

Wheatstone Bridge Calculator

Solve the resistance required for an ideal balanced Wheatstone bridge from three known arm values and the selected unknown position.

Generated October 10, 2026

<https://www.elecatrrix.com/circuits-components/wheatstone-bridge-calculator/>

Inputs		
Input	Value	Unit
Unknown resistor position	R4	
R1	100	ohm
R2	50	ohm
R3	200	ohm
R4	N/A	ohm
Supply voltage (context only)	5	V

Results

Result	Value	Unit
Unknown resistance	100	ohm
Left ratio R1/R2	2	
Right ratio R3/R4	2	
Ideal balance output	N/A	V

Calculation details

Detail	Value	Unit
Calculation basis	Ideal bridge balance arithmetic. The selected unknown resistance is solved so R1/R2 equals R3/R4.	
Circuit boundary	No resistor tolerance, sensor behavior, lead resistance, instrumentation loading, temperature, noise, excitation limit, or measurement-safety result is made by this calculator.	

Formulas

$$(R_1/R_2) = (R_3/R_4)$$

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$$R_1 R_4 = R_2 R_3$$

$$R_1 = (R_2 R_3 / R_4)$$

$$R_2 = (R_1 R_4 / R_3)$$

$$R_3 = (R_1 R_4 / R_2)$$

$$R_4 = (R_2 R_3 / R_1)$$

$$V_{out, ideal} = 0 \text{ V}$$

Warnings and limitations

This Wheatstone bridge estimate assumes ideal resistors and a balanced bridge. It does not model sensor behavior, lead resistance, loading, tolerance, temperature, instrumentation, noise, or measurement safety.