

Introduction

Micro: IO-BOX is a micro:bit multifunctional expansion board with on-board Li-ion battery power, delicate appearance and easy to use. We integrated numerous functions on the 6cm×6cm board such as 2-way driver motor, 9-way IO port, 2-way I2C port, 1-way serial port, 1-way buzzer, 4-way RGB LED, Li-ion battery box, charge circuit, emergency power interface, etc.

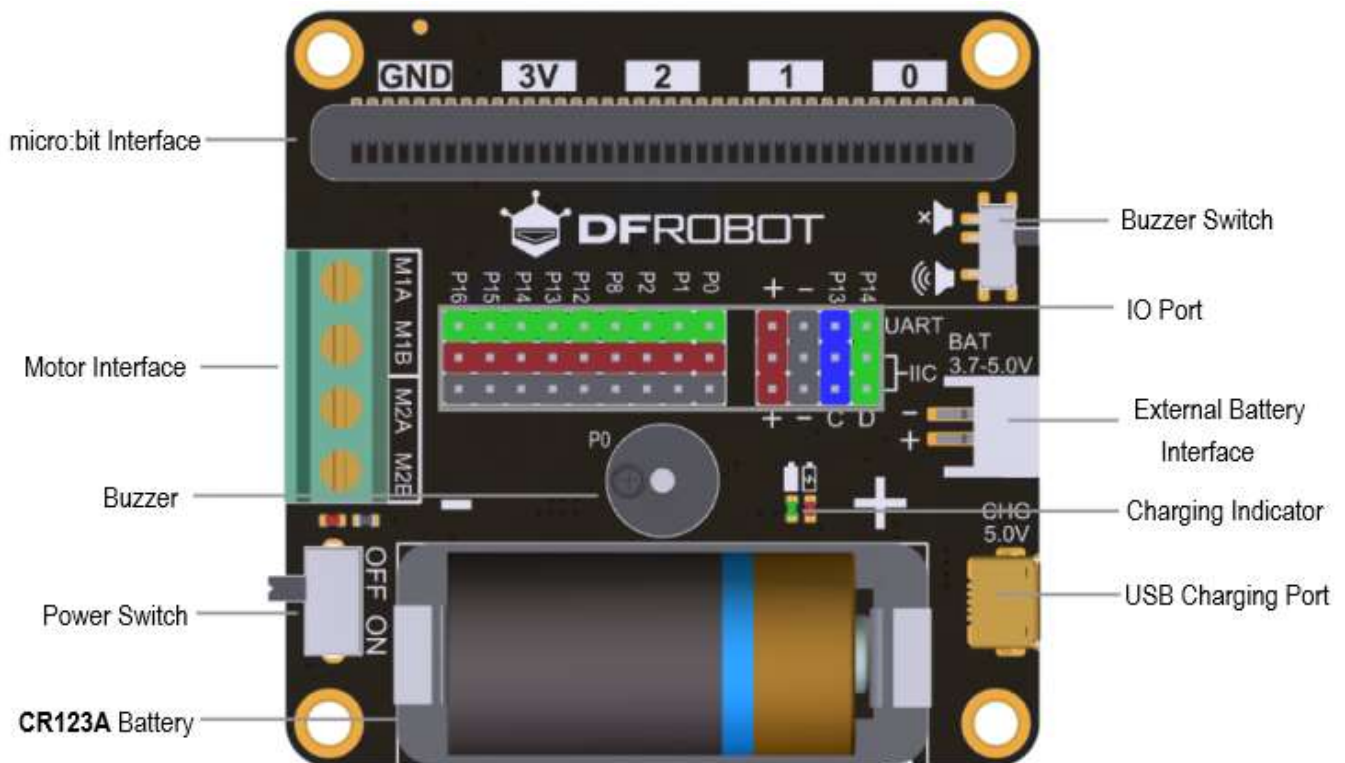
We design an outer protective cover for the product to make it more durable and indestructible. Besides, we also paid close attention to the safety of using the product, especially when most users are children. On the market, currently, some manufacturers adopt 18650 battery for their products. However, this kind of battery has explosion threats to people due to its high capacity and large size. Therefore, after a long-term testing, we selected CR123A 3.6V lithium rechargeable battery of 1000mA. This kind of battery features small size, large capacity and high safety. What's more, we set short circuit and reverse connection protection for it to further improve the safety in using Li-ion Battery.

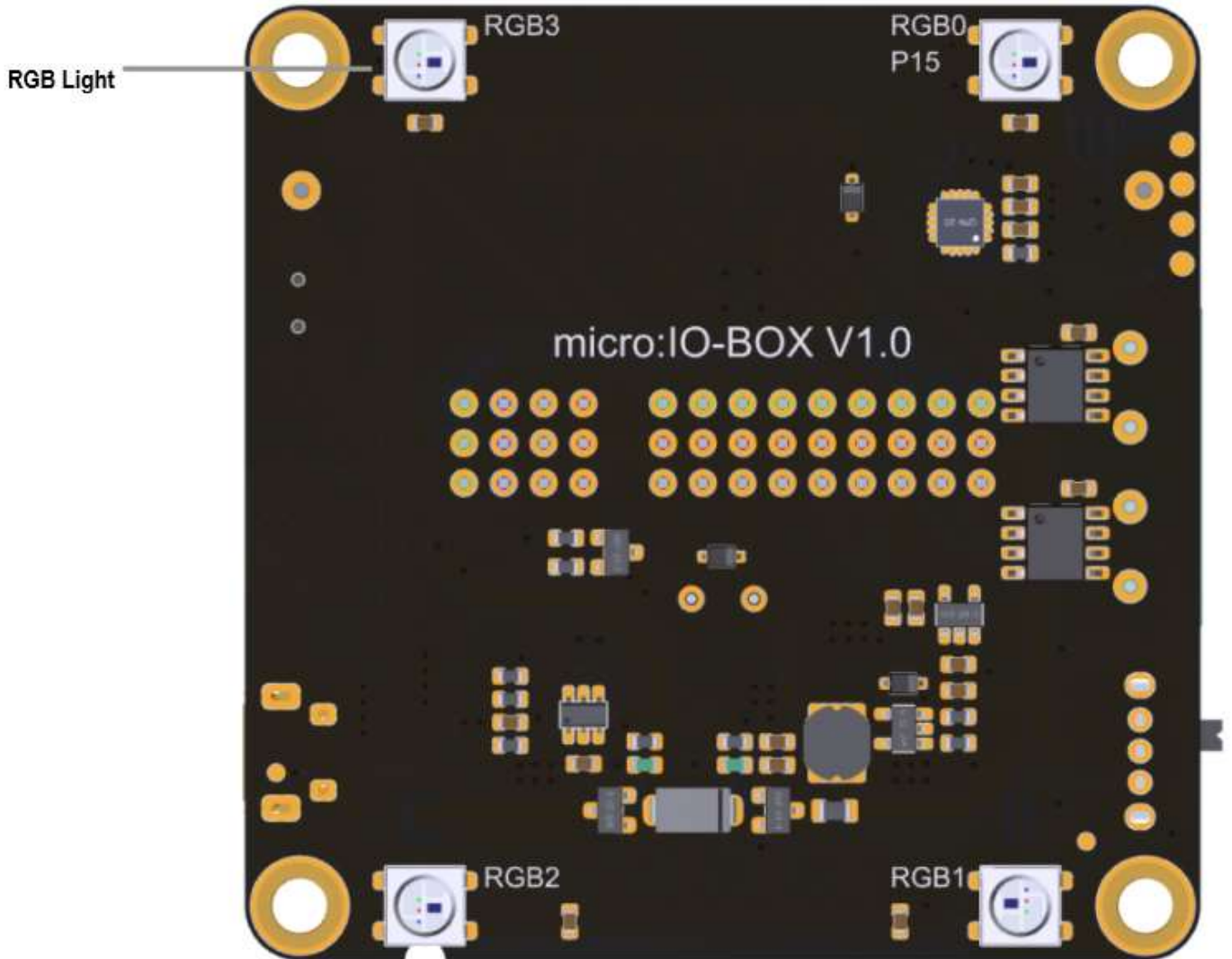
In order to provide a stable power supply, we employ a high-cost boost-buck power management solution. As we know, a motor's instantaneous current can reach up to 1A at its starting instant, which is a big challenge for power supply. So we specially carried out a strict test on our product: we make two TT motors keep rotating forward and reversely continuously, and even in such a condition, the board and motor can still work about 1.5 hours until running out of the battery.

Specification

- Battery Type: CR123A 3.6V Rechargeable LI-ION Battery (**Note:** do not use 3V CR123A or unchargeable Li-ion battery, because to recharge the unchargeable battery will cause battery damage or even endanger the personal safety.)
- Digital Input Voltage: 0V/3.3V
- Analog Input Voltage: 0~3.3V DC
- Standard Gravity Interface
- Micro: bit Interface: P0, P1, P2, P8, P12, P13, P14, P15, P16
- Motor Interface: DC motor ×2
- Onboard 4 way RGB
- Onboard Buzzer and Buzzer Switch
- Dimension: 61×61mm/2.40×2.40"
- Programming Platform: makecode graphical programming, mind+ graphical programming

Overview





Tutorial

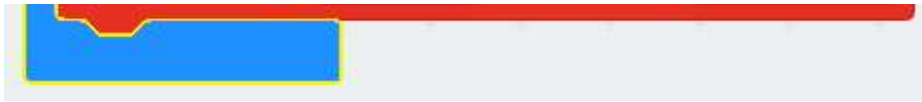
Makecode Online Graphical Programming

Motor drive library address: <https://github.com/DFRobot/pxt-micro-IOBOX>
(<https://github.com/DFRobot/pxt-micro-IOBOX>). About how to install the library?
(<https://www.arduino.cc/en/Guide/Libraries#.UxU8mdzF9H0>)

Drive the buzzer

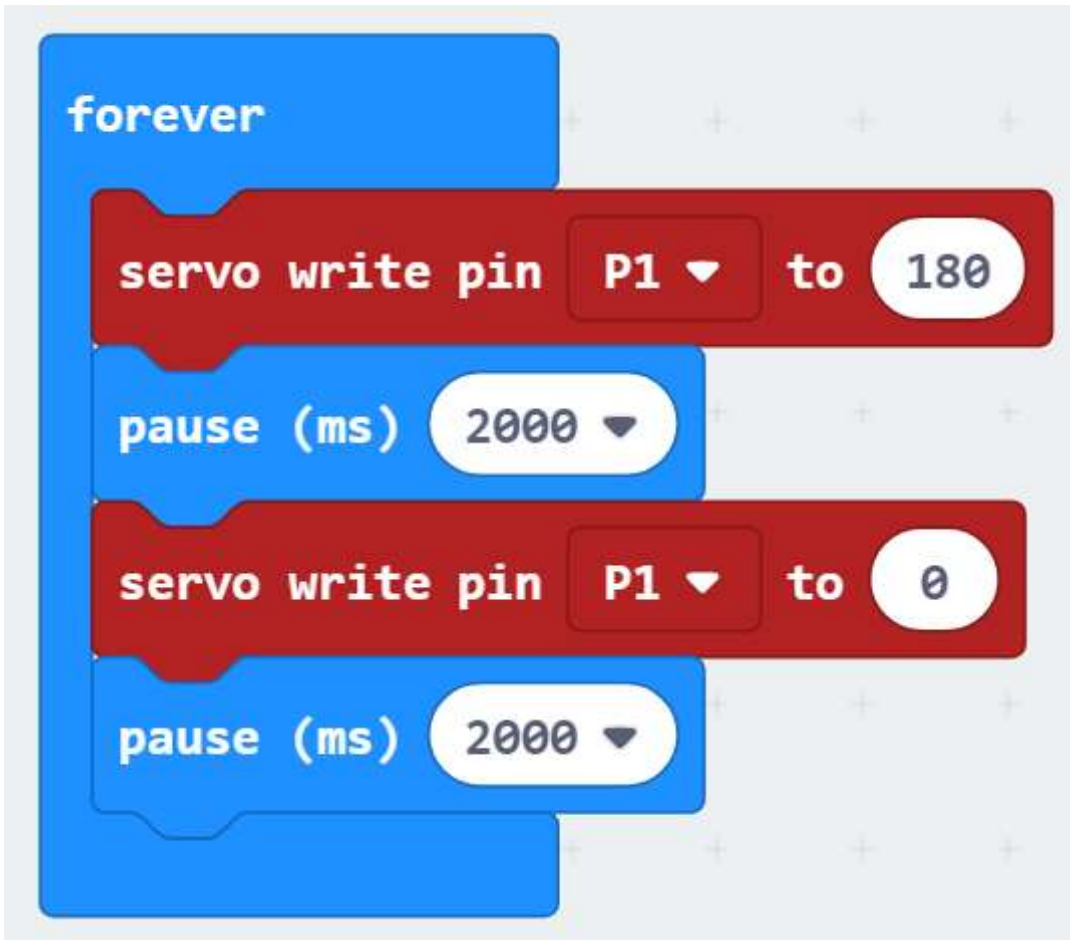
The effect of the program: play a music sound with the buzzer.





Drive the servo with IO port

The effect of the program: use IO port to drive the 9g servo.



Read the sensor data from IO port

The effect of the program: press the button, the dot matrix shows "0", release the button, it displays "0".



Drive the LED with IO port Output

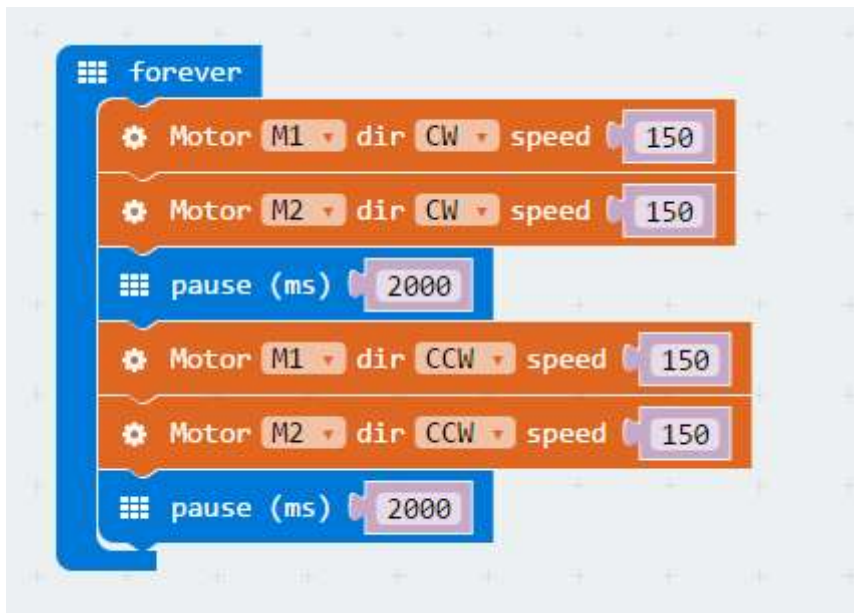
The effect of the program: drive the LED with IO port.



Drive the motor

Motor drive library address: <https://github.com/DFRobot/pxt-micro-IOBOX>
 (<https://github.com/DFRobot/pxt-micro-IOBOX>)

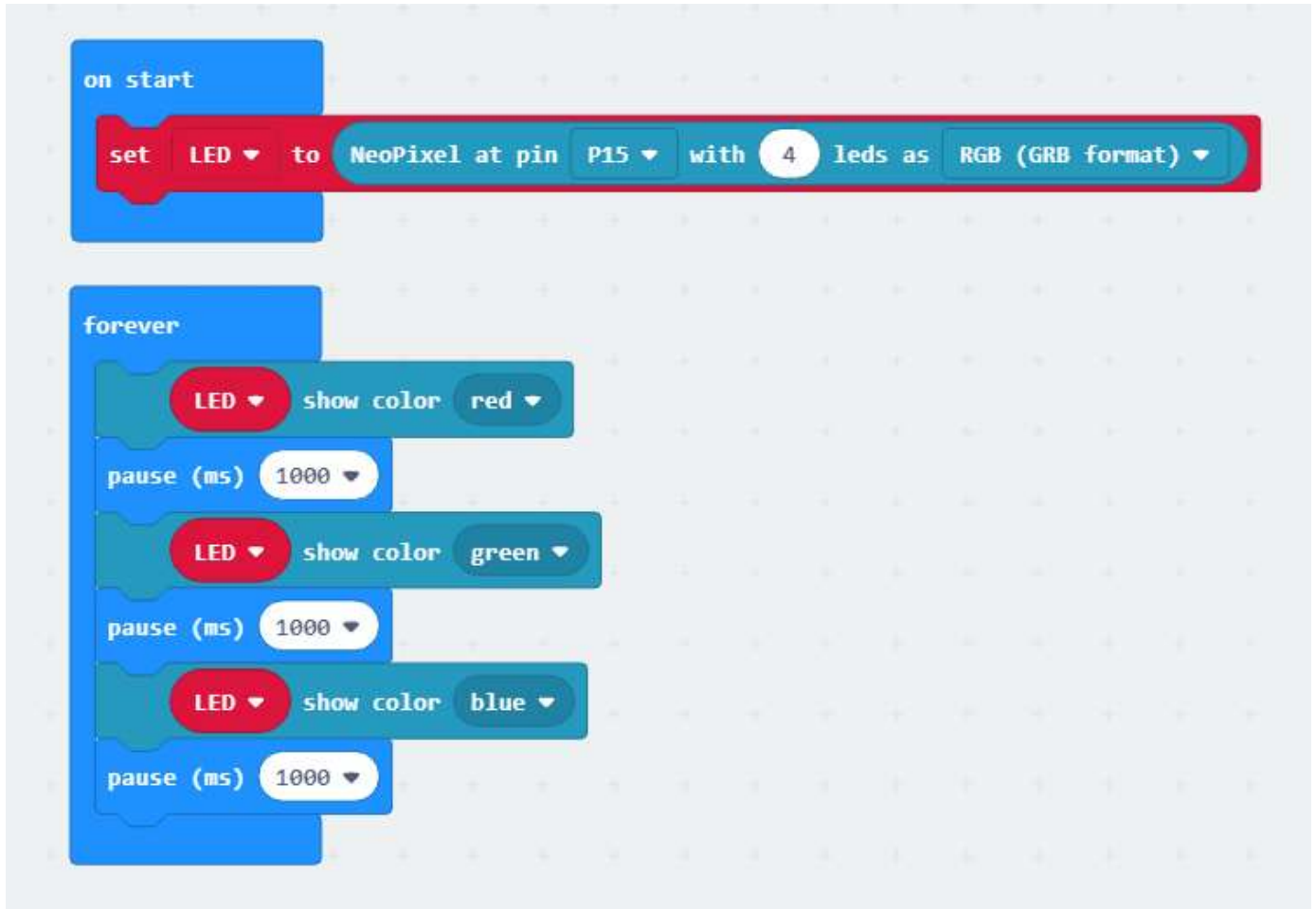
The effect of the program: Motor M1 and M2 rotate forward for 2 seconds at the speed of 150, then rotate reversely for 2 seconds with the same speed. Keep doing the actions repeatedly.



Drive the RGB light

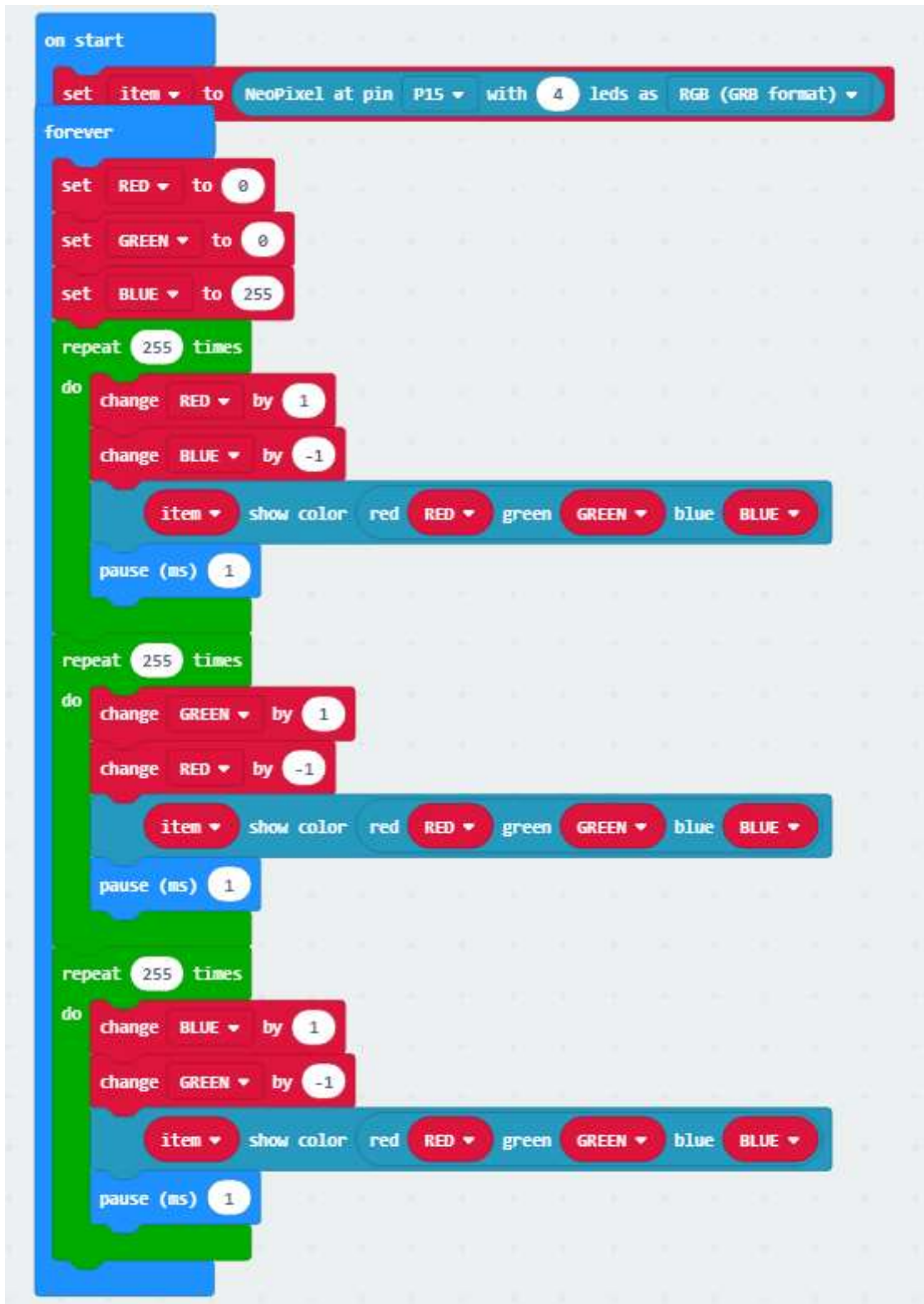
Colors Switch

The effect of the program: the color of four RGB lights at the bottom changes every 1 second in the order of red, green and blue.



Colorful breathing light

The effect of the program: the four RGB lights display an effect of breathing with changing colors.



####

FAQ

For any questions, advice or cool ideas to share, please visit the **DFRobot Forum**

(<https://www.dfrobot.com/forum/>)

More Documents



Get **micro: IO-BOX** (<https://www.dfrobot.com/product-1847.html>) from DFRobot Store or DFRobot Distributor. (<https://www.dfrobot.com/index.php?route=information/distributorslogo>)

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