



# System Level Protection for High-Voltage Multiplexers in Multi-Channel Data Acquisition Systems

Comparison and conclusion



# Comparison between discrete protection schemes

#	Protection scheme	Protection robustness	Impact to system performance	Implementation Cost
1	Diodes in series with supplies	Average	High	Low
2	Series resistor + Zener diodes on supplies	Good	Medium	Medium
3	Series resistor + Schottky + Zener diodes on supplies	Good	Medium	High
4	Series resistor + TVS (or Zener) diodes	Best	Low	High
5	Multiplexers with integrated fault protection	Best	Low	High



# Conclusion and recommendations

- Multiplexers are commonly used on the front-end of a data acquisition system
- Fault condition can cause damage to the multiplexer and other components in the system
- Discrete protection scheme:
  - TVS/ Zener diodes offer the most robust and flexible protection scheme
  - Diode in series with supplies and series resistors offer the cheapest implementation
- Multiplexers with integrated fault protection can be a good alternative to achieve good precision performance while saving external components