

Electronics with the Modular System

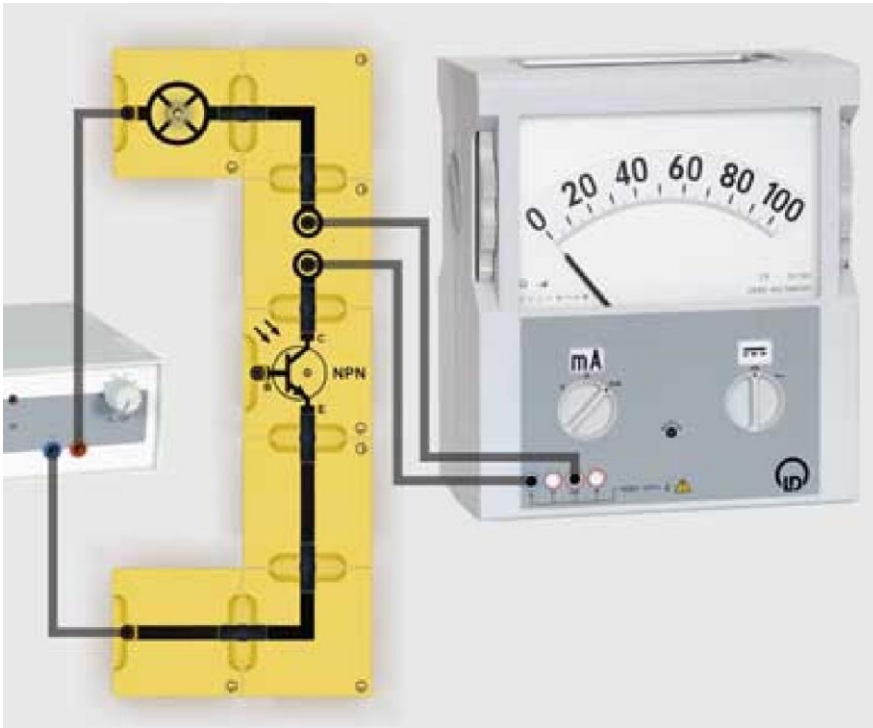
Phototransistor

Basic Electronic Circuits
Transistors

Objective of the experiment

To demonstrate the working principle of a phototransistor.

Setup



Apparatus

1	539 047	Phototransistor LWL, NPN, BST
1	539 024	Lamp socket E10, BST
1	from 505 15	Incandescent lamp, 6 V, 0.05 A, E10
1	450 651	Electric torch
2	200 26 381	Mono cells, 1.5 V
2	539 001	Connector blocks BST, straight
1	539 003	Connector block BST, straight, 2 sockets
2	539 004	Connector blocks BST, 90° angle
6	539 000	Bridging plug, BST
1	531 906	Demo multimeter, passive
1	521 49	Power supply, 12 V DC, 230 V
4	500 644	Safety connection lead, 100 cm
1	301 300	Demonstration experiment frame
1	301 301	Adhesive magnetic board

Carrying out the experiment

- Adjust a voltage of approx. 6 V at the power supply.
- Light the phototransistor base with the torch.
- Observe the incandescent lamp and the pointer deflection on the demo multimeter.

Observation

When the base of the phototransistor is irradiated with light, the incandescent lamp begins to glow. A collector current I_C flows.

Evaluation

A phototransistor (NPN) works like an NPN transistor.

If the phototransistor's collector is positive and the emitter is negatively polarised, no collector current I_C can be measured (see Experiment D 4.1.4.2.a Working principle of a transistor).

A collector current I_C only flows when the base of the phototransistor is irradiated.

The collector current I_C is controlled by light falling on the base.