microbit_k230 Apriltag code recognition

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K230 and microbit communication

1. Experimental Prerequisites

This tutorial uses microbit, and the corresponding routine path is [14.export\microbit-K230\4.Microbit_k230_apriltag].

K230 needs to run the [14.export\CanmvIDE-K230\04.find_apriltag.py] program to start the experiment. It is recommended to download it as an offline program.

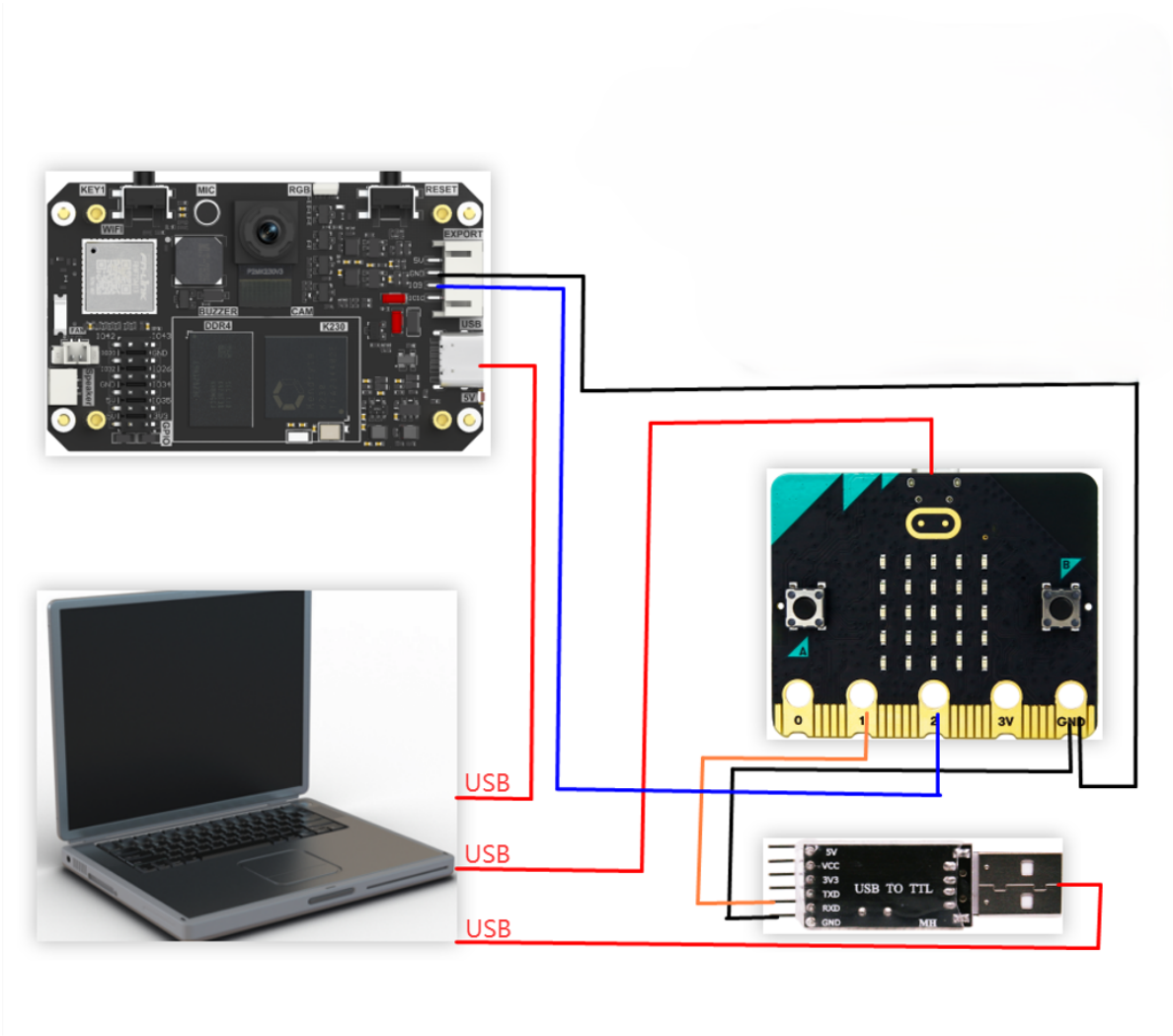
Items needed:

Windows computer, microbit, USB to TTL module, K230 vision module (including TF card with image burned), type-C data cable, connecting cable (Dupont cable), alligator clip, import K230AI library: https://github.com/YahboomTechnology/K230-Module.git

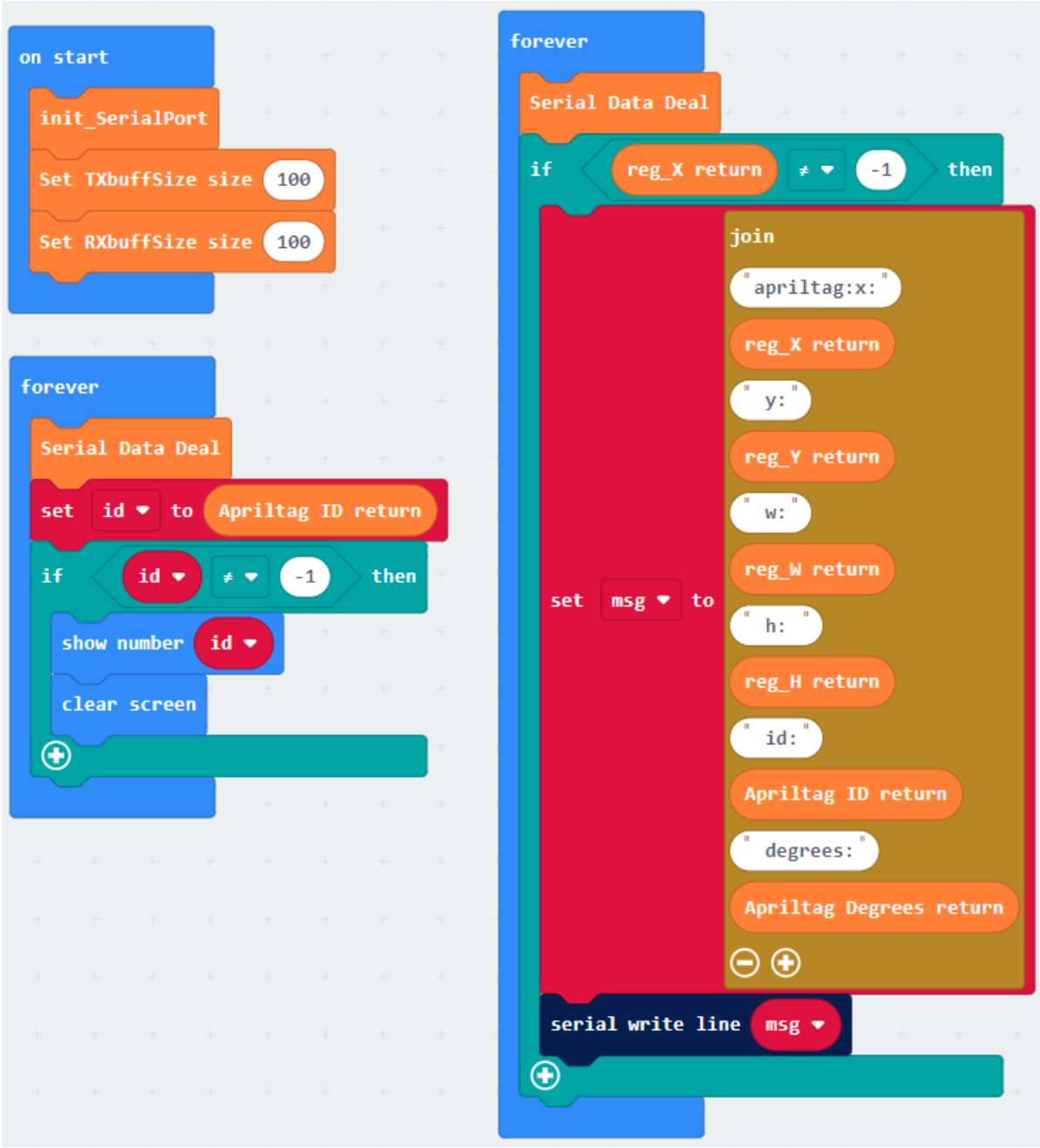
2. Experimental wiring

k230 vision module	Microbit
GND	GND
TXD(IO9)	P2

USB to TTL module	Microbit
RXD	P1
GND	GND



3. Main code explanation



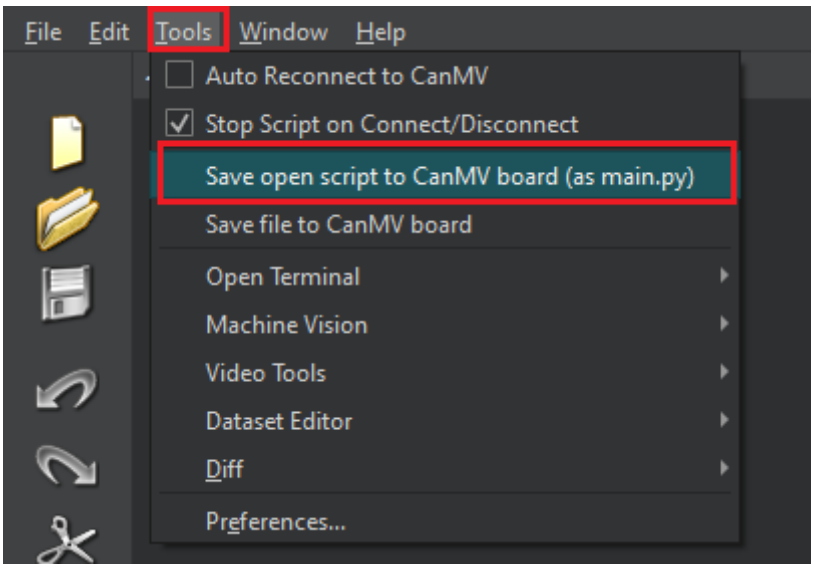
From the code, we can simply configure the serial port and call the relevant serial port and K230 building blocks to obtain data.

- x: is the horizontal coordinate of the upper left corner of the identified box
- y: is the vertical coordinate of the upper left corner of the identified box
- w: is the width of the identified box
- h: is the length of the identified box
- id: is the tag number of apriltag
- degrees: is the rotation angle of apriltag

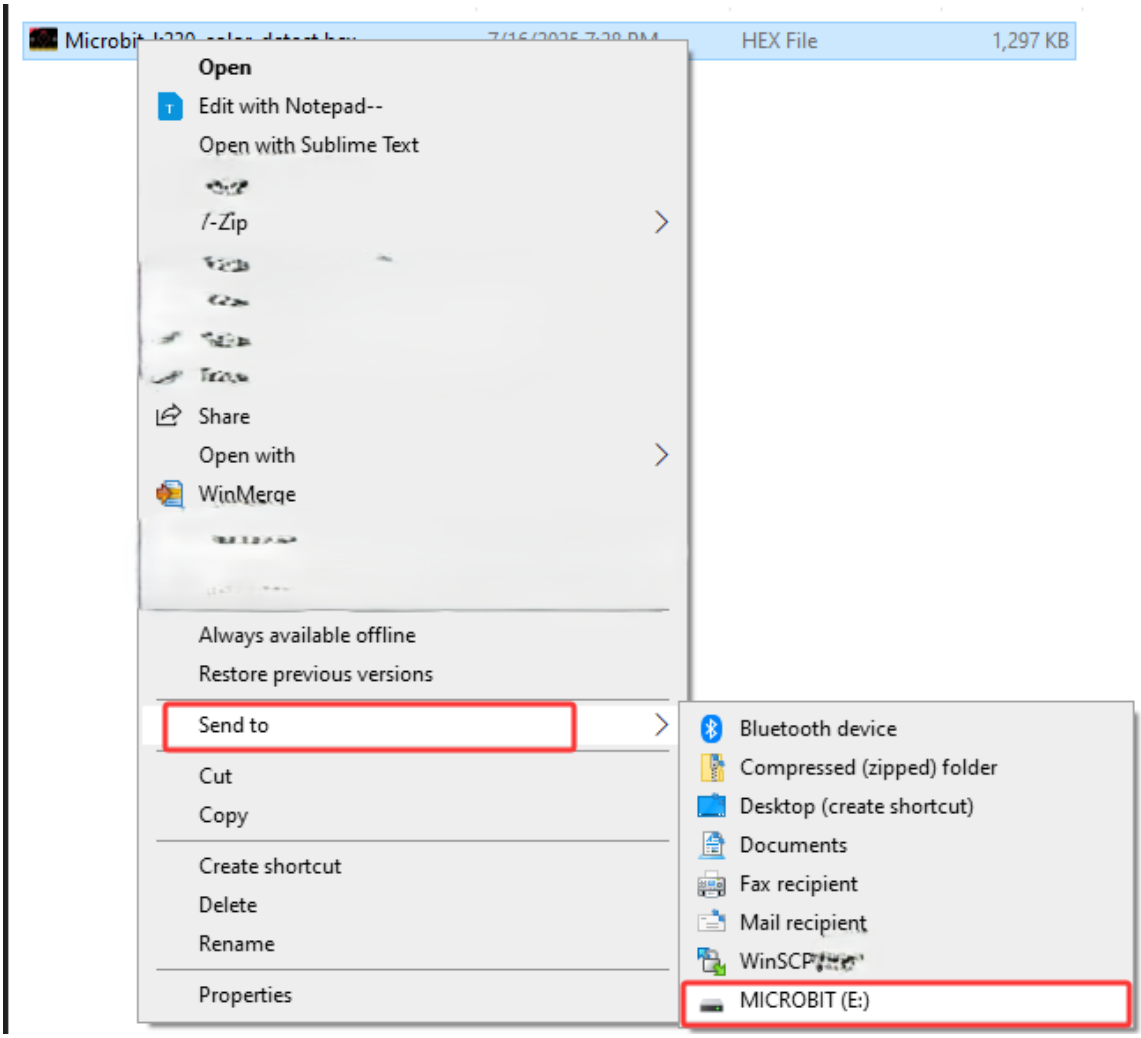
If you want to open the source code of this tutorial, please drag the microbit source code corresponding to this tutorial into the makecode online programming webpage of the browser. The online programming website is: https://makecode.microbit.org/#

4. Experimental Phenomenon

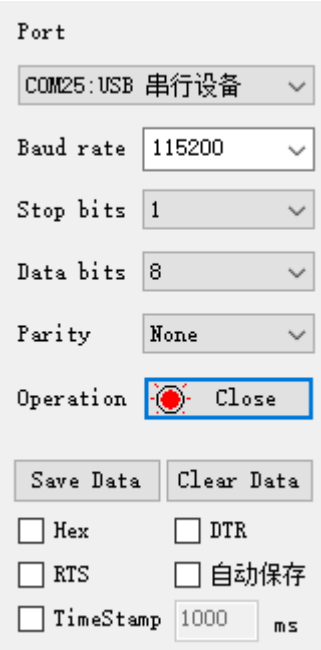
1. After connecting the cables, the k230 visual module runs offline
   After K230 is connected to Canmv IDE, open the corresponding program, click [Save open script to CanMV board (as main.py)] on the toolbar, and then restart K230.



2. Find the hex program of this tutorial, right-click the hex program, and upload the hex program of this tutorial to the microbit



3. The serial port assistant is set to the interface shown in the figure



4. When the K230 camera recognizes the AprilTag code, the serial port assistant will print out the information transmitted from K230 to microbit.

- x: is the horizontal coordinate of the upper left corner of the identified box
- y: is the vertical coordinate of the upper left corner of the identified box
- w: is the width of the identified box
- h: is the length of the identified box
- id: is the tag number of apriltag
- degrees: is the rotation angle of apriltag

As shown in the figure below

```
apriltag:x:187 y:148 w:32 h: 34 id:3 degrees:269

apriltag:x:187 y:148 w:32 h: 35 id:3 degrees:269

apriltag:x:187 y:148 w:32 h: 34 id:3 degrees:269

apriltag:x:187 y:148 w:32 h: 34 id:3 degrees:269

apriltag:x:187 y:148 w:32 h: 35 id:3 degrees:269

apriltag:x:187 y:148 w:32 h: 34 id:3 degrees:269

apriltag:x:187 y:148 w:32 h: 35 id:3 degrees:269

apriltag:x:187 y:148 w:32 h: 34 id:3 degrees:269

apriltag:x:187 y:148 w:32 h: 34 id:3 degrees:269

apriltag:x:187 y:148 w:32 h: 34 id:3 degrees:269

apriltag:x:187 y:148 w:32 h: 35 id:3 degrees:269
```