Experiment 11 – Automatic door

Instruction

It's so convenient when we enter and exit the gate of the community, that the door will open and closes automatically after we press the switch of the gate. How about making a mini automatic door?

Target

- Learn how servo work and use it to make a mini automatic door with touch sensor.
- Learn how to rotate the servo.

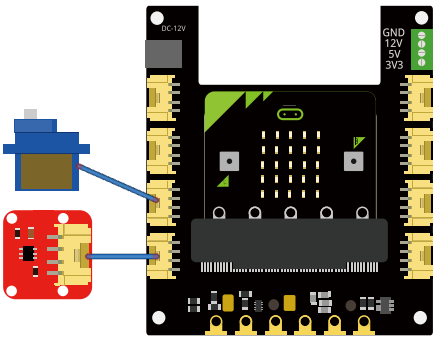
Required Parts

- Micro:bit x1
- Crowtail-Base shield for Micro:bit x1
- Crowtail-9G Servo x1
- Crowtail-Touch Sensor x1
- Crowtail-Cable x1
- USB cable x1

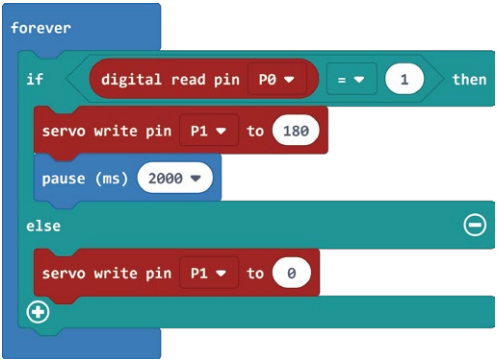
Hardware learning and connection

Tower Pro SG90 is a high quality, low-cost servo for all your mechatronic needs. It comes with a 4-pin power and control cable, mounting hardware. Servo is used in many intelligent situations, such as automatic doors, robots, aerial models, etc.
It can be said that the servo is almost an indispensable module in the field of intelligent control. Have you thought about adding a rotatable part to your smart product, such as automation field, robot's head and hand. ***Note: For all experiments using the servo module, you need to connect a 12V power supply for the Crowtail-Base shield for Microbit.***

Connect Crowtail-9G Servo and Crowtail-Touch Sensor to P1 and P0 ports of Crowtail-Base shield for Micro:bit. The hardware connections are as follows:



Programming and note



- **Servo write:** Use this **servo write** block to write a value to the servo on the specified pin and control the shaft. This function will move the shaft of a standard servo(Crowtail-9G Servo) to the specified angle, or set the speed of a continuous rotation servo (0 specifies full speed in one direction, 180 specifies full speed in the other, and approximately 90 specifies no movement). In this case, we will move the servo's shaft to 180 degrees and 0 degrees these two specified angles.

- **Pause:** After we moved the servo's shaft to 180 degrees (opening the door), we used a "pause" block to pause the code so that the door would not close immediately and there was enough time to enter or exit the door.

- **Download the program to micro:bit to see what happens.**

Result

Press the touch sensor, the shaft of the servo will move to 180 degrees. After two seconds, if the touch sensor is not touched, the servo' s shaft will move back to 0 degrees.

How to make automatic doors smarter? When we stand in front of the door, how do we make it open automatically without any keys or switches?