Auxiliary Input Unit

model AIU-01

NCE Corp.
1260 Creek Street   Suite 105
Webster, NY 14580

AUXILIARY INPUT UNIT - AIU-01

The Auxiliary Input Unit (AIU) provides a means connecting external devices such as switch contacts, Block Detectors, or other sensors to the Command Station. 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 on page 4.

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.
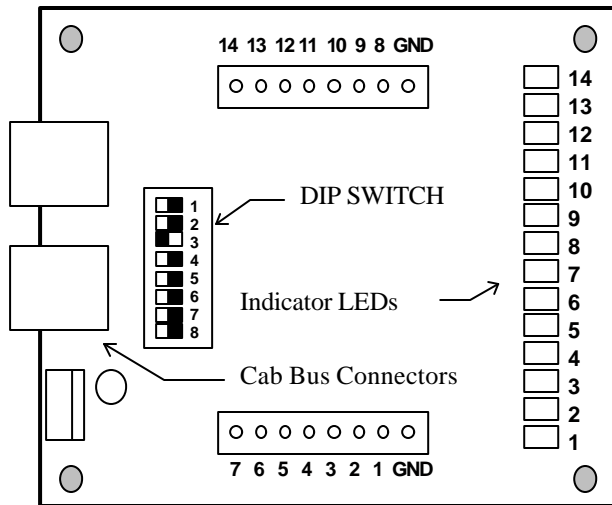

Figure 1 Main Components of AIU

Since the AIU is a Cab Bus device (thus 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 **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.

The AIU will also connect our *future* Signaling Control Unit for control of trackside signals without requiring the use of a computer. This will provide a capacity of over 800 block occupancy and switch position inputs to accommodate signaling on large home and club layouts while freeing up the cab bus for more cabs.

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

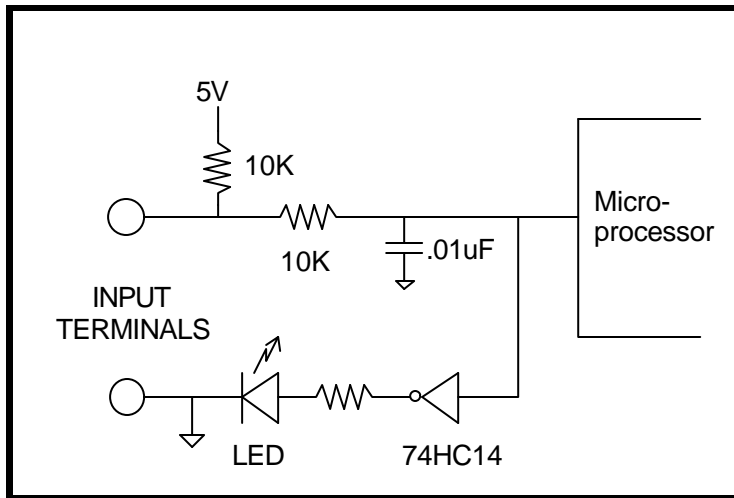the inputs due to track signals or other noise coupling in to any long wire runs between sensors and the AIU.

Figure 2 Schematic of AIU input circuitry

ADDRESS SELECTION

The AIU ships factory programmed to address 4. To change this address, an 8 position DIP switch is provided. Refer to the table below for address selection.

NOTE: on = move the switch toward the right of the AIU in figure 1, off = move the switch toward the left of the AIU (OFF). Also, not all of the addresses are in the table. To calculate the desired address, add the values "off" switches. E.g., Address 25 = 16 + 8 + 1. The position of switches 6 and 7 don't matter.

Address Table

	Switch Value					
	1	2	4	8	16	32
	Switch Position Number					
Address	1	2	3	4	5	6
4	on	on	off	on	on	on
48	on	on	on	on	off	off
49	off	on	on	on	off	off
50	on	off	on	on	off	off
51	off	off	on	on	off	off
52	on	on	off	on	off	off
53	off	on	off	on	off	off
54	on	off	off	on	off	off
55	off	off	off	on	off	off
56	on	on	on	off	off	off
57	off	on	on	off	off	off
58	on	off	on	off	off	off
59	off	off	on	off	off	off
60	on	on	off	off	off	off
61	off	on	off	off	off	off
62	on	off	off	off	off	off
63	off	off	off	off	off	off

RS-232 port commands relating to the AIU

ASCII Mode command:

I - STATUS OF AUXILLARY INPUT UNIT (AIU)

This command returns the status of an AIU. The first four digits are the most significant followed by least significant current input status. The next four digits are the most significant followed by least significant of the inputs that have changed since the last **I** command. There is a space after the "I" and the cab address must be 2 digits.

Format:
I cc   - cc = Cab address (1-63).

Example:
```
I 08                    - Read status of AIU at address 8.
00 01 00 01
```

Binary Mode commands:

Return status of Auxiliary Input Unit (long form).

Returns four bytes. The first 2 bytes are a bit map of the 14 AIU inputs. The last 2 bytes are a bit map of any changes since this command was last given. If the cab is greater than 0x3f (63) it will be "forced" to 0. The first time this command is given for a cab after the command station is powered on (or reset) the change bytes will be 0x3fff.

Format: 0x8A cc   (cc=cab number 0x00-0x3f)

Returns 4 bytes: current high byte (AIU inputs 9-14)
                     current low byte (AIU inputs 1-8)
                     change high byte 1= input changed since last read,
                                          0=no change
                     change low byte   1=input changed since last read,
                                          0=no change

Return status of Auxiliary Input Unit (short form).

Returns two bytes. The 2 bytes are a bit map of the 14 AIU inputs.

Format: 0x9B cc   (cc=cab number 0x00-0x3f)

Returns 2 bytes: current high byte (AIU inputs 9-14)
                     current low byte (AIU inputs 1-8)