STATUS

The status light signalizes with a **continuous yellow light** that the Calliope mini is connected to the power supply. It **flashes** when a program is transferred to the Calliope mini.

BUTTONS

The **buttons A** and **B** are inputs through which the Calliope mini executes the programmed commands.

BLUETOOTH

This makes it possible to connect the Callipoe mini to a tablet or smartphone.

PINS

By touching the **pins 0, 1, 2,** or **3** you can also make entries so that the Calliope mini executes commands.

You must touch the **negativ pin (-)** with the other hand at the same time in order to close the circuit.

PROCESSOR

The processor is the **heart** of the Calliope mini! It combines all functions with each other and processes all information and commands.

HELLO, CALLIOPE MINI!

5x5 MATRIX

You can display patterns and texts on the **5x5 grid** of red LEDs. The LEDs can send light as well as measure light.

USB

Plug a micro-USB cable into the **USB port** to connect the Calliope mini to a **computer**.

RESET

Use the reset button to **restart** the program on the Calliope mini.

RGB-LED

The **RGB-LED** can shine in various bright colours. The different colours are mixed using red, green and blue.

RADIO

You can wirelessly send signals from one Calliope mini to another and forward messages.

EXTENSIONS

Grove **connector** for sensors. Simply plug one in and get started!

SPEAKER

You can use the speaker to play **sounds**. The **microphone** can be used as a sensor to measure the volume in the environment.

BATTERY

Connect the cable of your battery holder to the **battery socket**. Now you are mobile!
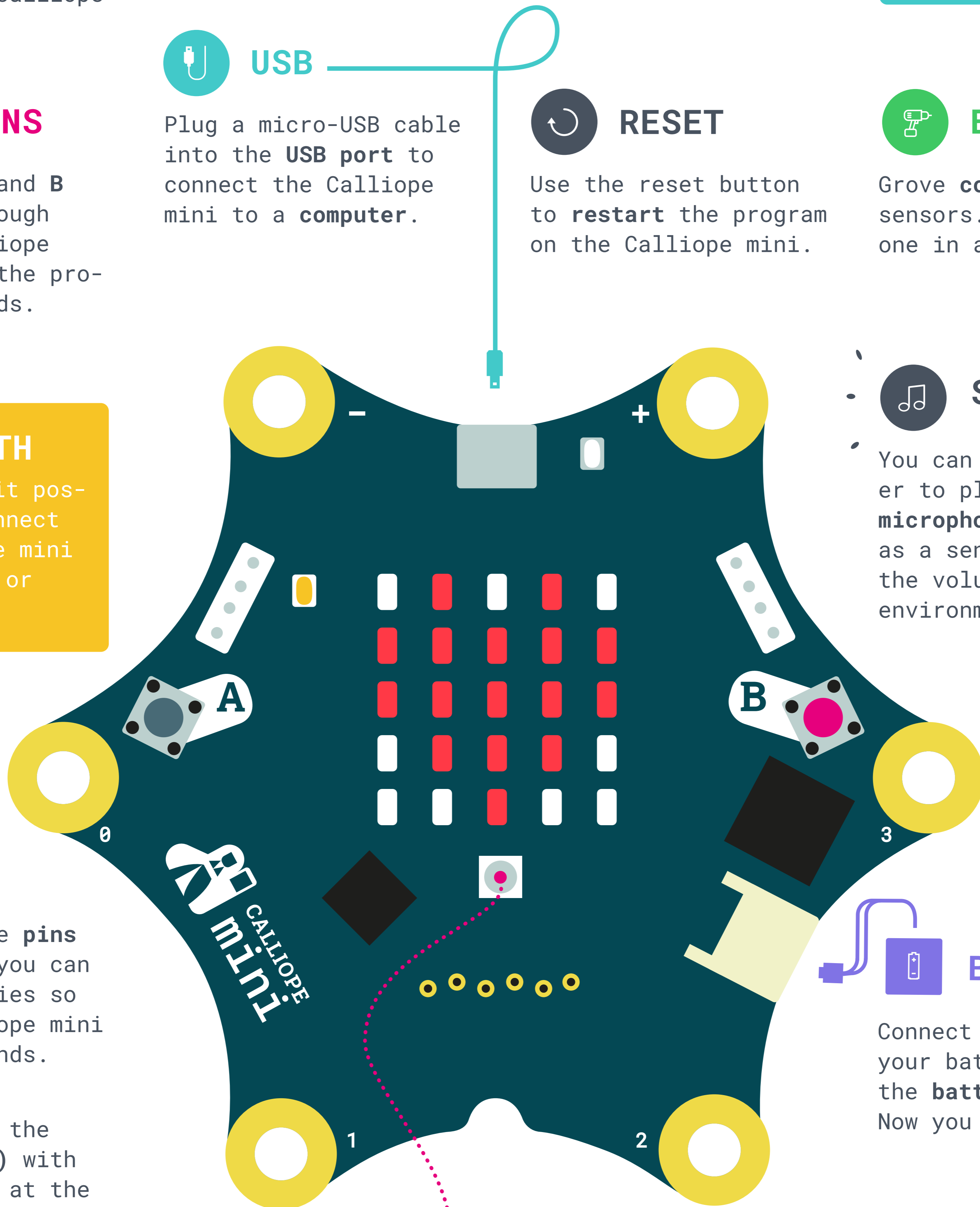
MOTORPINS

You can connect up to two motors here and then control them with your program.
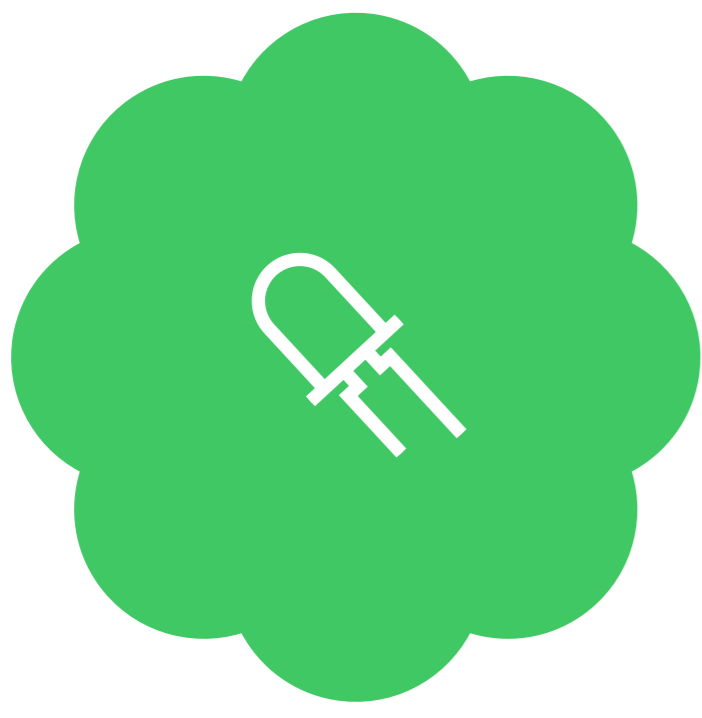
SENSORS

With the combined position and movement sensor, as well as a compass, you can determine whether the Calliope mini is moving, in which direction it is held, or how it is turned. The temperature and light sensors measure ambient heat and available light.

CALLIOPE

DISPLAY, HACKING, CODING - explanations of the technical terms can be found at calliope.cc/en/technical-words

RGB LED

Build your own disco ball.

BUZZER

Compose your own song - or a siren!

A
Press button A and show me a smile...

B
...press B and ask a question!

RESET

Reboot your program.
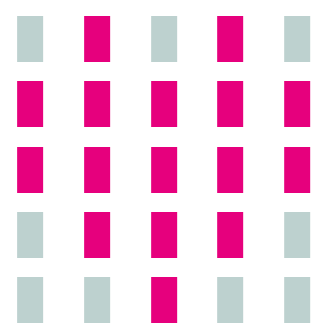
LED MATRIX

Express it with pictures or let the letters dance!

RADIO

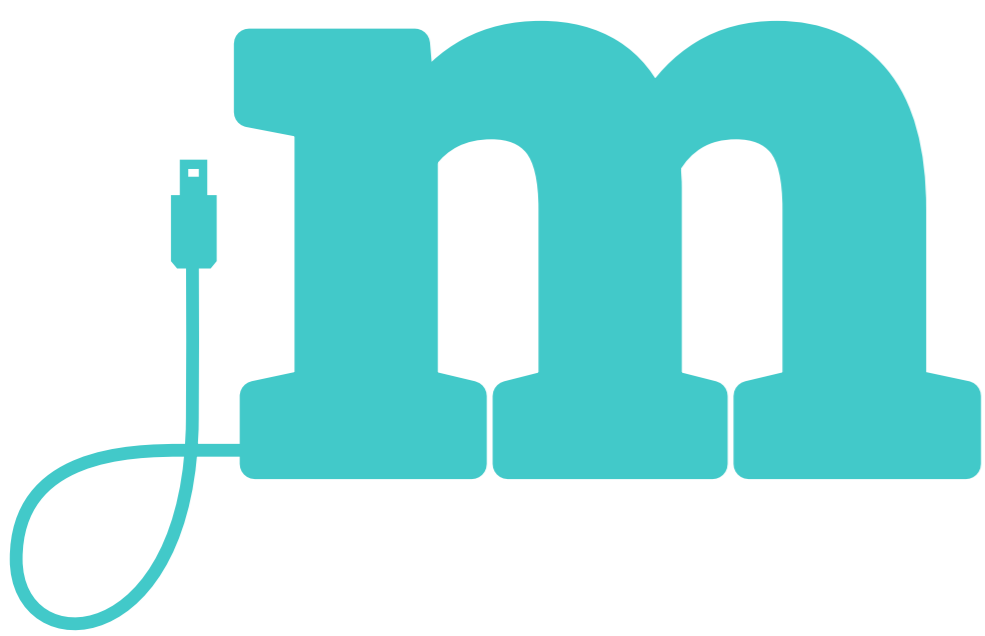Send secret messages with friends and build your own portable transceiver.
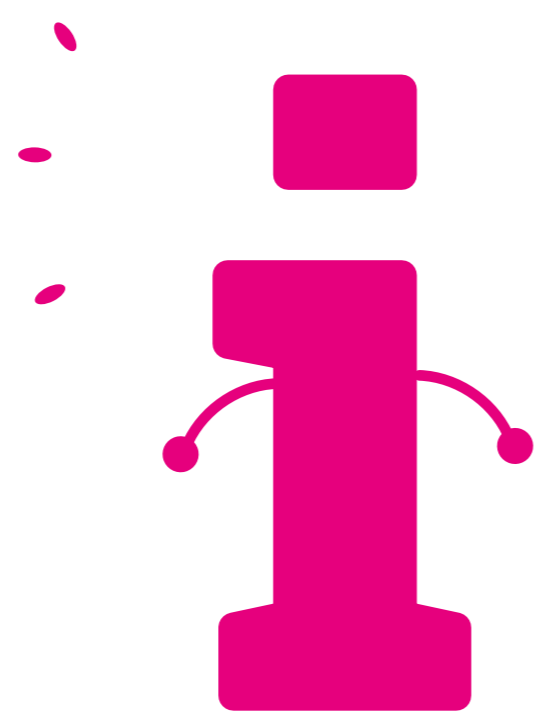
A+B
Reveal the correct answer!

MICROPHONE

Find out how quiet or loud you are!

m

n

i

SERVOS

...and let him wave.

PINS 0-3

They respond to touch!

DC-MOTORS

Invent new machines and program your car or your own robot...
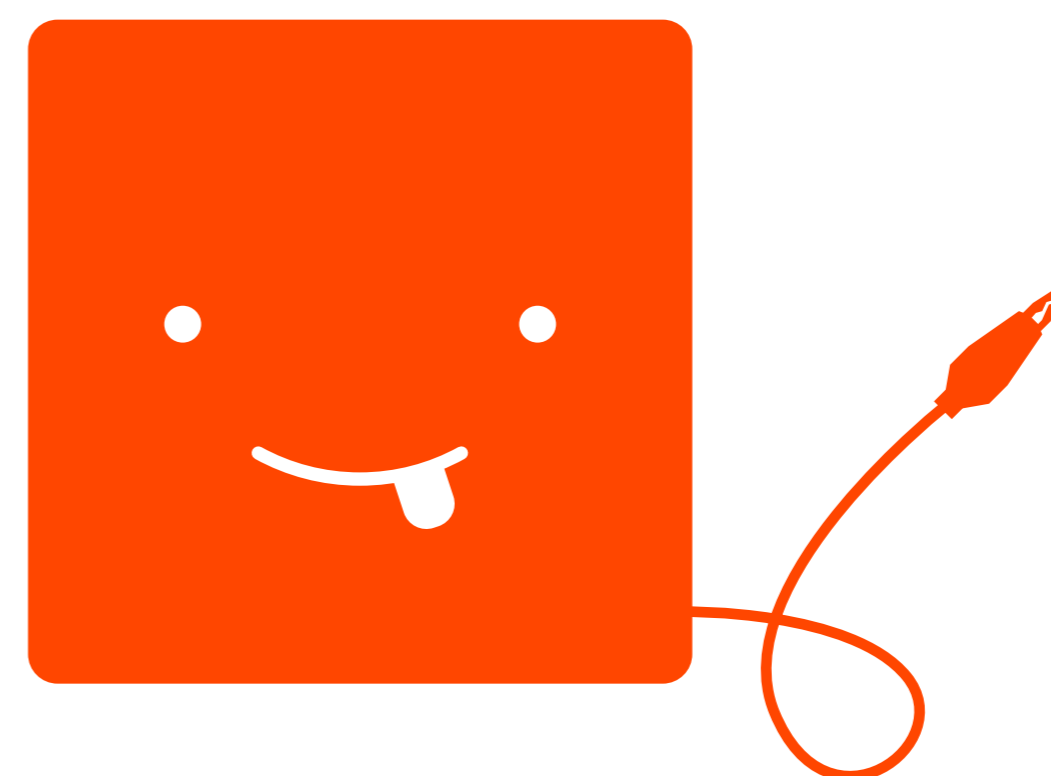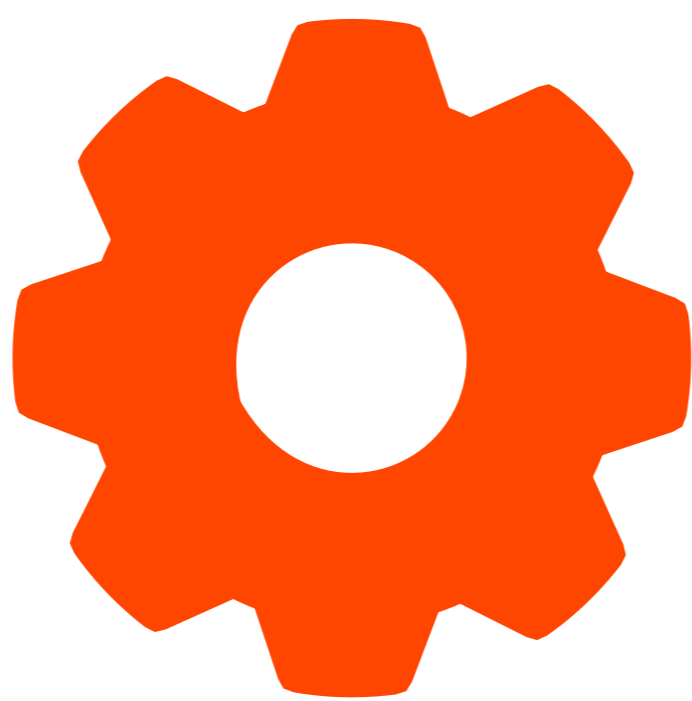
EXTENSIONS

Build your invention: Color, humidity sensors and much more. Plug it in and get started!

SENSORS ON THE MINI

Use movement, temperature and light and get creative!

OUTPUT

WHAT CAN MY CALLIOPE MINI DO?

LED MATRIX 5x5 red LEDs that can transmit and measure light.

RGB LED shines in many colors mixed from red, green and blue.

PINS/TOUCH PINS P0-P3 react to touch and can be connected to anything that conducts current.

BUTTON A, B: Pressed or not pressed can be prompted.

PIN +/- Batteries can be connected.

STATUS LED Lights up when current is flowing. Flashes during code transfer.

BUZZER/MICROPHONE Plays programmed tones and can measure volume.

PROCESSOR Processes commands and controls everything on the mini.

SENSORS Characteristics of the environment, such as temperature, light and position, can be determined.

MOTOR PINS Connection of motors.

EXTENTIONS Grove connector for sensors.

USB Connection of mini and computer.

BATTERIES Power source to go. Your mini becomes mobile.

CALLIOPE

DISPLAY, HACKING, CODING - explanations of the technical terms can be found at calliope.cc/en/technical-words

PLAN

When you start, think carefully about what small steps in particular you need to take to realize your great idea.

Here are some useful tips. Have fun!

SWIFT PLAYGROUND

CALLIOPE MINI PLAYGROUND

The Calliope mini Playground offers you an easy way to get to know the Calliope mini. In small steps you'll understand the basics of programming and control LEDs, pins, sensors and sounds. Build your own projects and prototypes with the Calliope mini.

✳ BLUETOOTH

This makes it possible to connect the Calliope mini to a tablet or smartphone.

ID-PATTERN

Each Calliope mini has its own ID pattern that can be used as identification and to communicate with it.

OUTPUT

The Calliope mini has various output options. Let the LEDs light up and the letters dance.

```
display.show(text: "hi")

display.show(image: .smiley)

rgb.on(color: .green)

sound.on(note: .C)
```
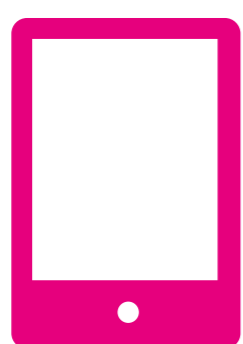
HACKING, CRAFTING, CODING

Be creative and program your own inventions!

```
rgb.off()

sound.off()

display.clear()

mini.sleep(1000)
```
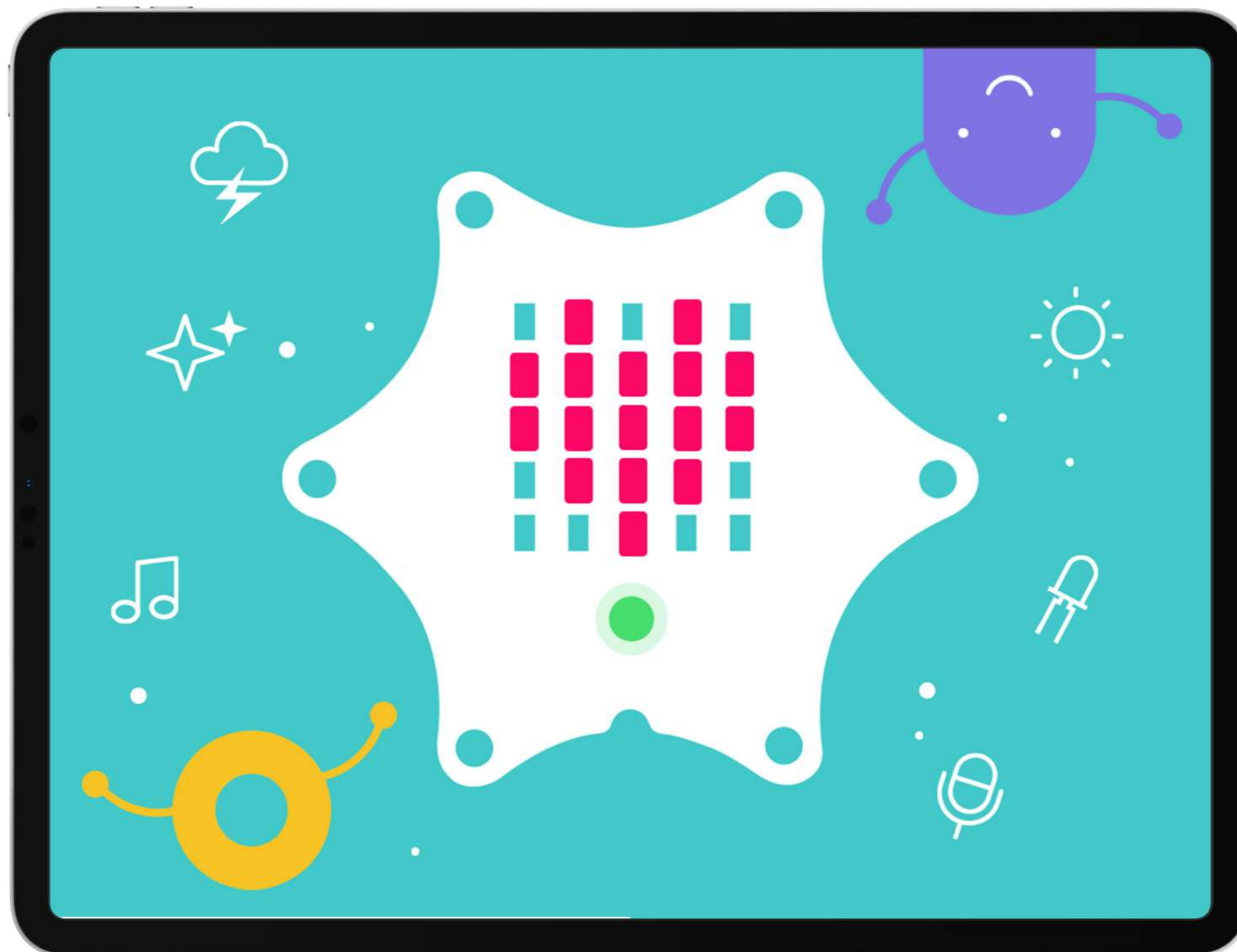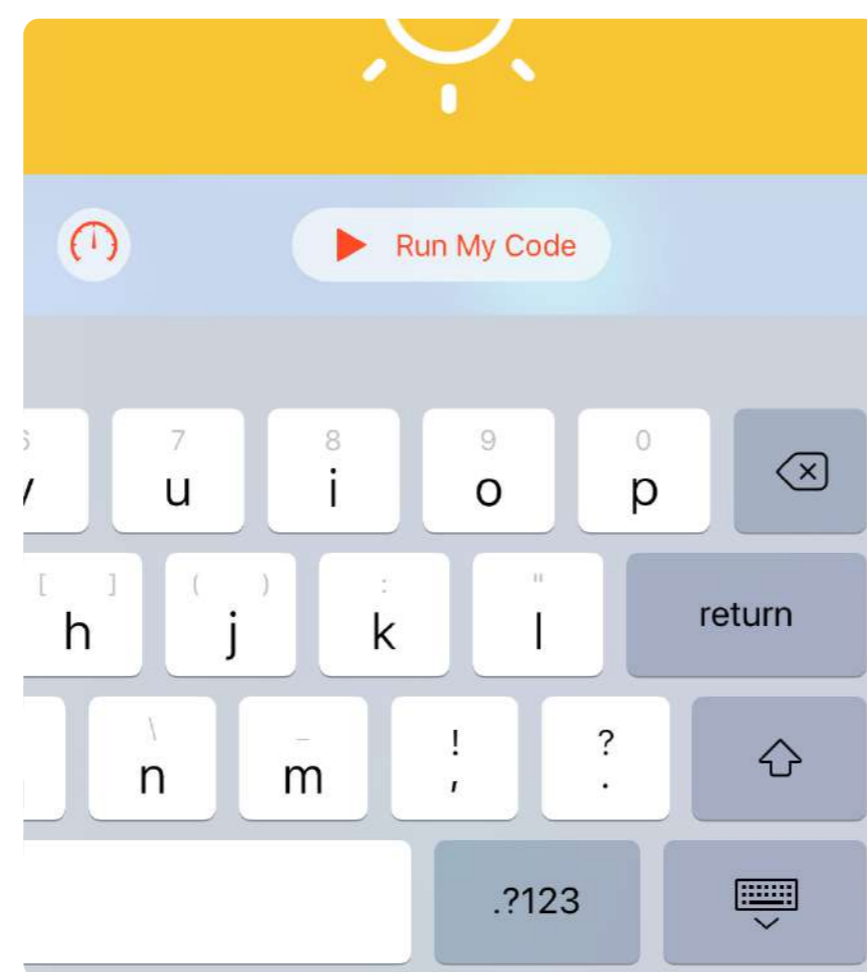
SENSORS ON THE MINI

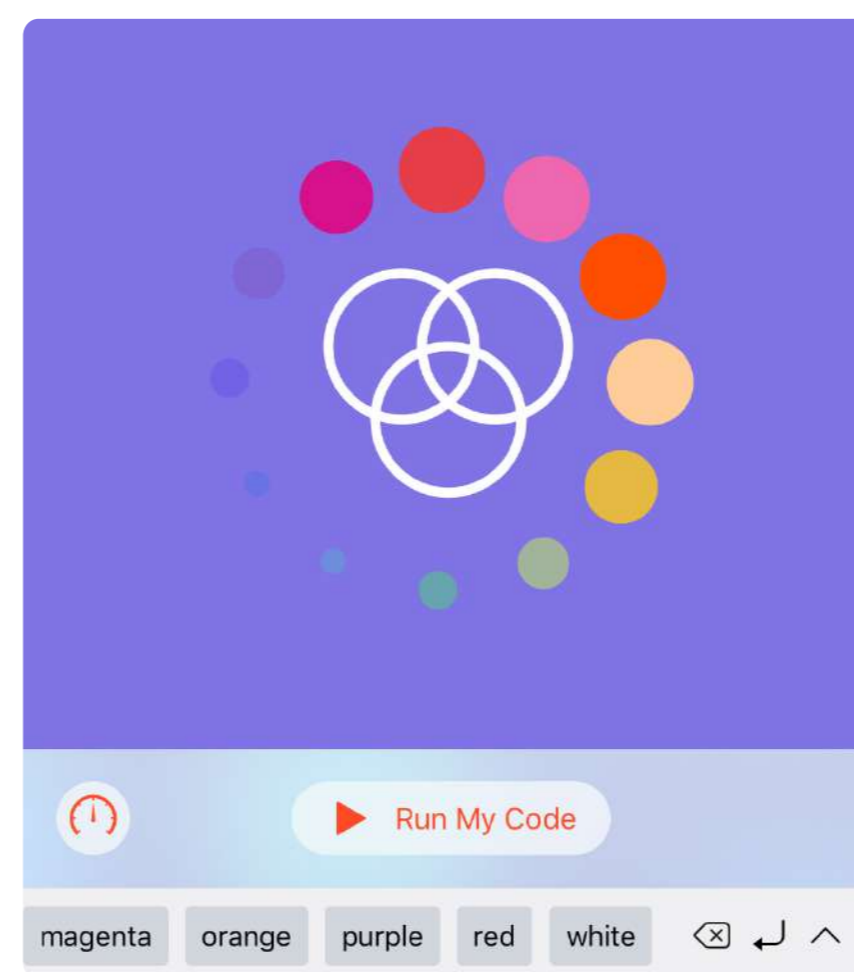Use movement, temperature and light and get creative!

⌨ PROGRAMMING

The parameters can easily be entered using either the keyboard or the shortcut bar.

The **keyboard** is used to enter letters and numbers. Attention! Text strings are always written in quotation marks.

The **shortcut bar** offers suitable programming blocks such as colors, sounds or images.

PARAMETERS

The Swift programming language is explained in an uncomplicated way by entering and adjusting parameters. Parameters are values which can be used to change a function (e.g. the colour of the RGB LED).
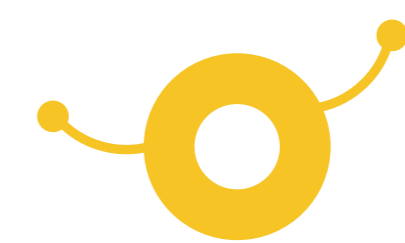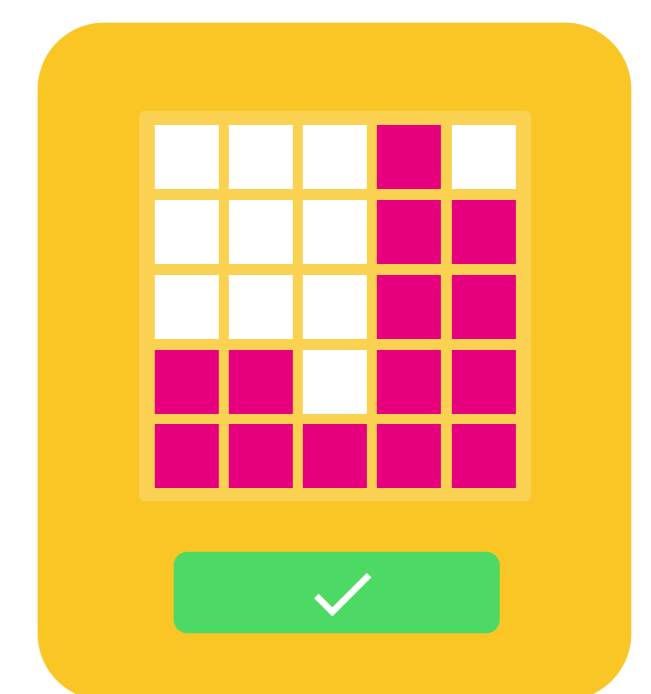

INPUT

The Calliope mini has various input options. Buttons, pins and sensors are waiting for your action.

```
func onButtonA() {
    display.show(image: .smiley)
}

func onButtonB() {
    display.show(image: .sad)
}

func onButtonAB() {
    display.show(image: .heart)
}
```
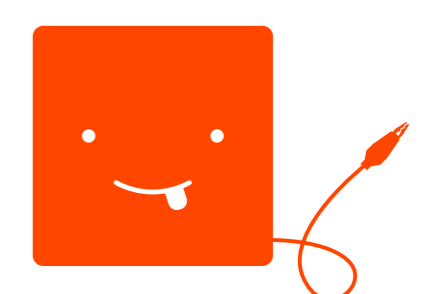
PINS 0-v3

```
func onPin(pin:UInt16) {
    if pin == 1 {
        rgb.on(color: .purple)
    }
}

func onShake() {
    display.show(text: "YEAH!")
}
```

CALLIOPE

PLAN

When you start, think carefully about what small steps in particular you need to take to realize your great idea.

Here are some useful tips. Have fun!

```
forever
  show LEDs
  pause (ms) 300
  clear screen
  pause (ms) 300
```
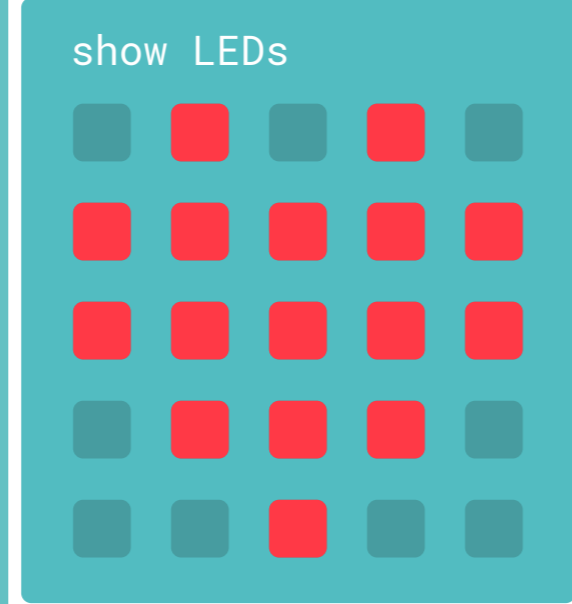
VARIABLE

stands for a value and must be created so that they can be read or changed.
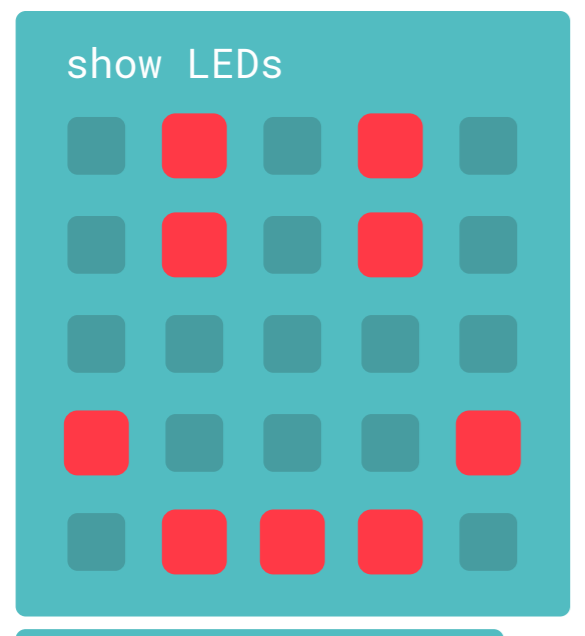You choose the name!

```
make a variable
ok ✓
```

REPETITIONS

are loops that are executed at different frequencies.

```
on pin P0 ▼ pressed
  repeat 3 times
  do
    show icon ghost ▼
    pause (ms) 300
    clear screen
    pause (ms) 300
```

START EVENT

contains all commands that should be executed once at the start of the program.

PERMANENT EVENTS

contain all commands that are executed continuously.

BY CHANCE

a number is selected from a range of numbers defined by you, the 0 is included!

```
on start
  show string „EMMA"
  show LEDs
  show number 8
```

DISPLAY CONTROL

Numbers, letters and images can be displayed on the LED matrix.

HACKING, CRAFTING, CODING

Be creative and program your own inventions!

CONDITIONS

in a program allow branching that determines which of two (or more) possible program sections is executed.

```
on shake ▼
  set random ▼ to pick random 0 to 4
  if
  then
    show string „YES!"
  else
    show string „NO!"
```

```
random ▼ = ▼ 0
```

```
1 = ▼ 0
  ✓ =
    ≠
    <
    ≤
    >
    ≥
```

BREAKS

stop the execution. You can determine the duration. Test the program without pauses!

IF THIS/THEN DO THAT CONDITIONS

wait until a certain input condition is fulfilled. If this condition is fulfilled, all commands within the brackets are executed one after the other.

```
on button A ▼ pressed
  play tone C ▼
  show string „C"
  set led to red ▼
```

RADIO

Identify groups and send and receive messages from one Calliope mini to another by radio.

```
on start
  radio set group 1
```

```
on button A ▼ pressed
  radio send string „Where are you?"
```

```
on button B ▼ pressed
  radio send string „Here"
```

```
on radio received receivedString ▼
  show string receivedString
```

INSTRUCTION Command – that the computer executes.

PROGRAM Row of instructions. Basis to let a computer solve tasks.

TRUTH VALUE Result of a condition that is met or not – true or false.

OUTPUT An action noticeable with your senses. But also radio signals and the electrical voltage at the pins are outputs.

INPUT Information from the sensors, keys and pins that can be processed by the programs.

CONDITION Includes one or more statements and is called by a distinct, user-defined name.

BUG Means beetle in English. When programming, this is what the errors in the code are called.

CALLIOPE.CC/EN/LETS-START/EDITOR

CALLIOPE

DISPLAY, HACKING, CODING – explanations of the technical terms can be found at calliope.cc/en/technical-words

PLAN

When you start, think carefully about what small steps in particular you need to take to realize your great idea.

Here are some useful tips. Have fun!

CODE WITH NEPO®

VARIABLE

stands for a value and must be created so that they can be read or changed.
You choose the name!

start
variable   item   number   0

REPETITIONS

are loops that are executed at different frequencies.

start
repeat   3   times
do
    show image
    wait ms   300
    clear display
    wait ms   300

start
repeat indefinitely
    show image
    wait ms   300
    clear display
    wait ms   300

START EVENT

contains all commands that should be executed once at the start of the program.

PERMANENT EVENTS

contain all commands that are executed continuously.

BY CHANCE

a number is selected from a range of numbers defined by you, the 0 is included!

start
show text   „EMMA"
show image
show text   8

DISPLAY CONTROL

Numbers, letters and images can be displayed on the LED matrix.

BREAKS

stop the execution. You can determine the duration. Test the program without pauses!

CONDITIONS

in a program allow branching that determines which of two (or more) possible program sections is executed.

repeat indefinitely
if   get   shaking   gesture?
do
    set   item   to   random integer from   0   to   1
    if   item   =   0
    do
        show text   „YES!"
    else
        show text   „NO!"

IF THIS/THEN DO THAT CONDITIONS

wait until a certain input condition is fulfilled. If this condition is fulfilled, all commands within the brackets are executed one after the other.

start
repeat indefinitely
if   button   A   pressed?
do
    show text   „C"
    play note   C
    turn LED on colour

RADIO

Identify groups and send and receive messages from one Calliope mini to another by radio.

start
set channel to   0
repeat indefinitely
if   button   A   pressed?
do
    send message string   „Where are you?"
if   button   B   pressed?
do
    send message string   „Here!"
show text   receive message string

HACKING, CRAFTING, CODING

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