



velleman VMM500 MicroBIT Education Smart Robot Kit User Manual

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Introduction

To all residents of the European Union Important environmental information about this product



■ This symbol on the device or the package indicates that disposal of the device after its lifecycle could harm the environment. Do not dispose of the unit (or batteries) as unsorted municipal waste; it should be taken to a specialized company for recycling. This device should be returned to your distributor or to a local recycling service. Respect the local environmental rules.

If in doubt, contact your local waste disposal authorities.

Thank you for choosing Velleman®! Please read the manual thoroughly before bringing this device into service. If the device was damaged in transit, do not install or use it and contact your dealer.

Safety Instructions



This device can be used by children aged from 8 years and above, and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning the use of the device in a safe way and understand the hazards involved. Children shall not play with the device.

Cleaning and user maintenance shall not be made by children without supervision.



Indoor use only.

Keep away from rain, moisture, splashing and dripping liquids.

General Guidelines



- Refer to the Velleman® Service and Quality Warranty on the last pages of this manual.
- Familiarise yourself with the functions of the device before actually using it.
- All modifications of the device are forbidden for safety reasons. Damage caused by user modifications to the device is not covered by the warranty.
- Only use the device for its intended purpose. Using the device in an unauthorised way will void the warranty.
- Damage caused by disregard of certain guidelines in this manual is not covered by the warranty and the dealer will not accept responsibility for any ensuing defects or problems.
- Nor Velleman nv nor its dealers can be held responsible for any damage (extraordinary, incidental or indirect) – of any nature (financial, physical...) arising from the possession, use or failure of this product.
- Due to constant product improvements, the actual product appearance might differ from the shown images.
- Product images are for illustrative purposes only.
- Do not switch the device on immediately after it has been exposed to changes in temperature. Protect the

device against damage by leaving it switched off until it has reached room temperature.

- Keep this manual for future reference.

What is micro:bit?

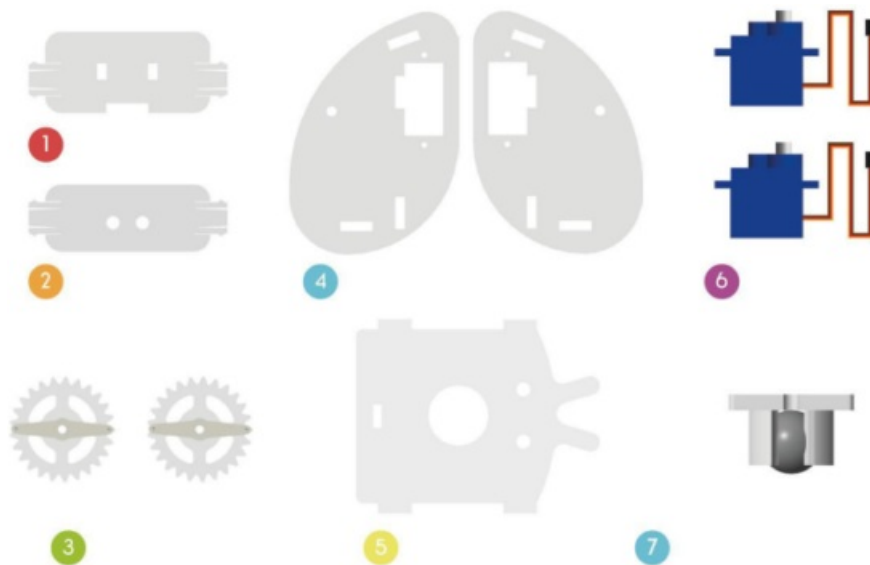
The BBC micro:bit is a pocket-sized (52 x 42 mm – 2" x 1.75") computer, 70 times smaller and 18 times faster than the original BBC micro computers used in schools. The design is appealing to a young public. It features 25 red LEDs used to flash messages and create games.

micro:bit is compatible with different coding languages starting from Block Editor and mobile apps for the starters, to Python for more advanced users.

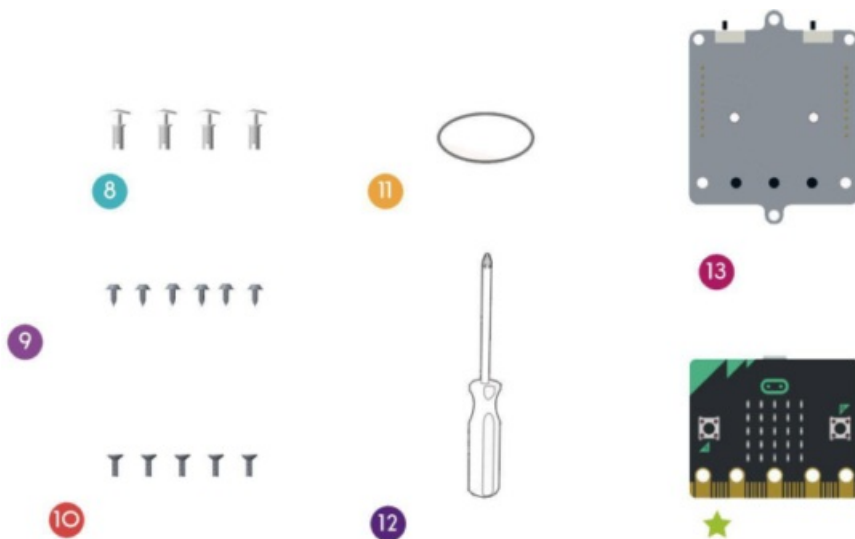
micro:bit has an accelerometer so it can detect motion and knows when you are on the move. The built-in compass knows which direction you are heading in and it uses a low-energy wireless connection to interact with other devices and the Internet.

Each element is completely programmable via easy-to-use software on a dedicated website (microbit.org) accessible from a PC, tablet or mobile.

Component List



1. front shield
2. back shield
3. 2x wheel
4. left + right side board
5. base board
6. 2x servo
7. 1x universal wheel



8. 4x rivet

9. 6x M2.2x5 tapping screw

10. 5x M3x5 screw

11. rubber band

12. screwdriver

13. Ring:bit



micro:bit

Assembly

Installing the universal wheel

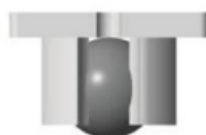


Before installation, please get rid of the film paste on the acrylic components.

Components used



base board



1x universal wheel

Assembly



Fix the universal wheels on the board with the rivets.

Installing the servos to each side of the board

Components used



2x servo

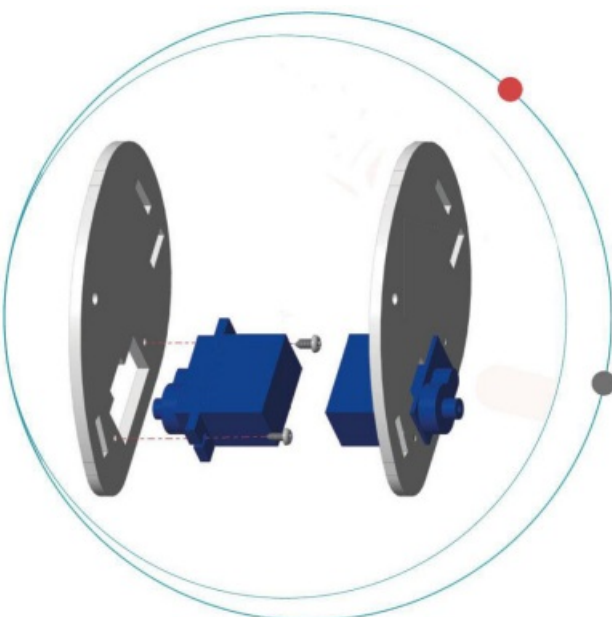


4x M2.2x5 tapping screw



left + right side board

Assembly

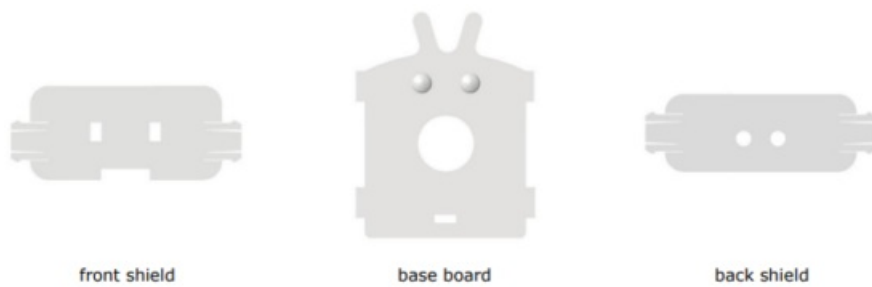


Fix the servos to each side board with the tapping screws.

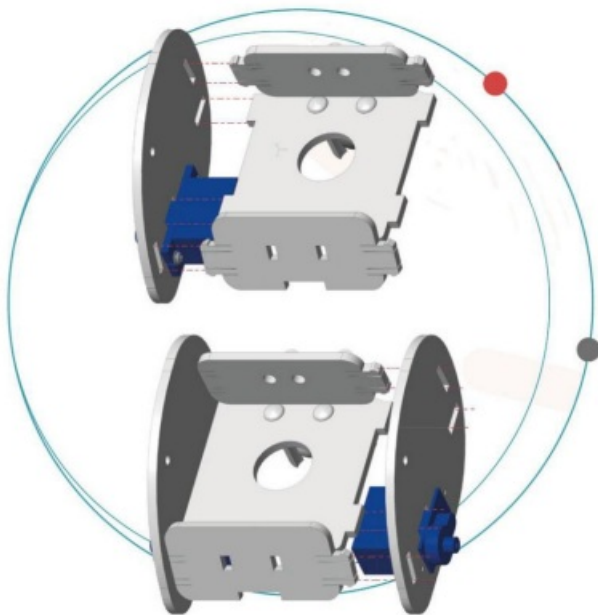
Hold the acrylic-frosted side on the outside.

Assembling the Ring:bit Car body

Components used



Assembly



Fix the front and back shield to the side and base boards.

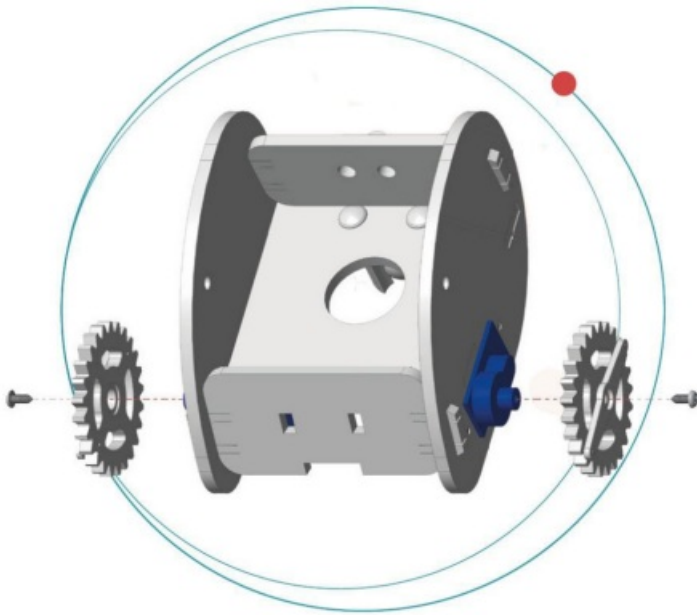
Hold the acrylic-frosted side on the outside.

Installing the Ring:bit Car wheels

Components used



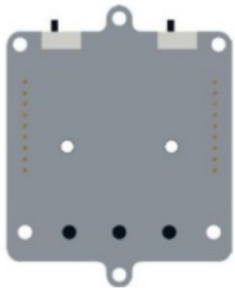
Assembly



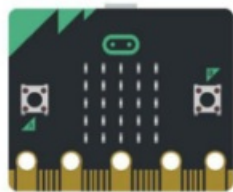
Fix the wheels to the servo rod with the tapping screws.

Fixing the micro:bit to the Ring:bit

Components used



Ring:bit

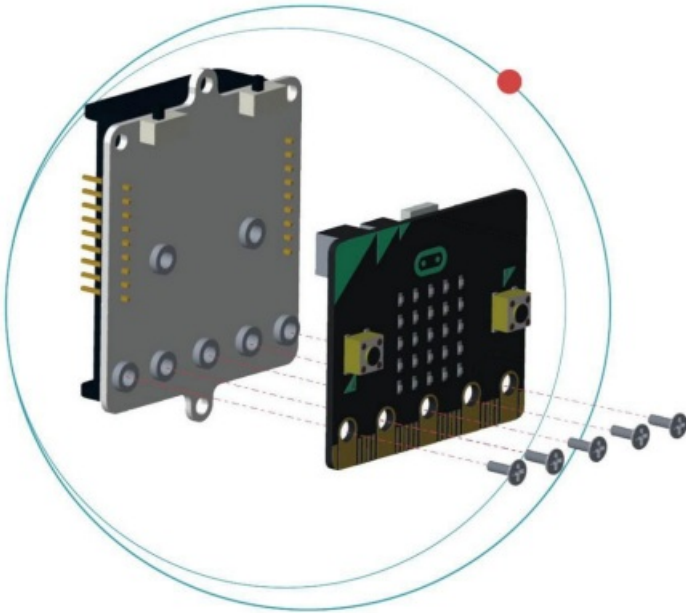


micro:bit



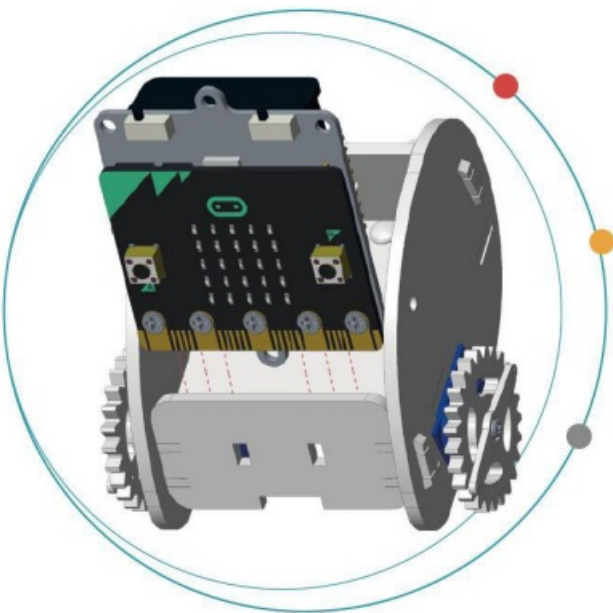
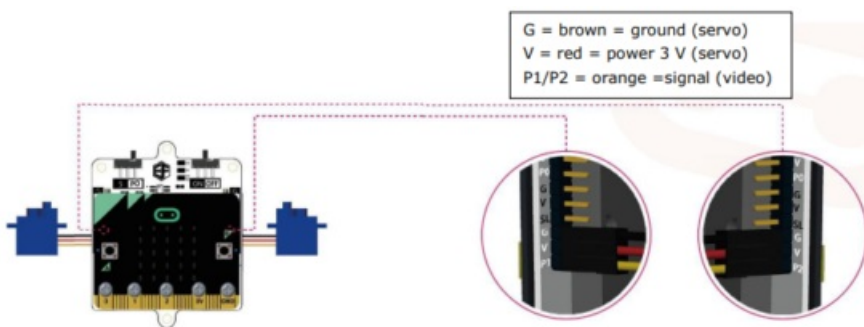
5x M3x5 screw

Assembly

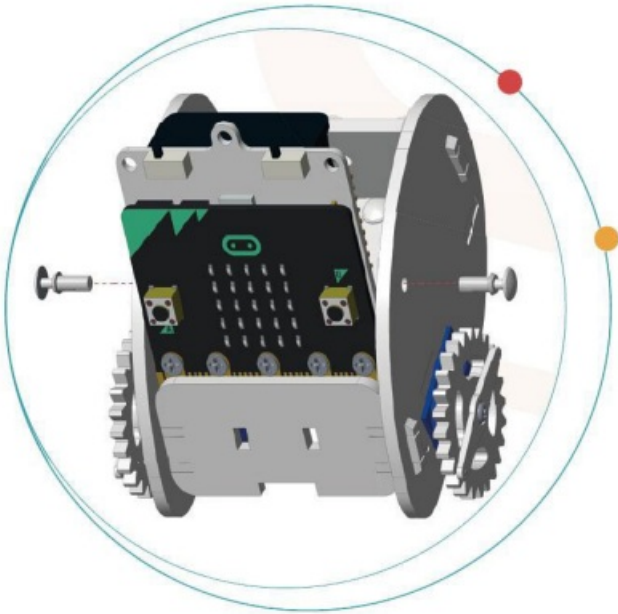


Fix the micro:bit to the Ring:bit with the screws.

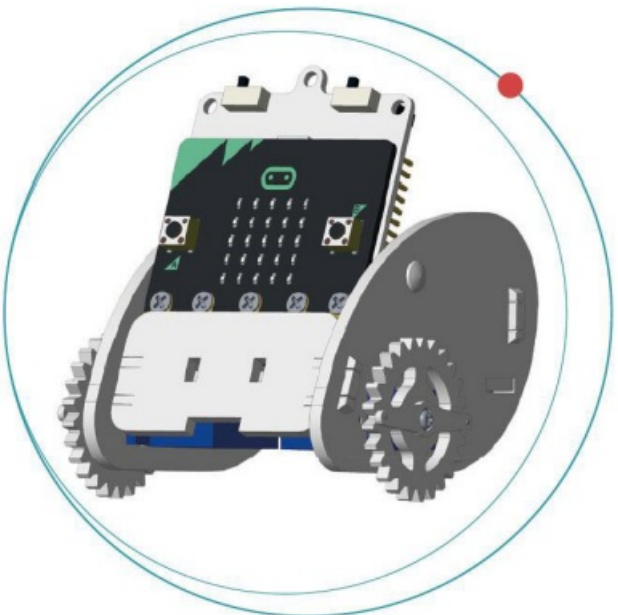
Wire connection



Place 3x LR03 batteries into the holder of the Ring:bit.
Slide and fit the micro:bit assembly into the car.



Fix with the rivets.

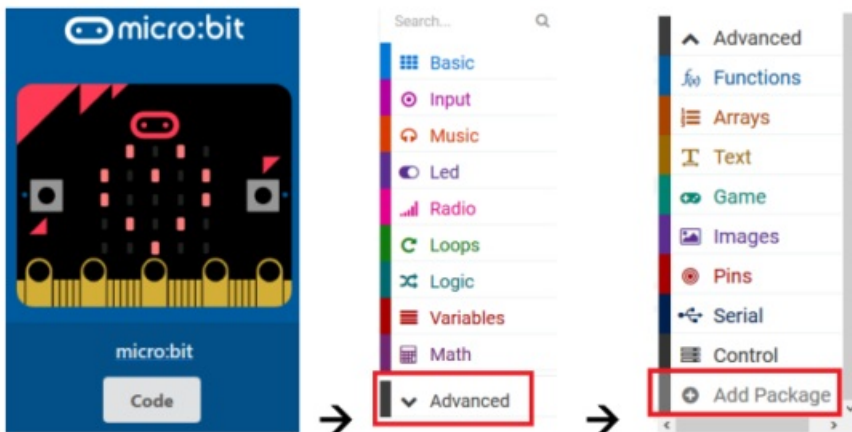


Your car is now completed!

Code

Adding the package

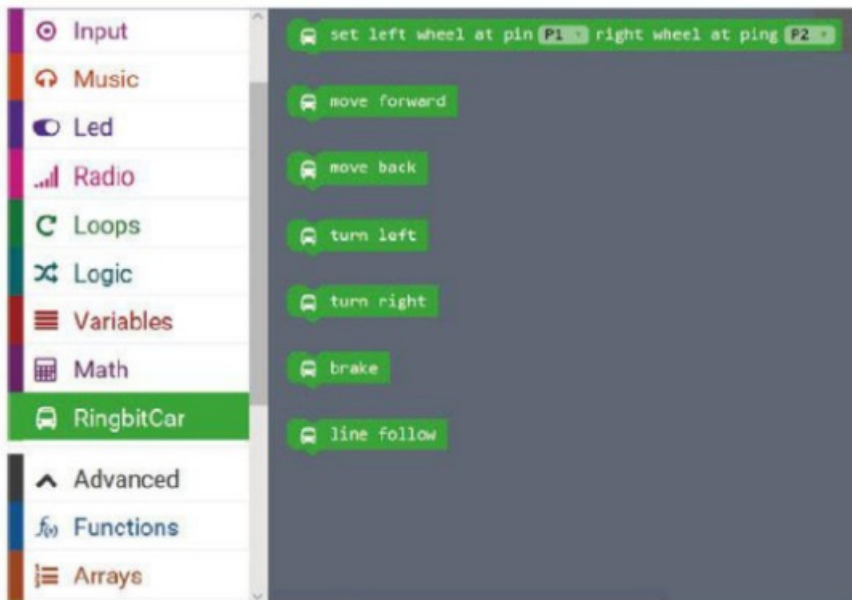
Go to www.makecode.org and click on the micro:bit button to enter the code editor.
Click and select Advanced in the bottom of the code drawer.
Click Add Package.



Search for Ring:bit. Select the Ring:bit Car package.

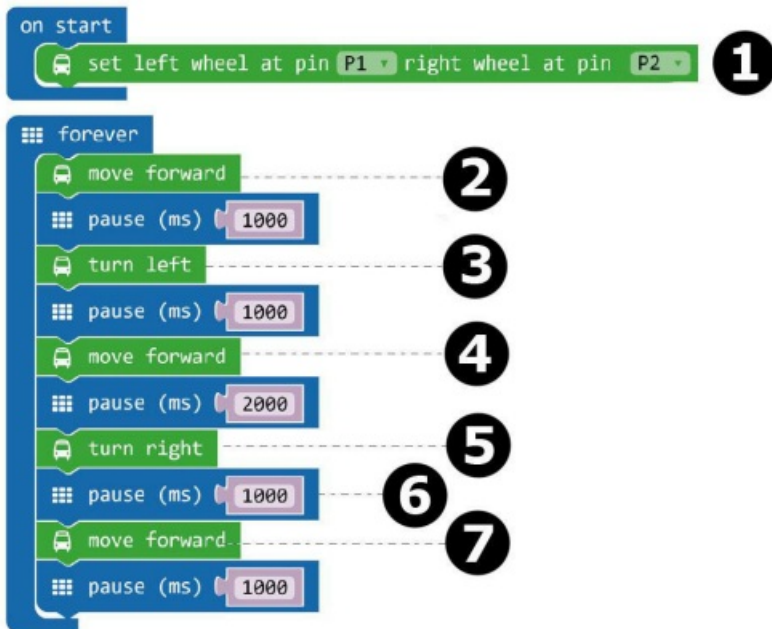


Once loaded, the Ring:bit Car appears in the code drawer.



The S-Walk

We make a code to let the Ring:bit Car run in an S-shape.



1. On start, set the pins for the servos.
2. Move forward for 1000 ms.
3. Turn left for 1000 ms.
4. Move forward for 2000 ms.
5. Turn right for 1000 ms.
6. Pause for 1000 ms.
7. Move forward for 1000 ms.
8. Download the programme into micro:bit.

Drag and drop the block set left wheel at pin P1 right wheel at pin P2 into the block on start in the editor window. You will find this block in the Ring:bit Car menu of the code drawer. When correct, they snap together.

Now, make a second block as shown in the image.

Drag and drop the block move forward into the block forever. Then, drag and drop the pause block under the move forward block. You will find the pause block in the basic menu of the code drawer. Set the pause at 1000 ms (= 1 second).

Now, do the same for the other blocks for steps 3 through 7.

When complete, we compile the program to generate a .hex file. Click on the download button and save the .hex file to the Downloads folder (C:\downloads). This .hex file is ready to be uploaded to the micro:bit.

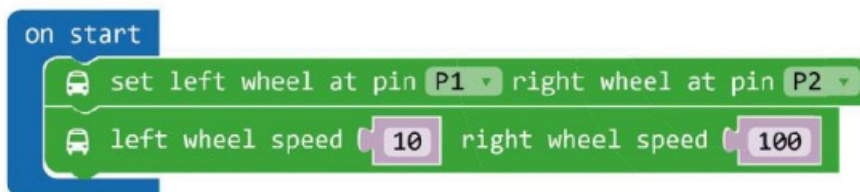
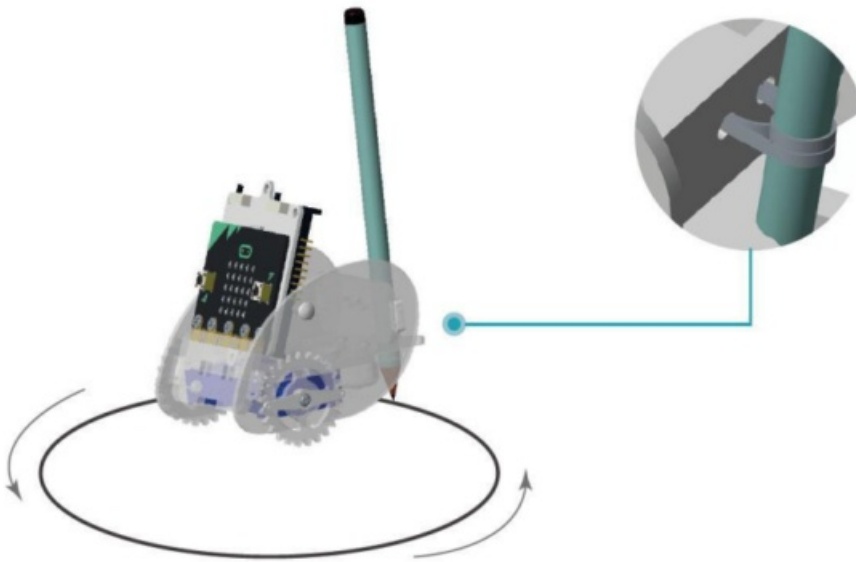
Plug the micro:bit into the USB port via the micro-USB cable. Then, drag and drop the .hex-file (from the Downloads folder) onto the micro:bit Removable device to upload the programme.

Now, place the Ring:bit Car onto the ground and switch on the micro:bit via the on-off switch. The Ring:bit Car runs in a S-shape line.

Drawing a circle

We make the Ring:bit Car draw a circle. Install a pen or pencil as shown below and install the Ring:bit Car on a

sheet of A4/A3 paper or cardboard.



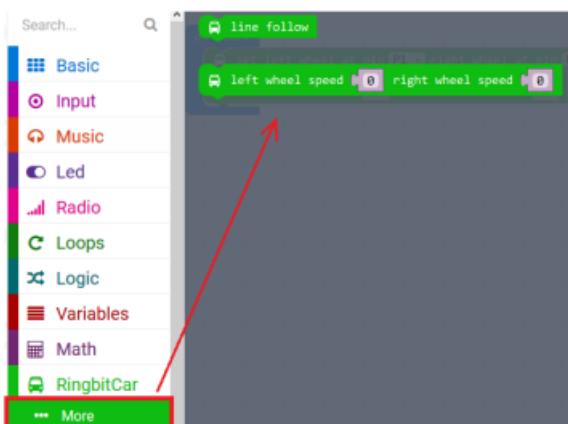
1. Set a different speed for the two wheels.
2. Download the programme into micro:bit.

The block left wheel speed (0) right wheel speed (0) can be found when you click on More in the menu of the code drawer.

When complete, we compile the programme to generate a .hex file. Click on the download button and save the .hex file to the Downloads folder (C:\downloads). This .hex file is ready to be uploaded to the micro:bit.

Plug the micro:bit into the USB port via the microUSB cable. Then, drag and drop the .hex-file (from the Downloads folder) onto the micro:bit Removable device to upload the programme.

Now, place the Ring:bit Car on a sheet of A4/A3 paper or cardboard. Switch on the Ring:bit Car and see what happens!



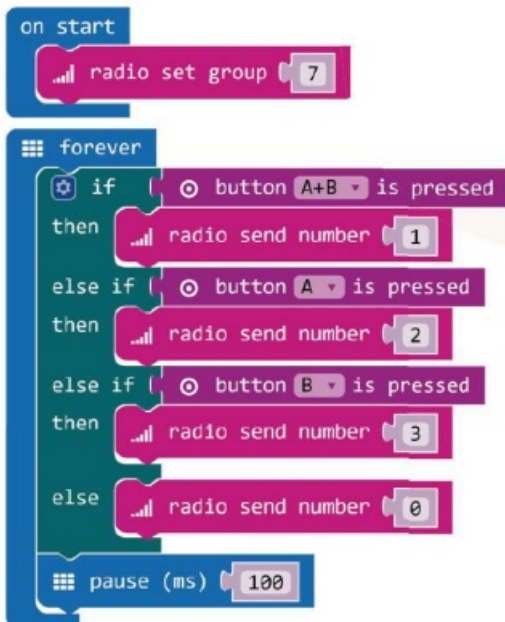
Wireless control

Let's make a remote control for controlling the Ring:bit Car via RF (radio frequency).
For doing that, you will need a second micro:bit in option.



Click button A to turn right.
Click button B to turn left.
Click buttons A + B to move forward.

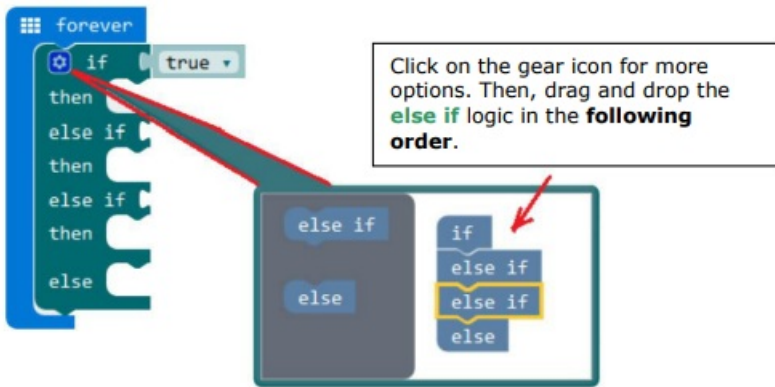
Remote control code



1. Set the radio group. Keep the sender and receiver the same.
2. Press buttons A + B to send number 1.
3. Press button A to send number 2.
4. Press button B to send number 3.
5. If there is no operation, send number 0.
6. Download the programme into micro:bit.

The block radio set group can be found in the menu of the code drawer Radio. Drag and drop this block in the on start block. Set the number on 7.

Then, we make a forever loop. In this loop, we add a logic function: if → then → else if.



Then click on the gear icon again, and drag and drop the new created logic function under the forever loop.

Now, place the block button A+B is pressed next to the first if logic. Place block button A is pressed next to the first else if logic, and block button B is pressed next to the second else if logic. The blocks can be found in the code drawer menu.

Now, place the radio send number 1 block next to the first then logic and set the number to 1. Drag and drop a second radio send number 2 block next to the second then logic and set the number to 2. Drag and drop a third radio send number 3 block next to the third then logic and set the number to 3. Drag and drop a fourth radio send number 0 block next to the else logic and set the number to 0. The blocks can be found in the code drawer menu.

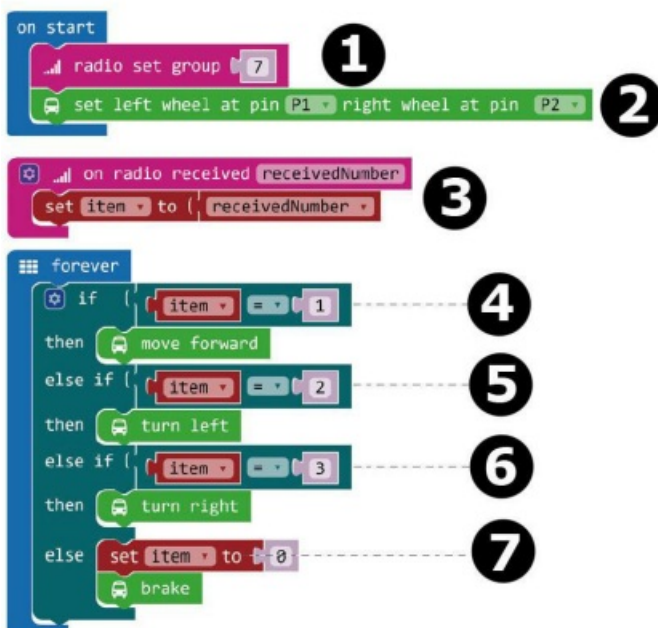
At least, place a pause block under the else logic and set it to 100 (100 milliseconds).

When complete, we compile the program to generate a .hex file. Click on the download button and save the .hex file to the Downloads folder (C:\downloads). This .hex file is ready to be uploaded to the micro:bit.

Plug the micro:bit into the USB port via the micro-USB cable. Then, drag and drop the .hex-file (from the Downloads folder) onto the micro:bit Removable device to upload the programme.

Ring:bit Car code

Drag and drop the blocks in the code drawer as shown below, and download this code into the second micro:bit.

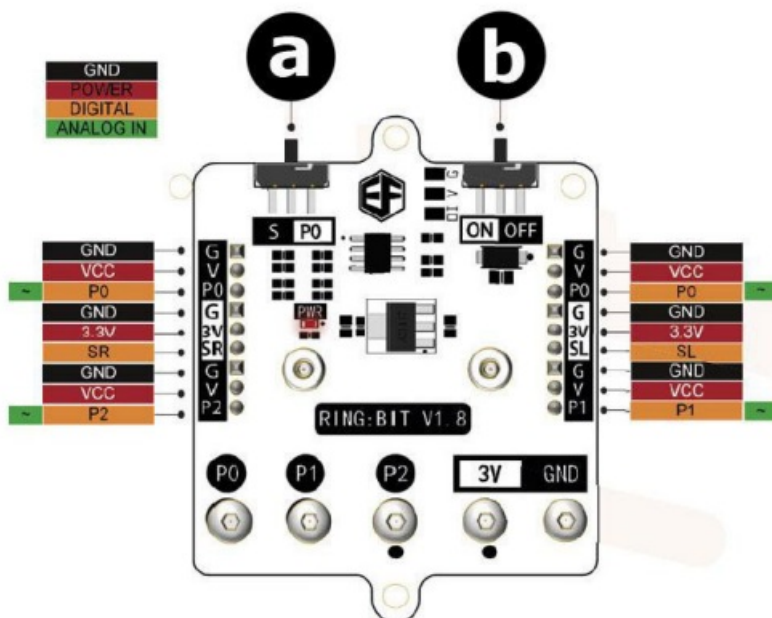


1. Set the radio group. Keep the sender and receiver the same.
2. Set the pins for the servos.
3. Save the received numbers into a variable item.
4. Judge the number received. 1 means to move forward.
5. 2 means to turn left.
6. 3 means to turn right.
7. Other means to stop.
8. Download the programme into micro:bit.

When complete, we compile the program to generate a .hex file. Click on the download button and save the .hex file to the Downloads folder (C:\downloads). This .hex file is ready to be uploaded to the micro:bit.

Plug the second micro:bit into the USB port via the micro-USB cable. Then, drag and drop the .hex-file (from the Downloads folder) onto the micro:bit Removable device to upload the programme for the remote control.

About Ring:bit



a. Function switch

S: P0 can connect two GVS modules through G-V-SR and G-V-SL.

P0: use the connector for P0 only.

b. Power switch

Use this device with original accessories only. Velleman nv cannot be held responsible in the event of damage or injury resulting from (incorrect) use of this device. For more info concerning this product and the latest version of this manual, please visit our website www.velleman.eu. The information in this manual is subject to change without prior notice.

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Velleman® Service and Quality Warranty

Since its foundation in 1972, Velleman® acquired extensive experience in the electronics world and currently distributes its products in over 85 countries.

All our products fulfil strict quality requirements and legal stipulations in the EU.

In order to ensure the quality, our products regularly go through an extra quality check, both by an internal quality department and by specialized external organisations. If, all precautionary measures notwithstanding, problems should occur, please make appeal to our warranty (see guarantee conditions).

General Warranty Conditions Concerning Consumer Products (for EU):

- All consumer products are subject to a 24-month warranty on production flaws and defective material as from the original date of purchase.
- Velleman® can decide to replace an article with an equivalent article, or to refund the retail value totally or partially when the complaint is valid and a free repair or replacement of the article is impossible, or if the expenses are out of proportion.

You will be delivered a replacing article or a refund at the value of 100% of the purchase price in case of a flaw occurred in the first year after the date of purchase and delivery, or a replacing article at 50% of the purchase price or a refund at the value of 50% of the retail value in case of a flaw occurred in the second year after the date of purchase and delivery.

Not covered by warranty:


- all direct or indirect damage caused after delivery to the article (e.g. by oxidation, shocks, falls, dust, dirt, humidity...), and by the article, as well as its contents (e.g. data loss), compensation for loss of profits;
- consumable goods, parts or accessories that are subject to an aging process during normal use, such as batteries (rechargeable, non-rechargeable, built-in or replaceable), lamps, rubber parts, drive belts... (unlimited list);
- flaws resulting from fire, water damage, lightning, accident, natural disaster, etc....;
- flaws caused deliberately, negligently or resulting from improper handling, negligent maintenance, abusive use or use contrary to the manufacturer's instructions;
- damage caused by a commercial, professional or collective use of the article (the warranty validity will be reduced to six (6) months when the article is used professionally);
- damage resulting from an inappropriate packing and shipping of the article;
- all damage caused by modification, repair or alteration performed by a third party without written permission by Velleman®.
- Articles to be repaired must be delivered to your Velleman® dealer, solidly packed (preferably in the original packaging), and be completed with the original receipt of purchase and a clear flaw description.
- Hint: In order to save on cost and time, please reread the manual and check if the flaw is caused by obvious causes prior to presenting the article for repair.

Note that returning a non-defective article can also involve handling costs.

- Repairs occurring after warranty expiration are subject to shipping costs.
- The above conditions are without prejudice to all commercial warranties.

The above enumeration is subject to modification according to the article (see article's manual).

Documents / Resources

	<p>velleman VMM500 MicroBIT Education Smart Robot Kit [pdf] User Manual</p> <p>VMM500, MicroBIT Education Smart Robot Kit, VMM500 MicroBIT Education Smart Robot Kit</p>
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References

- [!\[\]\(c8dce68b26731c7aa5915072fc9d68dd_img.jpg\) Micro:bit Educational Foundation | micro:bit](#)
- [!\[\]\(76b3245de86167eba9fcdc9cc9f32aa4_img.jpg\) Microsoft MakeCode](#)
- [!\[\]\(13db7587f50867332e5bedc6a161739d_img.jpg\) Microsoft MakeCode](#)
- [!\[\]\(7be5ea91065783fbb69e41ba5d9680f7_img.jpg\) Velleman “ Wholesaler and developer of electronics](#)