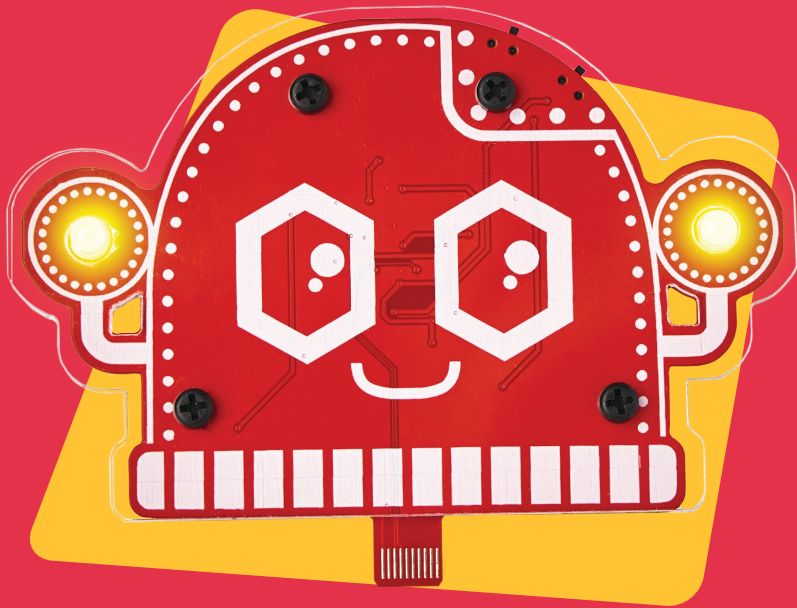


# CREATOR'S BOOKLET

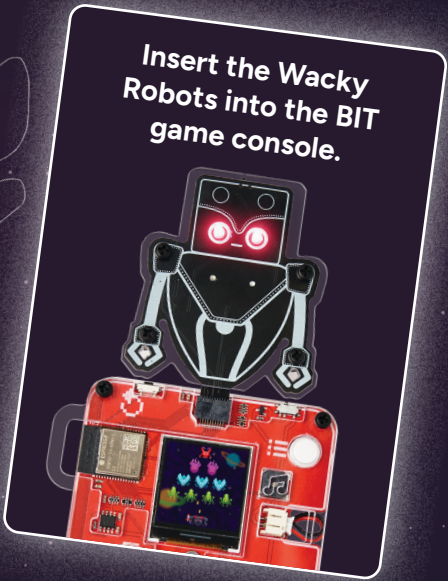


# Enhance your STEM knowledge with the CircuitMess toy collection!

Wacky Robots are a quirky group of mini-robots that will help you master the basics of robotics and electronics.



Collect all the Wacky Robots and unlock new games for the BIT!



**Connect your robots to Sparkly, a robot car that follows the source of light.**

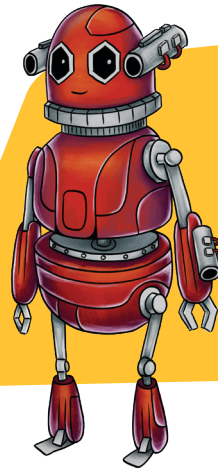
Sparkly, BIT, and Wacky Robots are sold separately.



## Meet Capacitron

Introducing Capacitron, a DIY Wacky Robot that will introduce you to the exciting world of robotics and STEM.

With Capacitron, you'll learn about different electronic components, LEDs, and capacitors.



## How does it work?



Assemble your  
Wacky Robot



Learn about LED  
and capacitors



Play with your new  
Wacky Robot

## What is CircuitMess?

**CircuitMess** started in 2016 when Albert (our CEO) was 17.

**Albert** loved tinkering with electronics, and one of his first projects was a DIY game console.

People liked the idea, so he launched it on **Kickstarter**, which raised \$100,745!

After that, CircuitMess was born. We are a small and fast-growing team of tech lovers who wish to share our love of creating new technology with the rest of the world!

Albert



All of our kits are developed, manufactured, and packed in Croatia!

## Behind the name

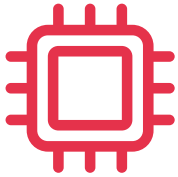
# Circuit Mess

electronic  
circuits

creative mess  
in our heads



## The mission

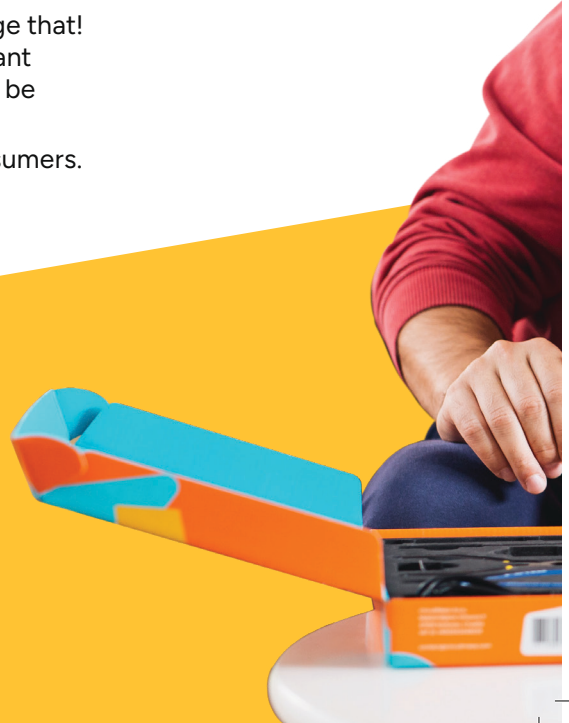


Everybody knows how important technology is, but less than 1% of the population knows

**HOW TO MAKE**  
new technology.







We're here to change that!  
With our kits, we want  
to inspire people to be  
**CREATORS**  
instead of just consumers.





# What's inside the box?

- 1  PCB
- 2  Screwdriver
- 3  Coin battery
- 4  Acrylic casings
- 5  LEDs
- 6  Plastic bolts
- 7  Plastic standoffs

## You'll learn about:



Electronics and different electronic components

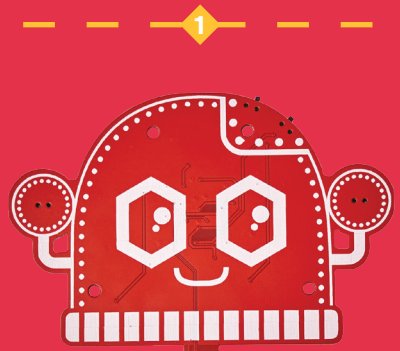
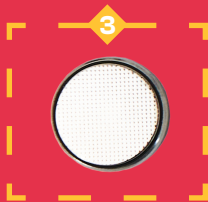


Capacitors



LEDs





## Leyden jar

The **capacitor** is a component that possesses the fundamental **ability to store energy in the form of electric charge**. This ability is referred to as **electric capacity**.

The first electric capacitor emerged in 1745 and was called the **Leyden jar**, created by **Pieter van Musschenbroek**.



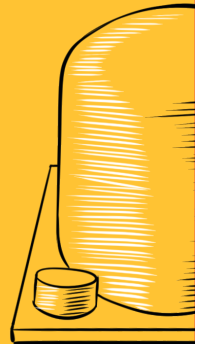
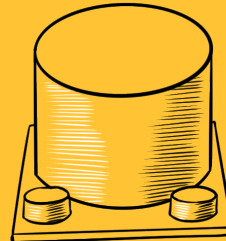


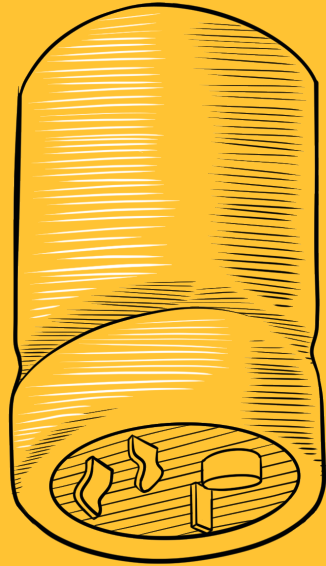
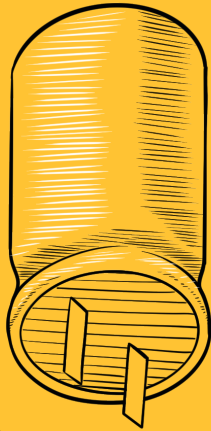
It was composed of a glass bottle filled halfway with water, sealed with a bottle cap punctured by a wire or nail immersed in water. To charge the bottle, the outer end of the wire was brought into contact with a friction device that generated static electricity.

Upon breaking the contact, we could demonstrate the charge by touching the wire with our hand and feeling the electricity.

The measurement unit of electric capacity is the **farad**, named in honor of **Michael Faraday**. Capacitors with a capacity of 1 farad are used to drive 1000W power amplifiers.

# Different types of capacitors

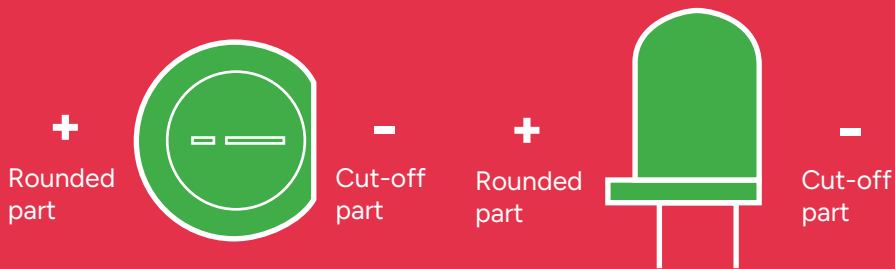




## LEDs take over the world

One of the key components of the Capacitron are **LEDs**. These are semiconductor electronic components that **convert an electrical signal into light**.

LEDs are **polarized**, so we must be cautious about how we place them. Current flows in only one direction, so if you place them in the opposite direction, the diode won't function.



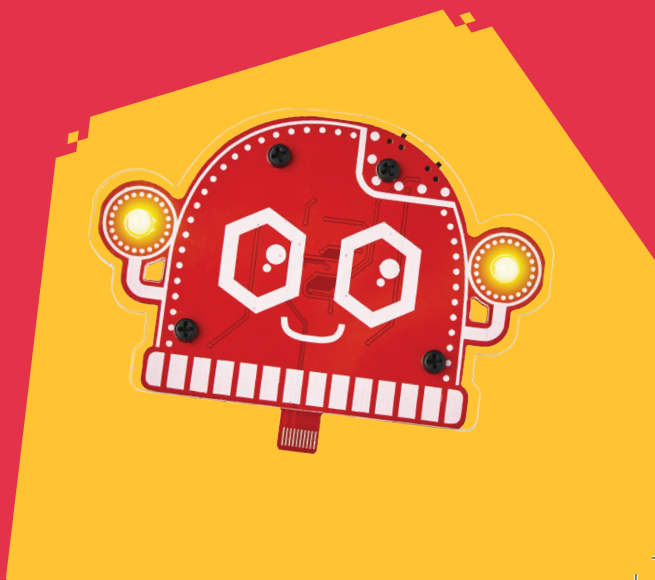
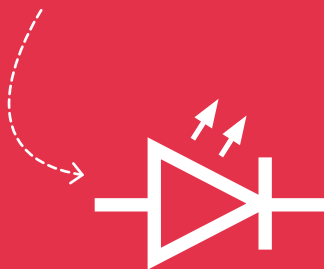
**You can recognize the polarity by the shapes of the sides of the diode.** The positive side is rounded and called the **anode**, while the negative side is flat and called the **cathode**. Electrical energy always travels from the anode to the cathode, never vice versa.

Since the energy produced by the battery is too high for LED diodes, we had to add **resistors** to decrease it and prevent the diodes from being “destroyed.”

LEDs are everywhere — from machines, car lights, and televisions to remote controls or bicycle lights.

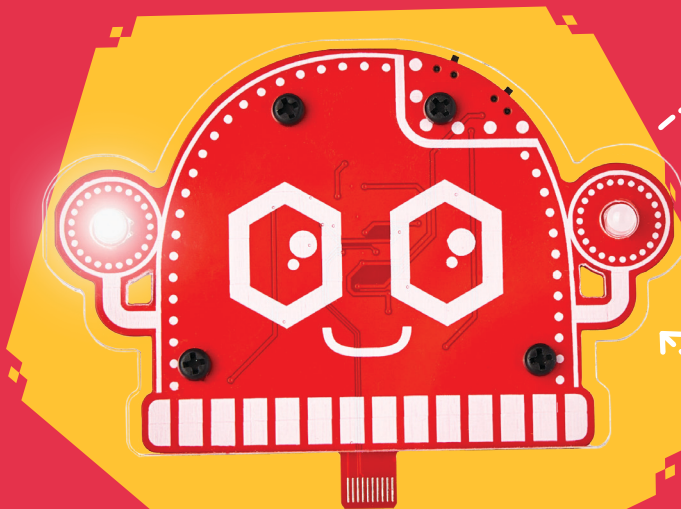
These diodes are more environmentally friendly than standard bulbs because they convert less energy into heat. Additionally, their lifespan is longer. That’s why LED diodes are being used today in various places and in increasing numbers.

### LED symbol



## Flip-flop - the playful side of the electronics

A bistable circuit (also known as a flip-flop) is a pulse-driven electrical circuit with **two stable states** and represents a fundamental memory element in digital systems. While connected to a power source, the bistable does not change its states on its two outputs.



State A



Capacitron has two transistors and two capacitors, which are used to charge and discharge alternately.

When one capacitor is being charged through a transistor, the other discharges into the LED, and vice versa. Because of this, the LEDs light up alternately.





# Safety first

Before you start with the assembly, pay attention to the following safety measures:



Handling a screwdriver is not recommended for children under the age of 7!



**Keep the Wacky Robots kit away from young children! This product contains small components that are dangerous to children under the age of 3.**



If you are a minor, assemble Capacitron strictly with the help of an adult.

**Closely follow all the instructions you received in this kit and those found on our online pages so that no one gets hurt.**

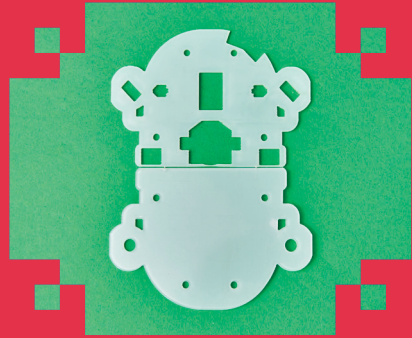
**If you have never used a screwdriver, carefully follow the assembly instructions on our website and, if necessary, ask someone more experienced or older than you to help you.**

**If you are having problems with our kit, contact our customer support via email at [contact@circuitmess.com](mailto:contact@circuitmess.com).**

# CAPACITRON BUILD GUIDE

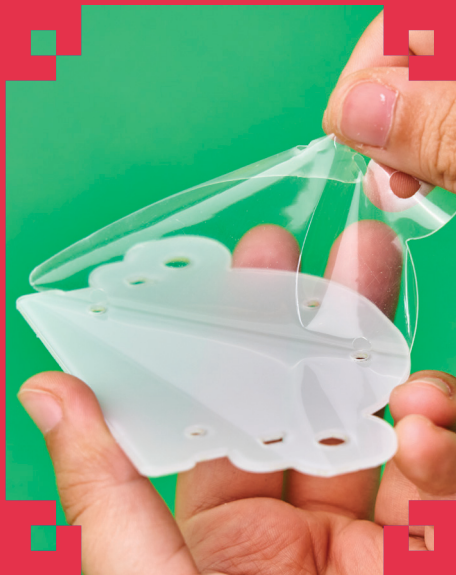
To get two smaller casings from the kit, you'll need to break one large acrylic piece.

But please, be **super careful** when doing this to make sure you don't damage the parts you need.

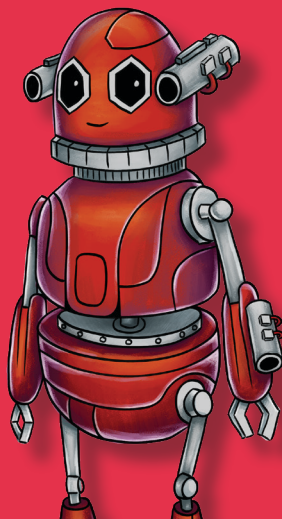
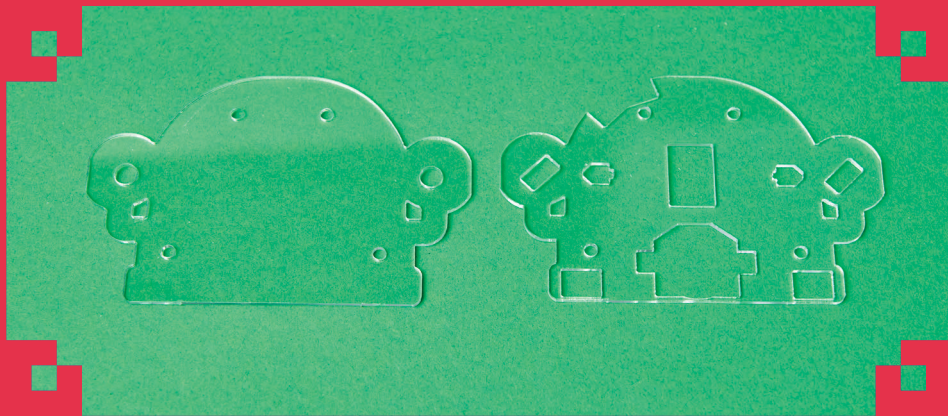


After breaking it, you'll end up with **two separate pieces** of acrylic casings.

Remove the protective foil from both sides of the casings now.

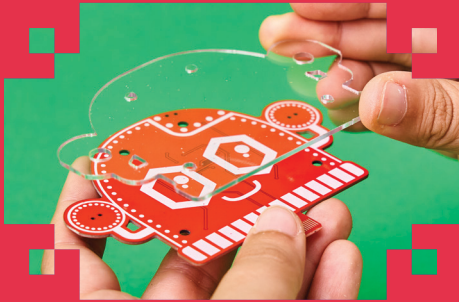
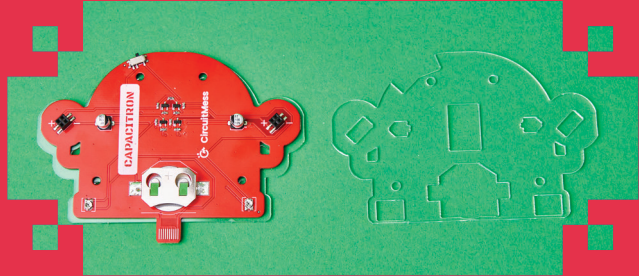


Your casings should be all nice and transparent now.

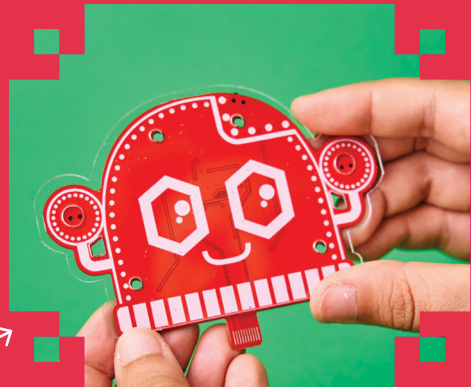


## Now, let's dive into the exciting assembly part!

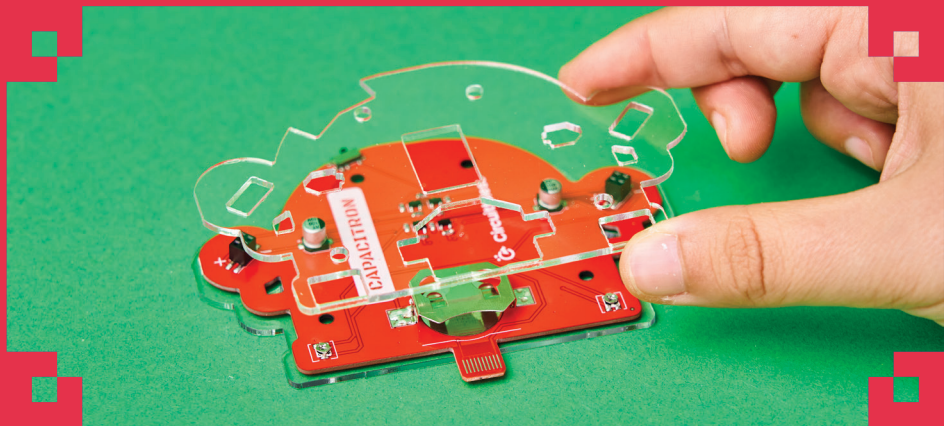
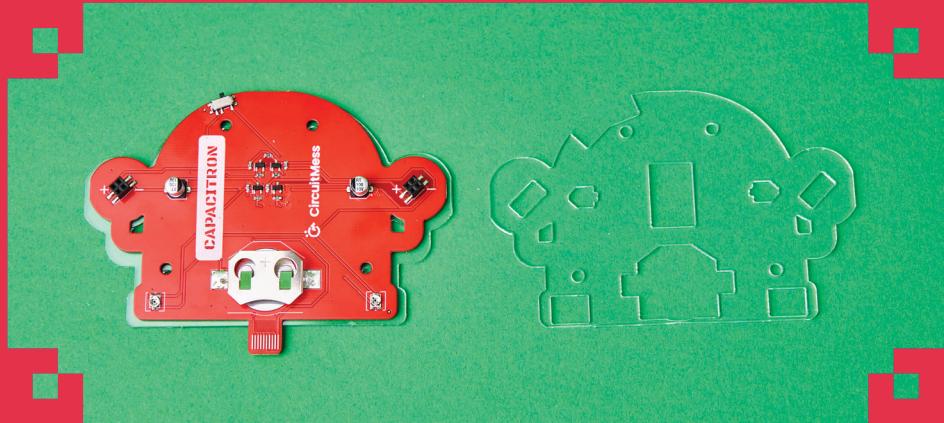
Start by grabbing the **case** that looks just like the one in the photo below and place it onto the **PCB**.



Make sure the front side of your Capacitron looks like in the picture.

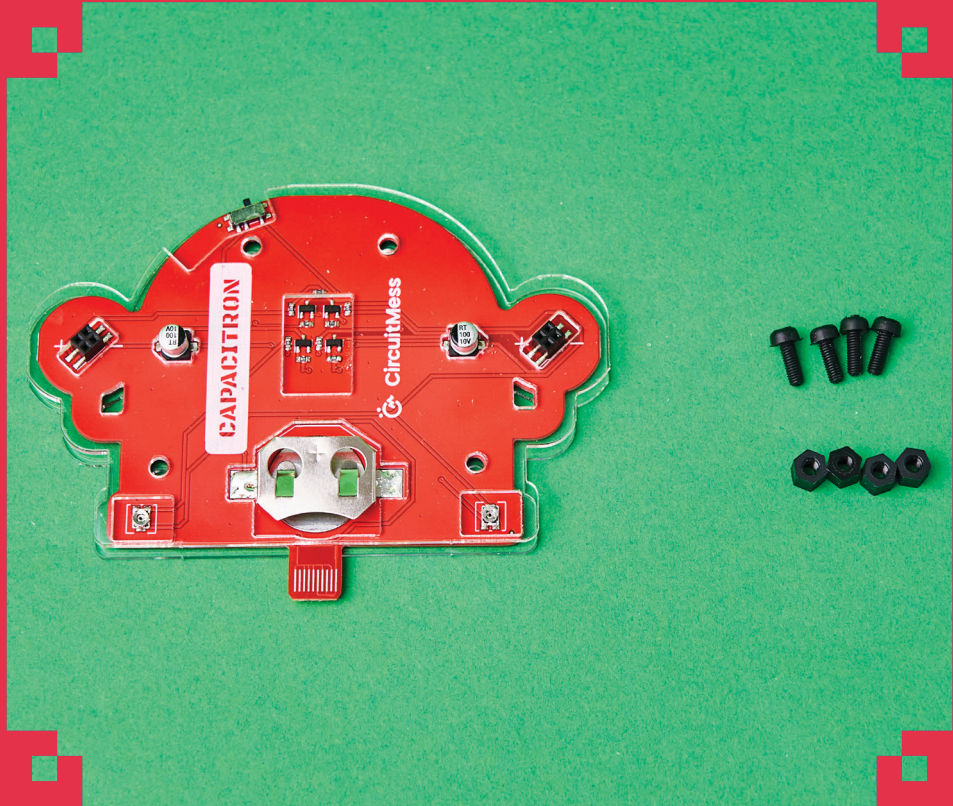


Now, let's move on to the next step – getting casings onto the backsides.

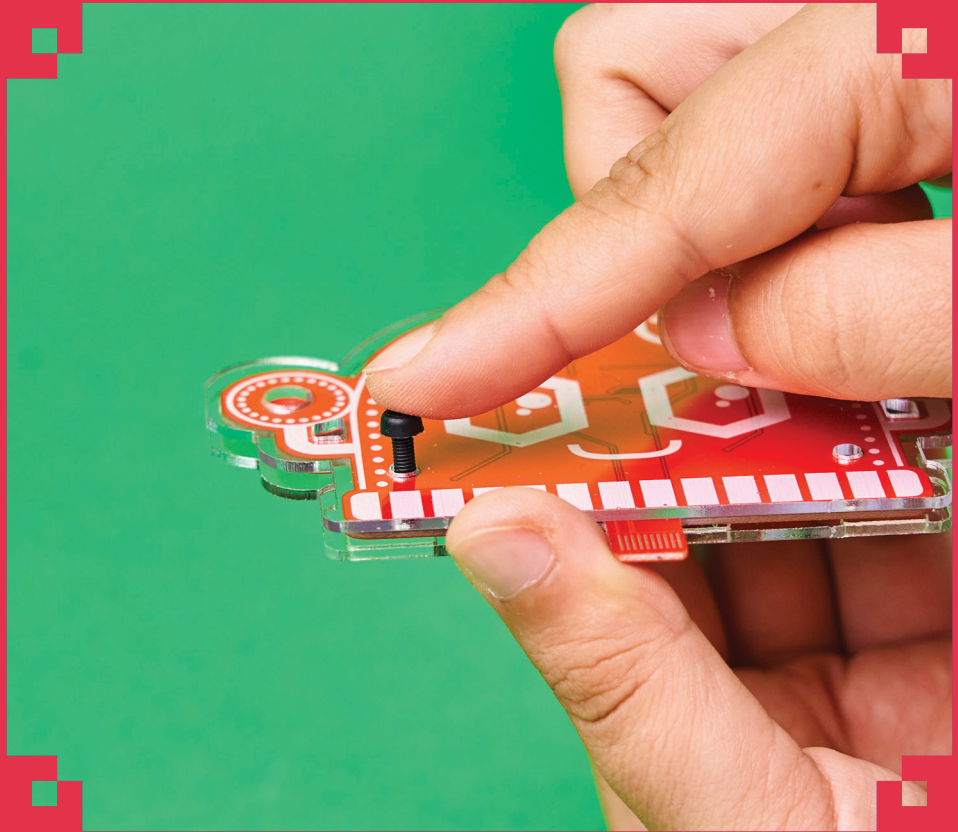




But here's the important part: We need to secure the casings in place so they don't fall off. So, slide the bolts onto the front, and then pop the standoffs onto the back.

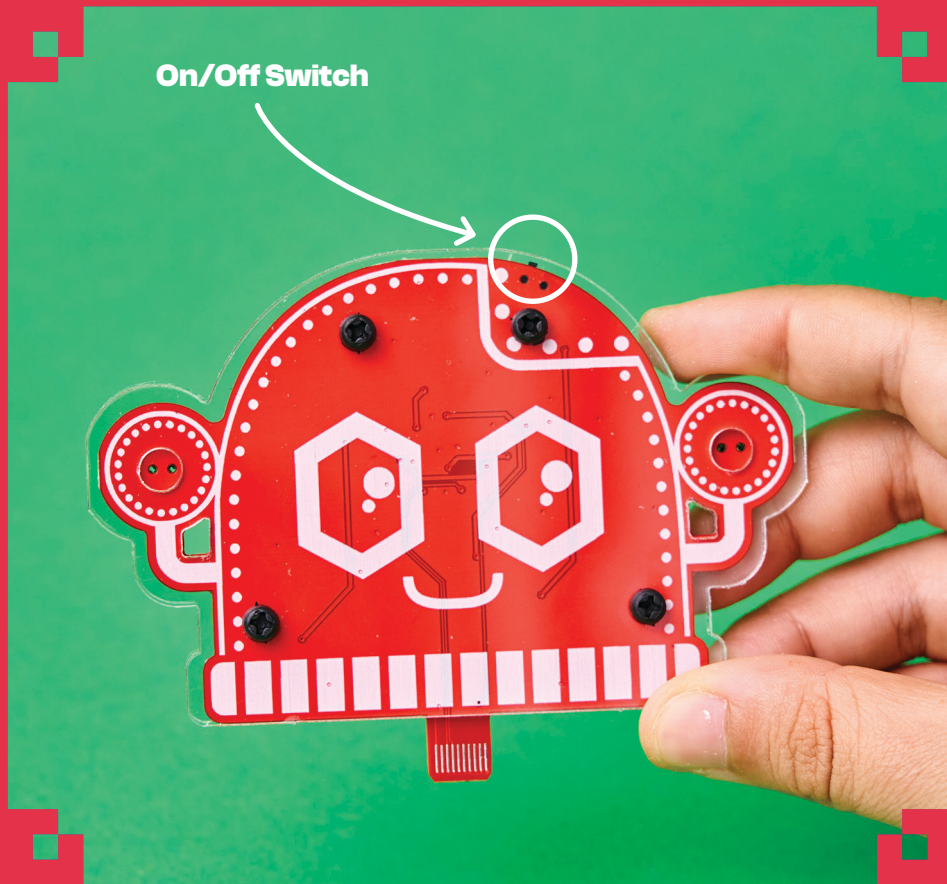


Put the bolts on the front and the standoffs in the back.

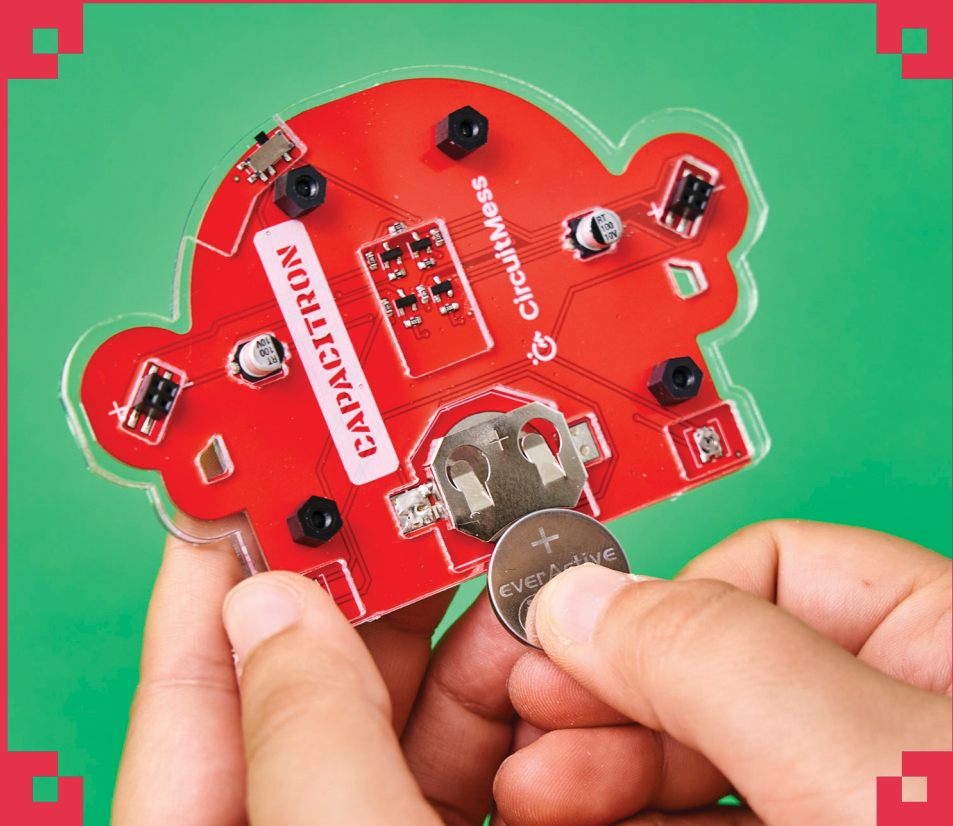




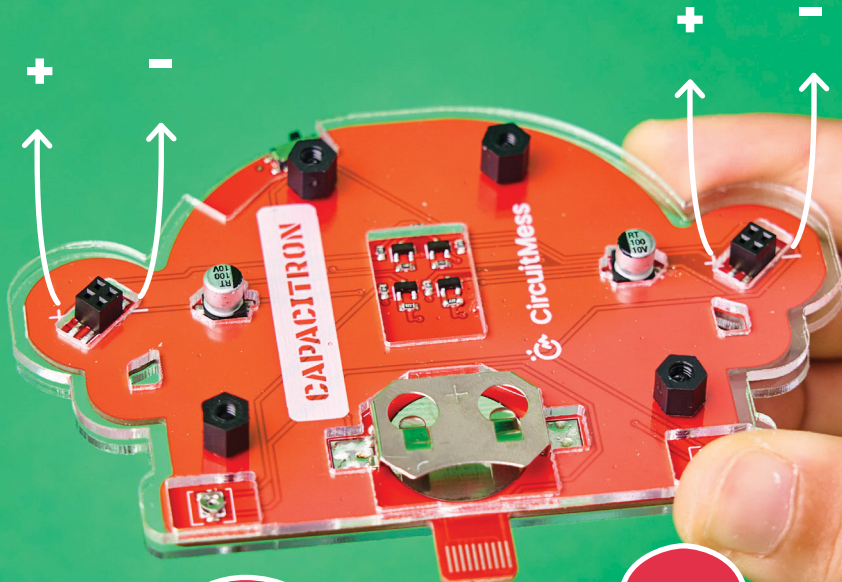
Your Capacitron should now look like this.



Grab the coin battery and carefully place it on the backside (make sure the + symbol on the battery matches the + sign on the board - front and up).



## LED polarity



+  
Rounded part



-  
Cut-off part

+  
Rounded part

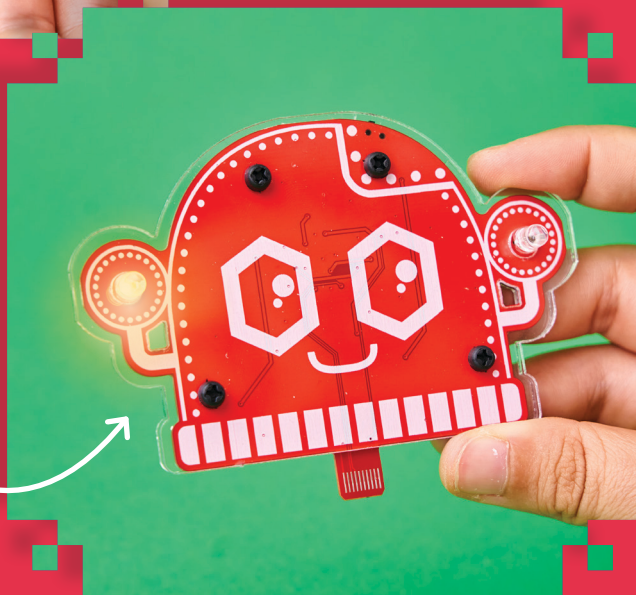


-  
Cut-off part



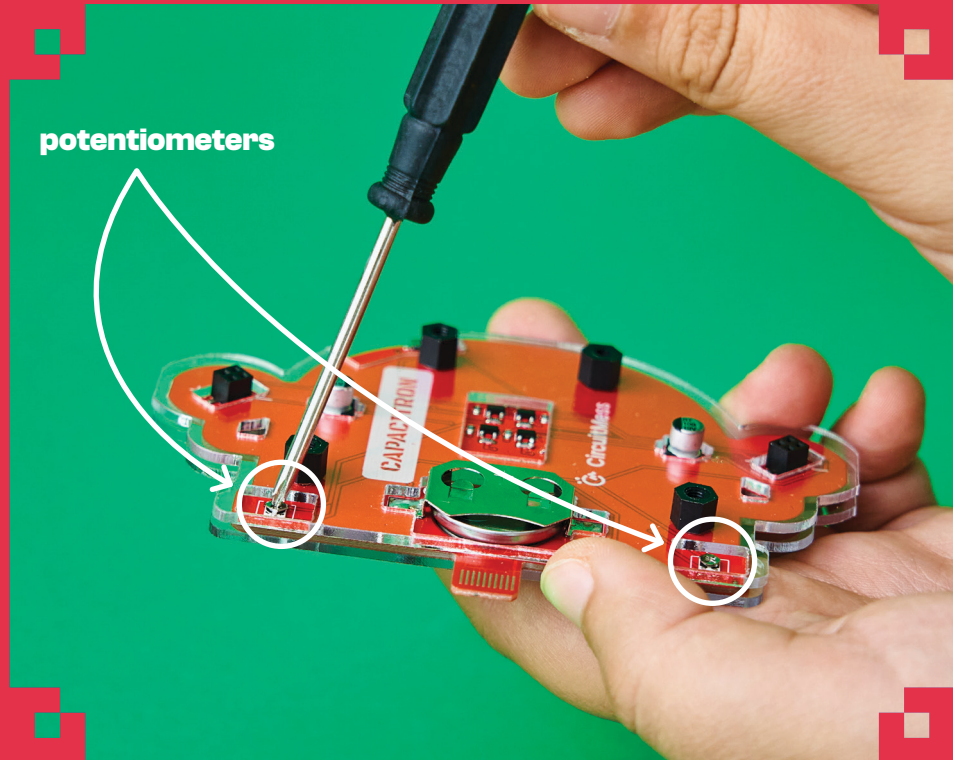
Turn on your Capacitron, and you can choose whichever LEDs you prefer to add.

They'll alternate between turning on and off for a cool light show.



If you want to fine-tune the LED action, flip the Capacitron over.

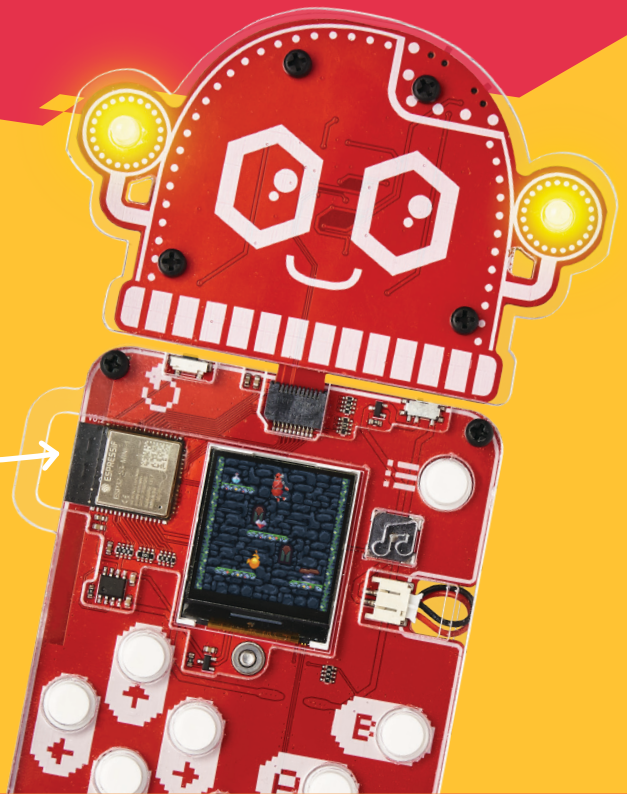
You'll find **two potentiometers on the back**. Grab a **screwdriver** and gently adjust these to control the speed of the LED alternation – speed it up or slow it down to match your preferences.





We hope you had a blast putting together your Capacitron and picked up some new skills along the way.

**And hey, here's a bonus:**  
Connect it to the CircuitMess  
BIT and unlock a new game!



\*BIT is sold separately

## **Thank you for purchasing CircuitMess Wacky Robots Educational kits**

For more information and detailed instructions on assembling and using your device, visit our official website: [circuitmess.com/resources/guides](http://circuitmess.com/resources/guides)

### **Important safety information for CircuitMess Wacky Robots**

Read all safety information before using the device.

**WARNING:** Failure to follow these safety instructions could result in fire, electric shock, injury, and damage to your device or other objects. Read all safety information before assembling and using this device.

This product is a do-it-yourself device, and for it to work properly, you must assemble it according to the instructions you'll find on our website.

If you are a minor, assemble it only under an adult's supervision to avoid potential risks.

CircuitMess Wacky Robots kit contains sensitive electronic components. CircuitMess Wacky Robots or its components may be damaged if dropped, burned, punctured, crushed, or in contact with liquid. If you suspect that any part of your CircuitMess Wacky Robots kit (especially the batteries) is damaged, stop using the device. Using a damaged device may cause injury.

Use only authorized accessories compatible

with your device and/or the supplied tools.

The device's operating temperature ranges from 0 °C ~ 40 °C.

Using this device in conditions outside this temperature range may damage the device.

Please turn off CircuitMess Wacky Robots after use and store it in a safe and dry location.

The included battery must be recycled appropriately and/or disposed of separately from household waste.

Improper handling of batteries can cause a fire or explosion. Dispose of or recycle

your device, battery, and accessories according to local regulations.

### **The included battery is NOT rechargeable.**

- Do not short-circuit the battery
- Improper use of the battery can cause overheating, burns, or other injuries.
- Do not leave the battery directly exposed to intense sunlight.
- Do not use the device or the battery in high-temperature conditions. Overheating may cause an explosion.
- Do not disassemble or damage the battery to avoid battery leakage, overheating, or explosion.

- In the case of deformation, stop using the battery immediately and dispose of it properly.

If you are not sure whether your device or the included battery is safe to use, turn off the device, put it in a safe place, and contact our customer support via email at [contact@circuitmess.com](mailto:contact@circuitmess.com).

Keep the device dry.

Do not attempt to repair the device by yourself.

If any part of the device does not work correctly, contact our customer support ([contact@circuitmess.com](mailto:contact@circuitmess.com)) or take your device to a certified repair shop.

Connect other devices according to their operating instructions. Do not connect incompatible devices to this device.

### **Precautions**

During prolonged use, Wacky Robots may rarely overheat.

Keep CircuitMess Wacky Robots in a ventilated room during the use and assembly. Pay special attention to this if you suffer from a physical condition that affects your ability to detect heat on your body.

Assembling or using CircuitMess Wacky Robots in an area with a potentially explosive atmosphere, such as areas where the air contains high levels of flammable chemicals, vapors, or particles (such as dust or metal powder), can be dangerous.

Exposure of CircuitMess Wacky Robots to environments with high concentrations of industrial chemicals, including liquefied gases that evaporate, such as helium, can damage the functionality of CircuitMess Wacky Robots.

Do not use CircuitMess Wacky Robots in hospital operating rooms or intensive care units.

Contact your doctor or our customer support ([contact@circuitmess.com](mailto:contact@circuitmess.com)) to determine if the device's operation may compromise the work of medical devices.

To avoid possible interference with a pacemaker, maintain a minimum distance of 15 cm between the CircuitMess Wacky Robots and the pacemaker. To achieve this, do not carry the included device in your pockets.

Do not use CircuitMess Wacky Robots near hearing aids or similar medical aids and equipment to avoid interference with medical equipment.

Check aircraft safety regulations and turn off CircuitMess Wacky Robots on the aircraft if necessary.

Do not use CircuitMess Wacky Robots while driving.

To avoid lightning strikes, do not use CircuitMess Wacky Robots outdoors during storms.

Do not use the CircuitMess Wacky Robots in high-humidity environments

such as bathrooms. Failure to do so may result in electric shock, injury, fire, and damage to the product, electronic components, power adapter, or other parts of this electronic educational kit.

Follow all the rules that limit the use of portable electronic devices in some situations and conditions.

The individual parts and components in the CircuitMess Wacky Robots can pose a choking risk to children under 36 months. Keep all components, tools, and parts of this product away from small children before and after assembling the device.

### **Additional Recommendations and Precautions for Parents, Guardians, and Teachers Buying CircuitMess Wacky Robots for Children**

1. Carefully follow the instructions for adequately assembling CircuitMess Wacky Robots. Keep these and all other instructions that came with the products in a safe place.
2. Supervise your child while assembling and using the CircuitMess Wacky Robots. Your responsibility is to ensure that the child uses the CircuitMess Wacky Robots correctly and that the CircuitMess Wacky Robots are suitable for the child's age and abilities.
3. Check from time to time if CircuitMess Wacky Robots are damaged or worn out in any way to prevent possible injuries and risks to the child's health and safety. If CircuitMess Wacky Robots is damaged, remove it immediately.

4. Remove any unnecessary packaging, but keep the instructions. Take care that children do not play with any plastic packaging as there are suffocation risks.

5. Teach children to always store CircuitMess Wacky Robots and other parts of the CircuitMess Wacky Robots educational kit appropriately to prevent accidents. Do not leave CircuitMess Wacky Robots on stairs or on the floor in your home or classroom where someone can step on them.

6. Always report a product security issue to our customer support (contact@circuitmess.com)

### **Declaration of Conformity**

CircuitMess d.o.o. declares that these DIY educational kits CircuitMess Wacky Robots model complies with the essential requirements and all other relevant provisions of Directive 2014/53 / EU. The full text of the EU declaration of conformity is available at the following Internet address: [circuitmess.com/certification](http://circuitmess.com/certification).

### **Legal Information**

These devices can be used in all EU Member States. Check all the national and local regulations about using the device. These devices may be restricted for use, depending on local laws.

Manufacturer:  
CircuitMess d.o.o.  
Ventilatorska cesta 24,

10250 Lučko,  
Zagreb,  
Croatia  
OIB: 50943449035

### **Proper disposal of this product**

WEEE markings on the product indicate that this product may not be disposed of with the rest of your household waste in the EU. To prevent possible damage to the environment or human health from uncontrolled waste disposal, recycle the product responsibly. Recycling promotes the sustainable reuse of resources. For more information on the disposal of electrical and electronic equipment, don't hesitate to contact your local household waste disposal service, the store where you purchased the kit, or our customer support ([contact@circuitmess.com](mailto:contact@circuitmess.com)).

### **IMPORTANT! Warranty conditions:**

The warranty is valid only if the original invoice is attached to the product as proof of purchase during the complaint. If the customer sends the product for repair for any reason not covered by the warranty, the customer may be charged for inspection and testing and delivery costs.

### **WARRANTY STATEMENT**

CircuitMess d.o.o., with its registered office in Zagreb, Croatia, Ventilatorska cesta 24, guarantees the quality and proper functionality of the components that come in the CircuitMess Wacky Robots

DIY educational kits for a duration of 24 months from the date of purchase.

If the assembled device does not work correctly due to defects in supplied parts or electronic components supplied in the CircuitMess Wacky Robots DIY educational kits, CircuitMess d.o.o. will repair the product or send an equivalent replacement product at their own expense.

In case you are experiencing assembly or functionality difficulties with your device, please contact us via email ([contact@circuitmess.com](mailto:contact@circuitmess.com)).

Please include a detailed description of the problem.

If you are sending the product to a repair shop, it is recommended to deliver the product in the original packaging to protect it from potential damage during transportation.

### **WARRANTY CONDITIONS**

The warranty period begins on the day of sale indicated on the invoice.

The warranty is valid upon presentation of the original invoice.

If the defect is not remedied within a reasonable period after receiving the product for repair, CircuitMess d.o.o. will replace it with a new product.

The repair shop does not take responsibility

for storing and/or losing personal data while repairing the device.

### **WARRANTY DOES NOT COVER**

Upgrades, alterations, modifications to hardware and/or software without the written consent of CircuitMess d.o.o.

Malfunctions due to improper handling, faults due to wear of the device and/or its parts (in you need help with assembly or if you have difficulty using the device after assembling it, please contact us at [contact@circuitmess.com](mailto:contact@circuitmess.com)).

Defects caused by external particles (including, but not limited to: staples, waste, dust, food) and external factors (including, but not limited to: moisture, water, thermal damage).

Mechanical damage and/or failures caused by mechanical damage.

Use of the product for a purpose for which it is not intended.

Requirements for the appearance, technical functionalities, and/or capabilities of the product outside the manufacturer's specifications and/or standards.

Damages to personal data, other tangible and/or intangible assets of the buyer and/or third parties, indirect damages, lost profits caused by the use of the product, and/or its failure.

Repairs in an unauthorized repair shop and/or installation of non-original spare parts.

Damage caused during transportation caused by improper packaging.

The rights under this warranty are the exclusive and final rights of the customer unless otherwise provided by national law.

CircuitMess d.o.o. as the warranty provider and/or its authorized partners will not be liable for any defect, damage, loss, direct or indirect cost, or connection with the delivered products outside the warranty conditions written here.

This warranty does not affect other rights of the customer belonging to him on other legal grounds.

## WARRANTY SHEET

<b>Product name:</b>	CircuitMess Wacky Robots do-it-yourself educational solder kit
<b>Warranty on components and parts contained in this set is:</b>	24 months
<b>Date of purchase:</b>	
<b>Seller and point of sale stamp:</b>	
<b>Invoice number:</b>	

Information on interventions during warranty period is entered by a repair shop technician at an authorized repair shop.

Received on	Issued on	Fault description	Warranty extension

### Manufacturer:

CircuitMess d.o.o.  
Ventilatorska cesta 24,  
10250 Lučko,  
Zagreb,  
Croatia  
Country of origin: Croatia  
[www.circuitmess.com](http://www.circuitmess.com)

### Authorized repair shop:

CircuitMess d.o.o.  
Ventilatorska cesta 24,  
10250 Lučko,  
Zagreb,  
Croatia  
Country of origin: Croatia  
[www.circuitmess.com](http://www.circuitmess.com)

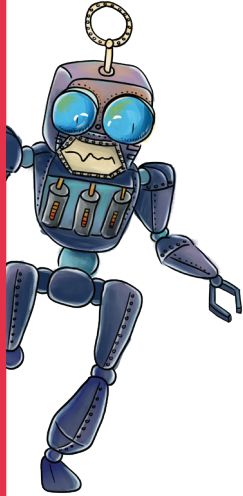
 **CircuitMess**



WARNING:  
Not for children  
under 3 years

**Scan and find more fun  
games and lessons:**



**CircuitMess**