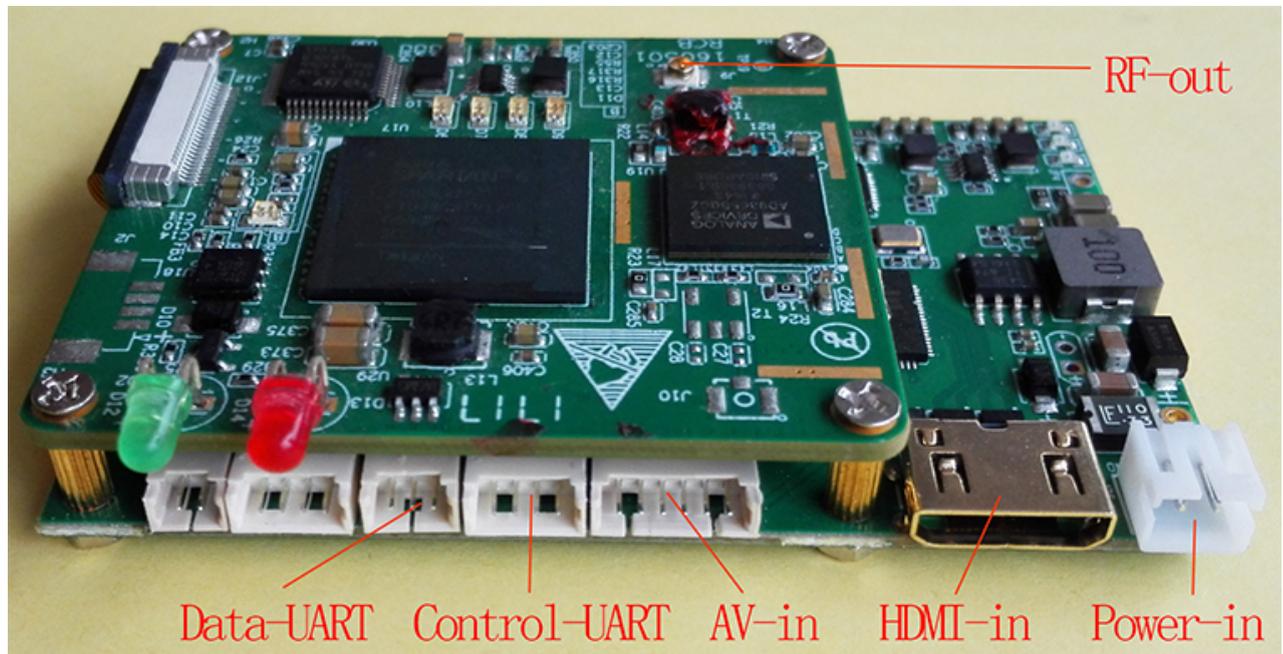


## Modulator Transmitter Module

-- HD video COFDM transmitter module with HDMI/AV input interface



This modulator transmitter module features HDMI/AV inputs with COFDM modulation technology and H.265/H.264 encoding that complete video audio transmission in high-speed motion and NLOS (none line of sight) conditions with low latency. Our modulator transmitter module consists of two boards(video codec board and COFDM modulation board) with a flat cable connection. The module also provides one transparent transmission uart(one way).

This modulator transmitter module can work in different features mode with different firmware which should be specified before it is shipped. The default normal features of our modulator transmitter module:

- H.265 video compression and COFDM modulation;
- Video input via HDMI or AV interface
- Full HD resolution, 1080p/I @60fps;
- Adjustable working frequency, bandwidth, bitstream rates, RF power, etc.

The default normal features of this modulator transmitter module will be paired with our demodulator receiver module. The HD video latency from its inputting of the transmitter to the HDMI screen displaying of the receiver is about 200ms to 250ms.

Specified features implemented with different firmware:

- Normal H.264 video compression;  
(Paired with our demodulator receiver module.)
- Proprietary H.264 video compression only used p-frames for lowest latency; (Paired with our demodulator receiver module with specified firmware. The video latency from its inputting of the transmitter to the HDMI screen displaying of the receiver is about 50ms to 130ms.)
- Video input via HDMI + AV interface, two channels video compression and transmitted  
(Paired with our demodulator receiver module with specified firmware.)

### Specification:

#### IO

HD Video input	Mini HDMI, HDMI type “B” Connector
----------------	------------------------------------

# Vcan Group Limited

Composite Video input	6PIN PH1.25mm Connector
-----------------------	-------------------------

TTL UART data	3PIN PH1.25mm Connector
TTL UART control	4PIN PH1.25mm Connector
Power in	2PIN PH2.0mm Connector
RF output	IPEX

## Modulation

Modulation Formats	COFDM(DVB-T)
Carriers	2K
Bandwidth	Configurable from 1MHz to 8MHz, step by 1KHz
FEC	1/2, 2/3, 3/4, 5/6, 7/8
Guard interval	1/32, 1/16, 1/8, 1/4
Constellation	QPSK, 16QAM, 64QAM
Bitrates	0.5Mbps to 31.67Mbps

## RF

Frequency Bands	200MHz~2300MHz(other bands can be supported with special manufacturing)
Tuning Step size	1KHz
Power out	Configurable from -93dBm to -5dBm(subject to frequency)

## Video and Audio

Video input	HDMI or CVBS, auto-detected after system start-up
Video formats	1080@60P, 1080@50P, 1080@30P, 1080@25P, 1080@24P, 1080@60I, 1080@ 50I, 1080@30I, 720@60P, 720@50P, 720@30P, ..... 720*480 60I(NTSC), 720*576 50I(PAL)
Video Coding	H.265
Audio input	Embedded HDMI or AV audio(Specify Mic in/Line in)
Audio Coding	AAC, 16bit, stereo, 32Kbps
Encryption	AES256

# Vcan Group Limited

## Monitoring and control

Comprehensive setup with our Config Panel or other device via control UART.

## Temperature range

Full specification: 0° to +70°C Ambient

Storage: -40° to +80°C

## Dimensions

70x45x13mm(not including connectors out of the board)

## Power requirements

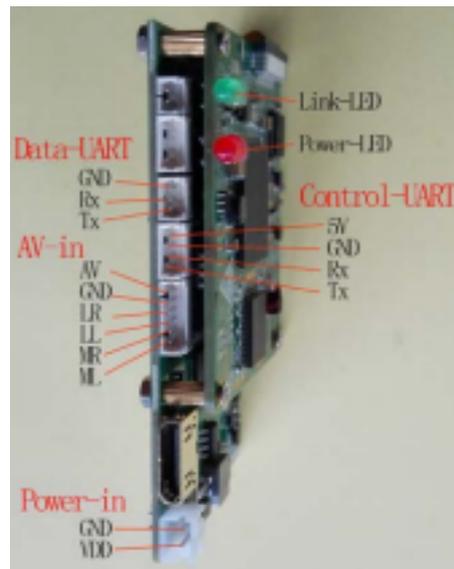
Input range: 7~24VDC

Power consumption: <300mA@12V

## Signals description

### AV-in

PIN	Signal
AV	Analog video input
GND	GND
LR	Line in right(Audio)
LL	Line in left(Audio)
MR	Mic in right(Audio)
ML	Mic in left(Audio)



### Data UART and Control Uart

TTL, 3.3V signal

### Power-LED

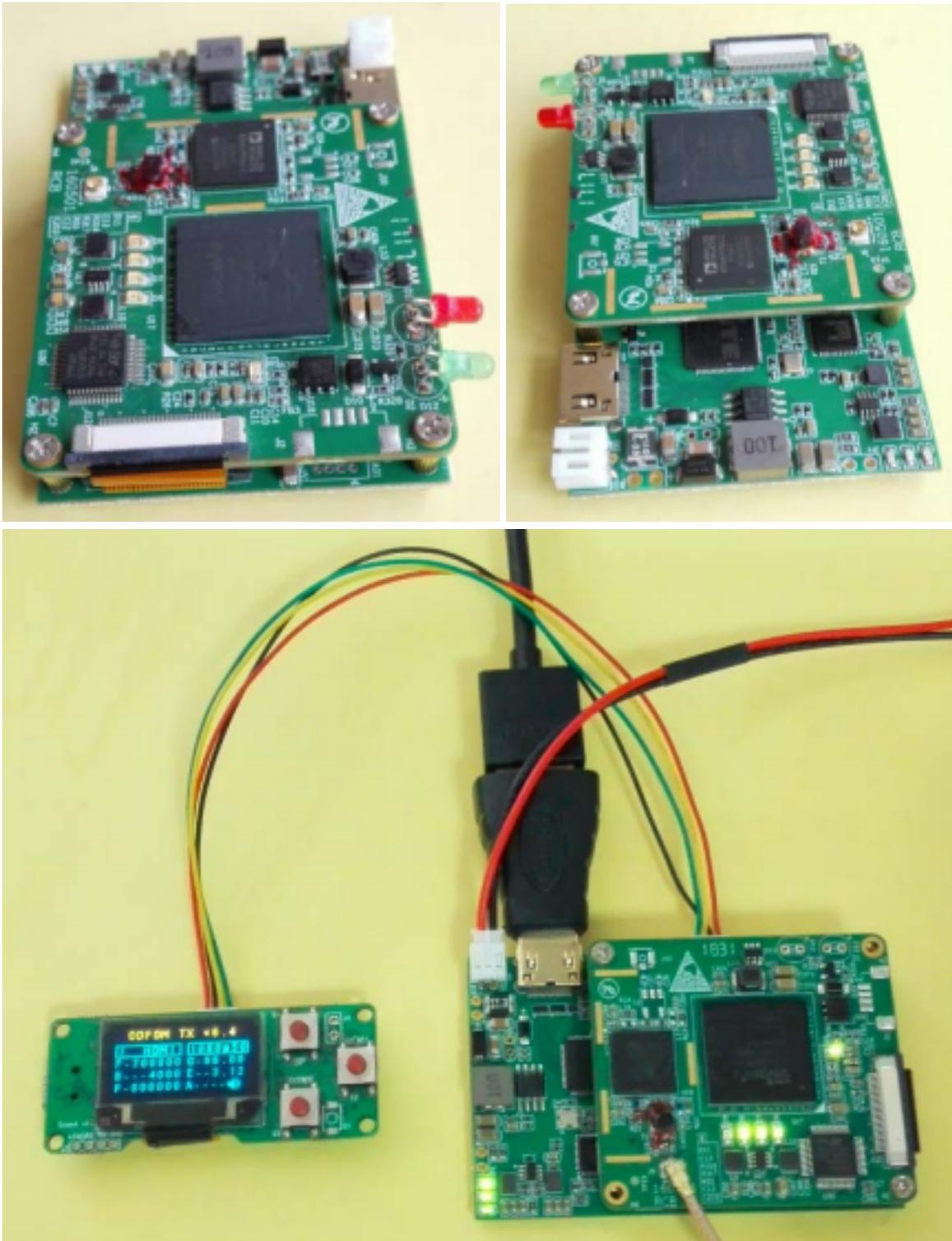
Red light when the board is powered

### Link-LED

Green blinks on transmitting

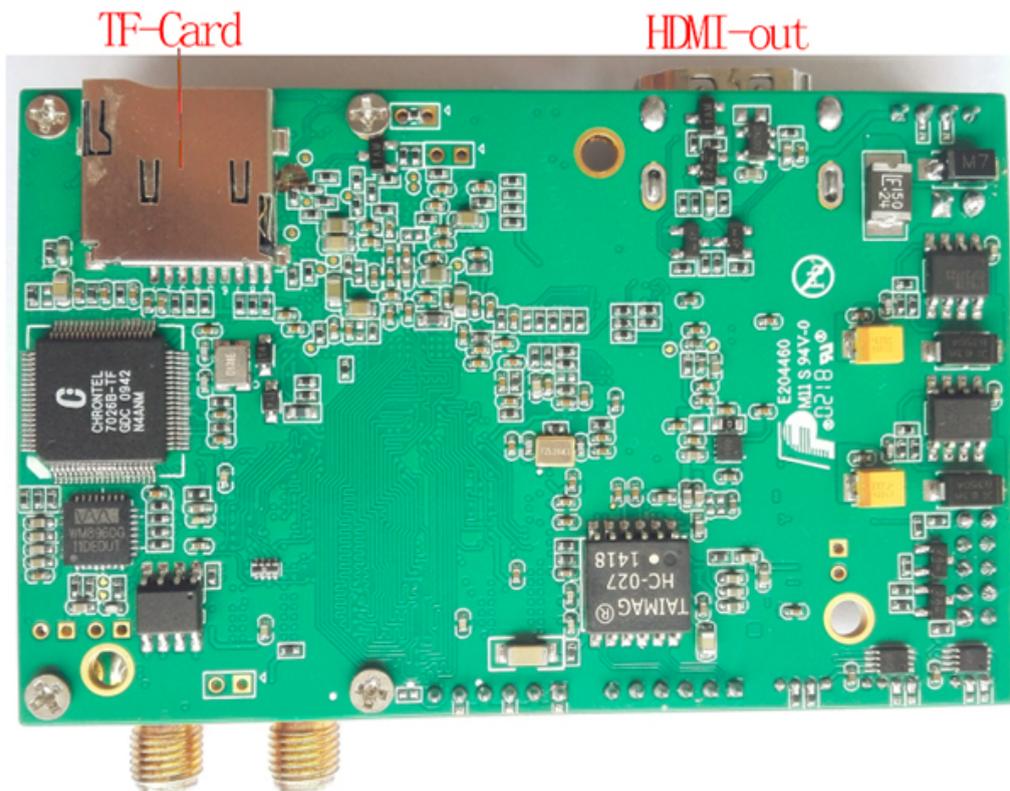
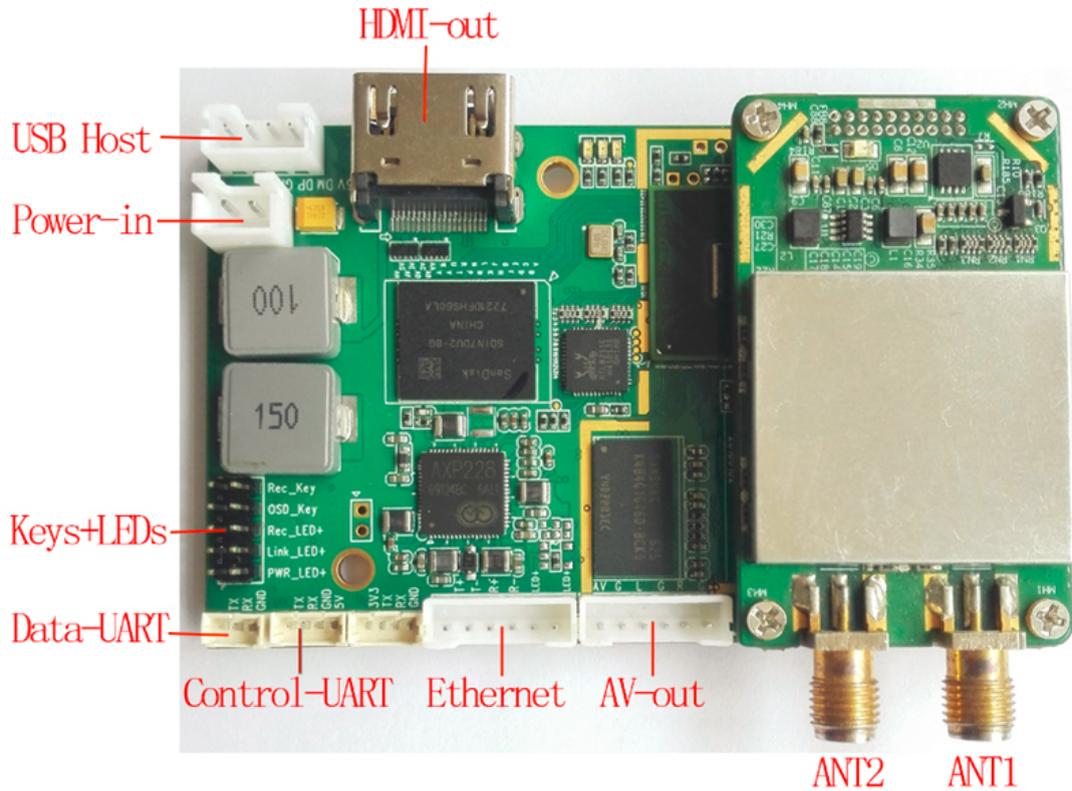


# Vcan Group Limited



## Demodulator Receiver Module

--160MHz~860MHz HD video COFDM receiver module with HDMI/AV/Ethernet/USB output



# Vcan Group Limited

The demodulator receiver module is a compact digital diversity receiver with integrated H.264 decoding, suitable for use in fluid and high-mobility applications. The receiver module accepts signals from two antennas to significantly enhance the demodulated performance and increase the operating range. The receiver module can find and lock automatically to the incoming transmission quickly according to the pre-set frequency and bandwidth. This receiver module features a range of comprehensive signal outputs including HD at 720p and 1080P, down-converted HD CVBS monitor video, and two analog audios supported.

The receiver module also includes DVR record functionality with a Micro SD card or USB disk. Additionally, the receiver module has a built-in RTSP server that enables video streaming over Ethernet for remote software or hardware decoders. And the receiver module also enables video streaming over USB for remote Android device decoders like smartphones or Android PAD. This allows multiple remote viewers to monitor the same video simultaneously. The receiver module also supports display characters string on the video display screen with the video together in OSD mode.

When paired with our COFDM transmitter module, the receiver module offers a comprehensive, rapidly-deployable video and audio solution that enables advanced situational awareness. It can play an essential role in delivering real-time live video from both ground and airborne mobile platforms. •

COFDM demodulation and H.264 video decoder;

- Full HD resolution, 1080P@60fps;
- Great security by AES decryption;
- DVR record with Micro SD card or USB disk;
- Built-in RTSP server enables video streaming over Ethernet;
- Enables video streaming over USB host for the remote device;
- Supports display characters string on the video display screen in OSD mode;
- Stable signal transfer in NLOS and high speed moving;
- Adjustable working frequency, bandwidth.

## Specification:

### IO

HD video output	HDMI type A connector
Composite video output	6PIN PH2.0mm connector
Audio output	Embedded HDMI and CVBS

RF input	Two SMA female 50Ω
Power in	2PIN PH2.54mm connector
USB Host	4PIN PH2.0mm connector
TTL UART data	3PIN PH1.25mm connector, 3.3V signal
TTL UART control	4PIN PH1.25mm connector, 3.3V signal
Ethernet	6PIN PH2.0mm connector
TF-Card	TF-Card slot
Keys&LEDs	2*5PIN PH2.0mm connector

# Vcan Group Limited

## Demodulation

Demodulation Formats	COFDM(DVB-T)
Carriers	2K
Bandwidth	Configurable from 1MHz to 8MHz, step by 1KHz
FEC	1/2, 2/3, 3/4, 5/6, 7/8
Guard interval	1/32, 1/16, 1/8, 1/4
Constellation	QPSK, 16QAM, 64QAM
Bitrates	0.5Mbps to 31.67Mbps

## RF

Frequency Bands	160MHz~860MHz
Tuning Step size	1KHz
Sensitivity	-97±1dBm(BW=8MHz, QPSK, CR=2/3, GI=1/16) for one channel and add 3dBm for two-channel

## Video and Audio

Video output	HDMI and CVBS, Ethernet(RTSP protocol by default, option UDP), USB
Video formats	1080P or 720P 720*480 60I(NTSC), 720*576 50I(PAL)
Video Decoding	MPEG-4/H.264 AVC
Audio output	Embedded HDMI and AV audio
Audio Decoding	AAC
Decryption	AES256
Storage	USB disk or micro SD card

## Monitoring and control

Comprehensive receiver setup with our Config Panel or Windows PC or another device via control UART.

## Temperature range

Full specification: 0° to +70°C Ambient

Storage: -40° to +80°C

## Physical Characteristics

Board Dimensions: 80.4\*50.8mm

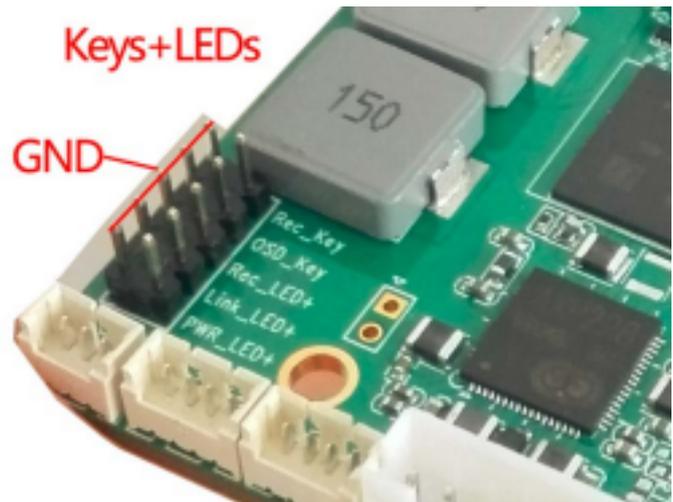
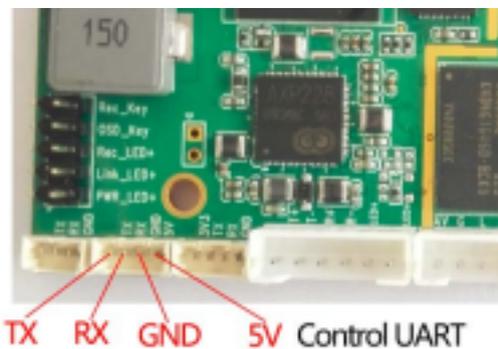
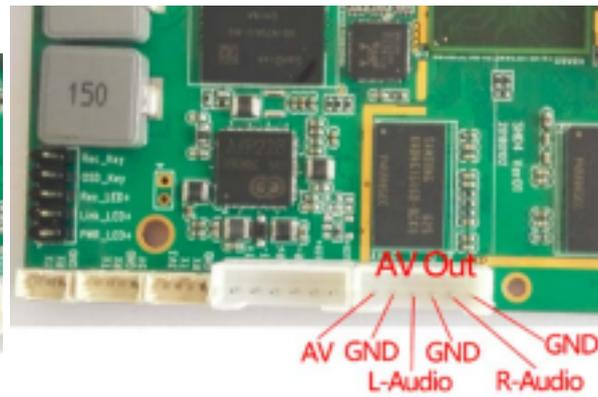
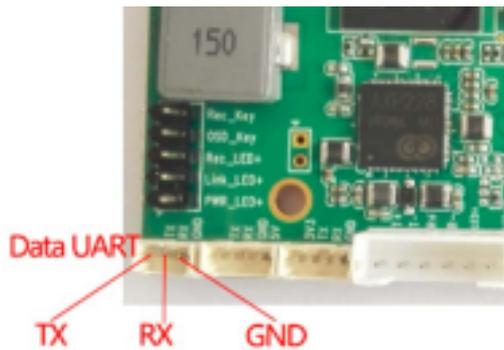
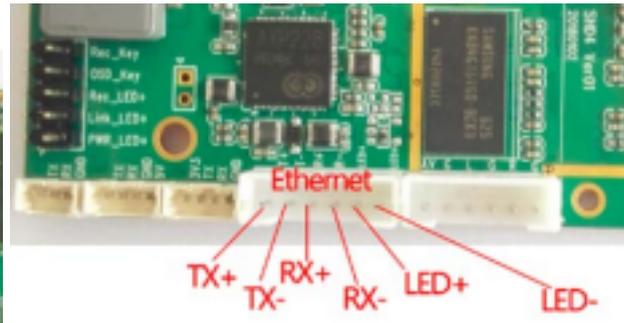
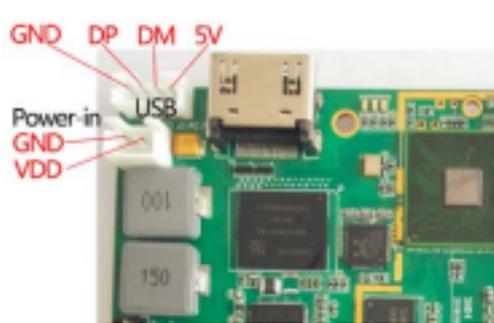
## Power requirements

Input range: 9~24VDC

Power consumption: <300mA@12V

# Vcan Group Limited

## IO Signals



### Keys + LEDs:

The receiver module has a 2\*5PIN PH2.0mm connector which provides “keys + LEDs” signals. It is designed for customers who want to expand LEDs and keys to their cases.

PWR led signal: these two pins can connect to a LED for a power indicator, and constant light when the device is normally powered.

The link led signal: these two pins can connect to a LED for a wireless link indicator, which blinks when the video stream is received.

REC led signal: these two pins can connect to a led for record indicator, and constant light when video recording.

REC key signal: these two pins can connect to a button for the switch of video recording, short press to change it's status. The receiver will automatically check the storage device(micro SD card or USB disk) after powering on and start to record video when the storage device is inserted. Just press it to stop or record again.

# Vcan Group Limited

---

OSD key: these two pins can connect to a button for turning on/off the status of the OSD displaying, long press it to switch(more than 1s). The status will be kept after a reboot. When the OSD status is on without any OSD data input from the data uart, the device will display information on the video screen as:

**RF:338.0MHz BW:4.0MHz**; RF, working frequency; BW, bandwidth

**QPSK CR:2/3 GI:1/16**; Constellation, FEC, Guard interval

**AIR:3.90Mbps**; AIR, wireless transmitting bitrates

**VBR:3.05Mbps AES OFF**; VBR, video bitrates; AES OFF, AES encryption turned off.

**SIG1:27 SIG2:22**; SIG1, the signal intensity of ant 1; SIG2, the signal intensity of ant 2

**ber1:0.14% ber2:100.00%**; ber1, the bit error rate of ant 1; ber2, the bit error rate of ant 2

**REC OFF No Storage**; video recording status

