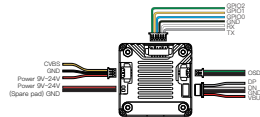




Connection



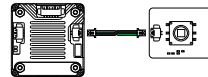
- Power Consumption: 12V@120mAh
- CVBS: Connect to analog VTX "CAMERA" port or "CVBS IN" port

Specifications

Detector type	Uncooled Vanadium Oxide
Resolution	256x192
Wavelength Range	8-12μm
LENS	F1.0/4mm
FOV	50°(H)*37.2°(V)*62.3°(D)
Frame Rate	50 fps
Power consumption	<1.5w
Output	PAL
Supply Voltage	9V~24V
Temperature	-20°C~60°C
Interface	Analog Interface: CVBS
Latency	Average Latency 20ms
Image Quality	All Image Enhancement

OSD Functions

Note: The hardware needs to be version V2.0 and the software is version 240724-1_002SL_v2 or higher.



The movement allows you to customize the OSD string of the video display through an external menu board. The OSD board is divided into four directions: up, down, left, right and center.

Operating Instructions:

- Connect the menu board to the movement
- Wait for the movement to power on the picture
- Press the center button, the operation interface will pop up, the operation interface is divided into four lines, the first line and the second line is to provide a choice of characters, the third line is to delete the option, the fourth line is the current character, the black background is the current cursor position
- Press up, down, left or right to move the cursor in the character line, and press center to select the character to be inserted into the current string.
- move the cursor to DEL, press the center, you can delete the last character in the string, all clear the current string will become [NA], this time that there is no character
- Move the cursor to the fourth line of the current character line, press the center key to exit the operation. This is the string if not empty, the lower left corner will have the current settings string

Serial Communication Description



TX	Master transmit, 3.3V level, baud rate default 115200bps
RX	Master receive, 3.3V level, baud rate default 115200bps
GND	Reference Ground
GPIO0	General Purpose IO, 3.3V level
GPIO1	General Purpose IO, 3.3V level
GPIO2	General Purpose IO, 3.3V level

1. Description of Agreement

0xFF (1Byte)	0x5A (1Byte)	version (1Byte)	cmd (2Byte)	sub_cmd (1Byte)	payload_len (4Byte)	payload	crc16 (2Byte)
header (10Byte)							

1.1 Field Description

0xFF: constant value
 0x5A: constant value
 version: Protocol version (initial version 0)
 cmd: Command id
 sub_cmd: subcommand
 payload_len: Payload data length
 payload: Data content
 crc16: Checksum value with header and payload

1.2 Calibration Function

```

crc16_code
static uint16_t crc16_modbus(uint8_t *data, uint32_t length)
{
    uint8_t i;
    uint16_t crc = 0xffff; // Initial value
    while(length--)
    {

```

```

    crc ^= *data++; // crc ^= *data; data++;
    for (i = 0; i < 8; ++i)
    {
        if (crc & 1)
            crc = (crc >> 1) ^ 0xA001; // 0xA001 = reverse 0x8005
        else
            crc = (crc >> 1);
    }
    return crc;
}

```

2. Command Definition

host->dev: The host computer sends to the device
 dev->host: The device sends to the host computer

2.1 Getting the Version

Directional	cmd	sub_cmd	payload_len (Byte)	Instruction
host->dev	0	0	0	
dev->host	0	0	N	Returns the firmware version string

2.2 Image Adjustment

Directional	cmd	sub_cmd	payload_len (Byte)	Instruction
host->dev	1	0	1/0	1Byte brightness value (0-100), no payload without setting only return the actual brightness value
dev->host	1	0	1	Returns the current brightness value
host->dev	1	1	1/0	1Byte contrast value (0-100), no payload not set only return the actual contrast value
dev->host	1	1	1	Returns the current contrast value

2.3 Pseudo-Color

Directional	cmd	sub_cmd	payload_len (Byte)	Instruction
host->dev	2	0	1	Set the pseudo-color serial number, 0 is off pseudo-color

2.4 Shutter Control

Directional	cmd	sub_cmd	payload_len (Byte)	Instruction
host->dev	3	0	1	Manual shutter calibration image
host->dev	3	1	1	Disable automatic shutter calibration
host->dev	3	2	1	Enable automatic shutter calibration

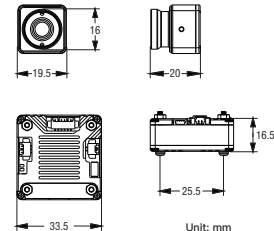
2.5 Hot Tracking

Directional	cmd	sub_cmd	payload_len (Byte)	Instruction
host->dev	4	0	1	Close Hot Tracking
host->dev	4	1	1	Open Hot Tracking

3. Example of Command

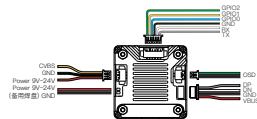
Command Description	Command Data
Get version	FF 5A 00 00 00 00 00 00 00 C7 57
Set the contrast to 80%	FF 5A 00 01 00 01 01 00 00 00 50 EB 73
Set the contrast to 50%	FF 5A 00 01 00 01 01 00 00 00 32 6A 9A
Set the brightness to 80%	FF 5A 00 01 00 00 01 00 00 00 50 EA A2
Set the brightness to 50%	FF 5A 00 01 00 00 01 00 00 00 32 6B 4B
Set pseudo color 5	FF 5A 00 02 00 00 01 00 00 00 05 6A 88
Set pseudo color 0	FF 5A 00 02 00 00 01 00 00 00 00 AA 8B
Shutter Calibration	FF 5A 00 03 00 00 00 00 00 00 F4 57
Disable Auto Shutter	FF 5A 00 03 00 01 00 00 00 00 C9 97
Enable Auto Shutter	FF 5A 00 03 00 02 00 00 00 00 8D 97

Dimensions



CADDXFPV Support
 email: support@caddxfpv.com
 This content is subject to change. Download the latest version from <https://www.caddxfpv.com>

安装连线



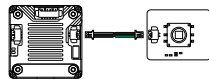
- 功耗参考: 1.2V@120mA
- CVBS: 连接至模拟图传 "CAMERA" 端口或 "CVBS IN" 端口

产品规格

探测器类型	氧化钒非制冷红外焦平面探测器
分辨率	256x192
波长范围	8-12μm
镜头	F1.0/4mm
FOV	50°(H)*37.2°(V)*62.3°(D)
帧率	50 fps
功耗	<1.5w
制式	PAL
宽电压输入	9V-24V
温度	-20°C-60°C
接口	模拟接口: CVBS
延迟	平均延迟20毫秒
画面质量	AI画质增强

OSD 功能

注意: 硬件需要为V2.0 版本, 且软件为240724-1_002SL_v2 以上版本。

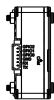


机芯可以通过外接菜单板自定义视频显示的OSD字符串。
菜单板分为上、下、左、右、中四个方向。

操作说明:

- 将菜单板接入机芯
- 等机芯上电出图
- 按下中键, 会弹出操作界面, 操作界面分为四行, 第一行和第二行是提供选择的字符, 第三行为删除选项, 第四行为当前字符, 黑色背景为当前光标位置
- 按上下左右可以在字符行移动光标, 按下中可以选择字符插入到当前字符串内
- 将光标移动到DEL, 按下中, 可以删除字符串内的最后一个字符, 全部清空当前字符串会变为【NA】, 此时表示无任何字符
- 将光标移动到第四行的当前字符行, 按下中键, 退出操作。这是字符串如果不为空, 左下角会有当前设置字符串

串口通讯说明



TX	主控发送, 3.3V电平, 波特率默认115200bps
RX	主控接收, 3.3V电平, 波特率默认115200bps
GND	参考地
GPIO0	通用IO, 3.3V电平
GPIO1	通用IO, 3.3V电平
GPIO2	通用IO, 3.3V电平

1. 协议说明

0xFF (1Byte)	0x5A (1Byte)	version (1Byte)	cmd (2Byte)	sub_cmd (1Byte)	payload_len (4Byte)	payload	crc16 (2Byte)
header (10Byte)							

1.1 字节说明

0xFF: 固定值 (constant value)
0x5A: 固定值 (constant value)
version: 协议版本 (初始版本为0) / Protocol version (initial version 0)
cmd: 命令id (Command id)
sub_cmd: 子命令 (subcommand)
payload_len: payload数据长度 (Payload data length)
payload: 数据内容 (Data content)
crc16: 校验值, 包含header和payload (Checksum value with header and payload)

1.2 校验函数

```

crc16_code
static uint16_t crc16_modbus(uint8_t *data, uint32_t length)
    
```

```

uint8_t;
uint16_t crc = 0xffff; // Initial value
while(length-->0)
{
    crc ^= *data++; // crc ^= *data; data++;
    for (i = 0; i < 8; ++i)
    {
        if (crc & 1)
            crc = (crc >> 1) ^ 0xA001; // 0xA001 = reverse 0x9005
        else
            crc = (crc >> 1);
    }
}
return crc;
    
```

2. 命令定义

host->dev: 上位机发送到机芯 (The host computer sends to the device)
dev->host: 机芯发送给上位机 (The device sends to the host computer)

2.1 获取版本

方向	cmd	sub_cmd	payload_len (Byte)	说明
host->dev	0	0	0	
dev->host	0	0	N	返回固件版本字符串

2.2 图像调节

方向	cmd	sub_cmd	payload_len (Byte)	说明
host->dev	1	0	1/0	1Byte亮度值 (0-100), 无payload 时不设置仅返回实际亮度值
dev->host	1	0	1	返回当前亮度值
host->dev	1	1	1/0	1Byte对比度值 (0-100), 无payload 时不设置仅返回实际对比度值
dev->host	1	1	1	返回当前对比度值

2.3 伪彩

方向	cmd	sub_cmd	payload_len (Byte)	说明
host->dev	2	0	1	设置伪彩序号, 0为关闭伪彩

2.4 快门控制

方向	cmd	sub_cmd	payload_len (Byte)	说明
host->dev	3	0	1	手动打快门板准图像
host->dev	3	1	1	禁止自动快门板准
host->dev	3	2	1	启用自动快门板准

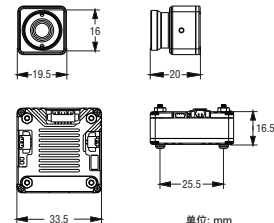
2.5 热点追踪

方向	cmd	sub_cmd	payload_len (Byte)	说明
host->dev	4	0	1	关闭热点追踪
host->dev	4	1	1	开启热点追踪

3. 命令示例

命令说明	命令数据
获取版本	FF 5A 00 00 00 00 00 00 00 C7 57
设置对比度80%	FF 5A 00 01 00 01 01 00 00 00 50 EB 73
设置对比度50%	FF 5A 00 01 00 01 01 00 00 00 32 6A 9A
设置亮度80%	FF 5A 00 01 00 00 01 00 00 00 50 EA A2
设置亮度50%	FF 5A 00 01 00 00 01 00 00 00 32 6B 4B
设置伪彩5	FF 5A 00 02 00 00 01 00 00 00 05 6A 8B
设置伪彩0	FF 5A 00 02 00 00 01 00 00 00 00 AA 8B
打快门板准	FF 5A 00 03 00 00 00 00 00 00 F4 57
禁用自动快门	FF 5A 00 03 00 01 00 00 00 00 C9 97
启用自动快门	FF 5A 00 03 00 02 00 00 00 00 8D 97

外形尺寸



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