Engineering Note: EN0107 - Recommendation for External Digital I/O Protection

Summary:	This note outlines recommendations on fitting external flyback diode across inductive loads to prevent damage to digital I/O ports on Hydro Control, Hydro View and Hydro Hub products.
Products affected:	Hydro Control, Hydro View & Hydro Hub
Revision Date:	26/01/2022
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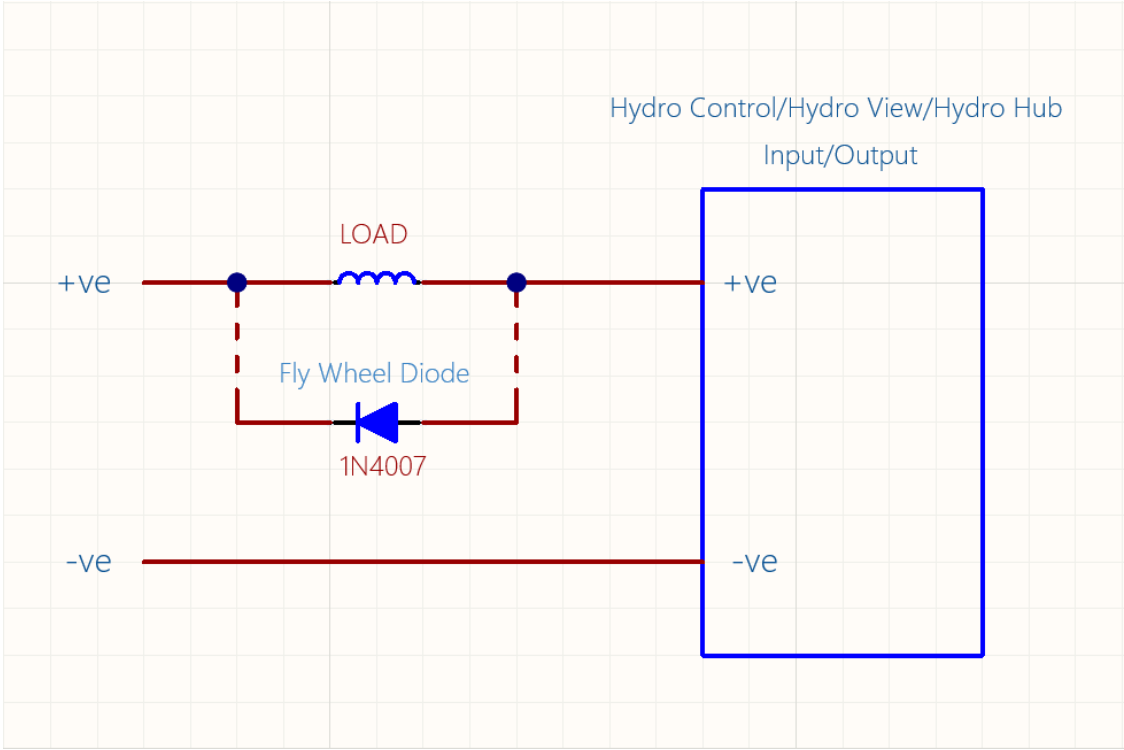
Background

Back electromotive force (Back EMF), also known as counter-electromotive force, is the electromotive force that opposes the change in current through a conductor. When current passes through a coil, such as an inductor, relay coil, motor or solenoid winding, energy is stored in the form of a magnetic field around the coil. When power is removed from the circuit, the magnetic field collapses producing a large reverse voltage spike which can damage sensitive components in the circuit such as transistors and diodes.

Recommendation

It is recommended that a “fly-wheel” diode is connected across any inductive load that is connected to the inputs or outputs of the Hydro Control, Hydro View or Hydro Hub. This diode will suppress the back EMF voltage spike, protecting the inputs from damage.

The recommended diode for this protection is a 1N4007 or equivalent. It should be connected as shown in the image below:



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