

k230Apritag code recognition

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k230 and MSPM0 communication

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1. Experimental Prerequisites

This tutorial uses the MSPMG3507 development board, and the corresponding routine path is [14.export\MSPM0-K230\04_k230_apritag].

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

Things you need:

Windows computer

MSPMG3507 development board

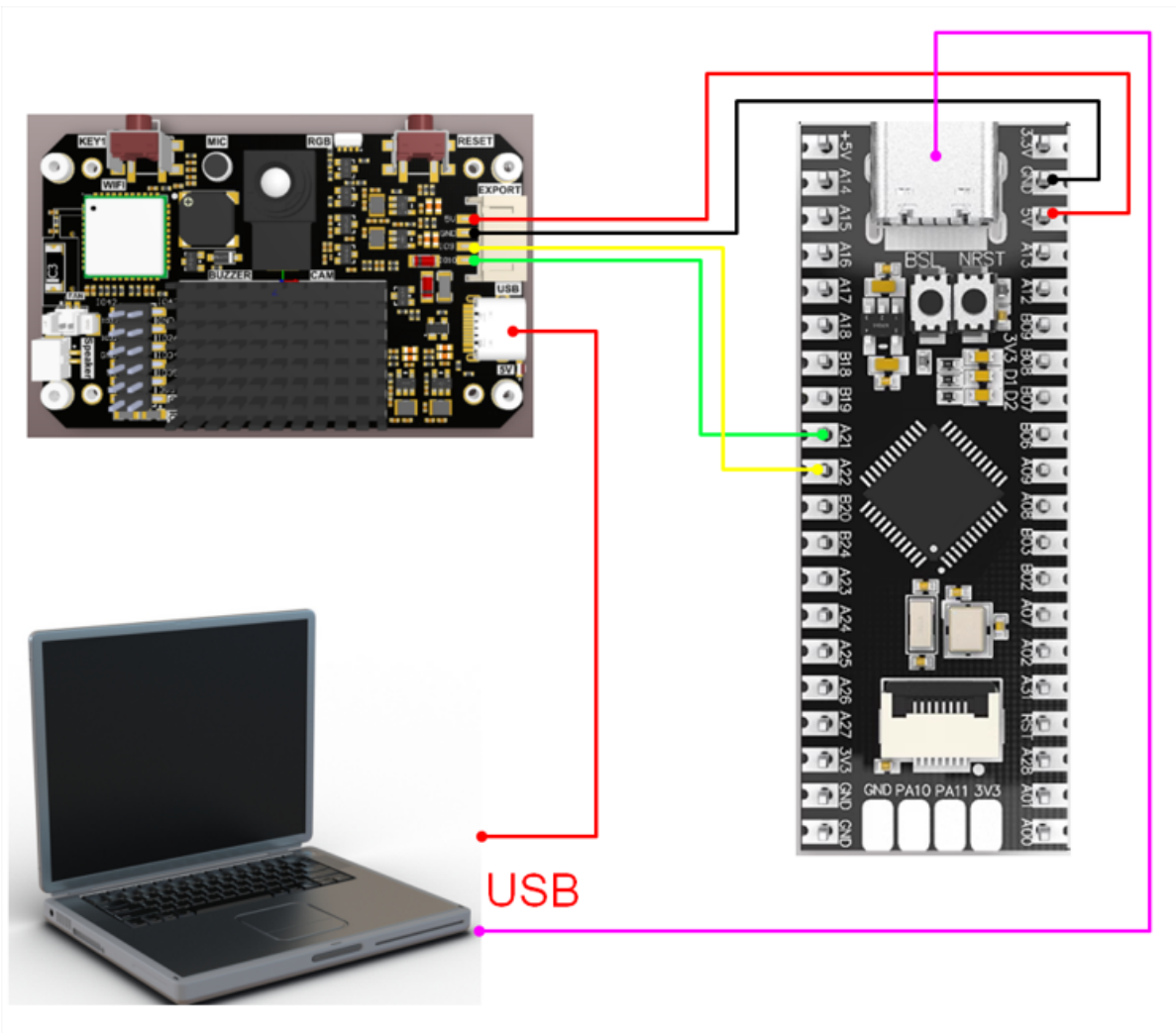
K230 visual module (including TF card with image burned in)

Two type-C data cables

Connection cable

2. Experimental wiring

k230 vision module	MSPM0 Development Board
5V	VCC
GND	GND
TXD(IO9)	A22
RXD(IO10)	A21



3. Main code explanation

```
void Pto_Data_Parse(uint8_t *data_buf, uint8_t num)
{
    uint8_t pto_head = data_buf[0];
    uint8_t pto_tail = data_buf[num-1];
    if (!(pto_head == PTO_HEAD && pto_tail == PTO_TAIL))
    {
        sprintf(print_buf, "pto error:pto_head=0x%02x , pto_tail=0x%02x\n",
pto_head, pto_tail);
        uart0_send_string(print_buf);
        return;
    }
    uint8_t data_index = 1;
    uint8_t field_index[PTO_BUF_LEN_MAX] = {0};
    int i = 0;
    int values[PTO_BUF_LEN_MAX] = {0};
    for (i = 1; i < num-1; i++)
    {
        if (data_buf[i] == ',')
        {
            data_buf[i] = 0;
            field_index[data_index] = i;
            data_index++;
        }
    }
}
```

```

for (i = 0; i < data_index; i++)
{
    values[i] = Pto_Char_To_Int((char*)data_buf+field_index[i]+1);
}

uint8_t pto_len = values[0];

if (pto_len != num)
{
    sprintf(print_buf, "pto_len error:%d , data_len:%d\n", pto_len, num);
    uart0_send_string(print_buf);
    return;
}
uint8_t pto_id = values[1];
if (pto_id != PTO_FUNC_ID)
{
    sprintf(print_buf, "pto_id error:%d, func_id:%d\n", pto_id,
PTO_FUNC_ID);
    uart0_send_string(print_buf);
    return;
}
int x = values[2];
int y = values[3];
int w = values[4];
int h = values[5];
int id = values[6];
int degrees = values[7];
sprintf(print_buf, "apriltag:x:%d, y:%d, w:%d, h:%d, id:%d, degrees:%d\n",
x, y, w, h, id, degrees);
uart0_send_string(print_buf);
}

```

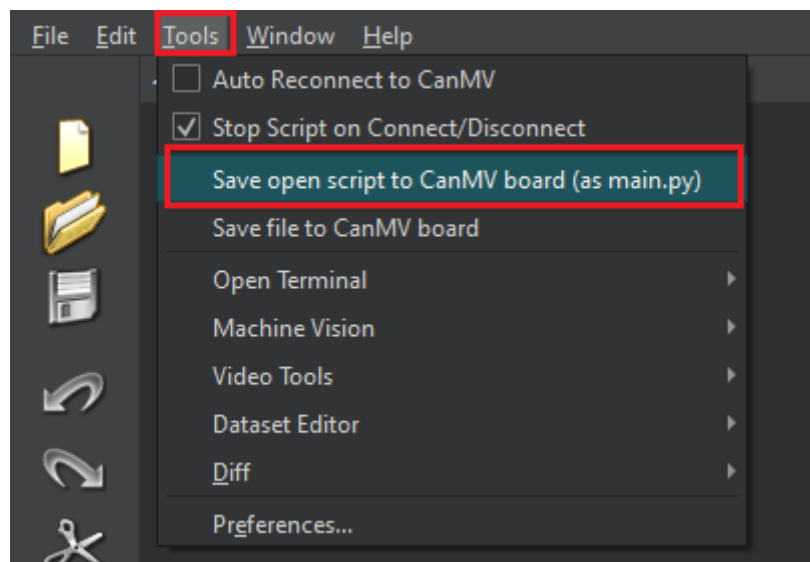
The above functions are for parsing K230 data. Only when they meet specific protocols can the corresponding data be parsed.

in

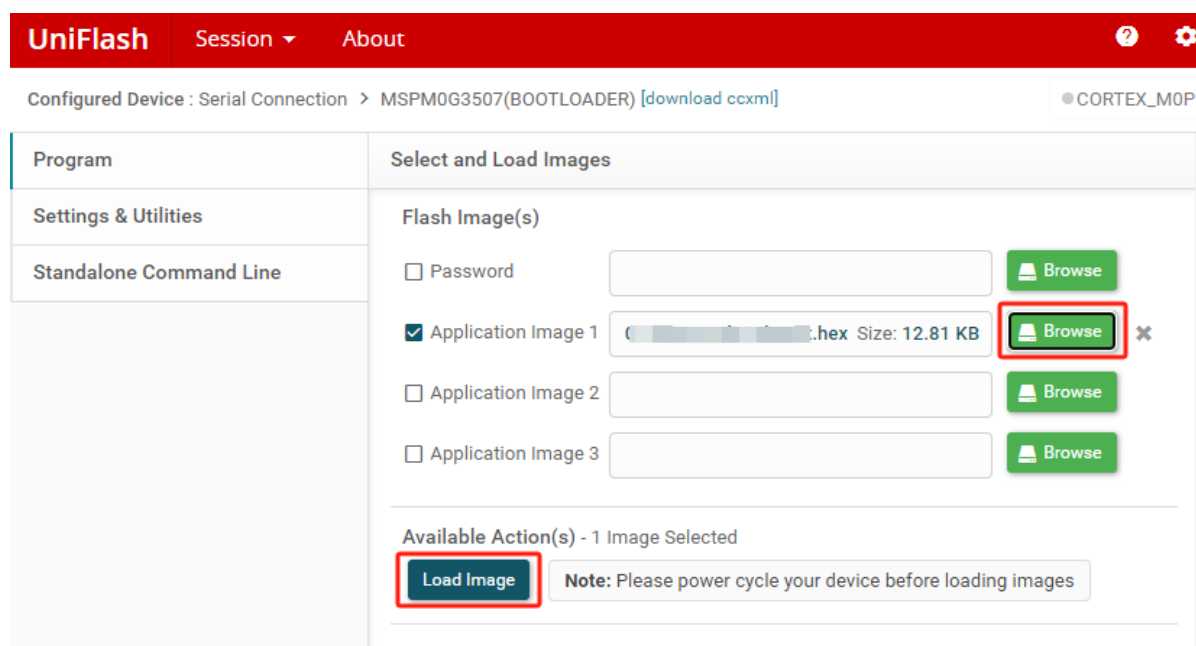
- x: is the horizontal coordinate of the upper left corner of the recognized box
- y: is the vertical coordinate of the upper left corner of the recognized box
- w: is the width of the recognized frame
- h: is the length of the recognized frame
- id: is the tag number of apriltag
- degrees: is the rotation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

4. Experimental Phenomenon

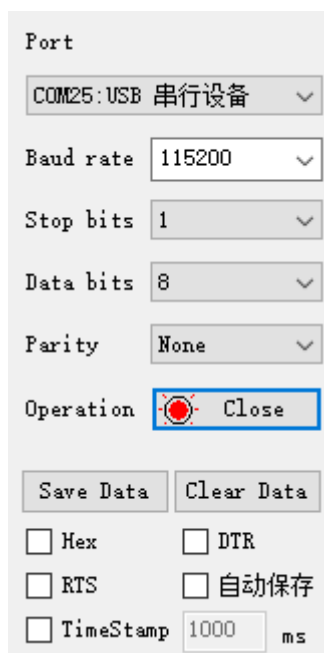
1. After connecting the cables, the k230 visual module runs offline. After K230 is connected to Canmv IDE, open the corresponding program, click [Save open script to CanMV board (as main.py)] on the toolbar, and then restart K230.



2. The hex file generated by the MSPM0 burning routine.



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 by K230 to MSPM0.

in

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

As shown in the figure below

```
[2025-04-30 11:40:14.481]# RECV ASCII>
apriltag:x:159, y:37, w:100, h:107, id:3, degrees:0

[2025-04-30 11:40:14.562]# RECV ASCII>
apriltag:x:158, y:37, w:99, h:105, id:3, degrees:0

[2025-04-30 11:40:14.640]# RECV ASCII>
apriltag:x:159, y:36, w:99, h:105, id:3, degrees:0

[2025-04-30 11:40:14.704]# RECV ASCII>
apriltag:x:161, y:35, w:97, h:103, id:3, degrees:0

[2025-04-30 11:40:14.864]# RECV ASCII>
apriltag:x:162, y:20, w:94, h:99, id:3, degrees:359
apriltag:x:168, y:10, w:92, h:97, id:3, degrees:0
```