EN: Elektronic building set
Set is powered by 4 AAA batteries (not included). Toy is meant for kids 8years old and older.
Study the manual thorougly before the first use.
Especially the category about what to be aware of and how to clean the contacts.

Warning: Toy is unsuitable for kids up to 3 years of age because it contains small parts.
Producer: 3Dsimo s.r.o., Praha 9, K Žižkovu 282/9, 19800, **www.boffinmagnetic.com**
Manual in the language of your preference on the link:
www.boffinmagnetic.com/manual

CZ: Elektronická stavebnice
Stavebnice na 4x AAA baterie (nejsou součástí balení). Hračka je určena pro děti od 8 let.
Před použitím si pečlivě prostudujte návod.
Zejména kategorii, na co si dát pozor a jak provádět čištění.

Upozornění: Hračka není určená pro děti do 3 let, protože obsahuje malé části.
Výrobce: 3Dsimo s.r.o., Praha 9, K Žižkovu 282/9, 19800, **www.boffinmagnetic.com**
Manuál v příslušné jazykové mutaci naleznete online na odkazu:
www.boffinmagnetic.com/manual

PL: Elektroniczny zestaw konstrukcyjny
Zestaw na 4 baterie AAA (brak w zestawie). Zabawka przeznaczona jest dla dzieci od 8 lat.
Przed użyciem przeczytaj uważnie instrukcję.
Zwłaszcza rozdział, na co zwrócić uwagę i jak przeprowadzić czyszczenie.

Ostrzeżenie: Zabawka nie jest przeznaczona dla dzieci poniżej 3 roku życia, ponieważ zawiera małe części.
Producent: 3Dsimo s.r.o., Praha 9, K Žižkovu 282/9, 19800, **www.boffinmagnetic.com**
Instrukcję w odpowiedniej wersji językowej można znaleźć online pod linkiem:
www.boffinmagnetic.com/manual

DE: Elektronisches Kit
Das Kit verwendet 4x AAA-Batterien (nicht enthalten). Baukasten ist konzipiert für Kinder ab 8 Jahre.
Lesen Sie die Anweisungen vor dem Gebrauch gründlich durch.
Besonders die Kategorie, worauf zu achten und wie die Reinigung durchzuführen.

Beachtung: Das Spielzeug ist nicht für Kinder bis 3 Jahre konzipiert.
Hersteller: 3Dsimo s.r.o., Praha 9, K Žižkovu 282/9, 19800, **www.boffinmagnetic.com**
Das Manual in der betreffenden Sprache finden Sie am Link:
www.boffinmagnetic.com/manual

HU: Elektronikus építőkészlet
Az építőkészlet működtetéséhez 4 AAA elem szükséges. A csomag elemet nem tartalmaz.
A játék 8 éves kortól ajánlott **Használat előtt olvassa el figyelmesen a használati útmutatót.**
Különösen a tisztítás és karbantartás kategóriát.

Figyelem! Nem alkalmas 3 éves kor alatti gyermekek számára. Fulladásveszélyes!
Gyártó: 3Dsimo s.r.o., Praha 9, K Žižkovu 282/9, 19800, **www.boffinmagnetic.com**
A kézikönyvet a megfelelő nyelvi változatban online található ezen a linken:
www.boffinmagnetic.com/manual

FR: Kit de construction électronique
Le kit utilise 4 piles AAA (non inclus). Le jeu est destiné pour les enfants à partir de 8 ans.
Lisez le mode d'emploi attentivement avant utillisation.
Notamment la categorie de ce qu 'il faut fair attention et comment nettoyer le produit.

Attention: le jouet n'est pas destiné pour les enfants jusqu'à 3 ans.
Fabricant: 3Dsimo s.r.o., Praha 9, K Žižkovu 282/9, 19800, **www.boffinmagnetic.com**
Le mode d'emploi dans la langue correspondante se trouve sur le lien:
www.boffinmagnetic.com/manual

IT: Kit elettronico
I kit utilizza 4 batterie AAA (non incluso). Il giocattolo è destinato a bambini dagli 8 anni.
Leggere attentamente le istruzioni prima dell'uso.
Soprattutto le avvertenze e i consigli su come effettuare la pulizia.

Avvertimento: il giocattolo non è destinato a bambini di età inferiore a 3 anni, poiché contiene piccole parti.
Produtore: 3Dsimo s.r.o., Praha 9, K Žižkovu 282/9, 19800, **www.boffinmagnetic.com**
Il manuale nella versione linguistica pertinente si trova al link:
www.boffinmagnetic.com/manual

ES: Kit electrónico
Kit para 4 pilas AAA (no incluido). El juguete es para niños a partir de 8 años.
Lea atentamente las instrucciones antes de usar.
Especialmente la categoría de qué evitar y cómo realizar la limpieza.

Advertencia: el juguete no está destinado a niños menores de 3 años, ya que contiene piezas pequeñas.
Fabricante: 3Dsimo s.r.o., Praha 9, K Žižkovu 282/9, 19800, **www.boffinmagnetic.com**
El manual se puede encontrar en línea en:
www.boffinmagnetic.com/manual

HI!

You have received a unique electronic kit, with which you can build fun and sometimes even almost crazy projects.

In this book you will find 100 sample builds.
Every month we are going to add another 10 new projects to our official website.
There are already more than 50 of them now.

You can find online projects at:
www.boffinmagnetic.com/community/projects

My name is Boffin Magnetic

I will accompany you throughout the book. From the simplest builds to the most complex ones.
We can accomplish everything together and you will learn, too.
I am going to teach you to understand electronic circuits and also how things work around us.

I am sure that you cannot wait to build your first circuit.

But before you start, turn to the next page!

ATTENTION!

Before you start building, read what you should definitely NOT do to avoid damaging the kit:

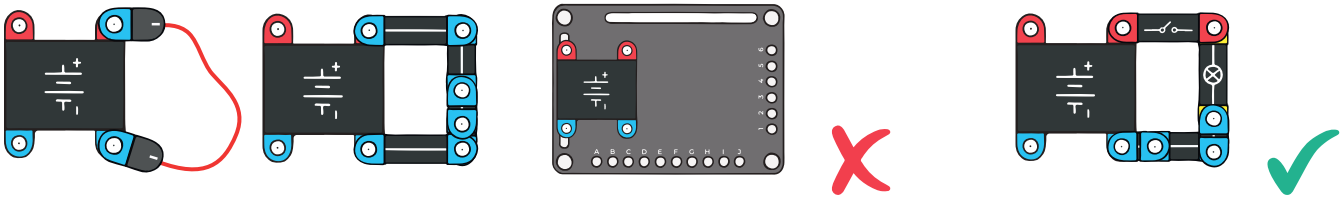
Battery type
Use only AAA 1.5V batteries!
(These batteries are not included in the kit.)

Battery polarity
Always insert the batteries with the correct polarity,
i.e. plus to ⊕ and minus to ⊖.

Replacing batteries
Replace AAA batteries regularly.
Remove defective batteries.
Do not mix old and new batteries.

Never!
Never connect the circuit or any component to household electrical sockets (risk of electric shock).

Never connect the ⊕ and ⊖ contacts directly on the battery component, otherwise a short circuit will occur and damage the batteries (the batteries will start to heat up quickly).



Always!
Always make sure that the build is connected correctly according to the instructions. Never reverse the polarity of both batteries and other components where the contacts are marked with a ⊕ and ⊖.

The package contains small parts.
There is a risk of swallowing. Not intended for children under 3 years.

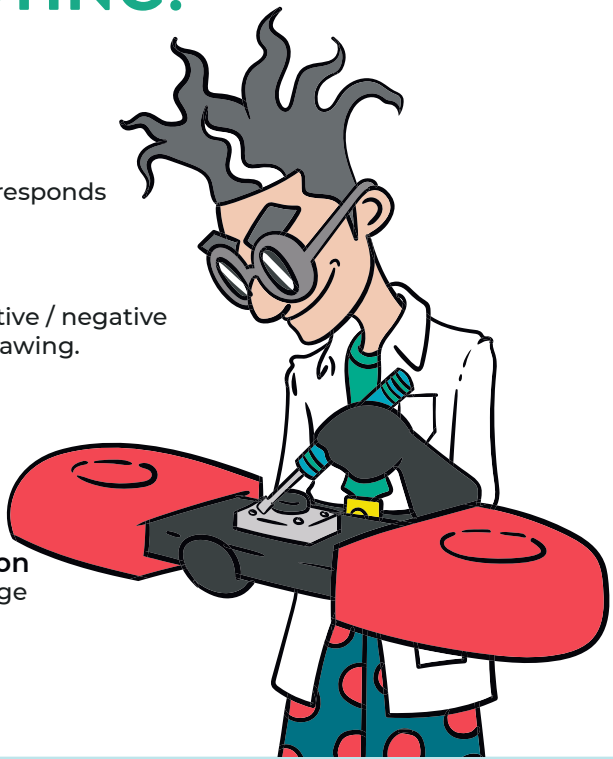
BASIC TROUBLESHOOTING:

1. Wrong build
Most problems are due to a wrong build.
Therefore, always carefully check that the circuit built corresponds to the sample drawing.

2. Polarity ⊕ and ⊖
Make sure that components with explicitly indicated positive / negative contacts are positioned in accordance with the sample drawing.

3. Bad contact
If the connection you have created does not have an adequate contact, you should gently move and push the components.

4. You may build your own projects at your discretion
3Dsimo s.r.o. cannot be held liable for any potential damage caused to components.

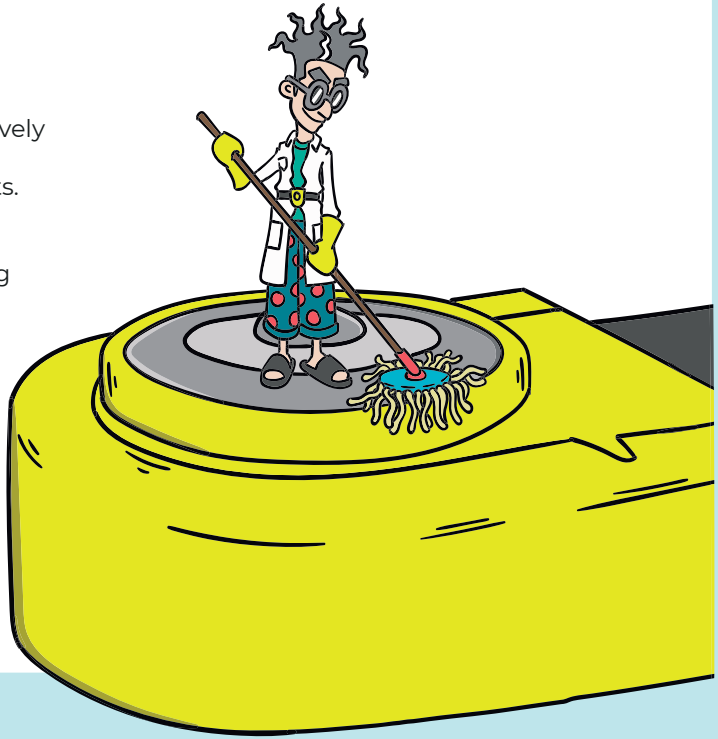


CLEANING:

Regularly clean magnetic contacts and the surfaces on which they rest.

Use the included pen with cleaning liquid or alternatively wet wipes for electronics or a piece of cloth soaked in alcohol or diluted dish detergent to clean components.

Over time, dirt or grease may adhere to the contacts, which may prevent the components from functioning properly (due to reduced conductivity).



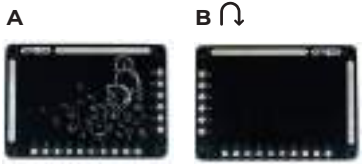
HOW IT WORKS

MAGNETIC BASE PLATE

It consists of several parts stacked on top of each other and represents a unique technology - a combination of magnetism, conductive surfaces and non-conductive space for placing components. You can build your project on both sides of the base plate to get an area larger than A4-size paper. Alternatively, you can buy another base plate and layer them on top of one another using conductive column spacers.

It is used to connect individual surfaces to the other side of the base plate.

There are two long conductive strips that can be used for power supply; they are also connected to the other side of the base plate.



CONDUCTIVE TRACE

It is a simple component that is only used to interconnect the components with which you create a functional build. It consists only of a conductive track or path that should bring electricity from point A to point B.

(ON-OFF) SWITCH

It is a manually operated mechanical switch used to switch an electrical circuit on or off. In one position, a permanent conductive trace is made (ON), whereas in the other position the trace is open or broken (OFF).

BUTTON

It is a simple switch that is used to manually control electrical equipment. The circuit closes when the button is pressed.

CHANGEOVER SWITCH (A/B SWITCH)

It is an electronic component operating on a similar principle as the on-off switch. If we do not connect one terminal, we will create a simple switch. This component is used to switch the flow of current from the common contact to contacts A or B.

MAGNETIC REED SWITCH

The reed contact is a mechanical switch controlled by a magnetic field. If you bring a magnet close to the contacts, it will be connected, and thus a conductive trace will be made. After removing the magnet, the trace is disconnected.

CAPACITOR

It is a component used in electrical circuits to temporarily store an electric charge, and thus to store electrical energy - charge.

RESISTOR

One of the basic components without which no circuit and build can do. Its basic property is electrical resistance. The main reason for including a resistor in an electrical circuit is to limit the flow of electrical current through the circuit or to obtain a certain voltage drop for measuring non-electrical quantities.

PHOTORESISTOR

This is a light-sensitive component. This means that the more light shines on the component, the less resistance it will have. For example, a motor connected to a circuit will spin faster in high light. If you shade the photoresistor with your finger, a high resistance will cause the motor speed to decrease until it stops. With this component you can create a large number of interesting and experimental builds that will respond to illumination or its change, as the case may be.

POTENTIOMETER

It is a component that changes the resistance when its axis rotates; for this reason, it is used to directly control, for example, the volume or intensity of light. With the Boffin Magnetic kit, you will find that it can also be used as a steering wheel for controlling a racing game.

BULB

A light bulb is a simple device used to convert electrical energy to light. It works on the principle of heating a thin conductor (mostly a tungsten filament) by an electric current flowing through it. At high temperatures, the filament of a light bulb glows, but consumes most of the energy to radiate heat instead of light. For this reason, we nowadays mostly used light sources that are much more economical and efficient. In one of the builds, you can compare both types of radiators and test how much they heat up, shine and consume energy.

DIODE

The purpose of the diode is to let electric current flow only in one direction, and this is why the diode symbol is similar to an arrow. The diode contains two transitions – P and N – referred to as the anode and the cathode, respectively.

LED (LIGHT-EMITTING DIODE)

The LED has the main task to light up as efficiently as possible.
It is a semiconductor device that can be connected in the forward or the reverse direction. If you connect the diode in the reverse direction, no current will flow through it and it will not light up. Current can flow through a diode connected in the forward direction, and it then lights up.

NPN/PNP TRANSISTOR

The main feature of a transistor is its ability to amplify an electric current.
This simply means that small changes in input voltage or current can cause large changes in output voltage or current.

BUZZER

Due to the piezoelectric effect, this component emits a squeaky tone.
This phenomenon occurs due to changing voltage at its contacts, which is applied to the crystal.

SPEAKER

The speaker converts electrical energy into acoustic pressure – in lay terms called the sound. Acoustic pressure changes generate acoustic waves, which stimulate the human auditory organ. Depending on the rate of change of the speaker‘s electric current, sound waves of different frequencies are generated. A person is able to perceive frequencies in the frequency range of from about 16 Hz to 20,000 Hz depending on the age and abilities of the individual.

MICROPHONE

A component enabling the conversion of an acoustic signal, or sound, to an electrical signal. Thanks to this, you can hear the singer at the concert even in the back rows.

JOYSTICK

The joystick replaces several buttons. If you need to move in all directions in a game and still jump, for example, you will need at least five buttons.
The joystick can be a full replacement of all of those buttons and do even much more.

BATTERY

Galvanic cells, which represent batteries or accumulators, supply electricity to a circuit through an electrochemical reaction inside the cell. The cells differ in size, chemical composition and, thus, the output voltage. Without this component, no circuit would work for you.

MICROCOMPUTER (THE BRAIN OF THE BOFFIN MAGNETIC KIT)

A component whose main function is to control the entire Boffin Magnetic kit; it can also be referred to as the brain. A miniature computer thanks to which you can play games or, for example, measure temperature and other quantities. If you are technically proficient, you can reprogram it at your discretion or upload new programs to it, which we are going to publish from time to time.

DISPLAY

A small OLED display with a resolution of 128 by 64 pixels and a size of 1.3“. One pixel represents one small square on a black area, and when the correct squares light up, an image on the display is formed. The display is directly connected to the microcomputer by two data conductors named according to the corresponding terminals.

SYMBOLS

On each module you also have the electrotechnical symbol of the component, which is commonly used. For a better understanding, you will find below an explanation of which component, which brand it belongs to.

Conductive trace


(On-Off) Switch


Button

Changeover switch


Reed switch


Capacitor

Polarized capacitor


Resistor


Photoresistor


Potentiometer


Bulb


Diode


LED


NPN transistor


PNP transistor


Buzzer


Speaker


Microphone


Joystick

Battery

PROJECTS