

# k230 self-learning object recognition

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## k230 self-learning object recognition

### k230 and RDK X5 communication

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## k230 and RDK X5 communication

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### 1. Experimental Prerequisites

This tutorial uses the RDK X5 development board, and the corresponding routine path is [14.export\RDK-K230\16\_k230\_self\_learning.py].

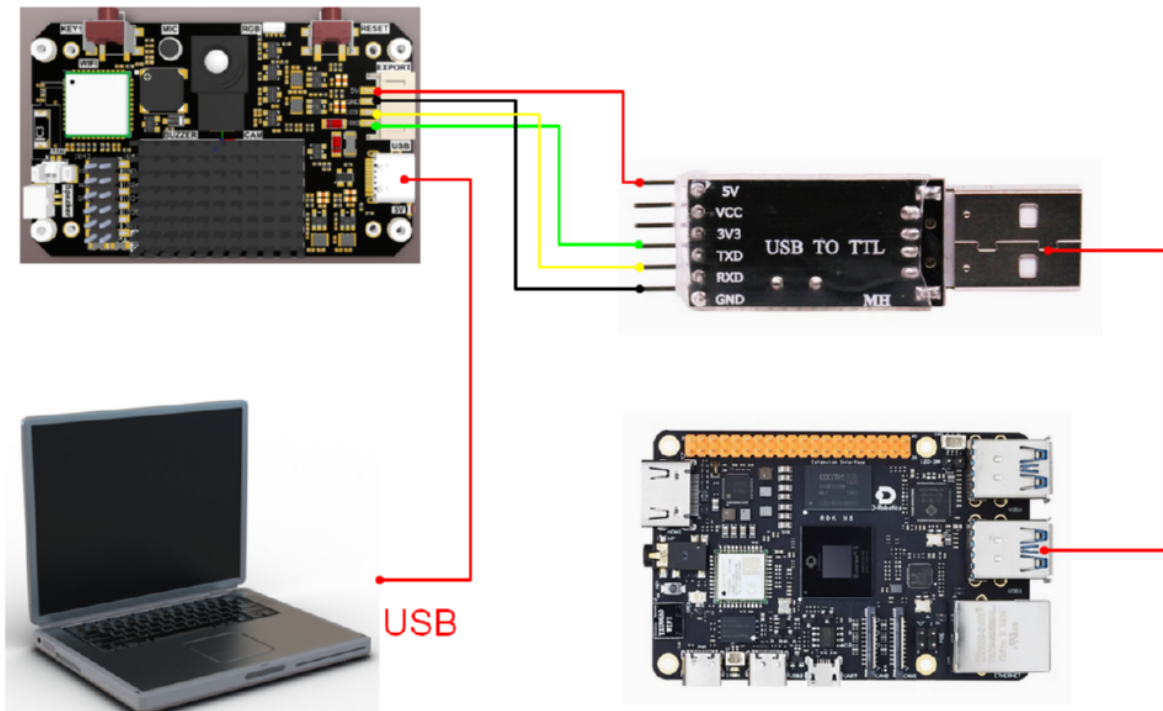
K230 needs to run the [14.export\CanmvIDE-K230\16.self\_learning.py] program to start the experiment. It is recommended to download it as an offline program.

Things you need:

Windows computer  
RDK X5 development board  
USB to TTL module  
K230 visual module (including TF card with image burned in)  
Type-C data cable  
Connection cable

### 2. Experimental wiring

k230 vision module	USB to TTL module
5V	VCC
GND	GND
TXD(IO9)	RxD
RXD(IO10)	TXD



### 3. Main code explanation

```
import serial

com="/dev/ttyUSB0"
ser = serial.Serial(com, 115200)

FUNC_ID = 16

def parse_data(data):
    if data[0] == ord('$') and data[len(data)-1] == ord('#'):
        data_list = data[1:len(data)-1].decode('utf-8').split(',')
        data_len = int(data_list[0])
        data_id = int(data_list[1])
        if data_len == len(data) and data_id == FUNC_ID:
            # print(data_list)
            category = data_list[2]
            score = int(data_list[3])/100.0

            return category, score
        elif (data_len != len(data)):
            print("data len error:", data_len, len(data))
        elif(data_id != FUNC_ID):
            print("func id error:", data_id, FUNC_ID)
        else:
            print("pto error", data)
    return "", -1

while True:
    if ser.in_waiting:
        data = ser.readline()
        # print("rx:", data)
        category, score = parse_data(data.rstrip(b'\n'))
        print("category:%s, score:%.2f" % (category, score))
```

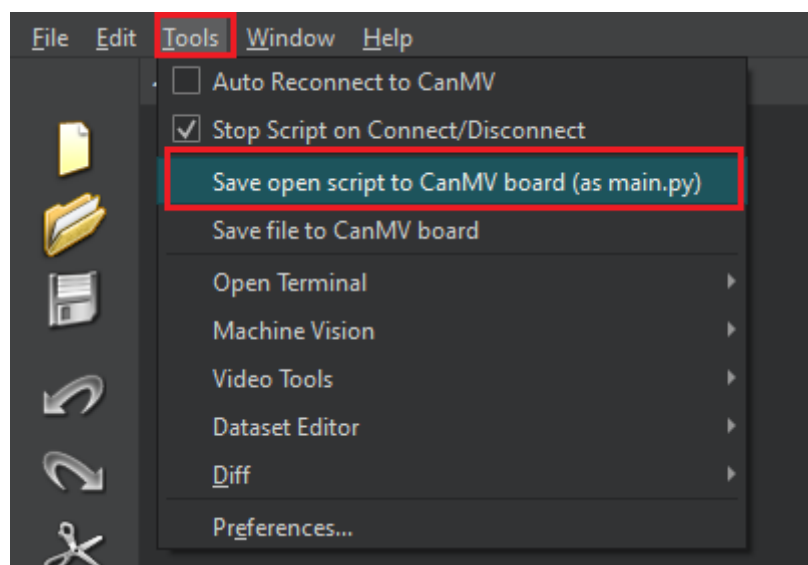
The above program is for parsing K230 data. Only when it complies with specific protocols can the corresponding data be parsed.

in

- category: is the recognized name
- score: is the score

## 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.



When K230 is turned on, a purple box will appear on the screen. Please align the purple box with the objects to be learned. There are two objects in total. Follow the on-screen prompts to learn the two objects.

After both objects have been learned, if the corresponding object appears in the purple box, the object name and score will be displayed.

2. Transfer the program file to the system, open the terminal and enter the corresponding directory, then run the following command to start the program.

```
python3 16_k230_self_learning.py
```

3. When the K230 camera image recognizes an object, the terminal will parse and print out the information transmitted by the K230.

in

- category: is the recognized name
- score: is the score

As shown in the figure below

category:'ultrasonic', score:0.96  
category:'ultrasonic', score:0.96  
category:'ultrasonic', score:0.95  
category:'ultrasonic', score:0.89  
category:'ultrasonic', score:0.85  
category:'ultrasonic', score:0.72  
category:'earphone', score:0.61  
category:'earphone', score:0.71  
category:'earphone', score:0.77  
category:'earphone', score:0.82  
category:'earphone', score:0.86  
category:'earphone', score:0.87  
category:'earphone', score:0.88  
category:'earphone', score:0.88