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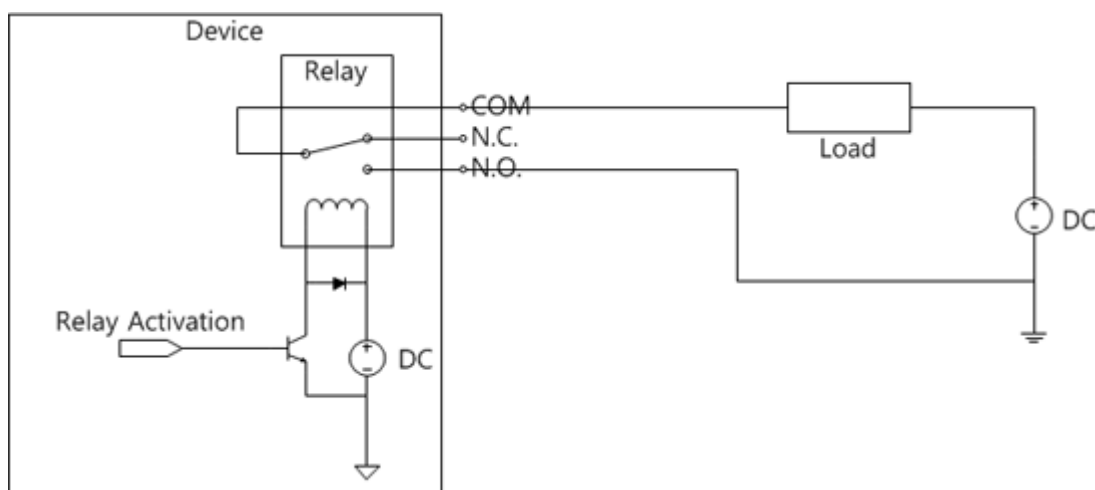
Proper Use of Relays

This article is intended to introduce a basic application guide for relays in access control devices. Additionally, a means to prevent undesired arcing in relay contacts is proposed, to suppress unintended radiation and maintain relay lifespan.

A relay is a switch operated by electrical means such as electromagnets. It is widely used to control electric loads with low power signals. For access control systems, it is mainly used to control electric strikes or alarm signals.

Typical Diagram

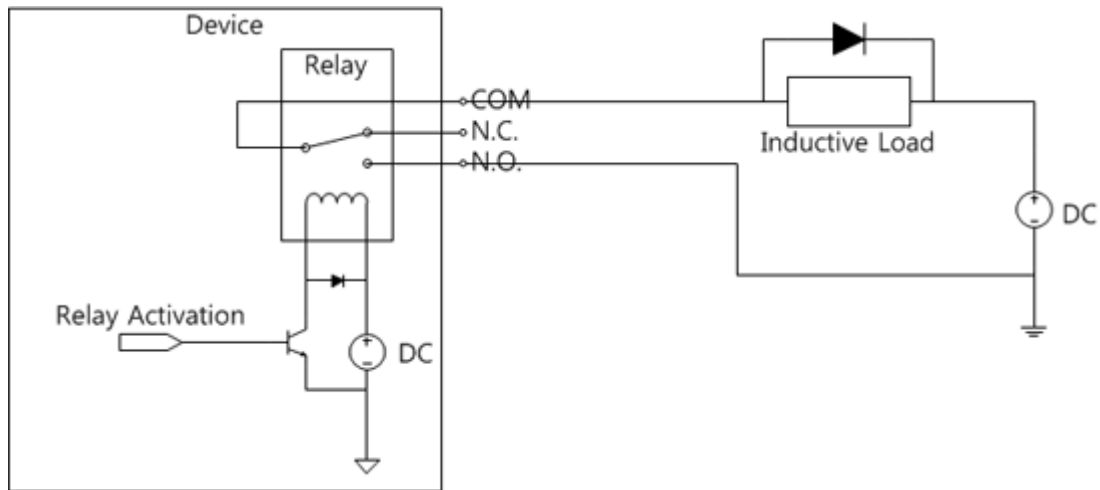
A typical diagram of a relay application is illustrated below. For some event; if the relay activation signal is asserted, the relay driver circuit is closed to energize the relay's electromagnet which results in a change of the switch state. In this scenario, the load is powered via external DC power supply.



Prevent Reverse Current Flow

A special care should be taken when using inductive loads such as electric strikes. If the circuit is switched off, the current flow of the inductive load cannot be cut off to zero immediately - a transient arc could be formed across the contacts of the relay. These arcs degrade the internal contacts of the relay, limiting the lifespan of the device. Another harmful effect of the arcs is unintended radiation of electromagnetic field that not only could violate EMI regulations but also could compromise system stability.

To suppress those undesired arcs, it is crucial to place protective circuits accordingly. In our application above, a diode placed across the terminals of the inductive load should be sufficient, as illustrated below.



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