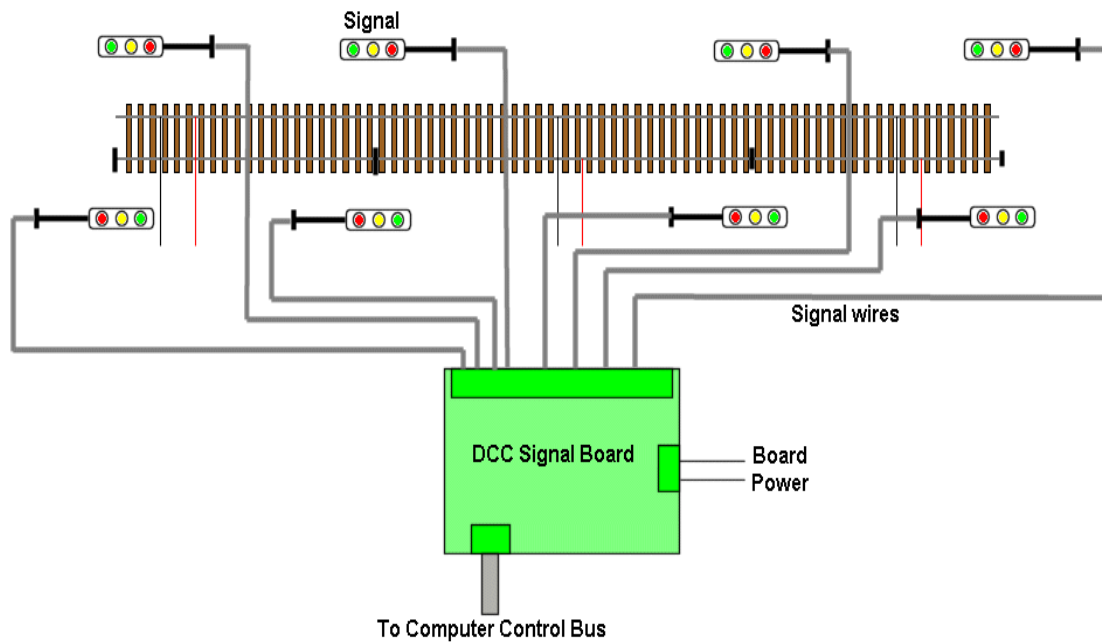
Computer Control

More model railroaders are starting to think about using computers for partial control or full control of their layouts. If you build your layout to be operated, running trains and switching cars as the prototype did, full computer control may not be something that you want to do. However you can use a computer to control a sophisticated signal system on your layout which will enhance your operations considerably. If you are building a layout for a museum or other public venue, then full computer control with signals may be exactly what you need.

There are a couple of programs available to do either. The section on Signals is a good place to get an overview of what's available. The program from RR & Company has been reported to be able to do it all, but it is not cheap. JMRI is free, but is just adding automation, and some programming skills may be necessary to it use effectively.

No matter which program you decide to use, both require a substantial investment in the hardware that is required, and the skills to wire it all together.