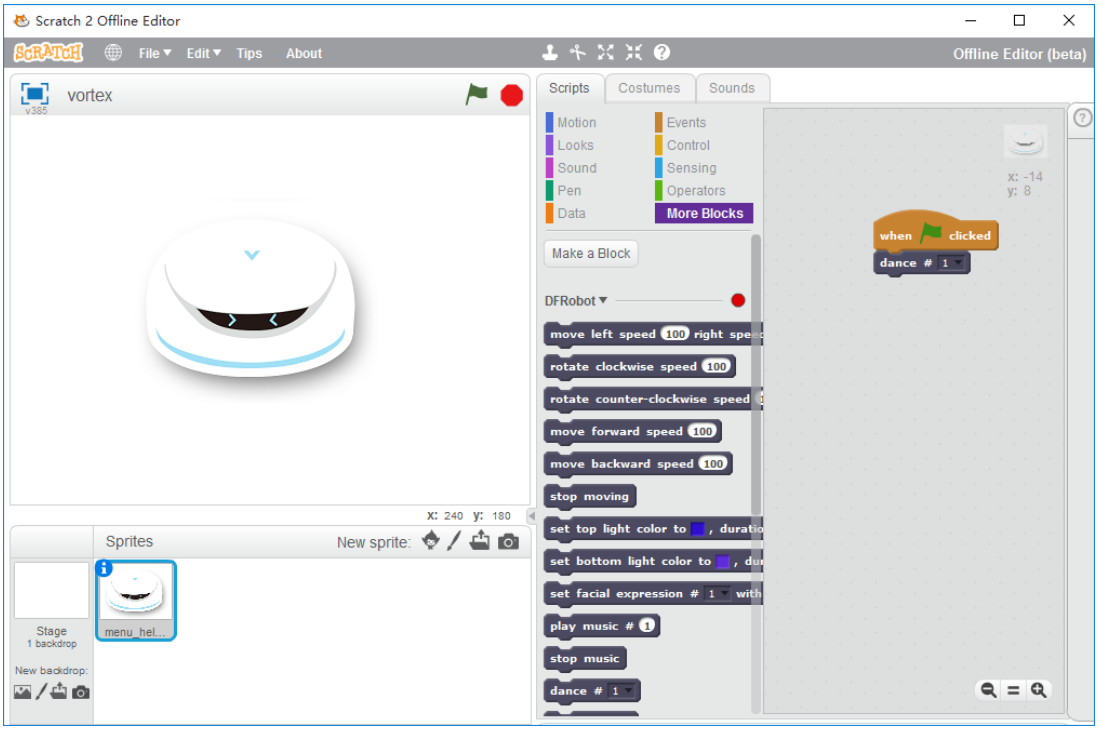
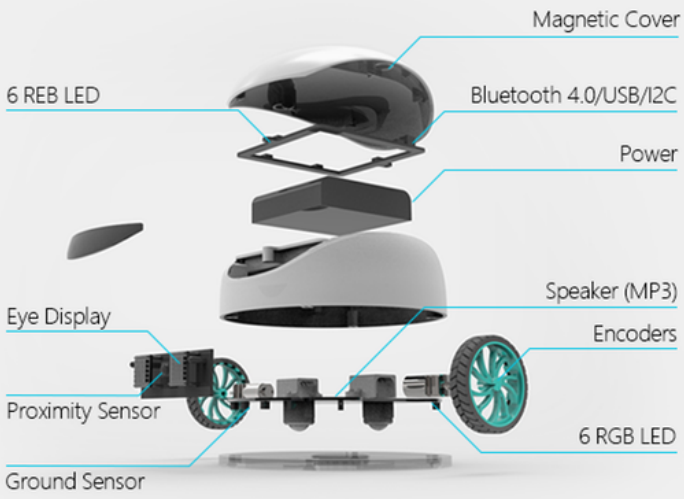
What is DF4Scratch?

DF4Scratch is a modified version of Scratch which adds support for Arduino and Android. With DF4Scratch, you can write powerful programs by simply dragging with your mouse. It is very easy to use, and kids with no programming experience are able to create programs within DF4Scratch and enjoy the fun of coding.



Let's meet Vortex

Vortex is a new robot developed by DFRobot. Based on the Atmega 328 and equipped with many sensors, it is both highly advanced and adorable. Carefully designed in the details, Vortex can let you control very fluently and give you an enjoyable experience.



CPU:	Atmega 328 (Compatible with Arduino UNO)
Power:	4xAA Battery
Duration:	40-90 mins
Ground Clearance:	3mm
Size:	120x120x64mm
Sensor:	2 Infrared Proximity Sensors 2 Encoders/Speed Control 6 Ground/Line Following Sensors
Sound:	MP3 Sound Player with 8M Memory (Customizable)
Light:	12 Independent RGB LED
Communication:	Bluetooth 4.0/USB/I2C
Display:	32 Vivid Eye Expressions >. < ∩_∩ --. -- ⊙‿⊙
Support Software:	Arduino IDE/WhenDo Ardublock/Scratch
Expandability:	Temperature, Sound, Accelerometer, GYRO, Ultrasonic, Touch sensor and much more via I2C socket

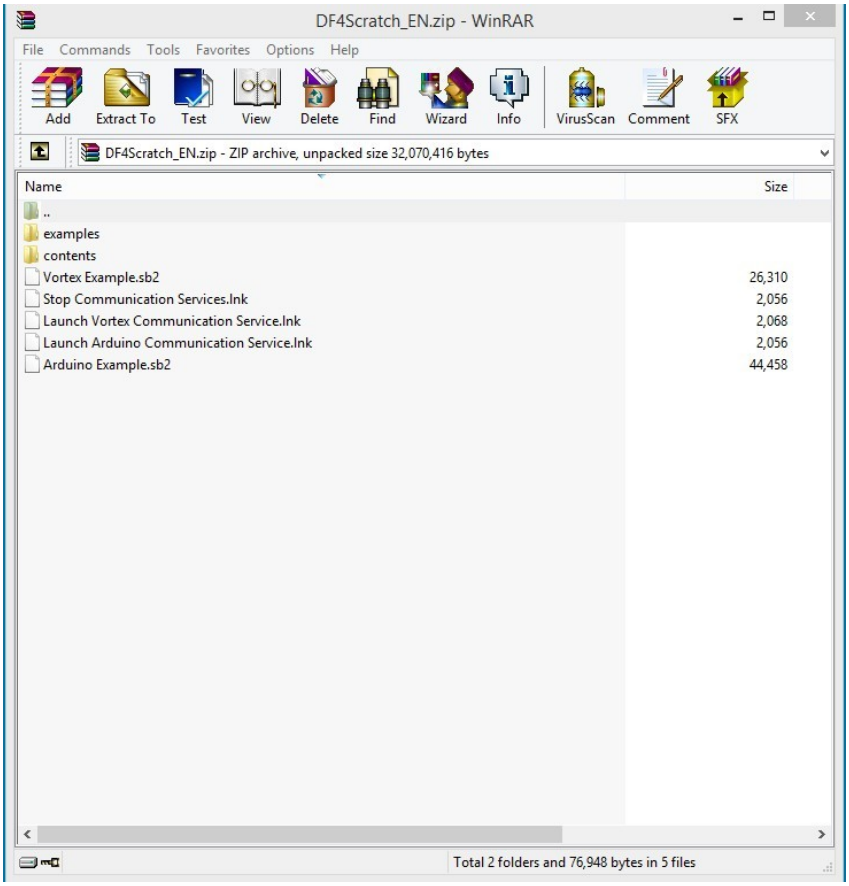
Getting Started with DF4Scratch for Vortex

Step 1: Download DF4Scratch

Use the following link to download and install Scratch2:
https://scratch.mit.edu/scratch2download/

Use the following link to download DF4Scratch needed.
https://github.com/DFRobot/DF4Scratch

Open the compressed folder “DF4Scratch” and decompress it into a directory.



Note: DF4Scratch supports windows 7 and above and all Mac OS X versions, but not windows XP.

Step 2: Plug Bluetooth Adapter

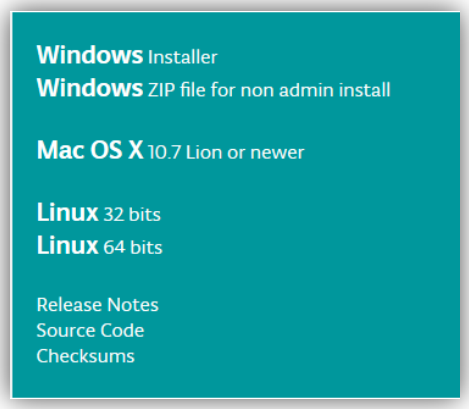
We will use the Bluno wireless adapter with which we can control Vortex using DF4Scratch. Plug the adapter into your computer’s USB port.

Note: You can also control Vortex by connecting it with a USB wire. However, the Bluetooth adapter makes Vortex move more freely.

Step 3: Install Drivers

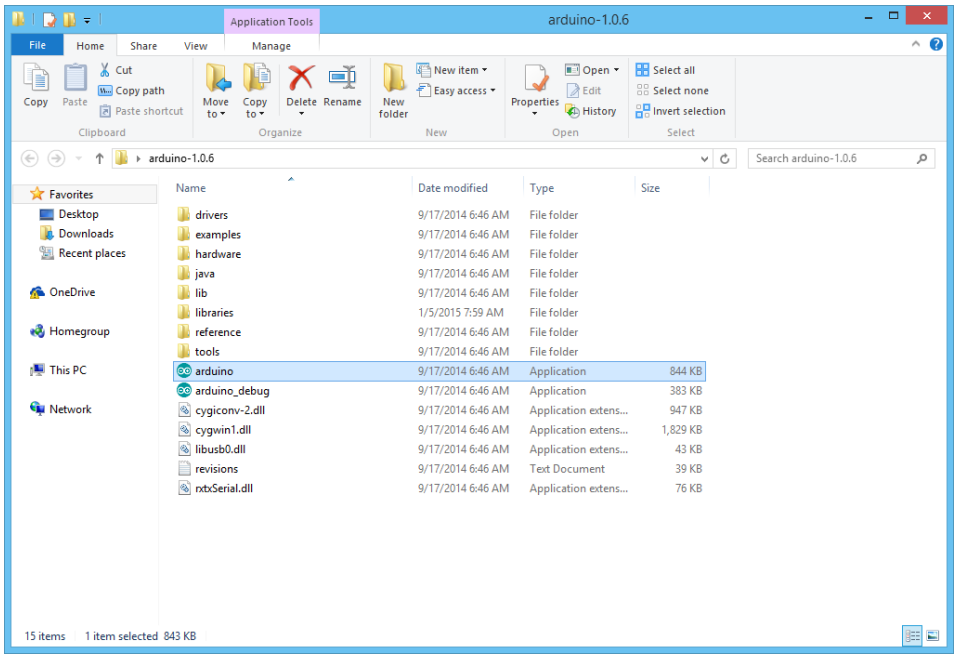
(If you have used Arduino before, you can jump to the next step.)

Download the Arduino IDE with the link: http://arduino.cc/en/Main/Software
Find the section shown in the image below.

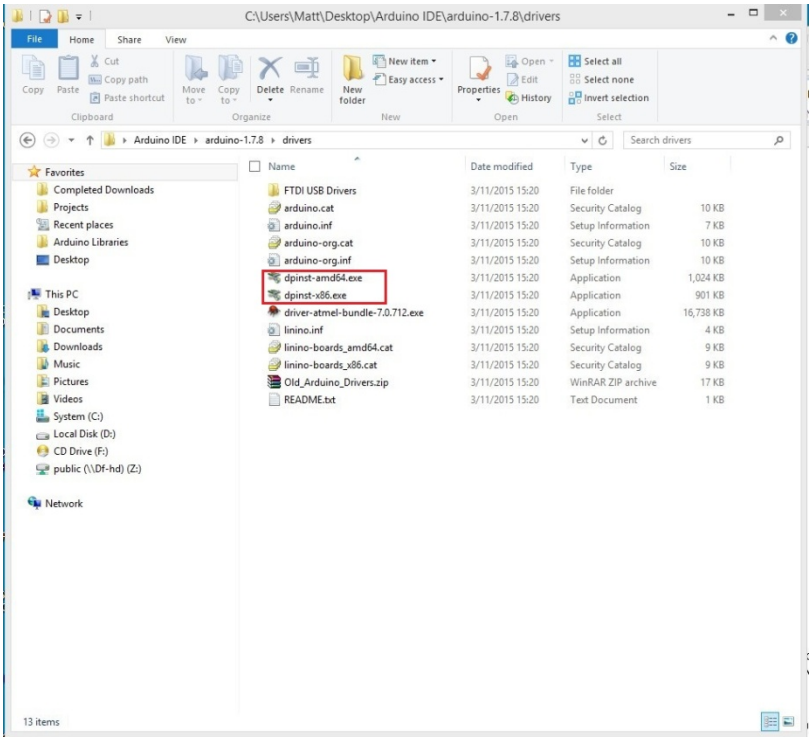


For Windows users, please click Windows(ZIP file). For Mac and Linux users, please select the corresponding link for your operating system.

Once downloaded, extract the files to a directory of your choice. Once extracted, open the directory. It should look like the image below:



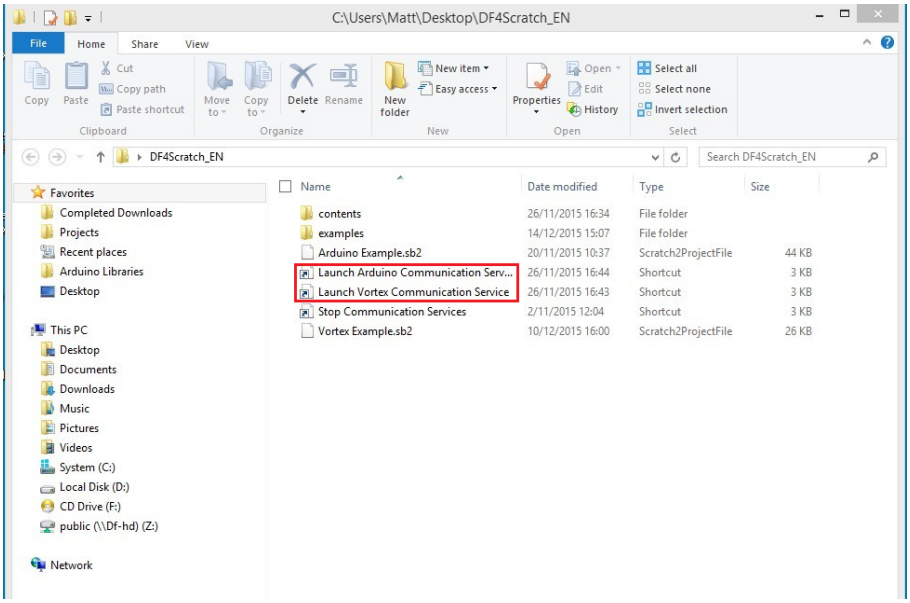
Install the drivers by running the installers in the Arduino folder. For 32-bit systems, run dpinst-x86.exe. For 64-bit systems, run dpinst-amd64.exe.



Step 4: Launch Communication Services

In the folder “DF4Scratch”, double-click the file “Launch Vortex Communication Service”. If a dialog asks “Do you want to allow the following program to make changes to this computer”, select “Yes”.

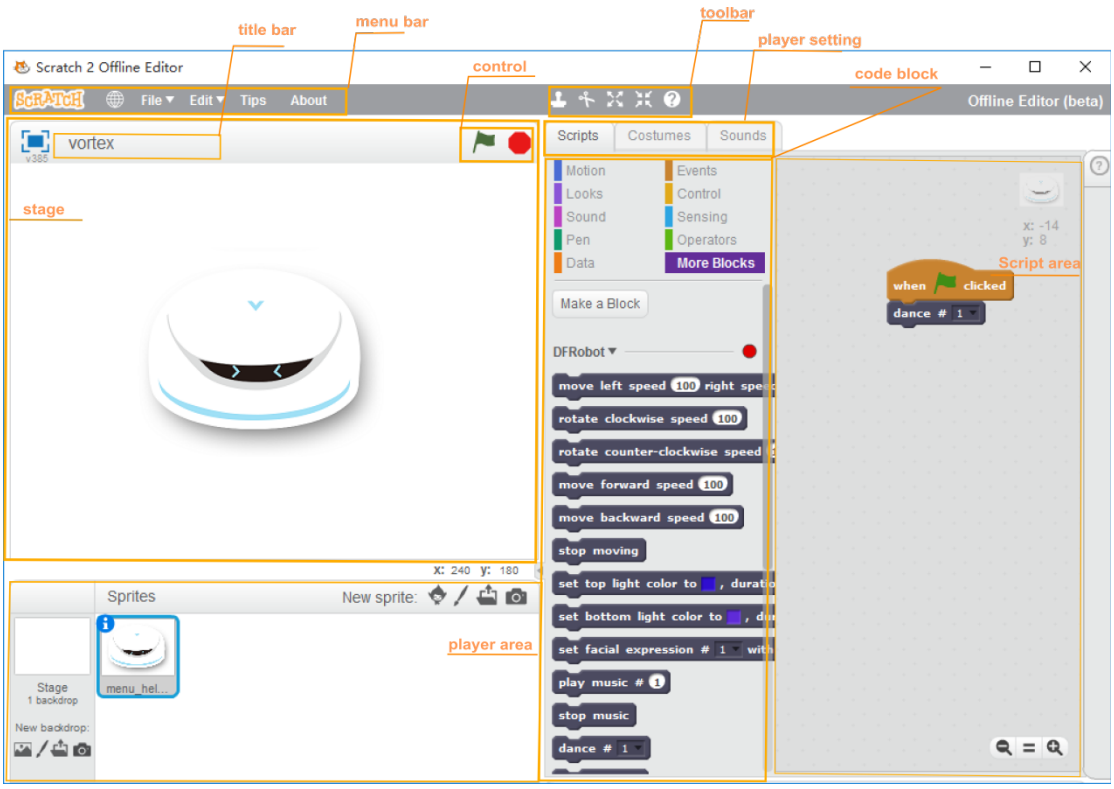
A black window should appear for a moment and then disappear.



Step 5: Open DF4Scratch

Simply open the file “Vortex Example.sb2” to begin using DF4Scratch.

You should see the following interface when you open Scratch:



Title Bar: Shows name of current file

Menu Bar: Lists actions for files or the software

Toolbar: Control size of the character, copy, or delete

Code Block: Shows code blocks you can use

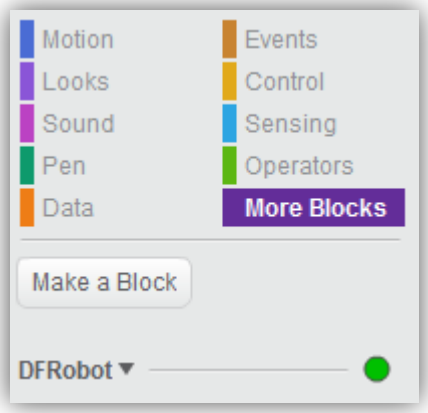
Player Area: Lists all the players

Script Area: Drag code blocks to create programs here

Control buttons: Controls the start and finish of the programs

Stage: Shows the actions of the players

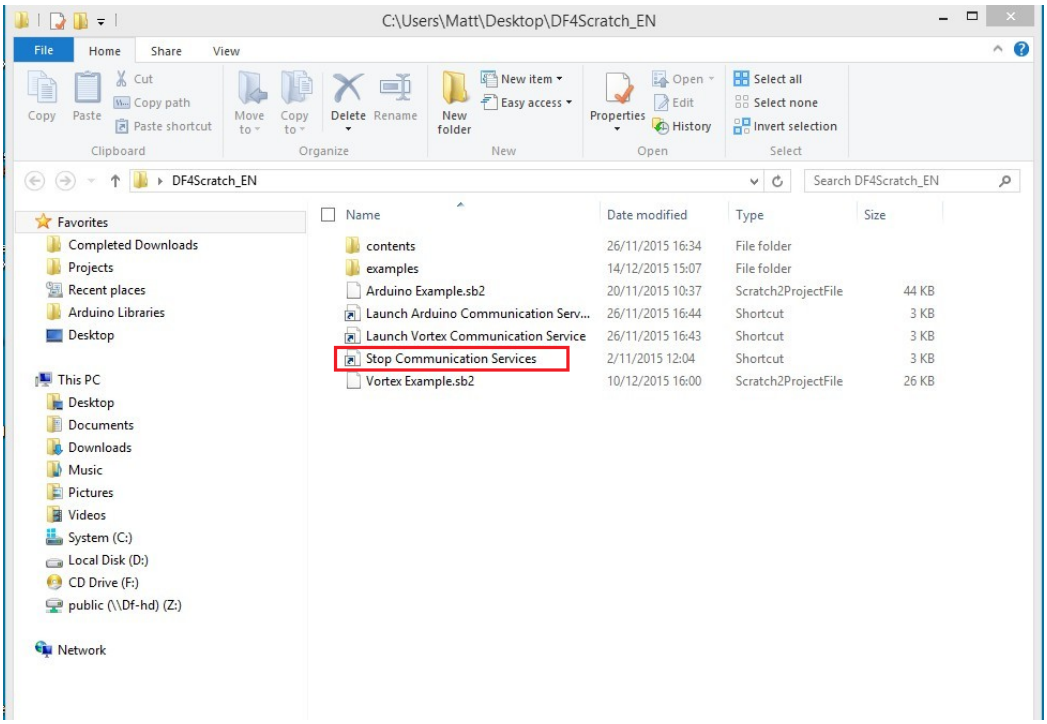
Make sure “More Blocks” is selected in the code area, and check the small colored circle beside “DFRobot”. If it is green, you can continue to the next step. If it is red, it means there is a problem with the connection with Vortex.



Step 6：Vortex Bluetooth Connection

Turn on Vortex and place Vortex near the Bluetooth adapter. Vortex will connect to the computer automatically.

When Vortex successfully connects with the computer, it will light up with constant brightness. If it is not connected, the light will repeatedly brighten up and fade.
If Vortex is not connected, close the program, unplug the Bluetooth adapter, and double-click “Stop Communication Services”.



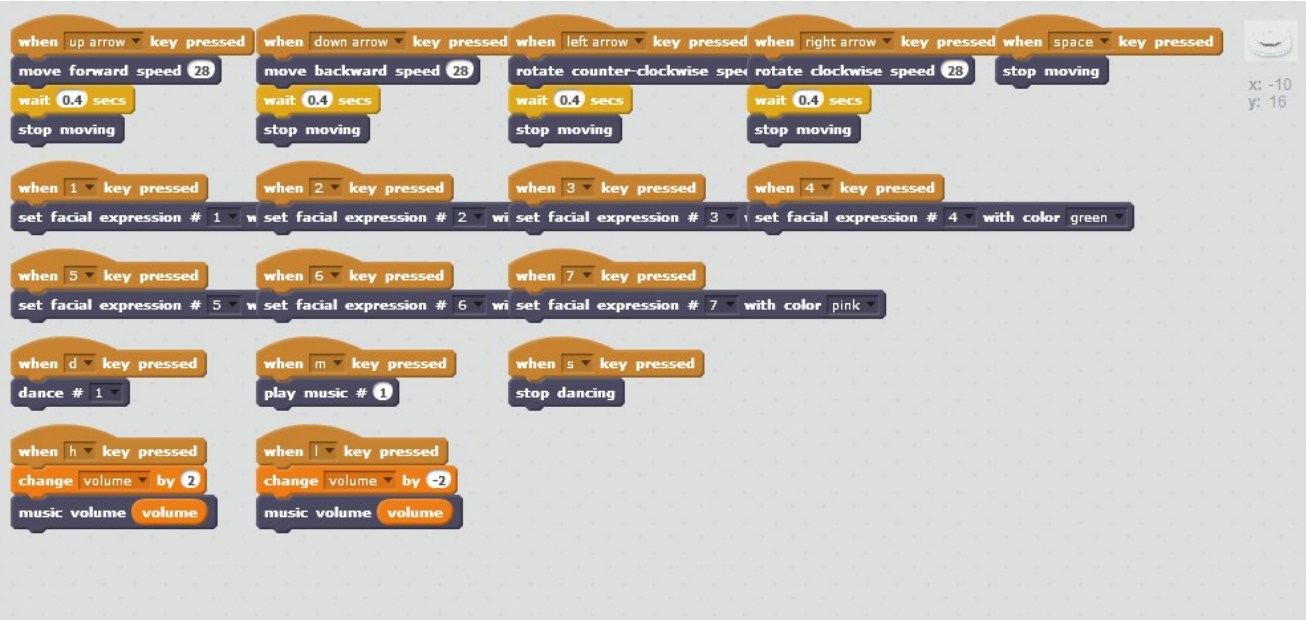
Then replug the Bluetooth Adapter and repeat steps 4 and 5.

Step 7：Connection Successful

Now Vortex is successfully connected to your computer. Click the green flag and you will see Vortex dancing.

Learning to Code in Scratch

In the example program we can use the keyboard to control the actions of Vortex, such as moving, playing music, and dancing. We can even control the facial expressions of Vortex.



Effects:

Arrow Keys lets Vortex move forward and backward and turn left and right.

“1~7” controls the facial expressions of Vortex.

“d” lets Vortex dance.

“m” controls the playing of music.

“s” stops the music and dance of Vortex.

“h” increases the volume.

“l” lowers the volume.

Appendix:

DF4Scratch for Vortex Code Blocks

Code Block	Function	Parameters
move left speed 100 right speed 100	Set speeds of the two wheels	speed: 0-255
rotate clockwise speed 100	Make Vortex rotate clockwise	rotation speed: 0-255
rotate counter-clockwise speed 100	Make Vortex rotate counter-clockwise	rotation speed: 0-255
move forward speed 100	Make Vortex move forward	speed: 0-255
move backward speed 100	Make Vortex move backward	speed: 0-255
stop moving	Set speed to 0	none
set top light color to , duration 10 s	Set top light color	duration: 0-∞ (s)
set bottom light No. 10 color to , duration 10 s	Set bottom light color	duration : 0-∞ (s)
set facial expression # 1 with color red	Set facial expression of Vortex	expression: 1-30 ; 7 colors
play music # 1	Let Vortex play music	music: 0-32
stop music	Let Vortex stop music	none
dance # 1	Let Vortex dance	dances: 0-3
stop dancing	Let Vortex stop dancing	none
music volume 50	Set music volume	volume: 0-255
turn proximity check on	Turn on/off the distance sensor	states: on/off
turn greyscale check on	Turn on/off the greyscale sensor	states: on/off
greyscale threshold 50	Set greyscale threshold	threshold: 0-255
proximity	Detected obstacle	return true or false
greyscale	Choose a greyscale sensor	sensor: 1-6
version	Return version number of Vortex	none
query vortex version	Query version number of Vortex	none
set top light No. 10 color to , duration 10 s	Set color of a top light	top light: 1-6, duration: 0-∞
set bottom light color to , duration 10 s	Set color of bottom light	duration: 0-∞