

## AIU-01 Additional Info

The Auxiliary Input Unit (AIU01) provides a means connecting up to 14 external devices such as switch contacts, Block Detectors (BD20), or other sensors to the Command Station via the Cab Bus. These external devices can be anything that supplies an electrical connection between the input pins (1-14) and the pins marked "GND" in Figure 1. These connections can then be read by a computer through the RS-232 port of the command station using the RS-232 commands. The 14 LEDs provide indication of which input is active. An LED will light when its corresponding input terminal is connected to ground. This provides an easy means to test whether the block detector or other device you have connected to the terminal is working. Since the AIU is a Cab Bus device it must be plugged in to the cab bus using the cab bus connectors. Both connectors are in parallel so you may "daisy chain" the cab bus through the AIU. The AIU Cab address must be set to a number that is not used by any other existing Cab Bus device. We suggest that you set it to a very high number, say between 50 and 63. A DIP switch is provided to set the address. Only switches 1-6 are active, switches 7 and 8 are not connected. All AIUs ship from the factory with an address of 4 as indicated by the switch positions in figure 1. If you wish to build your own sensors Figure 2 provides an illustration of the input circuitry on the AIU. The series resistor and capacitor provide protection against electrostatic discharge and some RFI filtering to prevent possible false triggering of the inputs due to track signals or other noise coupling in to any long wire runs between sensors and the AIU.

The BD-20 block detector module is normally used to indicate the presence of a locomotive, caboose or other rolling stock in a track section by sensing electrical current drawn by that rolling stock. Locomotives will naturally trigger the detector because they draw current through their DCC decoder. Unpowered rolling stock will not trigger the detector unless equipped with some means of drawing current from the rails such as lights or resistor wheel sets.

The BD20 acts like a normally open switch that gets triggered by sensing current going thru the coil. In a typical application you connect the outputs of the BD20 to something (Logic + 5 to 12vdc) that will react to a ground short. we use it to trigger the inputs of the AIU. Most signal systems work the same way.

The BD20 is a detection device and cannot drive a signal directly unless you want to use the external LED connection in some fashion. An AIU is an input device that detects a 5v line being shorted to ground, such as the output of a BD20. The AIU then puts this information on the NCE Cab Bus. Neither device (BD20 or AIU) are directly related to signaling. They do detection and notification.