

3-State and 4-State Supervision Wiring for NXT Controllers

Application Note

3-state supervision wiring is used to monitor an input line for either a cut-line or short-circuit condition, as well as the switch open and closed states. Cut-line or short-circuit monitoring is dependent upon whether the switch is normally-open or normally-closed.

4-state supervision wiring is used to monitor all four conditions: cut-line, short-circuit, switch open, and switch closed states.

Wiring instructions are provided in Sections 1 and 2, below – for all inputs regardless of bus, whether on a 2-door or 4-door NXT Controller (standard or Mercury Powered) or 4x4 I/O Expansion Module:

- Pin 4 is the Door Sense/Input
- Pin 5 is the Ground

Once your inputs are wired with the desired supervision type, configure these inputs in Doors.NET according to the type of supervision you have installed. Whenever an input line is cut or shorted, an event will be posted in Doors.NET software according to the type of supervision applied.

The NXT controller provides the +3.3 VDC supervision reference used by the input connection.

1K ohm resistors at 1% tolerance are preferred.

Cable Supervision Reference Voltage:

- Shorted Line: $V_{sense} \approx 0$ VDC (Ground)
- Cut/Open Line: $V_{sense} \approx +3.3$ VDC

Input Switch Supervision Reference Voltage:

- Input Switch Closed: $V_{sense} \approx +1.65$ VDC
- Input Switch Open: $\approx +2.2$ VDC

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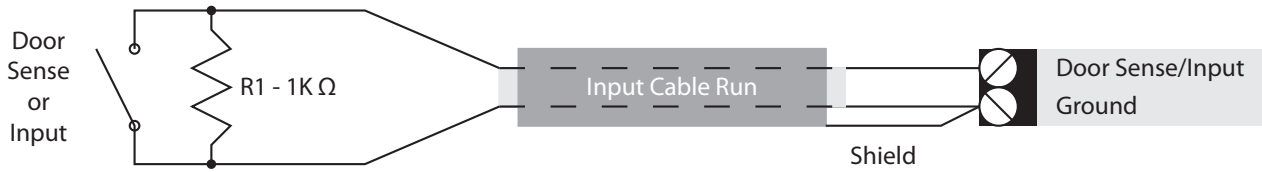
1.0 3-State Supervision

The following condition states will be reported when an input is wired for 3-state supervision.

Table 1: 3-State Supervision Table

Input Transition Detected	Normally-Closed Contact Type	Normally-Open Contact Type
circuit shorted	<i>shorted/trouble</i>	active/alarm
switch closed	normal	active/alarm
switch open	active/alarm	normal
open circuit	active/alarm	<i>open/trouble</i>

For a Normally-Open Switch



For a Normally-Closed Switch

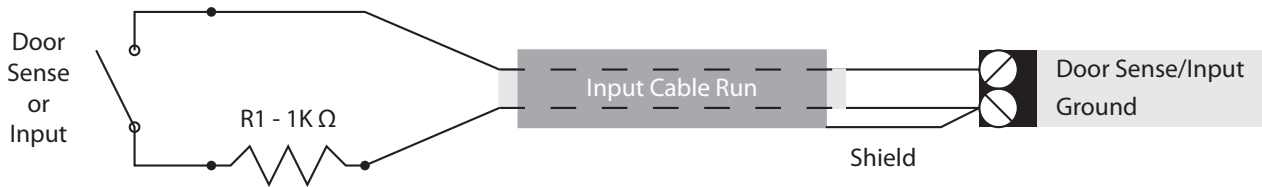


Figure 1: 3-State Input Switch Wiring Diagrams

NOTE: In 3-state supervision the firmware is unable to sense the difference between:

- *Switch Open and the Open Circuit conditions for the Normally-Closed switch*
- *Circuit Shorted and Switch Closed conditions for the Normally-Open switch*

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2.0 4-State Supervision

The following condition states will be reported when an input is wired for 4-state supervision.

Table 2: 4-State Supervision Table

Input Transition Detected	Normally-Closed Contact Type	Normally-Open Contact Type
circuit shorted	<i>shorted/trouble</i>	<i>shorted</i>
switch closed	normal	active/alarm
switch open	active/alarm	normal
open circuit	<i>open</i>	<i>open/trouble</i>

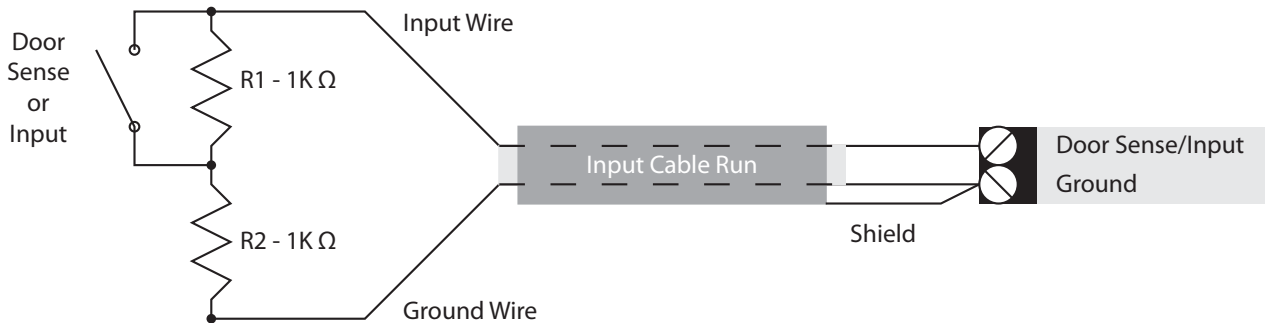


Figure 2: 4-State Input Switch Wiring Diagram

3-State and 4-State Supervision Wiring for NXT Controllers

Application Note

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