

Resistance measurement

Student Group

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Resistance measurement

Procedure for resistance measurement:

- Set the measuring device to resistance measurement
- Connect the resistance to be measured to the corresponding sockets on the measuring device (the measuring device sockets labeled COM and Ω)
- Read the measured value

There are different types of resistance measurement:

- **direct** resistance measurement
- **indirect** resistance measurement

Direct resistance measurement

Determine the nominal and measured values of the resistance for $R_{\rm 1}$ (brown, green, orange), $R_{\rm 2}$ (yellow, violet, red), $R_{\rm 3}$ (red, violet, red) and the incandescent lamp $R_{\rm L}$. Also measure the approximate resistance $R_{\rm K}$ of your body from your right to your left hand.

	$R_{\rm 1}$	$R_{\rm 2}$	$R_{\rm 3}$	$R_{\rm L}$	$R_{\rm K}$
nominal value					
measured value					

Tab. 1: Direct resistance measurement

How do you explain the deviation between $R_{\rm L,nominal}$ and $R_{\rm L,meas}$?

What consequences can R_K have?

Now determine the series and parallel connections of resistors R_1 , R_2 and R_3 .
Specify the formulas used:

$R_{\text{serial}} =$

$R_{\text{parallel}} (= R_a || R_b) =$

	R_1+R_2	R_1+R_3	R_2+R_3	$R_1 R_2$	$R_1 R_3$	$R_2 R_3$
calculated						
measured		Text is not SVG - cannot display				

Tab. 2: Series and parallel connections

Indirect resistance measurement

The resistances can also be determined by measuring the current/voltage.

Ohm's law: In an electrical circuit, the current increases with increasing voltage and decreases with increasing resistance.

$$I = \frac{U}{R}$$

Build the measuring circuit shown in [figure 1](#) for each of the three resistors and set the voltage on the power supply to $U \sim 12 \text{ V}$.

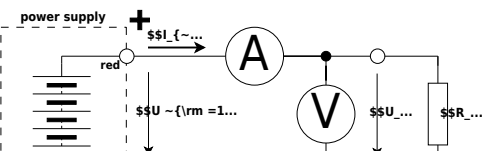


Fig. 1: Indirect resistance measurement

Measure U_{n} [V] and I_{n} [mA]. Calculate R_{n} [k Ω] from these values.

I_{n}	U_{n}	R_{n}	I_{n}	U_{n}	R_{n}	I_{n}	U_{n}	R_{n}

Tab. 3: Indirect resistance measurement

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