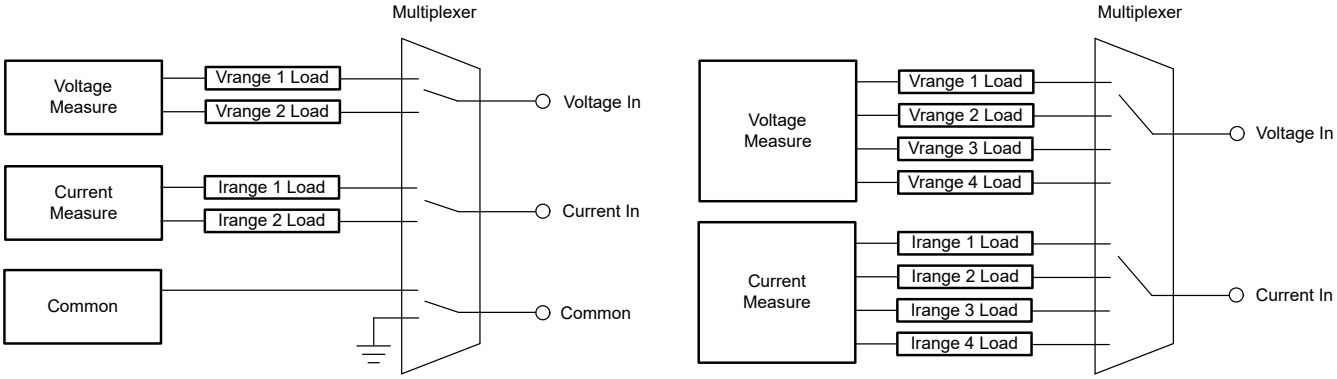
Product Overview

How to Multiplex Multiple Loads to Scale Voltage and Current Measurement Ranges

To enable measurement capability and accuracy across a wide voltage or current range, different resistive and/or capacitive loads are used to scale input signals. A multiplexer is used in between the input signal and the analog to digital converter to switch in and out the different loads that scale the inputs in order to take advantage of the entire dynamic range of the analog to digital converter.



Design Considerations

- Match the input signal range greater than or equal to the supply voltage of the multiplexer. Most multiplexers will only support signals up to the supply voltage provided to the mux.
- Select relatively low on-state resistance multiplexers with respect to the Vrange attenuation resistors to reduce errors and increase system measurement accuracy
- For battery powered systems, select multiplexers with low supply current to maximize battery life
- Learn about multiplexer parameters with *TI precision lab video*
- Ask a question on our *TI E2E™ forum*

Recommended Parts

Part Number	V_{CC} Range (V)	Configuration	R_{ON} (Ω)	Supply current (uA)	Features
TMUX4052	3 to +/-12	4:1 2-channel	60	20	1.8-V compatible control inputs
TMUX4052-Q1					
TMUX4053		2:1 3-channel			
TMUX1109	1.08 to +/-2.75	4:1 2-channel	1.8	0.008	1.8-V compatible control inputs, Break-before-make, Fail-safe logic
TMUX6209	4.5 to +/-18	4:1 2-channel	4	35	1.8-V compatible control inputs, Break-before-make, Fail-safe logic

For more devices, browse through the *online parametric tool* where you can sort by desired voltage, channel numbers, on-state resistance and other features.

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Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265