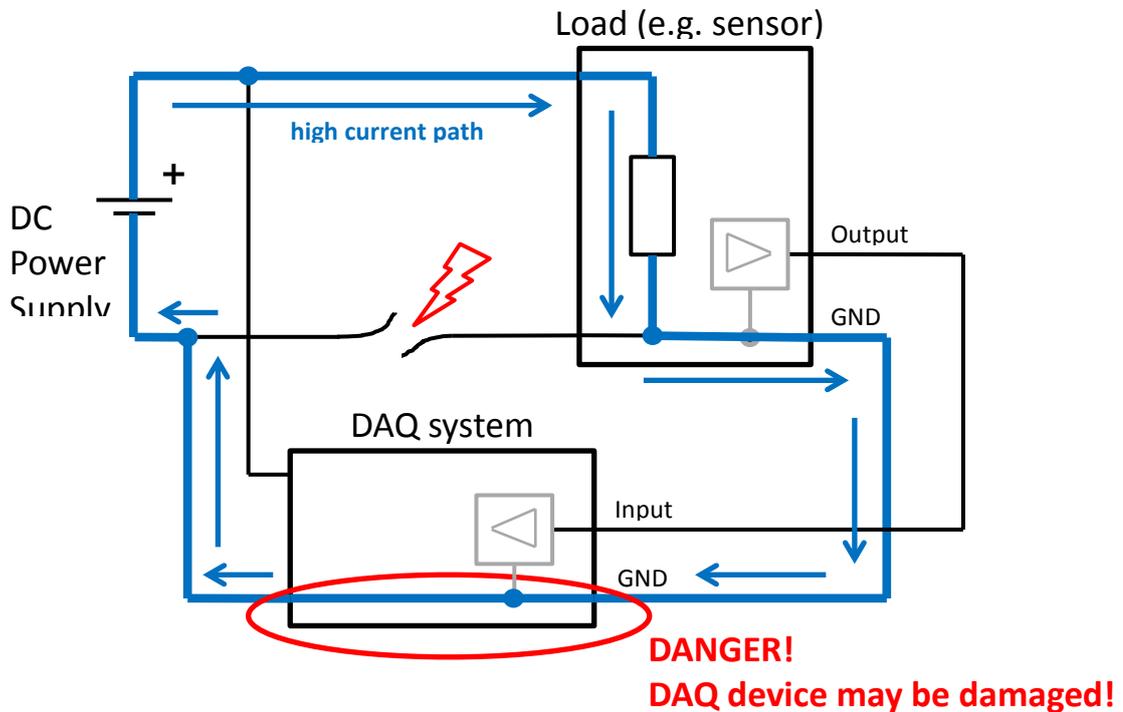


Error case with broken GND cable:

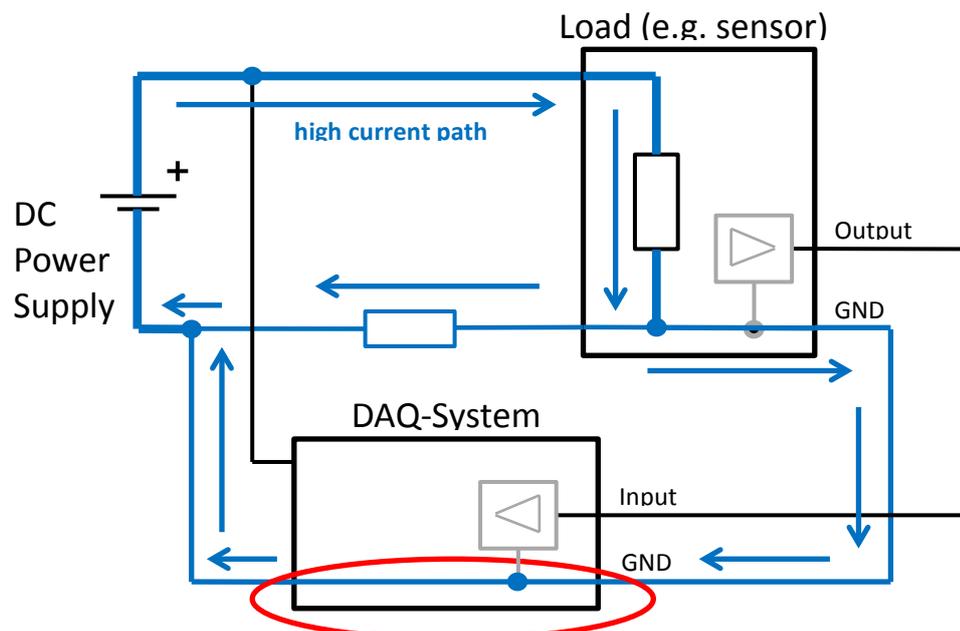
You can imagine what will happen when “high-current path” is open. The current will flow a different way. Now the return supply path of the sensor is routed through the GND of the sensor input from the DAQ device.



Usually the internal circuitry is not capable of driving this high current. So the DAQ device may be damaged.

Error case with not symmetric supply line resistor:

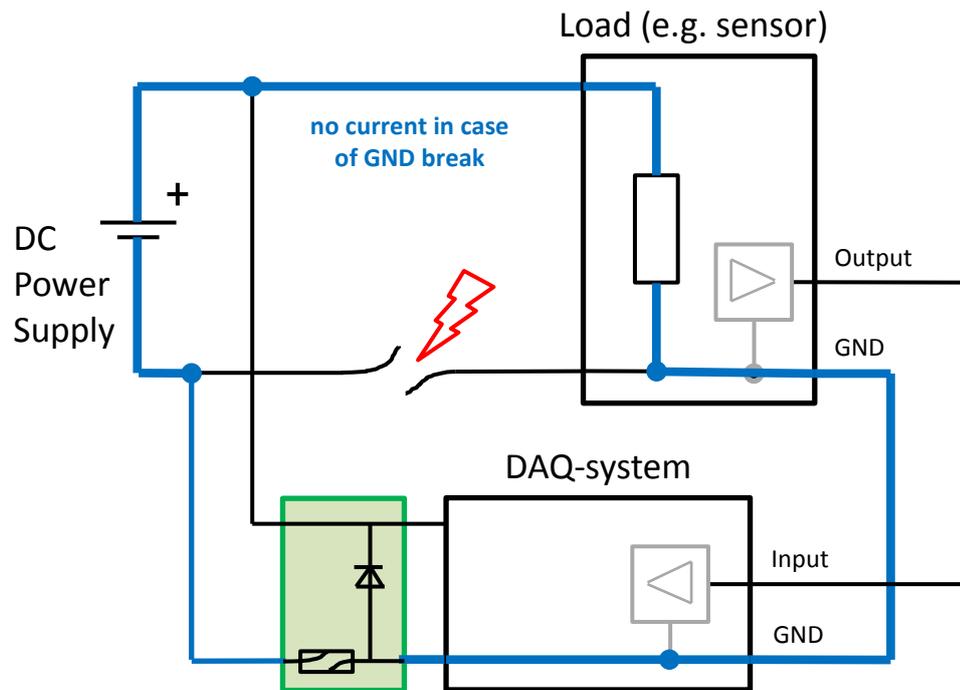
In practice the supply wiring is more complicated like shown in this basic diagram. A cable brake on the supply line is for sure the worst case. But also line resistances in the supply lines combined with different supply current levels will cause unintentional current flow through the DAQ-system like shown below.



3. Solution

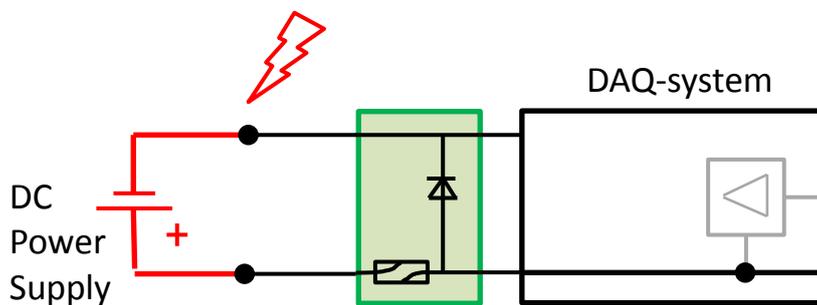
Supply protection box:

An external fuse in the GND line solves this problem already. If the current through the supply line is too high, the will fuse blow. Therefore no damage on the DAQ-system or the sensor may happen.



PROTECTION against high current

In addition the supply protection box provides reverse polarity protection. The current is shorted over the diode (failure current does not flow through the sensor) and will blow up the fuse.



PROTECTION against wrong polarity

Isolated power supply

Another way of protecting the DAQ device is the usage of the “DS isoPOWER 75W”. This box includes a DC/DC converter which galvanically isolates the power supply input of the DAQ-System (the example shows the DEWE-43). Due to the isolation, no error current is possible through the supply line.



The final result is the same: reverse polarity protection of the supply line.