ProgBlox
Car set
programming manual

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fischertechnik

The goal is to learn to solve more complex problems by breaking them down into parts (objects) and with logical thinking to learn the basic steps of programming, construction and robotics.

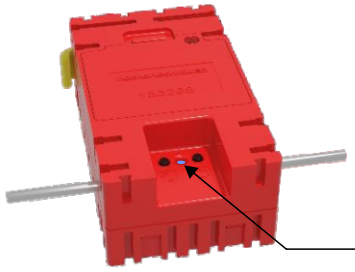
ProgBlox Car set

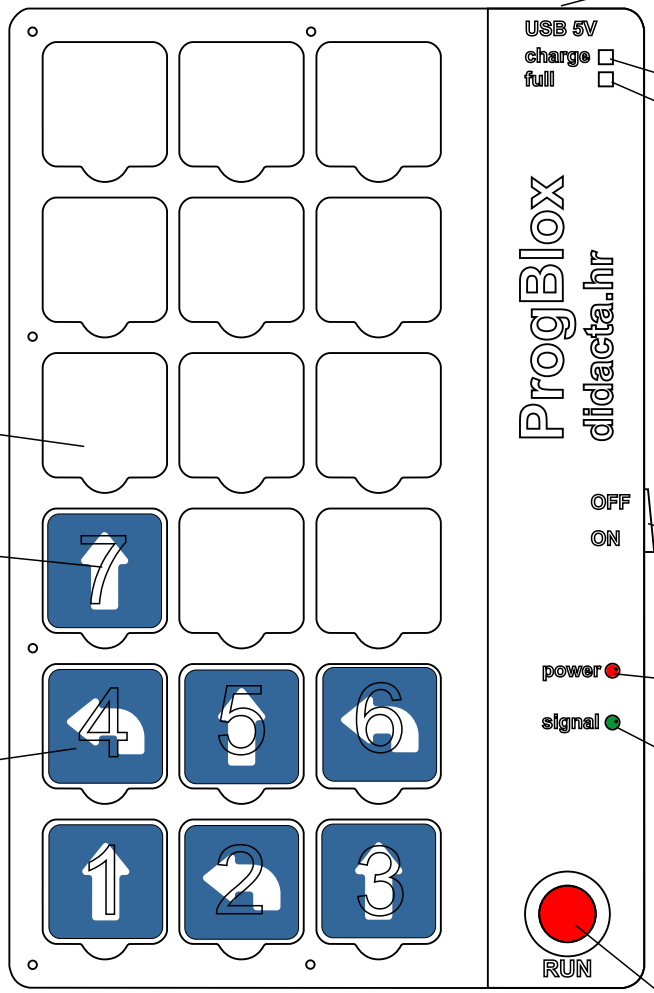
Content:

Tablet

- working time more than 4 hours

- battery low - signal LED
  (green) all the time lights up





USB port for
charging the battery

The battery is charging

The battery is full

program fields

numbers show
order of stacking
program

command cube
- empty fields inside
programs are not
affected to the
program

turn ON - turn OFF the tablet

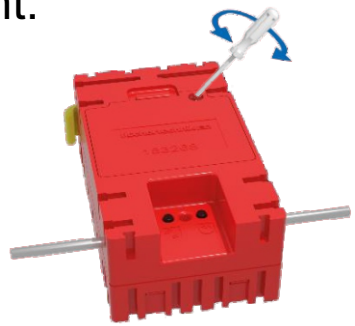
Tablet ON

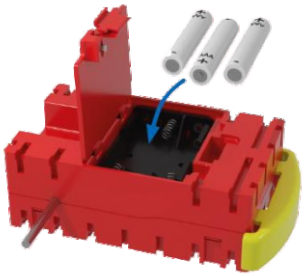
The tablet works
(after pressing the RUN button)

RUN button to start execution program,
to confirm the launch of the program
on the robotic car, will turn on briefly
BLUE LED light

Robot car

Open the battery compartment of the robotic car and place the batteries in the compartment.

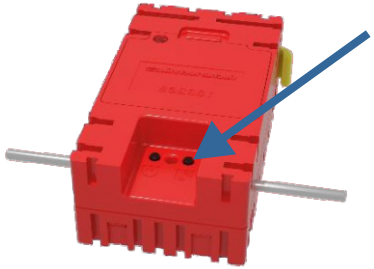




To turn ON the robotic car, press the right button (the blue light will flash briefly).

To turn OFF the robotic car, press the right button until the blue light goes out (about 6 seconds).

If the robotic car is not used for more than 15 minutes, it will turn itself OFF.



Assembling a program on a tablet

To control the robotic car, we combine two types of programs:
Main program:
- cannot contain command cubes for sensor control (INPUTS)
- can be run once or repeated indefinitely

Subprograms:
- for bumper sensors or IR sensors - programs according to the state of the sensor
- the program has a command cube at the beginning for bumper sensors or IR sensors
- the program is started according to the change of the state of the sensor (bumper or IR)

MULTIPLE subprograms can be assembled on the tablet at the same time (according to the state of the sensor), but ONLY ONE main program.

After the program or subprogram has been assembled, it is necessary to press the RUN button on the tablet to activate it. The blue LED light on the car will signal that the program is on loaded into the car's memory, and started.

The programs remain in the car's memory until the vehicle is turned OFF, or the programs are deleted.

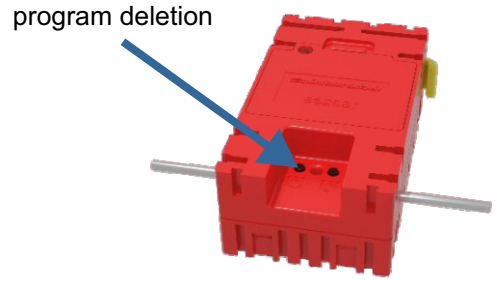
Stopping and deleting the programs

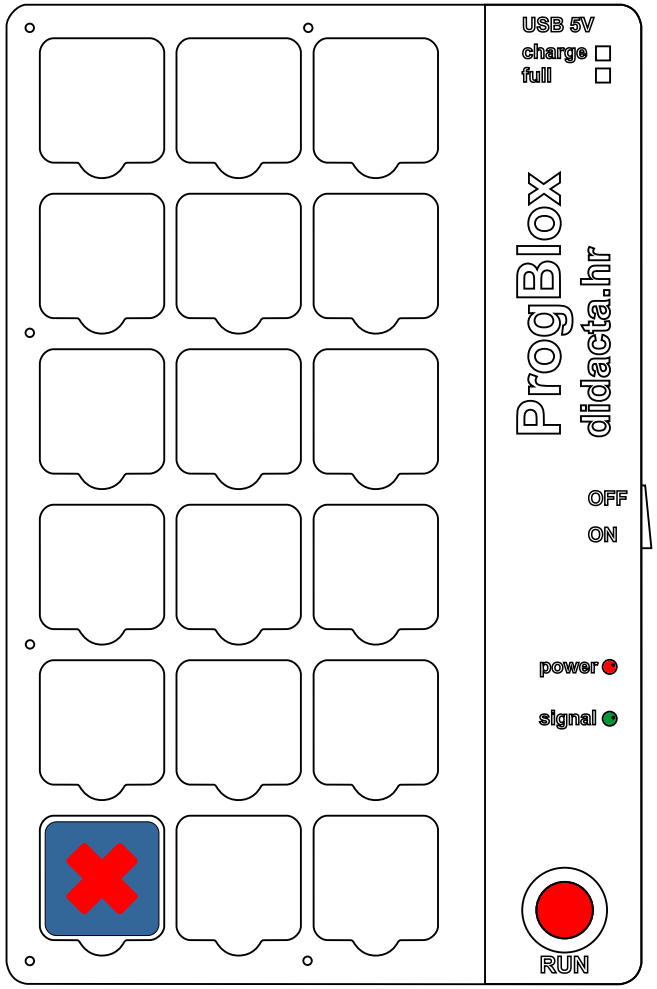
Deleting all programs and stopping work, can be done in two ways:

- By pressing the left button on the robotic car (the red LED will light up), and the programs will be deleted from the car's memory

- by selecting the command cube 

  and pressing the RUN button.



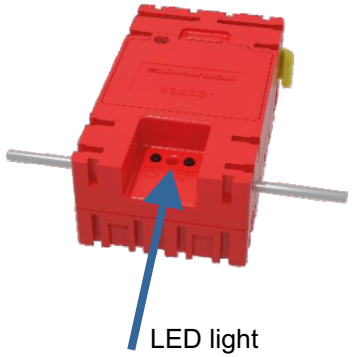


Example 1 - MAIN PROGRAM - LED light

turn on the red LED light

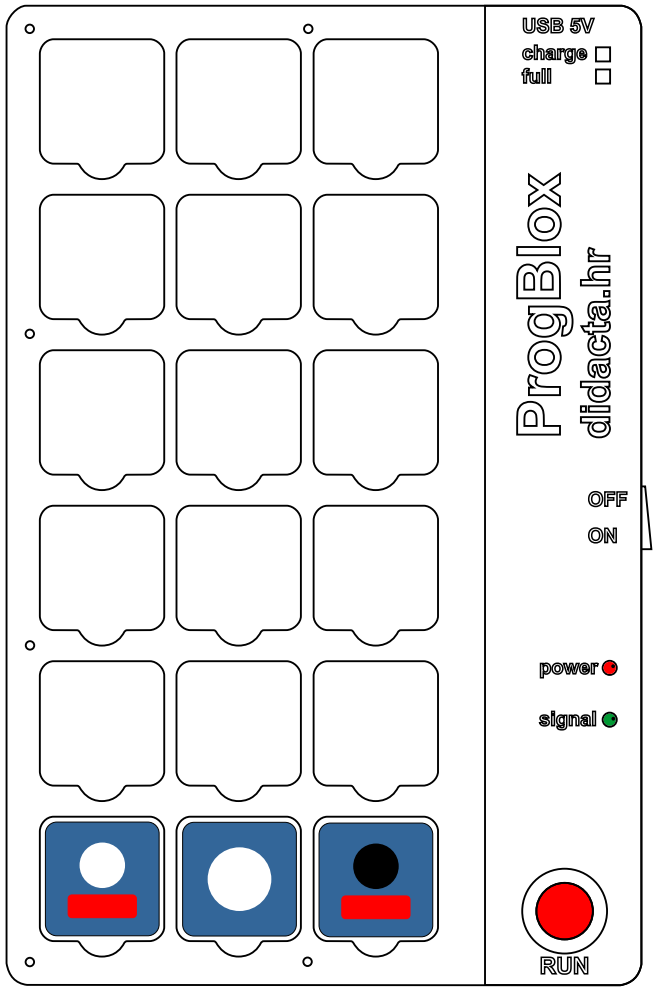
wait a moment (1 sec.)

turn off the red LED light



press the RUN button on the tablet

The LED on the robotic car will short light up with BLUE light (the program is started) , then it will light up RED LED light. One second later it will shut down.



Example 2 - MAIN PROGRAM - LED light endlessly

turn on the red LED light

wait a moment (1 sec.)

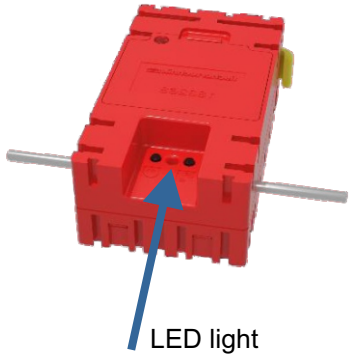
turn off the red LED light

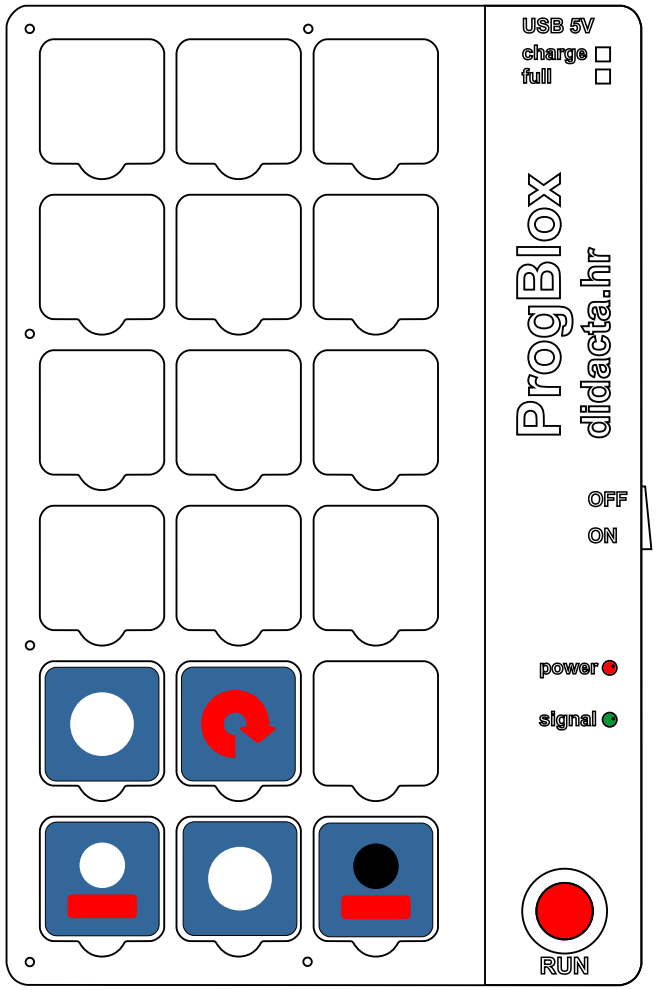
wait a moment (1 sec.)

repeat the program endlessly

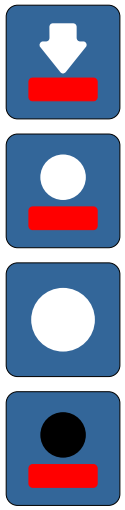
press the RUN button on the tablet

The LED on the robotic cart will briefly light up with BLUE light (the program is running), and then the RED LED light will turn on and off endlessly every second.





Example 3 - SUBPROGRAM - car bumper - red sensor



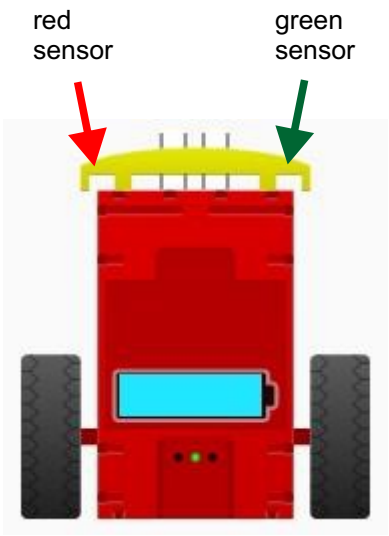
pressure on the red side of the bumper

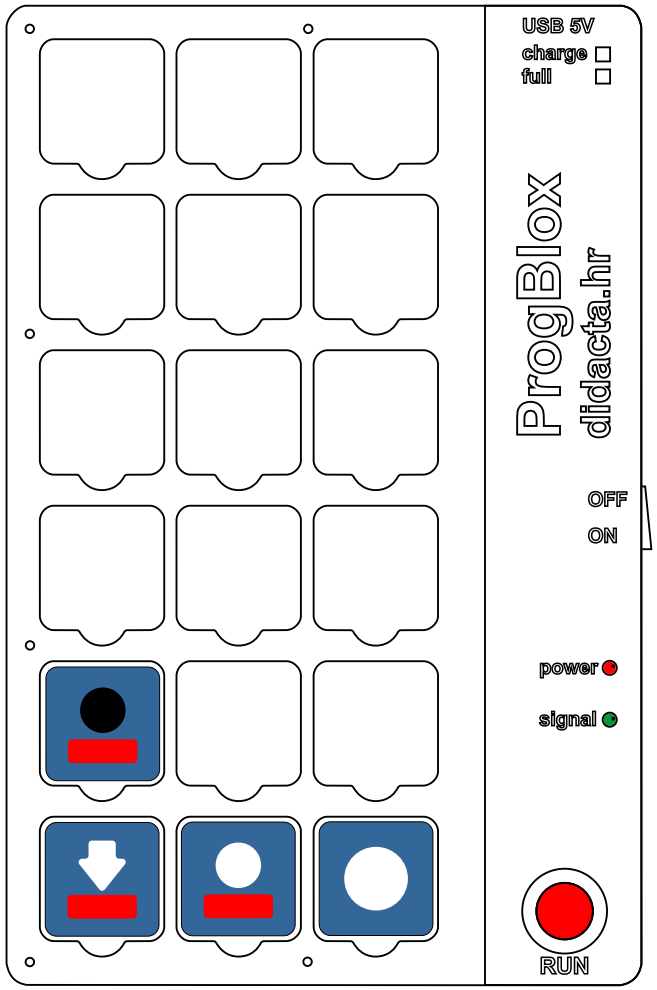
turn on the red LED light

wait a moment (1 sec.)

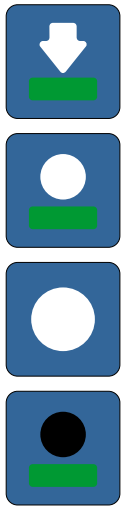
turn off the red LED light

sensors on the bumper





Example 4 - SUBPROGRAM - car bumper - green sensor



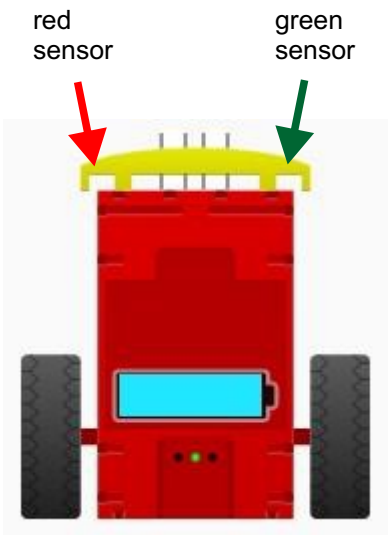
pressure on the green side of the bumper

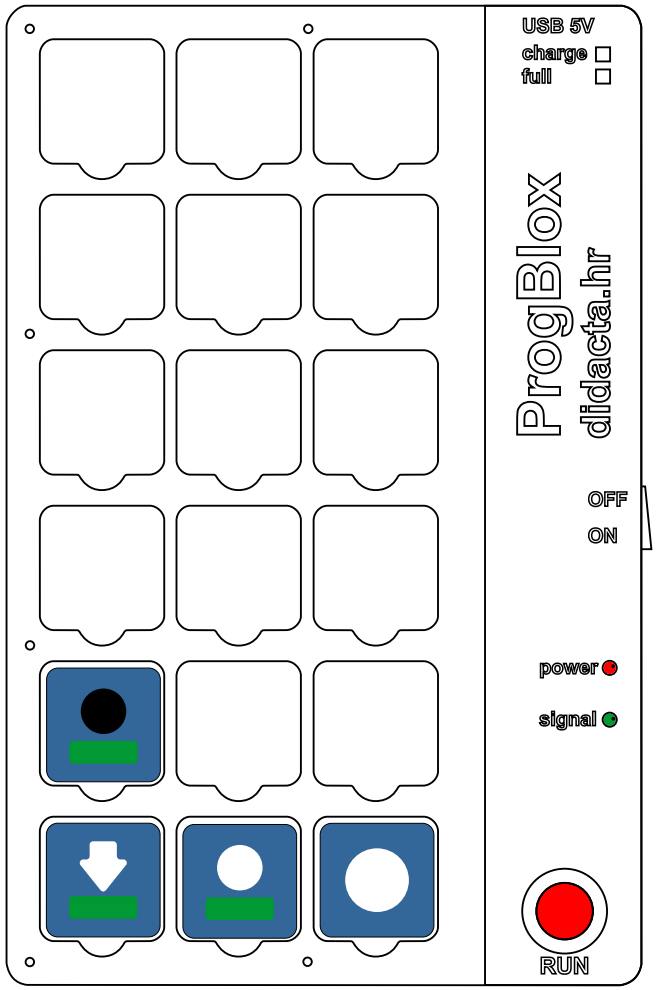
turn on the green LED light

wait a moment (1 sec.)

turn off the green LED light

sensors on the bumper



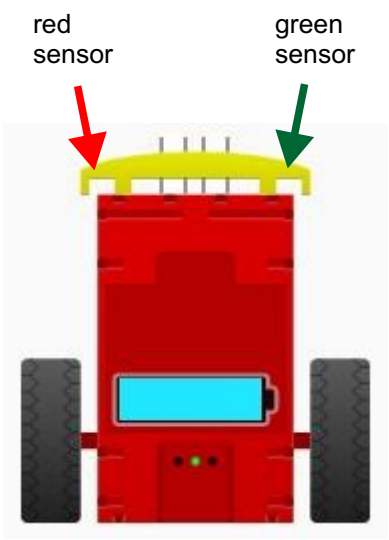


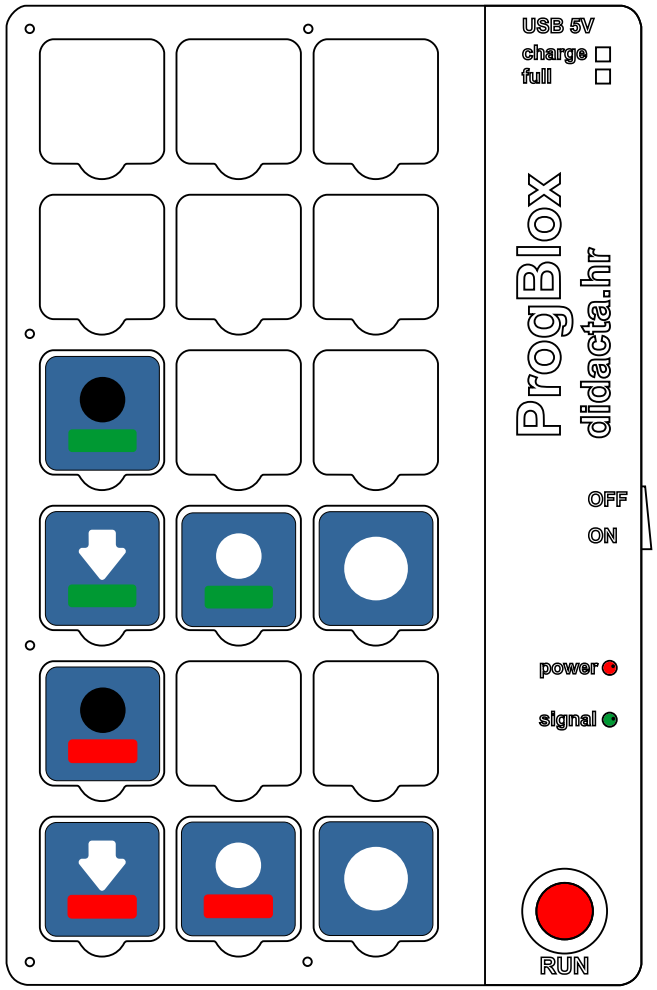
Example 5 - SUBPROGRAMS - car bumper both sensors

pressing the red side of the bumper turns on the red LED light for one second

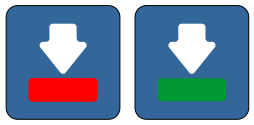
pressing the green side of the bumper turns on the green LED light for one second

sensors on the bumper

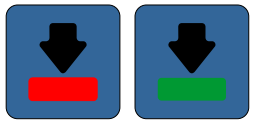




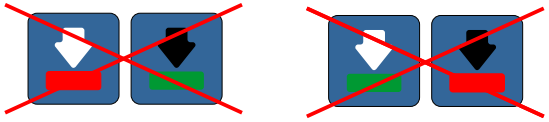
Example 6 - SUBPROGRAMS - car bumper both sensors simultaneously

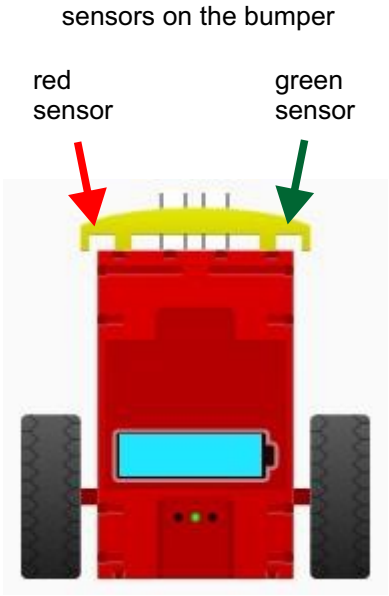


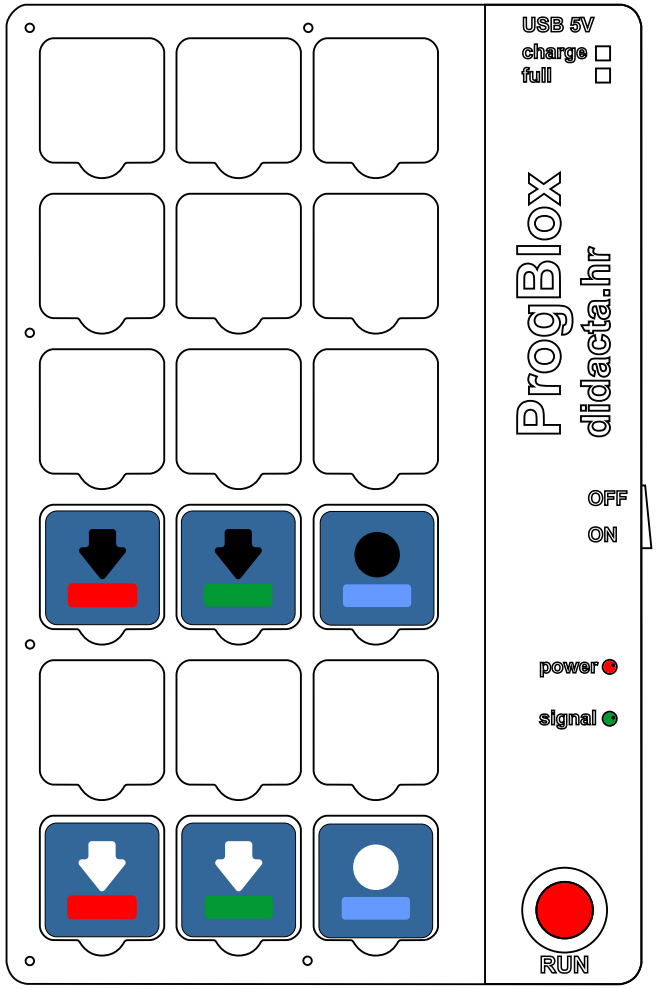
pressing the red and green side of the bumper simultaneously turns on the blue LED light



the bumper is not pressed, the blue LED light turns off



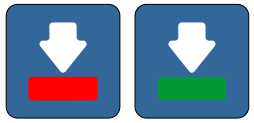




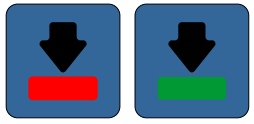
Example 7 - SUBPROGRAMS - car bumper sensors combined

pressing the red side of the bumper turns on the red LED light

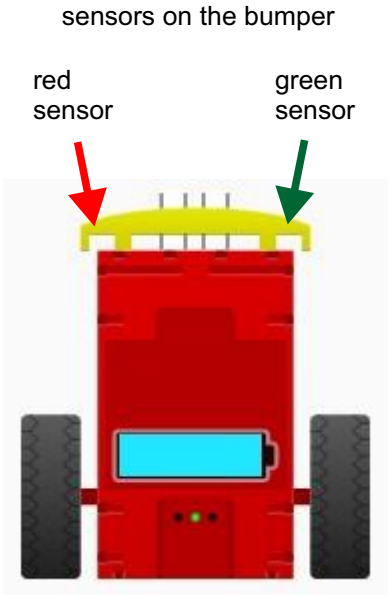
pressing the green side of the bumper turns on the green LED light

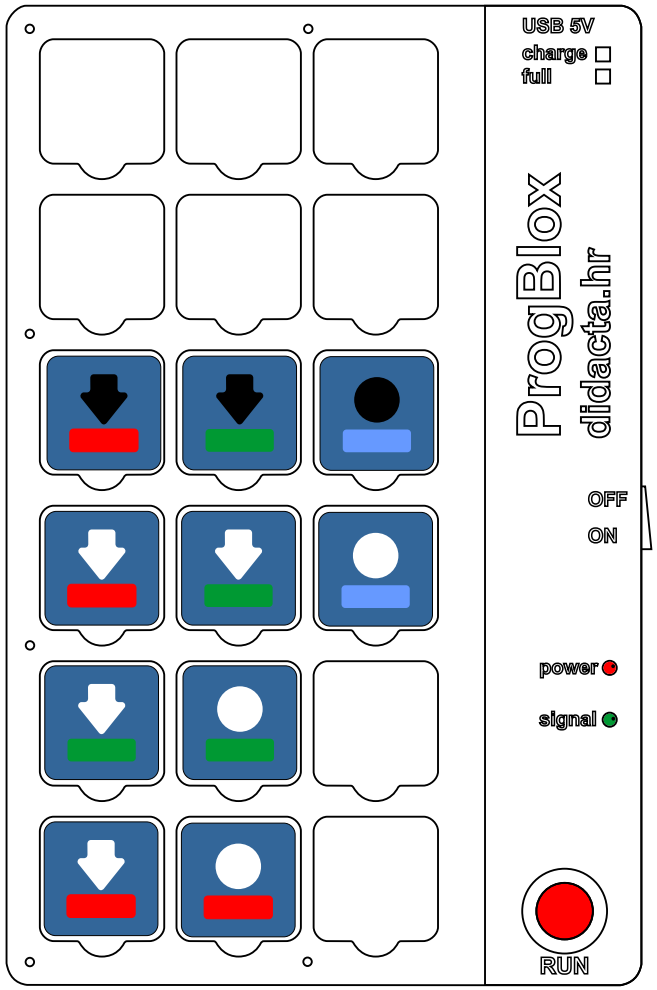


pressing the red and green side of the bumper simultaneously turns on the blue LED light



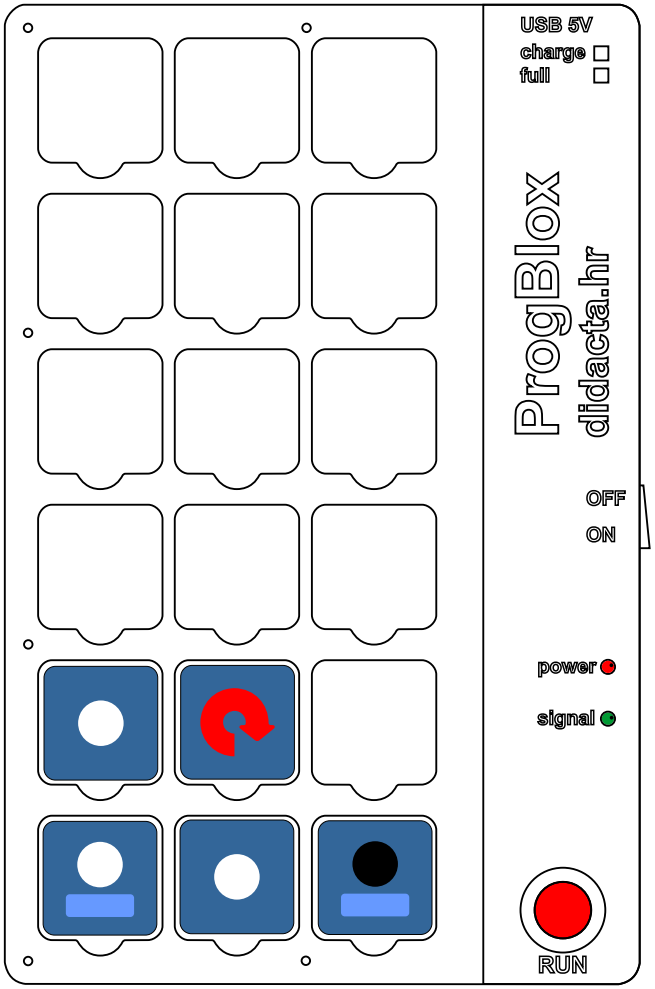
the bumper is not pressed, the blue LED light turns off

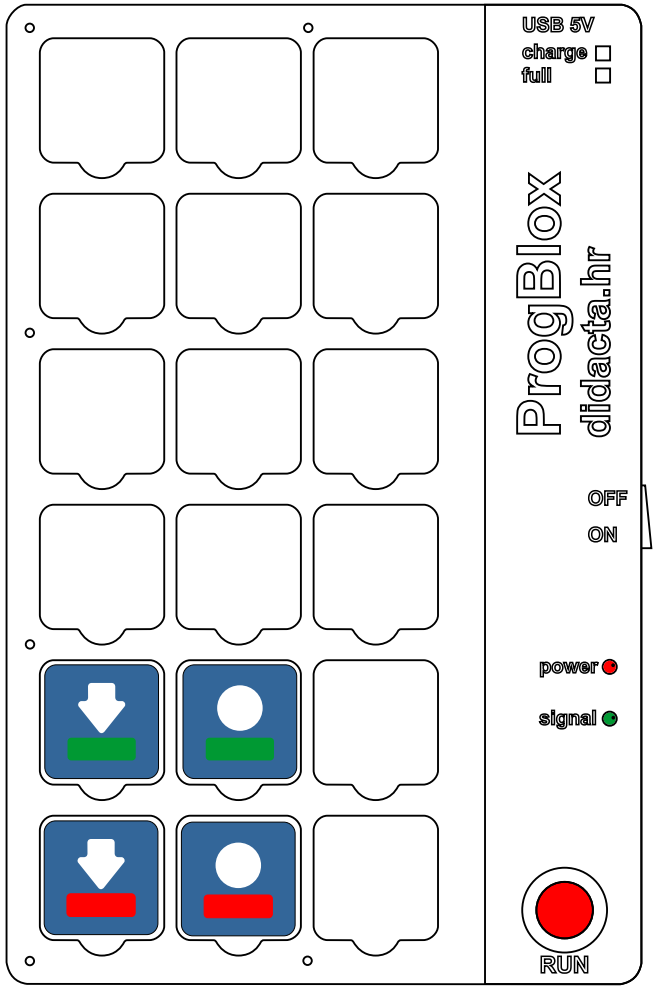




Example 8 - MAIN PROGRAM + SUBPROGRAMS

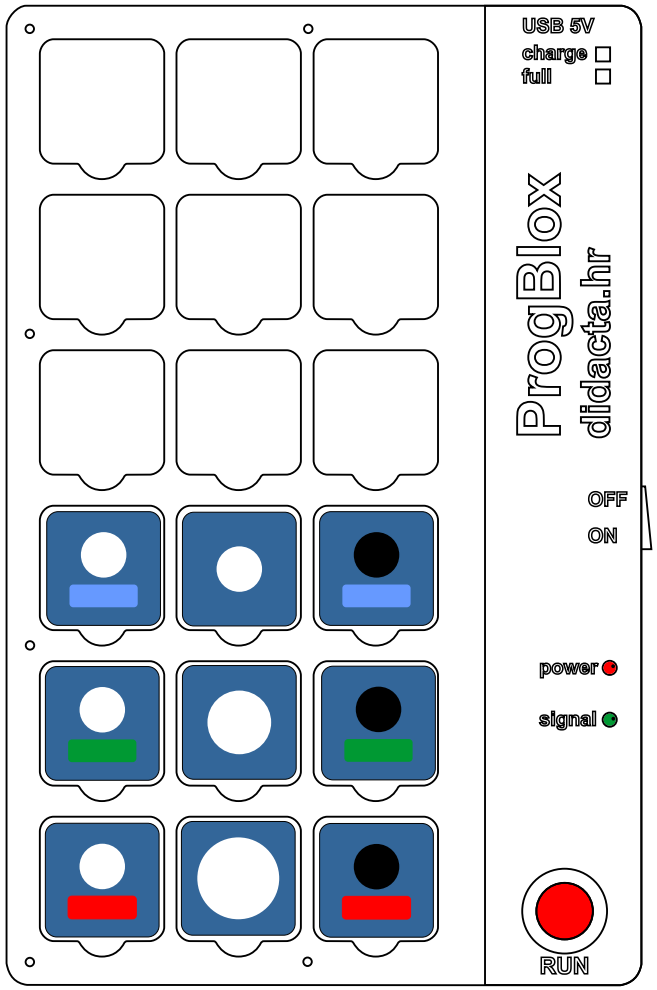
endlessly repeat the MAIN PROGRAM



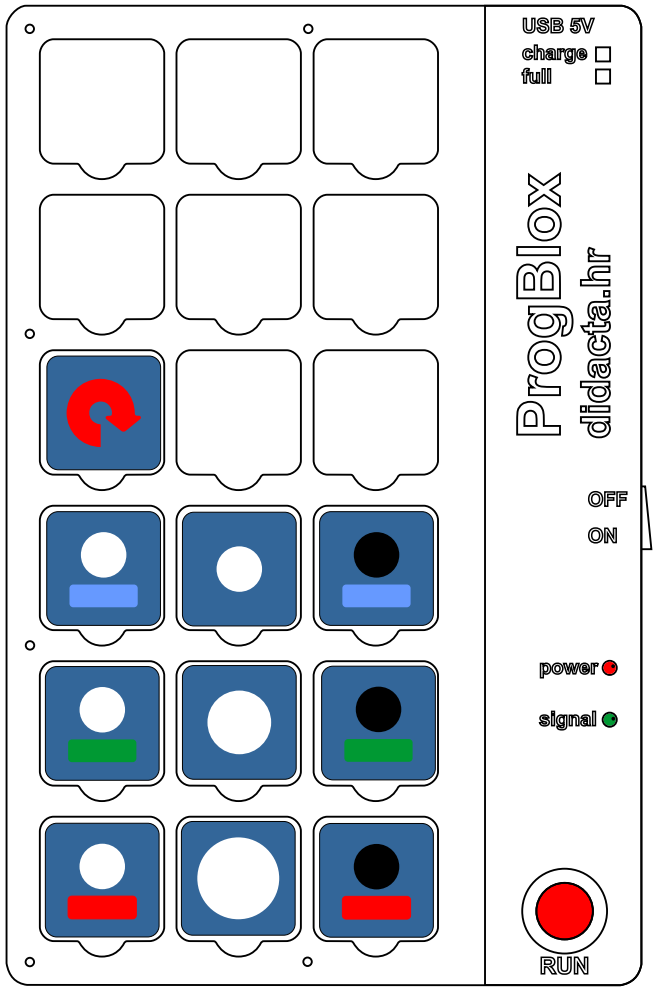


REMOVE THE CUBE  **, WHAT COLOR THE LED LIGHT WILL BE NOW ?**

Example 9 - LED LIGHTS

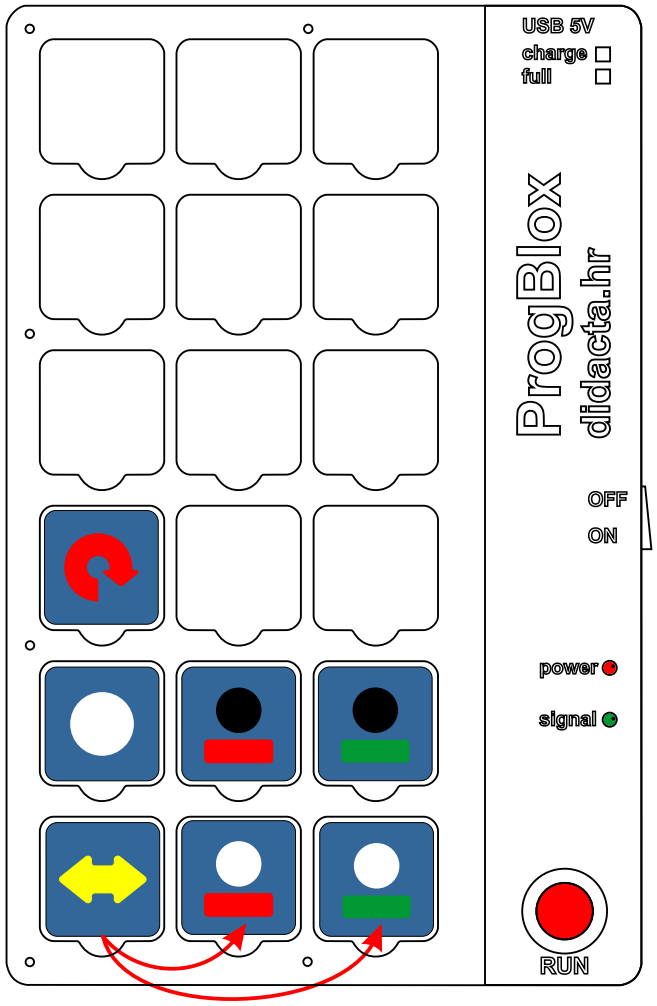


Example 10 - LED LIGHTS - ENDLESSLY



Example 11 - LED LIGHTS - ADVANCED

THE ROBOTIC CAR DECIDES WHICH LED LIGHT SHOULD ILLUMINATE, RED OR GREEN

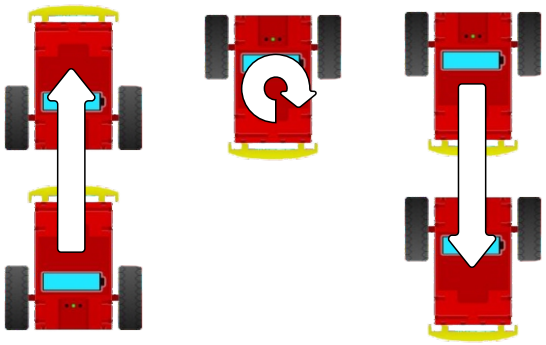


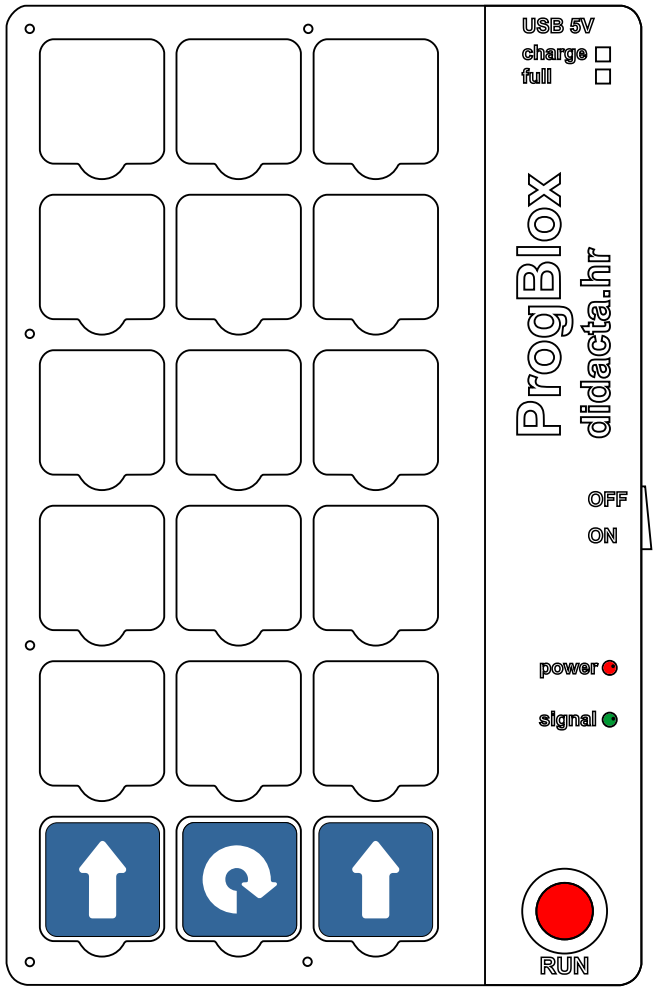
Example 12 - robotic car movement control

- drive long forward

- rotate the vehicle to the right completely

- drive long forward





Example 13 - robotic car movement control

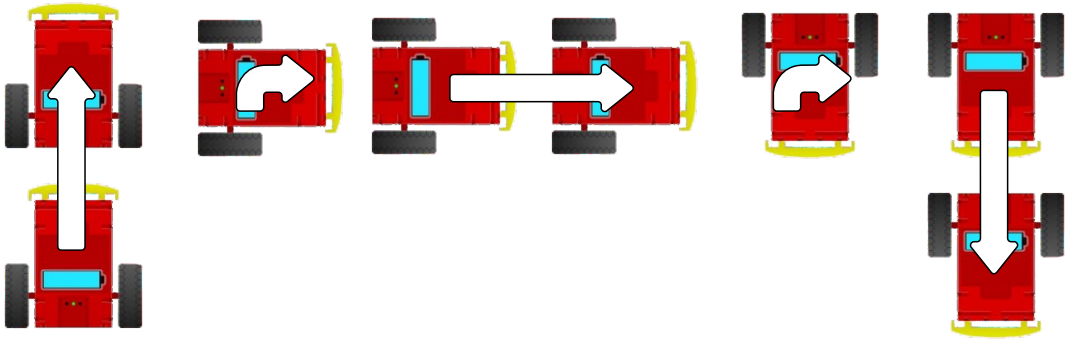
- drive long forward

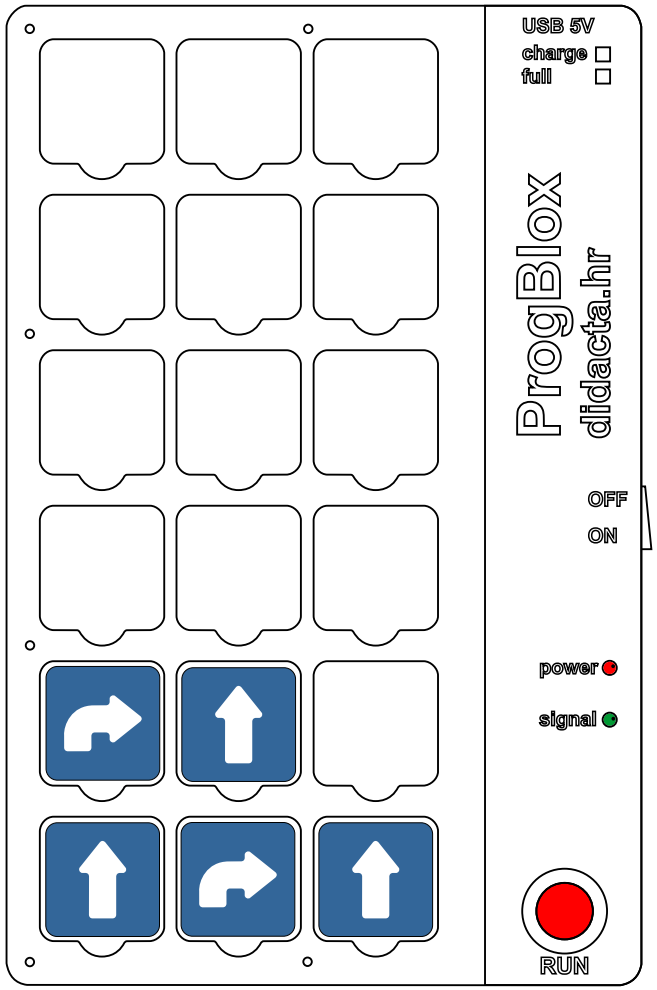
- rotate the vehicle halfway to the right

- drive long forward

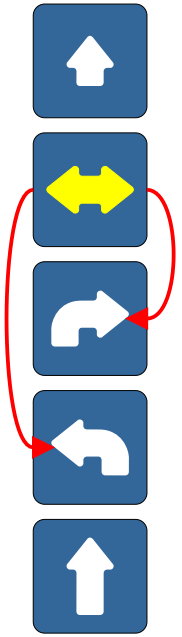
- rotate the vehicle halfway to the right

- drive long forward





Example 14 - robotic car movement control - ADVANCED



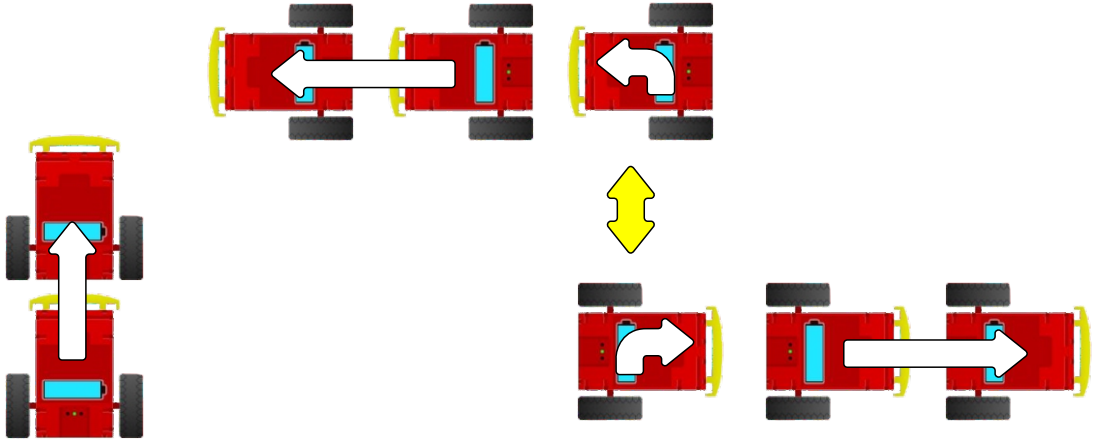
- drive short forward

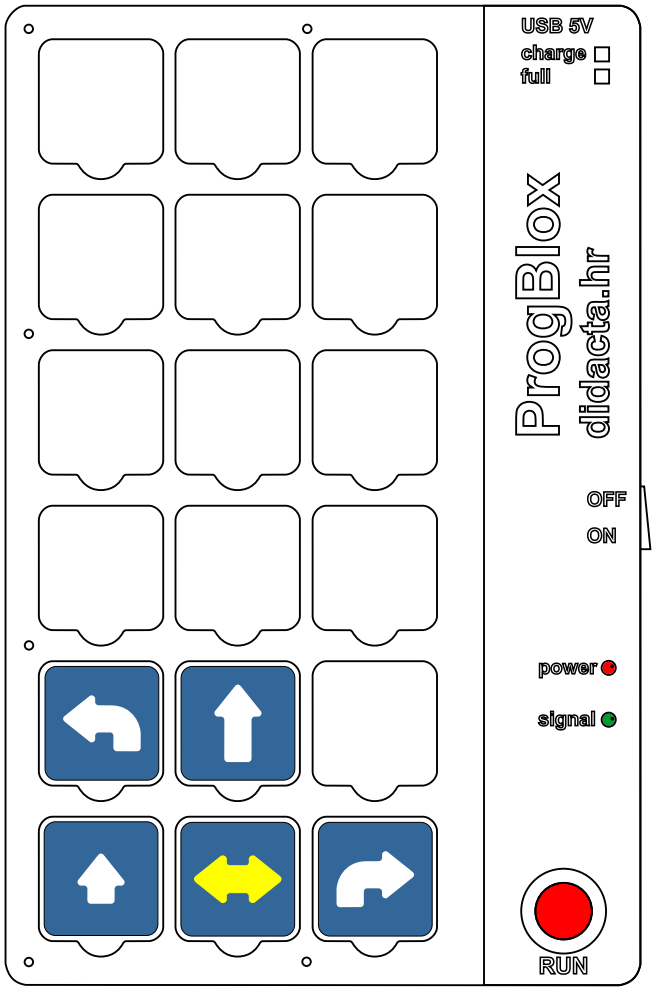
- the vehicle decides - first
  or second command cube

- rotate the vehicle halfway to the right

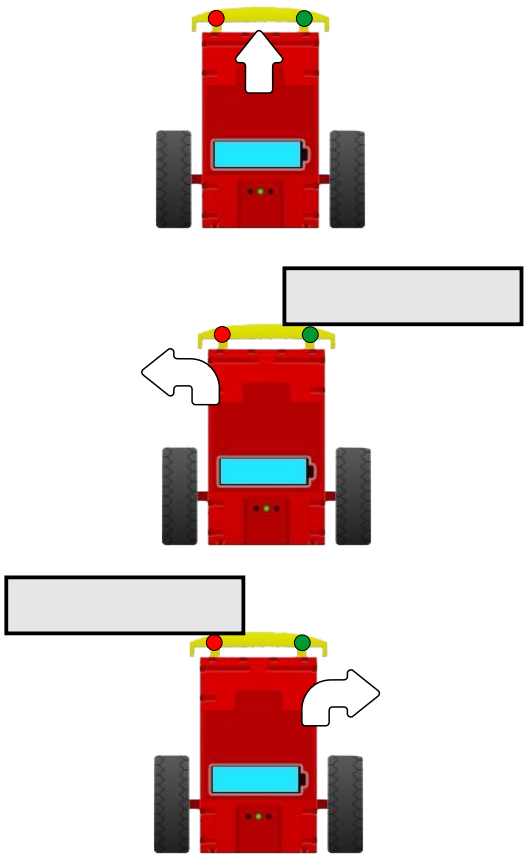
- rotate the vehicle halfway to the left

- drive long forward





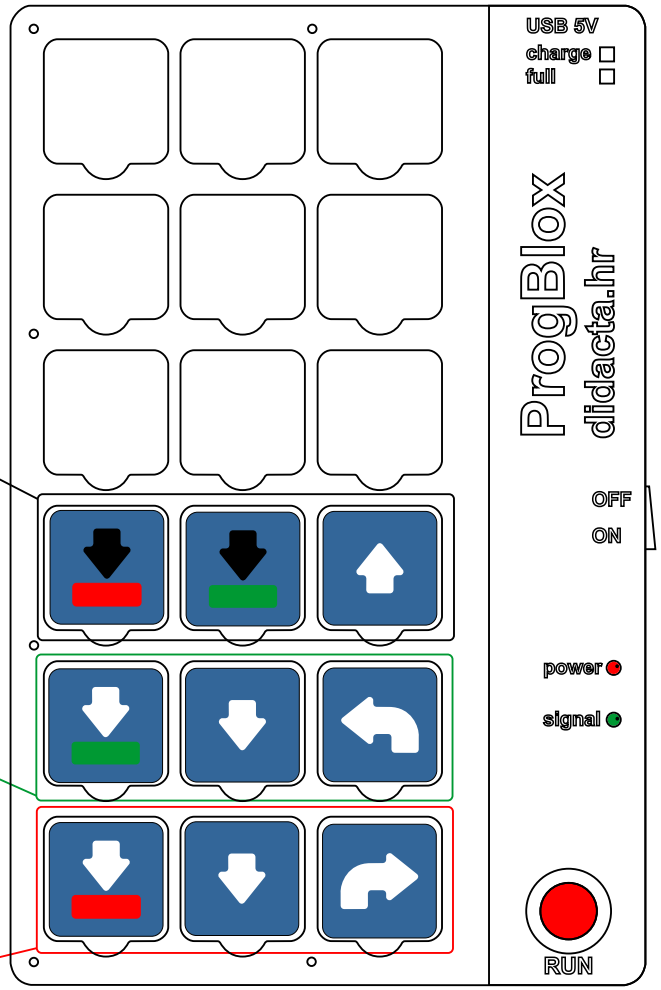
Example 15 - ROBOTIC CAR AVOIDS OBSTACLES



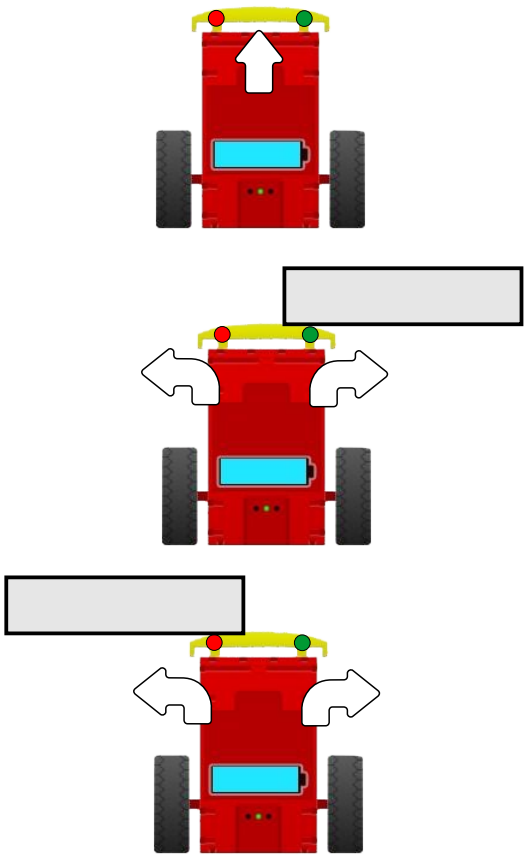
the bumper is not pressed
- drive a short forward
  (subprogram 1)

the green side of the bumper is pressed - drive a short backwards and rotate the vehicle halfway to the left (subroutine 2)

the red side of the bumper is pressed - drive a short backwards and rotate the vehicle halfway to the right (subroutine 3)



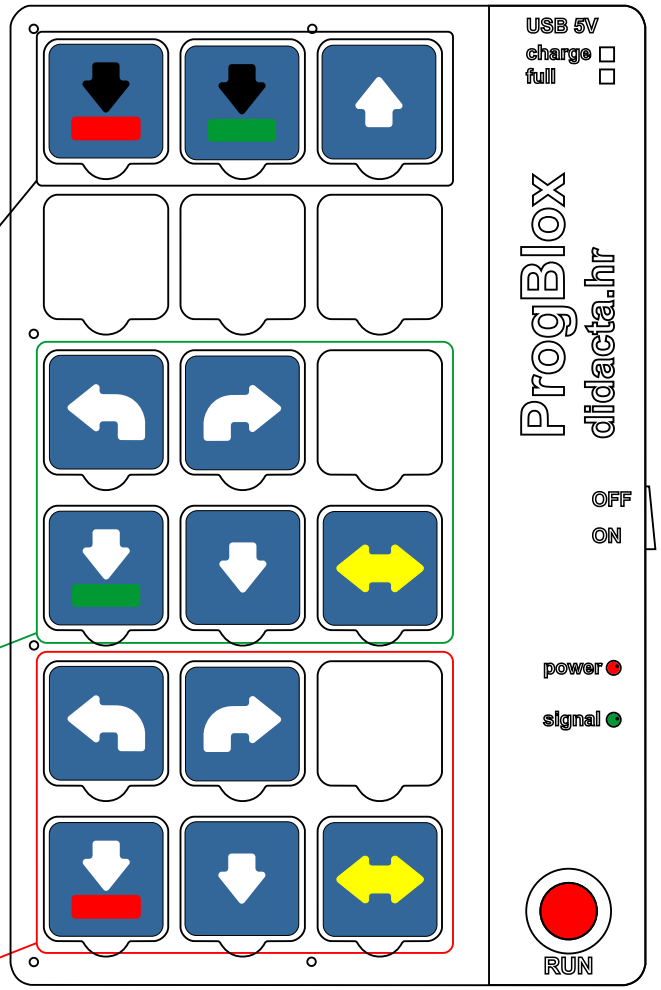
Example 16 - ROBOTIC CAR AVOIDS OBSTACLES - ADVANCED



the bumper is not pressed
- drive a short forward
(subprogram 1)

the green side of the bumper is pressed - drive a short backwards and rotate the vehicle halfway to the left or right (subroutine 2)

the red side of the bumper is pressed - drive a short backwards and rotate the vehicle halfway to the left or right (subroutine 3)



Example 17 - IR sensors - EYES on the bottom of the vehicle

- test the operation of the program by moving the robotic car above the black line

subprogram 1

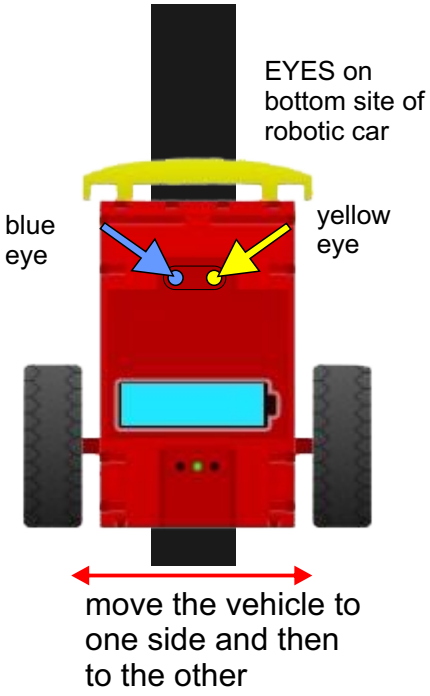
when the yellow eye is above the white background

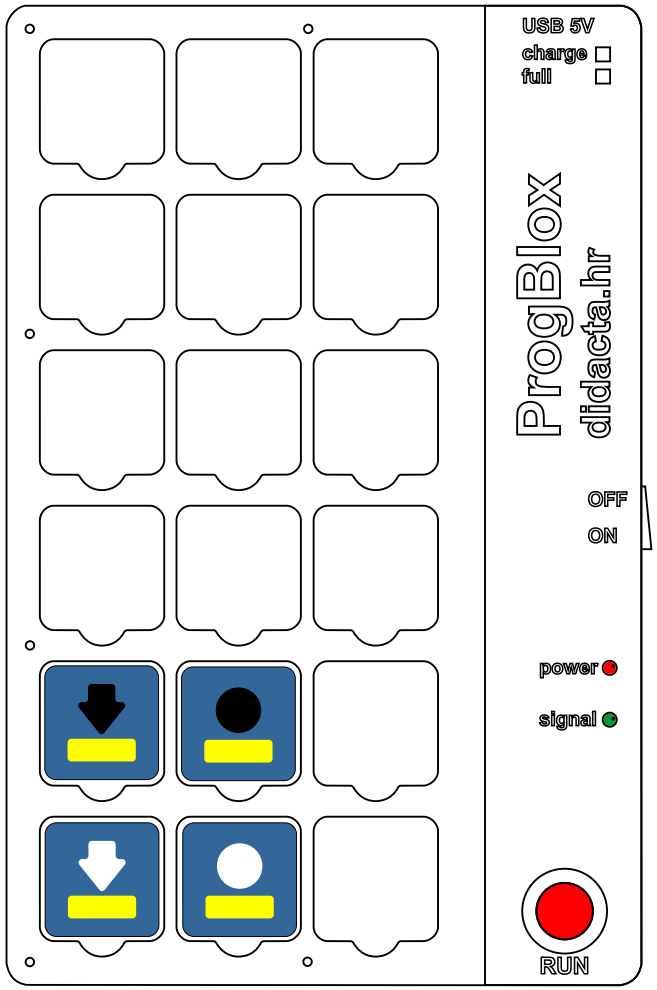
turn on the yellow LED light

subprogram 2

when the yellow eye is above the black background (line)

turn off the yellow LED light

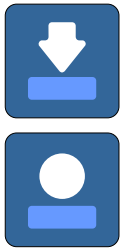




Example 18 - IR sensors - EYES on the bottom of the vehicle

- add to the previous program
- test the operation of the program by moving the robotic car above the black line

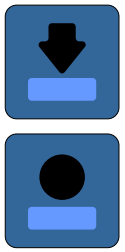
subprogram 1



when the blue eye is above the white background

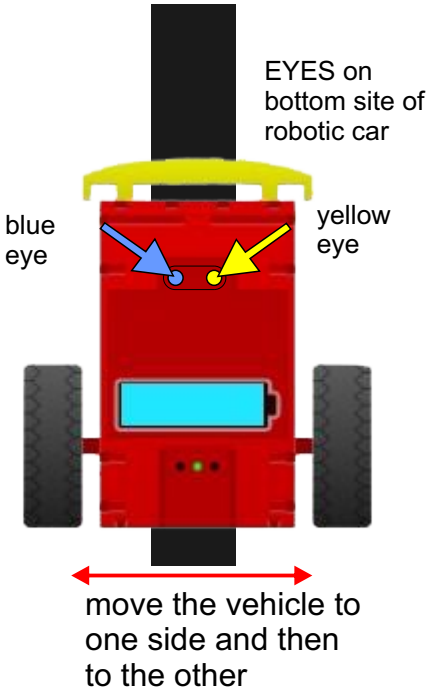
turn on the blue LED light

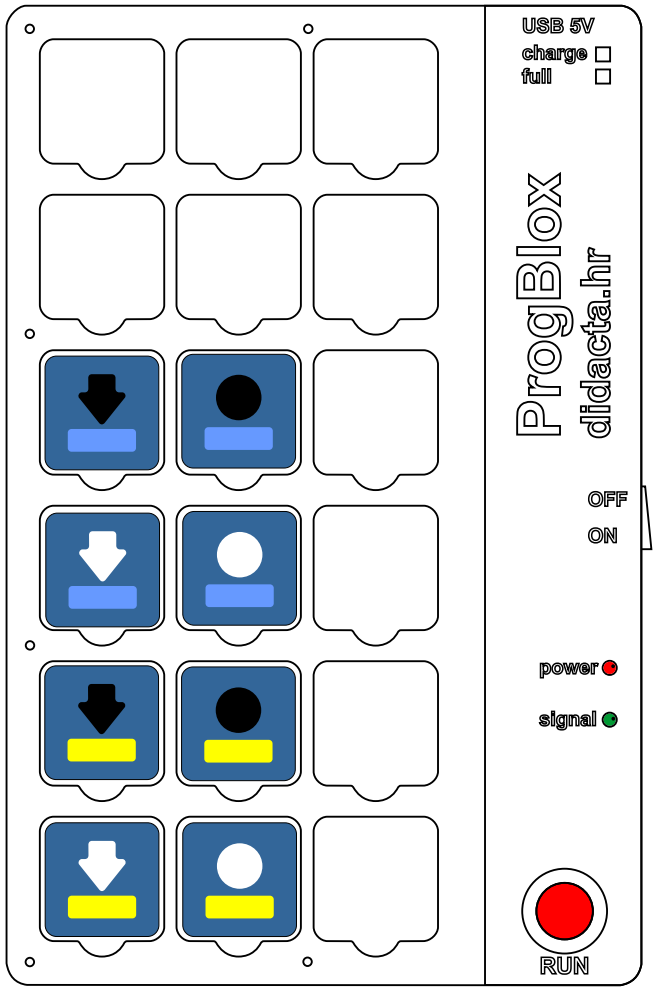
subprogram 2



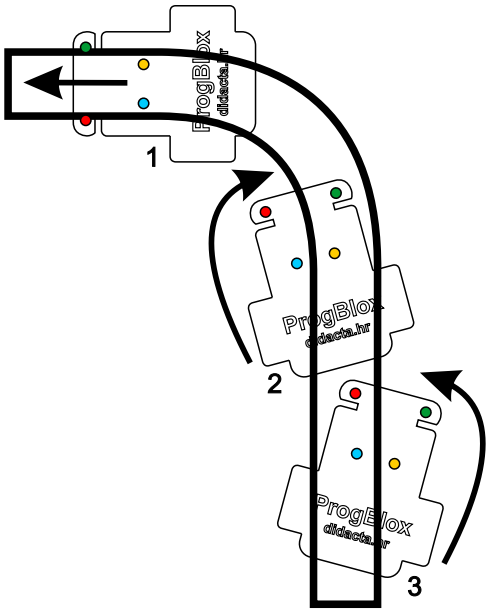
when the blue eye is above the black background (line)

turn off the blue LED light

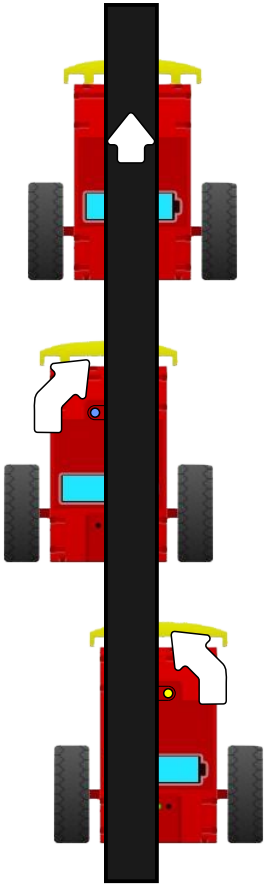




Example 19 - THE ROBOTIC CAR FOLLOWS THE LINE



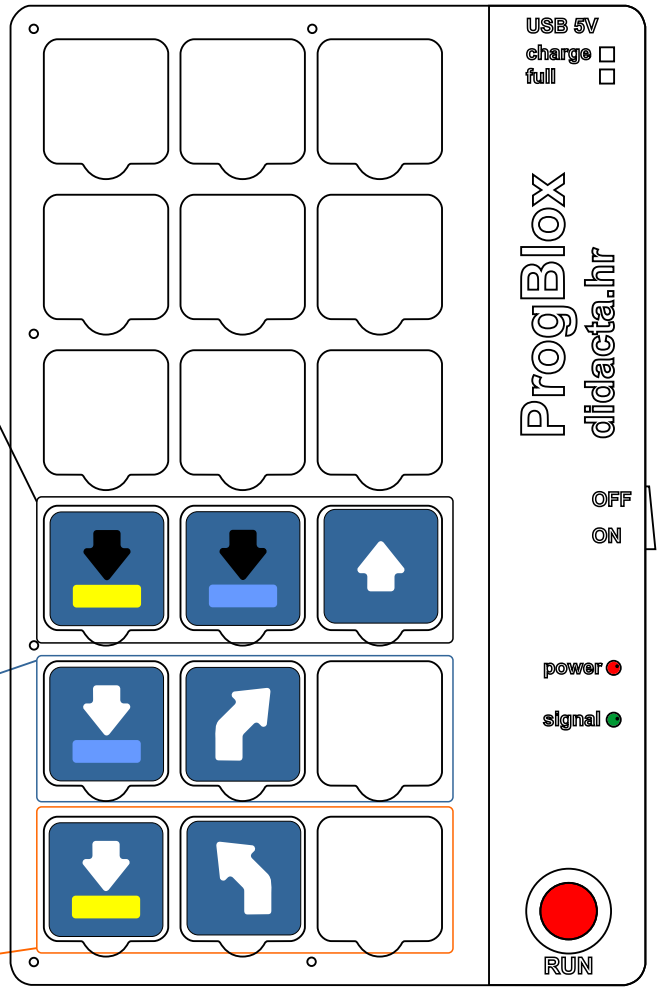
How to explain using the vehicle template.



both eyes are on a
black background (line)
- drive a little forward
(subroutine 1)

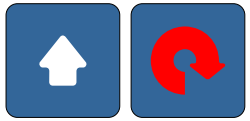
the blue eye is on a
white background
- turn a little to the right
(subroutine 2)

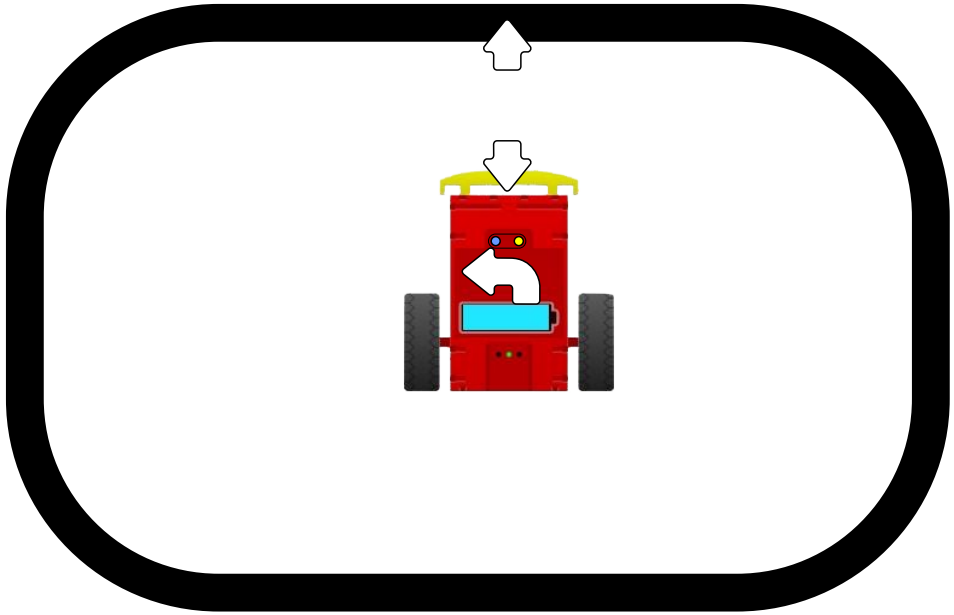
the yellow eye is on a
white background
- turn a little to the left
(subroutine 3)

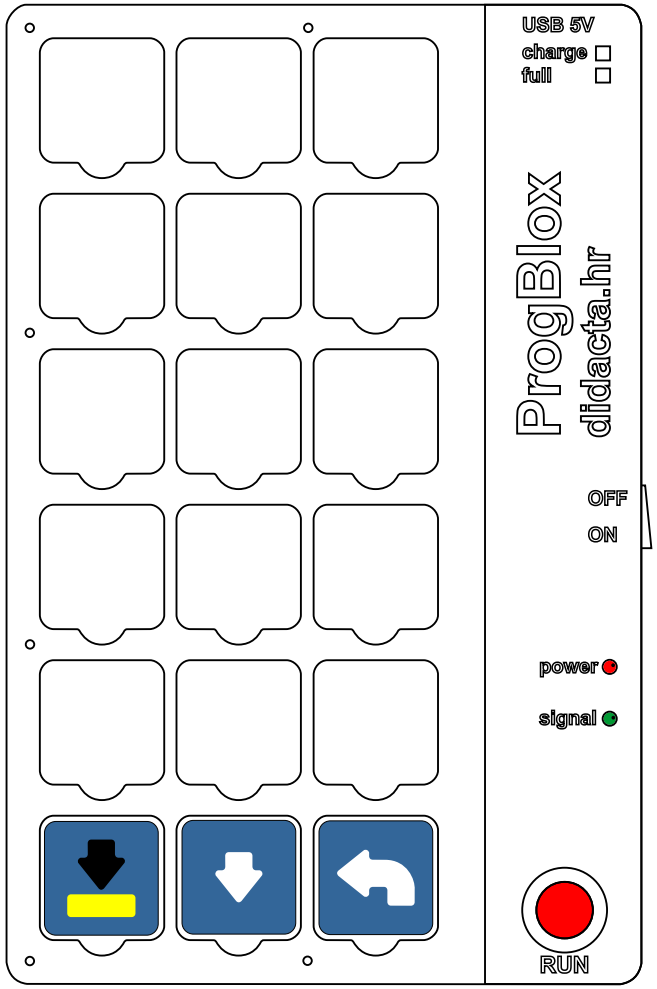


Example 20 - THE VEHICLE IS LOOKING FOR AN EXIT

- in the example you can use a blue or yellow eye

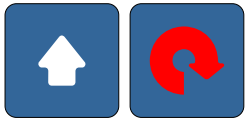
Run (separately) as the main program 

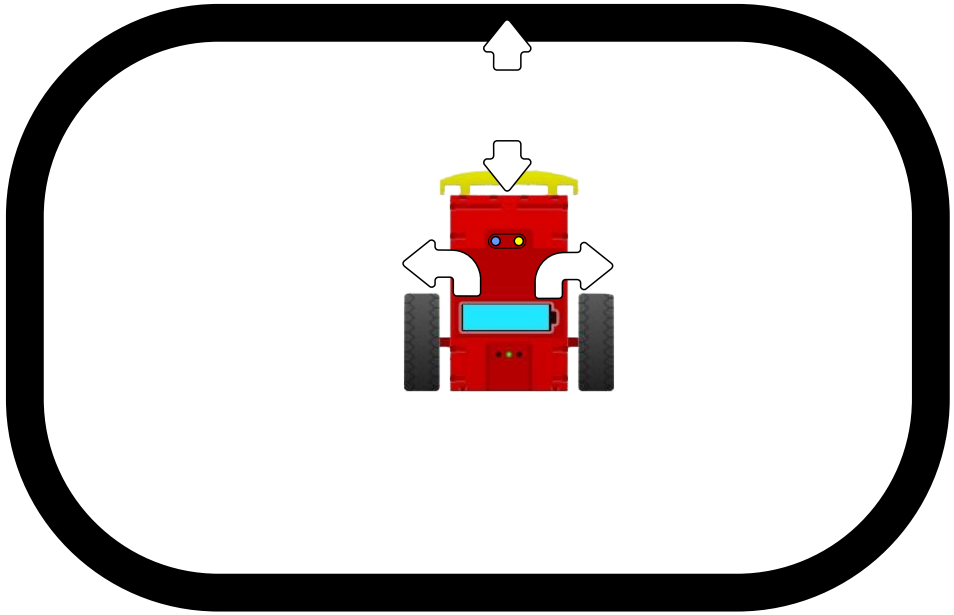


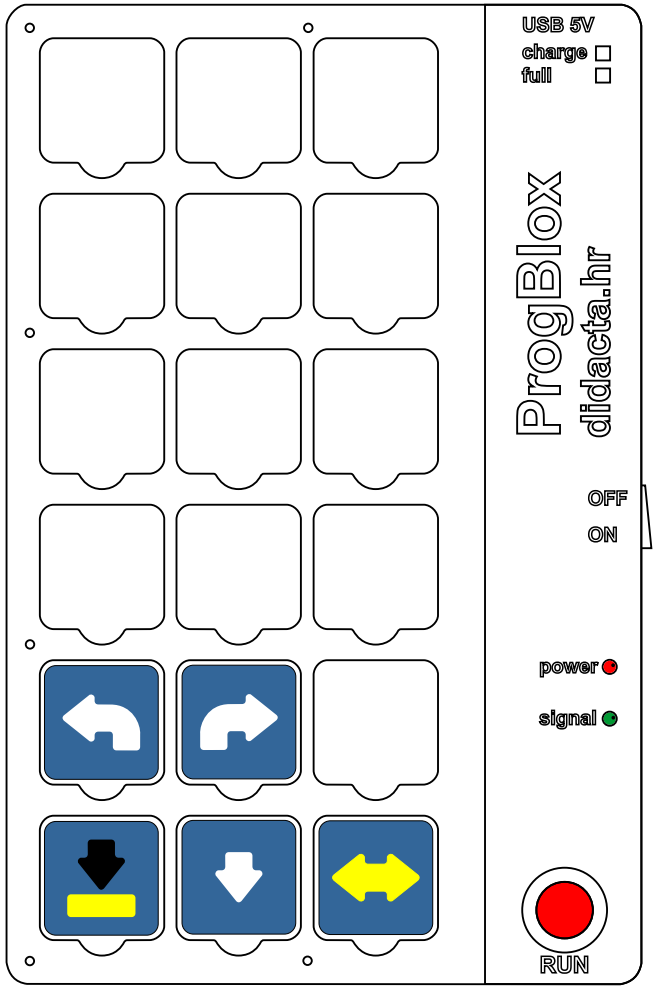


Example 21 - THE VEHICLE IS LOOKING FOR AN EXIT - ADVANCED

THE ROBOTIC CAR DECIDES ON THE DIRECTION OF TURN

Run (separately) as the main program 

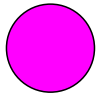




Example 22 - WE MIX COLORS OF LED LIGHTS

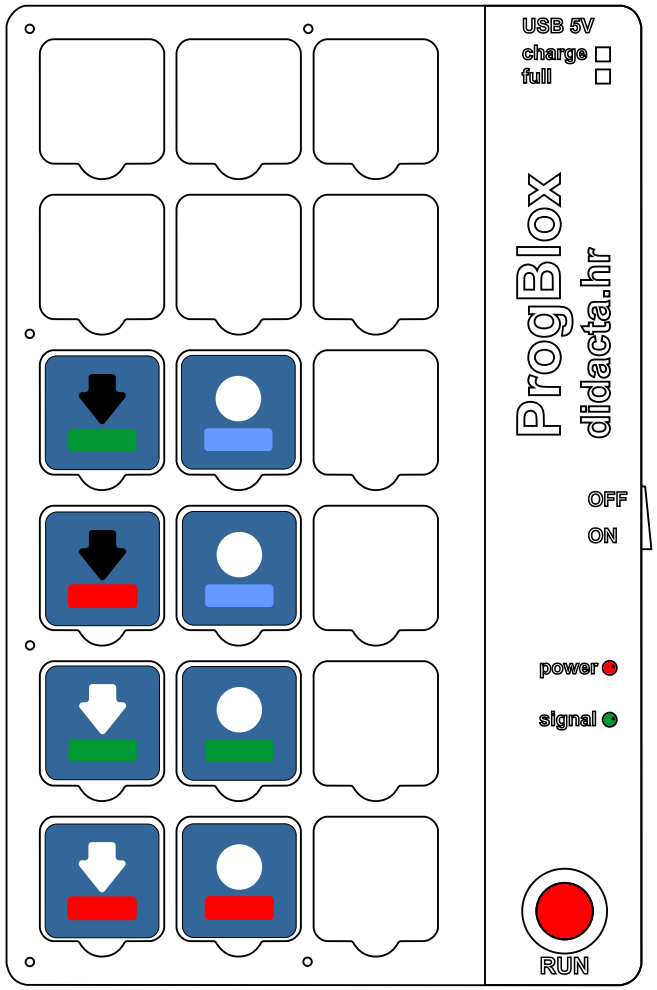
An LED light can display different colors of light

To get a bright PINK color, we have to turn it on BLUE and RED light



For the TURQUOISE color of the light, we have to turn it on BLUE and GREEN light

TRY OTHER COMBINATIONS



GROUP 1 - for vehicle movement control and other command cubes

2 x  wait a little longer (2 sec.)

4 x  wait little (1 sec.)

2 x  wait very little (0.5 sec.)

 delete all programs from the car memory

 repeat endlessly the main program

2 x  decide - command cube first or second in sequence

3 x  rotate the vehicle to the left side in half

3 x  rotate the vehicle to the right side in half

3 x  drive in the forward direction for a long

3 x  drive in the direction back long

2 x  rotate the car to the right completely

2 x  rotate the car to the left completely

 rotate the vehicle to the right a little

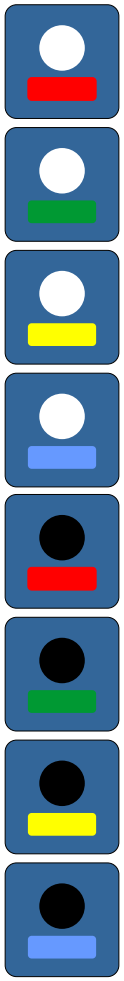
 rotate the vehicle to the left a little

 drive in the forward direction for a short

 drive in the direction back short

NOT USED FOR SUBPROGRAMS

GROUP 2 - for lights and sensors



turn on the red LED light

turn on the green LED light

turn on the yellow LED light

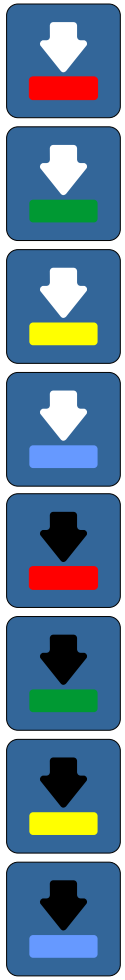
turn on the blue LED light

turn off the red LED light

turn off the green LED light

turn off the yellow LED light

turn off the blue LED light



2 x the red side of the bumper is pressed

2 x the green side of the bumper is pressed

2 x the yellow (EYE) IR sensor is over the white background

2 x the blue (EYE) IR sensor is over the white background

2 x the red side of the bumper is not pressed

2 x the green side of the bumper is not pressed

2 x the yellow (EYE) IR sensor is over the black background

2 x the blue (EYE) IR sensor is over the black background

command blocks to control the bumper and IR sensor CANNOT be used in the main program

ProgBlox
Car set
programming manual

fischertechnik

didacta advance
didacta.hr

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