Using BAPI's DMA with Multiple Switches

Application Note

The BAPI DMA can monitor a single door or multiple doors. The table below shows how the DMA will respond to a single Normally Closed (NC) or Normally Open (NO) switch.

The switches available from BAPI can be wired as either NC or NO. All the diagrams in this document show Normally Closed (NC) switches.

BAPI DMA

Switch Used	Door Position	Switch State	DMA Relays State	DMA LEDs State
NC	closed	open circuit	not energized	green
NC	open	closed circuit	energized	amber/red
NO	closed	closed circuit	energized	amber/red
NO	open	open circuit	not energized	green

The "Magnet" rectangle below the switch means the door is closed as shown in Figures 1 and 2.

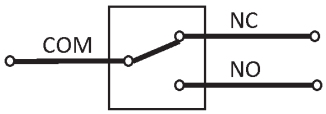

Fig. 1: Normally Closed Switch with Door Open

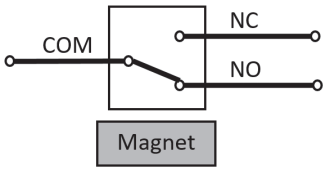

Fig. 2: Normally Closed Switch with Door Closed

Wiring Switches in Series - All Doors Must Be Open for a DMA Alert

The examples at right show multiple NC switches wired in a series configuration. In this configuration, all three doors must be open for the DMA to provide an alert.

Fig. 3: One Door Open
Door 1 is open (no magnet) but the DMA is still reading an open circuit because of the other two doors. The DMA's LEDs are green and its relays are not energized.

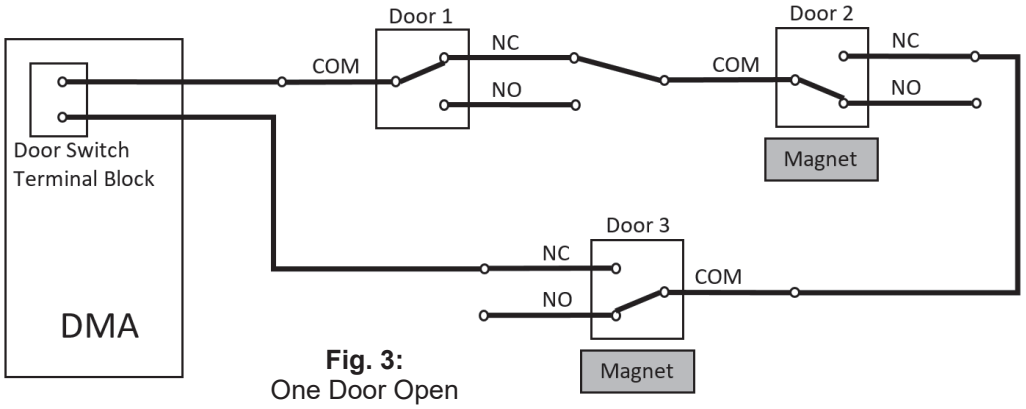

Fig. 3:
One Door Open

Fig. 4: All Doors Open
All three doors are open (no magnet). The DMA is reading a closed circuit so its LEDs are amber or red and its relays are energized.

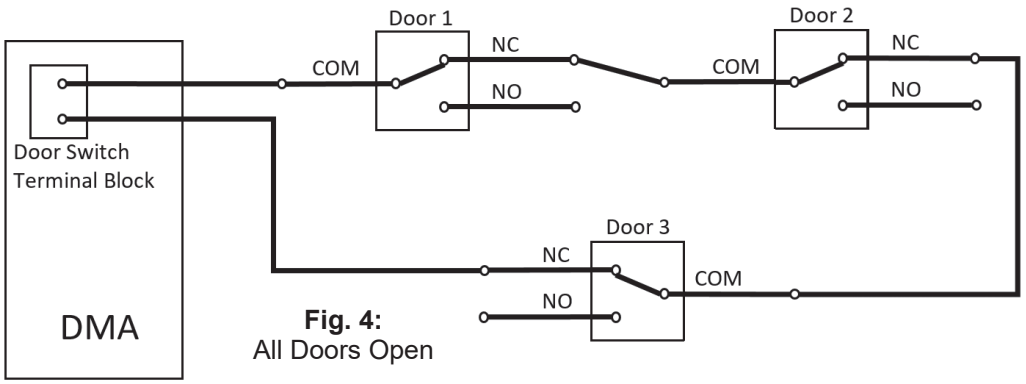

Fig. 4:
All Doors Open

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Using BAPI's DMA with Multiple Switches

Application Note

Wiring Switches in Parallel - Any Door Open for a DMA Alert

The examples at right show multiple NC switches wired in a parallel configuration. In this configuration, the DMA will provide an alert if any door is open but it will not know which door is open nor if multiple doors are open.

Fig. 5: One Door Open
Door 1 is open (no magnet). The DMA is reading a closed circuit through the Door 1 Switch. Its LEDs are amber or red and its relays are energized.

Fig. 6: All Doors Closed
All three doors are closed so the DMA is reading an open circuit. The DMA's LEDs are green and its relays are not energized.

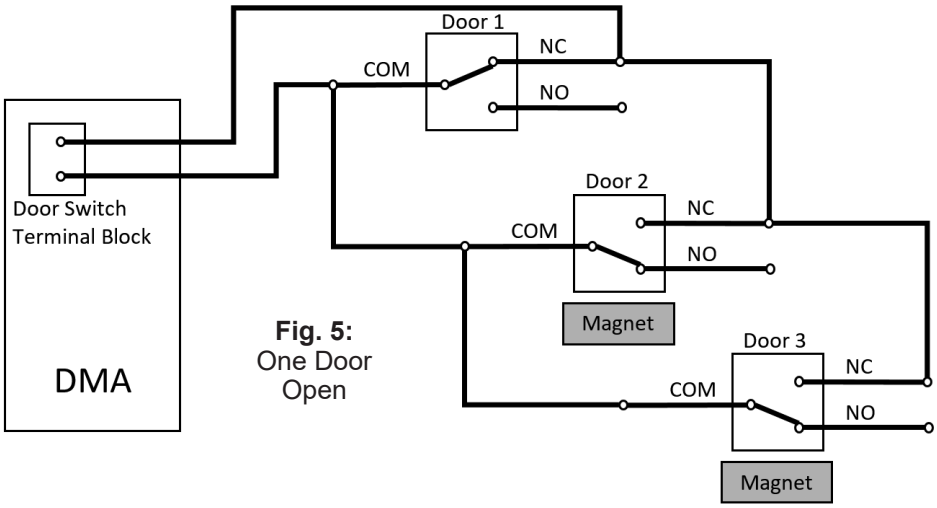

Fig. 5:
One Door Open

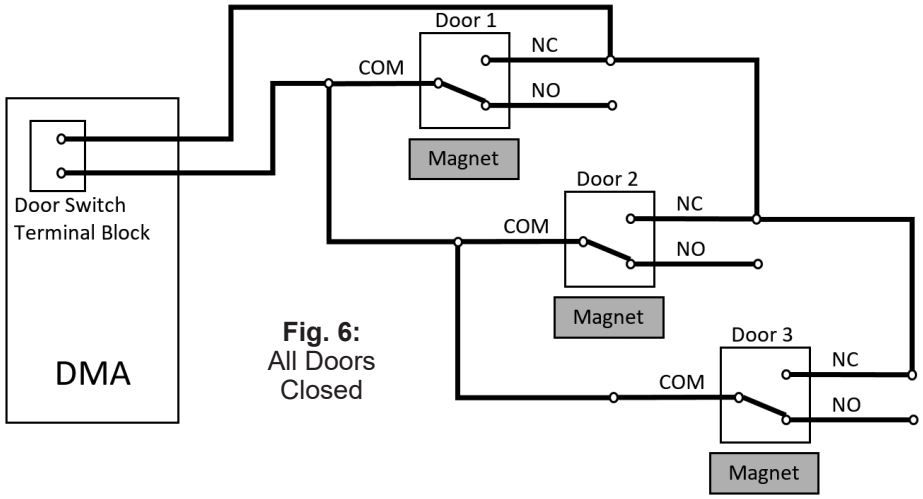

Fig. 6:
All Doors Closed

Example Applications

A SINGLE REFRIGERATOR WITH MULTIPLE DOORS (SUPERMARKET REFRIGERATED DISPLAY CASE)

- Use multiple NC switches in parallel.
- The DMA will alert if any door is open, but it will not know which door is open nor if multiple doors are open.
- The timer will not reset until all of the doors are closed.

A COUPLE OF WALK-IN REFRIGERATORS OR FREEZERS NEXT TO EACH OTHER

- Use multiple NC switches in parallel.
- If it's rare that more than one door is open at a time, then this provides most of the benefits of using multiple DMAs.
- The DMA will alert if any door is open, but it will not know which door is open nor if multiple doors are open.
- If multiple doors are often open at the same time, this method will be less effective in saving energy and may cause nuisance alarms. You may want to use multiple DMAs in this case.

DOOR PANELS ON AN AHU

- Use multiple NC switches in parallel.
- You probably don't care how long a panel door is open nor which panel it is. You only care that one of them is open and someone needs to close it.
- The DMA will alert if any door is open, but it will not know which door is open nor if multiple doors are open.

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