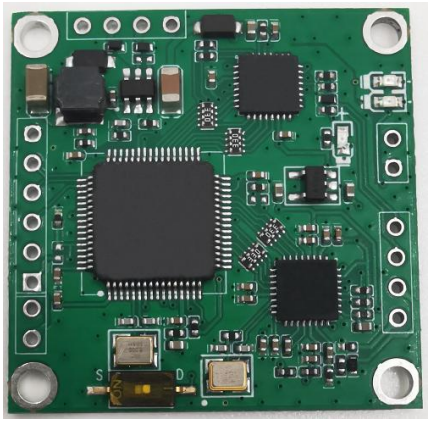
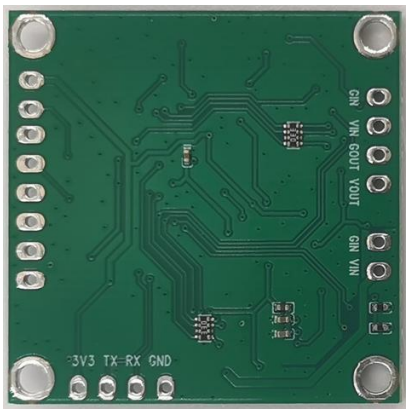
SAC Module for CVBS Video Encryption/Decryption

* Sometimes it is called as analog video scrambler and descrambler too.



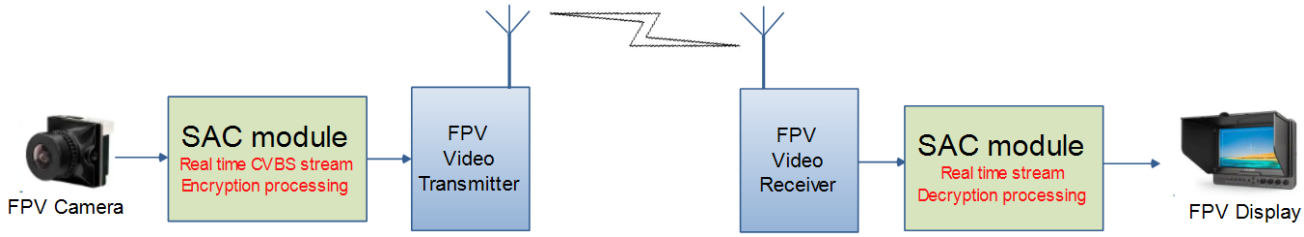


Working principle and typical applications

Schematic diagram of real-time encryption processing for CVBS video streams

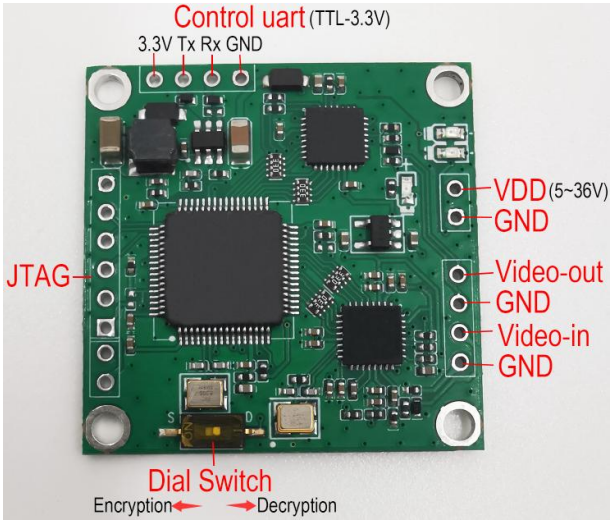
Schematic diagram of real time decryption CVBS video stream

Application of SAC module in FPV:



SAC hardware description

The size of the SAC module is 34.5*34.5mm, the top height within 3mm and bottom height within 1mm, board thickness is 1.2mm. The diameter of the fixing holes on the four corners is 2.5mm. The weight of the SAC module is 4.1 grams.



Power input VDD/GND port

2 PIN PH2.54mm spacing interface, default shipment is welding holes, PIN pins can also be welded according to customer requirements. The SAC board supports DC5V~36V power input and supports reverse power input protection. SAC board operates normally with a power consumption of 0.85W (0.17A@5V).

Video in/GND analog video input port

2 PIN PH2.54mm spacing interface, default shipped as solder hole, can also solder PIN pins according to customer requirements, or directly solder BNC AV input testing cable. When used as an encryption device, Video in/GND is used to interface with the original CVBS video. When used as a decryption terminal, Video in/GND is used to interface the received encrypted video (such as the video output port of an FPV receiver radio).

Video out/GND analog video output port

2 PIN PH2.54mm spacing interface, default shipped as solder hole, can also solder PIN pins according to customer requirements, or directly solder BNC AV output testing cable. When used as an encryption terminal, Video out/GND is used to interface with encrypted video output devices (such as the video input port of an FPV transmitter radio). When used as a decryption terminal, Video out/GND is used to interface with video display screen.

Dial switch

To set whether the SAC module worked as an encryption or decryption function module. When the dip switch is turned to "on" (as shown in the above picture, turned to the left), it is used as an encryption function module. When the dip switch is turned to "I" (as shown in the above picture, turned to the right), it is used as a decryption function module.

JTAG interface

The SAC module software debugging and firmware programming interface, it is not open to users.

Serial port (Control UART)

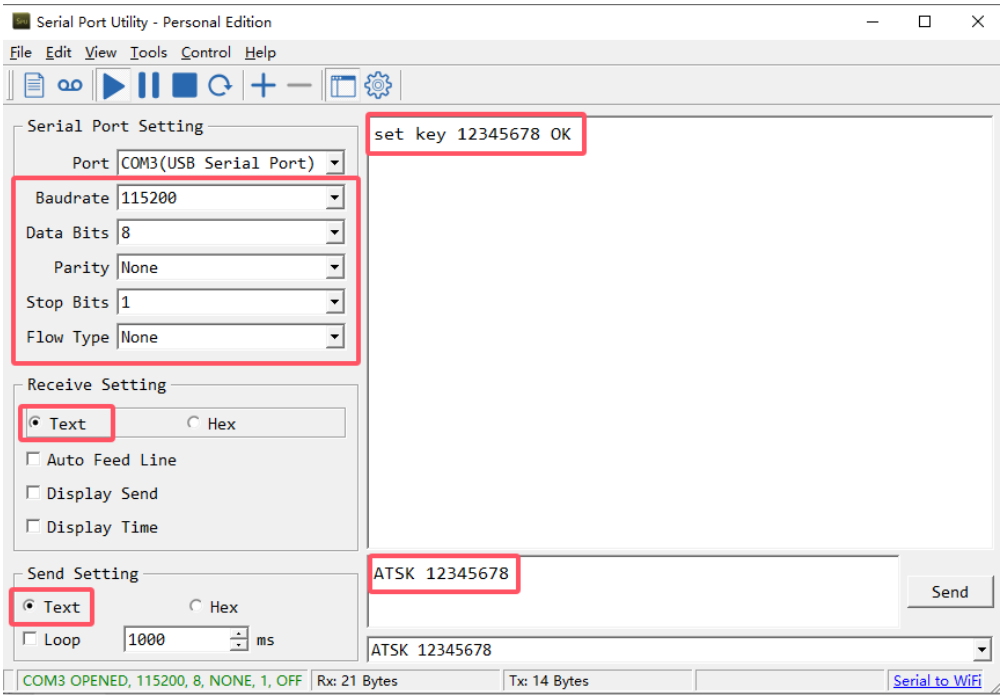
4-pin PH2.54mm spacing interface, default shipped as solder hole, can also solder PIN pins according to customer requirements, TTL 3.3V serial port. The serial port is used to set encryption/decryption passwords. You can

connect to a computer (or upper MCU) through a USB to TTL UART dongle and send AT commands to set encryption/decryption passwords. The serial port also reserves a 3.3V external power supply pin, with a maximum power supply current of 500mA. The serial port baud rate is fixed at 115200, with 8-bit data bits, 1-bit stop bits, and no parity check bits.

AT Command:

1) To set encryption/decryption passwords. The passwords string must be 1 to 8 HEX characters (up to a maximum of 8). HEX characters consist of numbers 0-9 and letters A-F (case insensitive), totaling 16 characters. Each HEX character represents a 4-bit binary number. When set the password to more than 8 hexadecimal digits, the system will set the password to "ffffffff" as default; When only entering "ATSK+Enter (\ r \ n)", the system will set the password to "0" as default. The password can only be set and can't be read. If you forget your password, you can reset it.

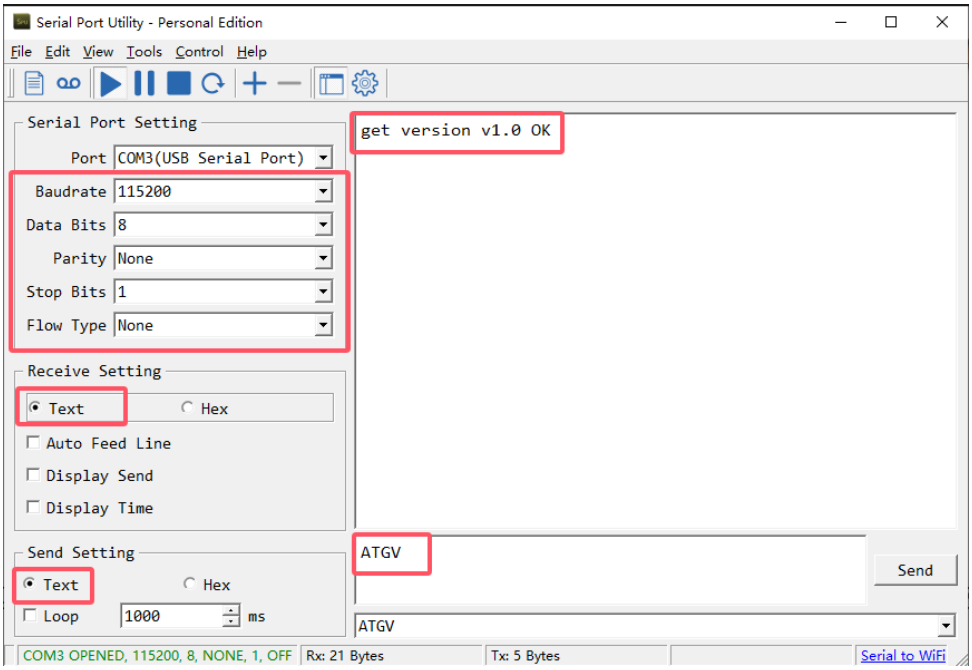
Format	ATSK $(password) \r\n Example : ATSK 12345678 \r\n
Parameter	Password: 1 to 8 HEX characters.
Function	Set Encryption / Decryption password
Feedback	Example : ATSK 12345678 \r\n set key 12345678 0K
Comments	After setting the password, it can’t be queried. If you forget the password, you can only reset it



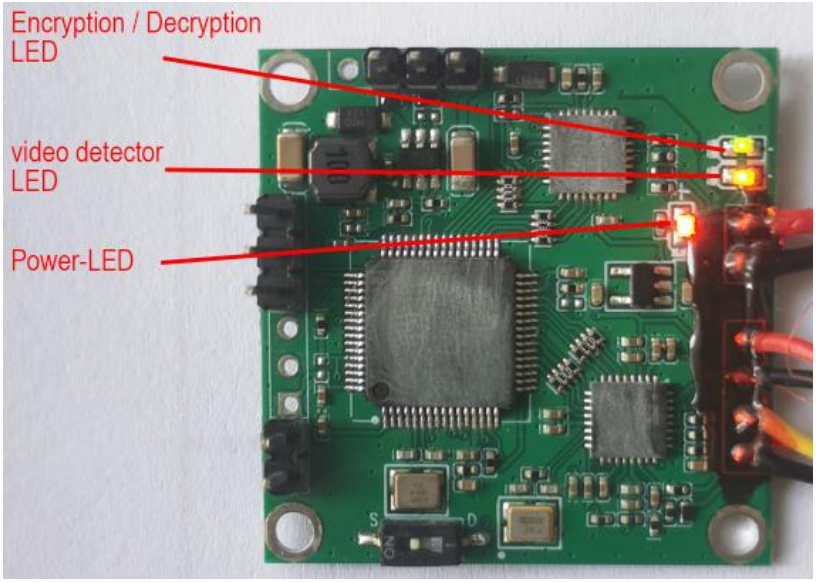
2) Query firmware version number

Format	ATGV \r\n
Parameter	No
Function	Query firmware version number

Feedback	Example : ATGV \r\n Return firmware version number
Comments	no



Power and working indicator LEDs



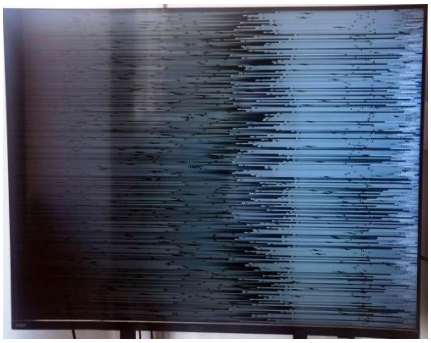
The SAC module has three working indicator lights, and their working status is shown in the following table:

LED	Color	Status description
Encryption / Decryption LED	Green	Constant light indicates working in encryption mode, while no light indicates working in decryption mode
Video detector LED	orange	Constantly light when detecting input video successfully,

		otherwise no light.
Power-LED	Red	Power indicator light, always on during normal operation

The video frame after encryption and decryption processing

Original CVBS video



Encrypted video

Encrypted and decrypted video