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# User Manual

T40 Portable Ground Control Station  
*(July, 2021)*

V 1.0.3 [video&data&RC link V21 V30 V40](#)



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# 1. Disclaimer

Thank you for purchasing the T40 portable remote-control station. Please use it in accordance with local radio control regulations and read this statement carefully before using it. Once used, it shall be deemed to endorse and accept all contents of this statement. Please strictly follow this instruction to install and use the product. The supplier will not bear any legal liability for any result or loss caused by improper use, installation, final assembly or modification of the product.

# 2. Product Precautions

- 1) T40 ground terminal is matched with airborne unit to use together.
- 2) T40 can be matched with 3 different airborne units: V21, V30, V40. Frequency 800MHz, 1.4GHz and 2.4GHz for choice. Default: 1.4GHz.

Frequency	Range
800M	806 – 826MHz
1.4G	1427.9 – 1447.9MHz
2.4G	2401.5 – 2481.5MHz

- 3) The ground unit is with built-in 16.8v battery(4S lithium battery); the airborne unit needs external power input DC7.4-24v(2S-6S lithium battery). Please power the system in strict accordance with specifications.
- 4) With improper operation, the aircraft may cause a certain degree of injury and damage to human and the system, please be sure to pay attention to safety during use.
- 5) In order to better serve customers, our R&D team has been upgrading and optimizing the product. The software and firmware are being upgraded frequently. There may be incompatibilities between different firmware versions. Please pay attention to asking the supplier for the latest software firmware and technical support.
- 6) Software and firmware version example:

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Parameters Setting Software: HZY Remote-controller configuration software 1.0.2

Ground unit firmware: TTx40-1.2.3-1.0

Airborne unit V21 firmware: V21RX-1.2.3-1.00

Airborne unit V30 firmware: V30RX-1.2.3-1.0

7) The software, firmware, drivers and port conversion tools covered in this manual will be updated from time to time on our website, so please visit our website to download them, or contact us directly.

8) If you encounter any problem that cannot be solved during installation or use of the product, please contact us.

## ***2.1 Installation Note***

- 1) Be sure to use the spare parts provided by our company.
- 2) Be sure to install the antennas before power-on to avoid damage to the circuit.
- 3) Try to make the receiver antenna without obstruction, and the end part of the antenna is vertically downward without bending, so as to avoid shortening the communication distance or even failing to communicate due to obstruction.
- 4) Do not disassemble or refit without permission. If you encounter any problem that cannot be solved during installation, please contact us directly.
- 5) During installation, keep proper distance between electronic devices to minimize electromagnetic interference.

## ***2.2 Precautions for Use***

- 1) Before use, please make sure that all connection wires are fastened reliably and all components work normally.
- 2) Please open the **<RC Configuration Software>** and check whether the channels are normal.

- 
- 3) Please check the surrounding environment to ensure that there is no interference from other devices, otherwise T40 data transmission performance will be seriously affected.
  - 4) Ensure that the antennas are free from obstacles and bends during use, and stay away from large metal structural parts as far as possible to avoid communication obstruction
  - 5) Check the power of the remote control before use. If the **<Parameter Setting Software>** shows that power is low, please charge the remote control timely. If the remote control is turned off, the receiver has entered the state of out-of-control protection. Stop using it when the battery is too low. Don't rely on the device's low-power alarm, which is only a precaution and tells you when to charge. It takes about 2.5hs to be fully charged.

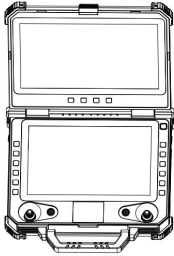
### 3. Product Introduction

T40 is all-in-one hand-held GCS that integrates remote control, data transmission module, video transmission module and industrial computer. High integration, dual screens display, dual SBUS output, easy operation. There are 20 physical channels and 7 virtual channels to map to any channel of SBUS. Multiple frequencies for choice, 800MHz, 1.4GHz and 2.4GHz. It can be used widely in commercial unmanned applications for remote control and data transmission.

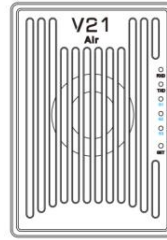
### 4. Item List

#### 4.1 V21 Version

Main module	
T40 Remote Control*1	V21 Receiver*1



TNC ZYJB antenna\*2  
(For T40 remote control)



SMA ZYJB antenna\*2  
(For V21 receiver)



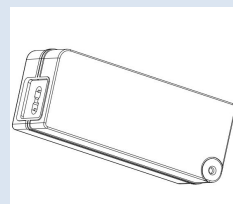
Fibre-glass epoxy antenna  
(TNC sucker\*2, TNC fibre glass epoxy antenna\*2)



### Accessories

Cables  
(XT40 power cable\*1;  
SBUS signal wire GH 3pin\*2;  
TTL signal wire GH 4pin\*1;  
Aviation plug 6pin\*1)

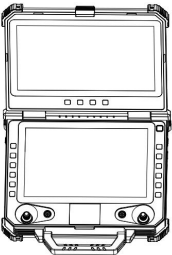



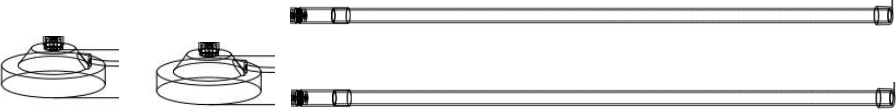
Charger\*1  
(DC16.8V, charging for RC)



LAN-to-4Pin wire\*1  
(used for module parameters setting)


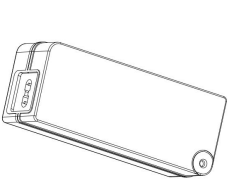
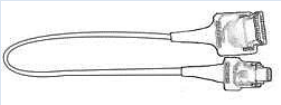



## 4.2 V30 Version

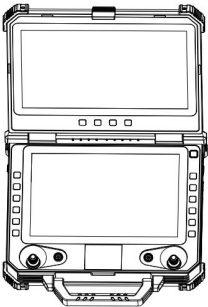
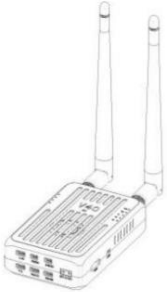


Main module	
T40 Remote Control*1	V30 Receiver
	
TNC ZYJB antenna*2 (For T40 remote control)	SMA ZYJB antenna*2 (For V30 receiver)
	
Fibre-glass epoxy antenna (TNC sucker*2, TNC fibre glass epoxy antenna*2)	
	
Accessories	
Cables (XT40 power cable*1; SBUS signal wire GH 3pin*2;	Charger*1 (DC16.8V 6V, charging for RC)



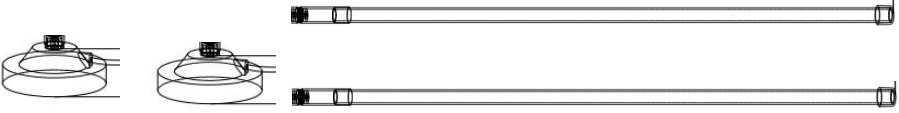


TTL signal wire GH 4pin*1)	
	
HDMI wire (HDMI A to micro)	Aviation Plug 6pin
	

### 4.3 V40 Version

<b>Main module</b>	
T40 Remote Control*1	V40 Receiver
	
TNC ZYJB antenna*2 (For T40 remote control)	SMA ZYJB antenna*2 (For V40 receiver)
	

Fibre-glass epoxy antenna  
(TNC sucker\*2, TNC fibre glass epoxy antenna\*2)

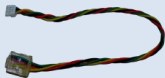


**Accessories**

Cables  
(XT40 power cable\*1;  
SBUS signal wire GH 3pin\*2;  
TTL signal wire GH 3pin\*1;  
GH 4pin\*5)



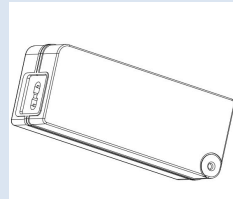
LAN-to-4Pin wire\*1



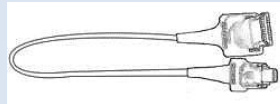
Aviation plug 6pin



Charger\*1  
(DC16.8v 6A, charging for RC)

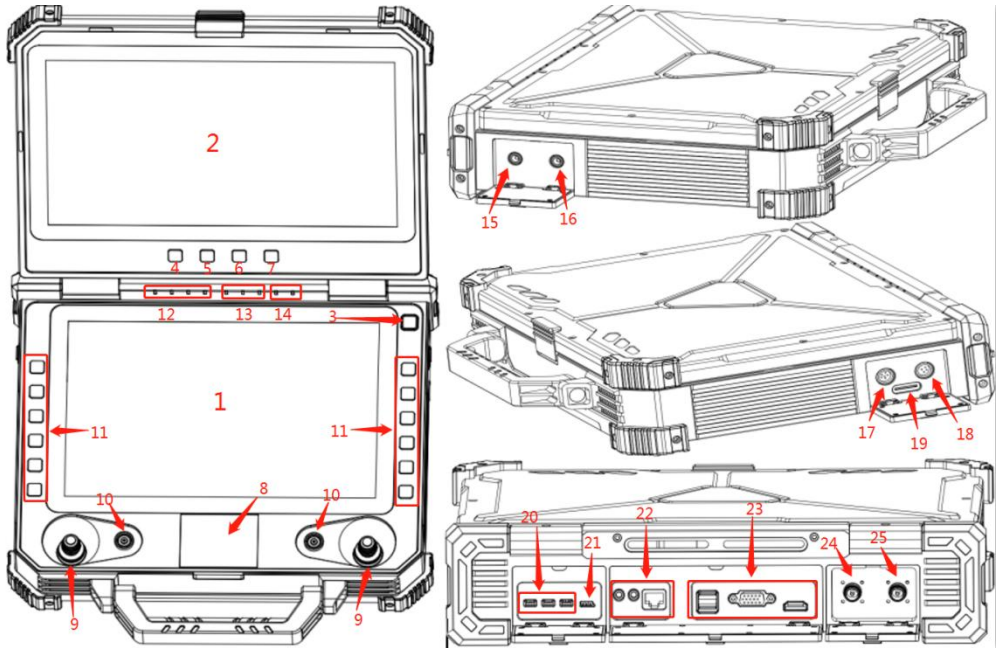


HDMI-to-HDMI micro\*1



# 5. Product Instruction

## 5.1 T40 GCS



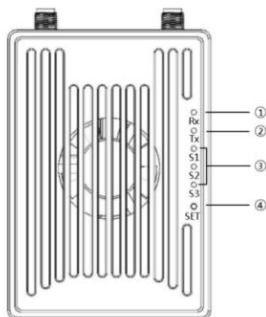
- 1. GCS main screen: the computer main interface display
  - 2. GCS secondary screen: used for split screen and external input display
  - 3. Power supply button and indicator: used for power-on and power-off the GCS
  - 4. Upper screen brightness +: used to adjust the brightness and Menu up
  - 5. Upper screen brightness -: used to adjust the brightness and Menu down
  - 6. External HDMI Switch: for external HDMI and computer split screen switching
  - 7. Menu key of upper screen function: used to enter menu settings of the upper screen
  - 8. Touch panel: Used to control the mouse cursor
  - 9. Main joysticks: corresponding to T1, T2, T3, T4 channels
  - 10. Secondary joysticks: corresponding to T5, T6, T7, T8 channels
  - 11
- [www.chinowing.com](http://www.chinowing.com)

- 
11. Buttons channel: corresponding to F1-F12, 12 buttons
  12. Power indicators: 1 indicator stands for 25% battery capacity
  13. Wireless link indicators: indicating signal strength; in the flow light state when no connection
  14. Transparent transmission data indicators: Tx light ON when there is data transmitting; Rx light ON when there is data receiving.
  15. Battery charging port: DC16.8V 6A input
  16. Power supply output interface: DC12V 3A output
  17. 6 Pin Aviation Plug: corresponding to RS232 Level, COM4, 2 channels of SBUS
  18. 4 Pin Aviation Plug: corresponding to LAN port of the computer
  19. SIM card slot: for installing SIM card
  20. 3\*RS232 serial port: corresponding to COM1, COM2, COM3.
  21. External SBUS input: corresponding to SBUS2 signal output
  22. Audio interface and LAN port: for audio output and Ethernet connection
  23. USB, VGA, HDMI interfaces: used for SUB communication and video output
  24. Antenna interface: corresponding to slave antenna
  25. Antenna interface: corresponding to main antenna

## 5.2 V21 Receiver

### 5.2.1 V21 Receiver Indicator&Port Instruction

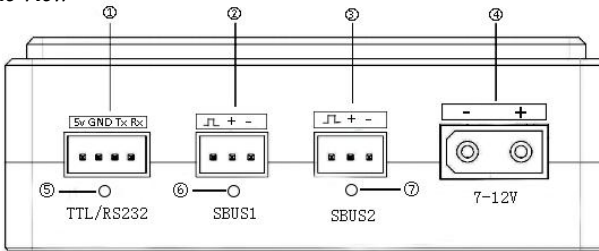
Front view



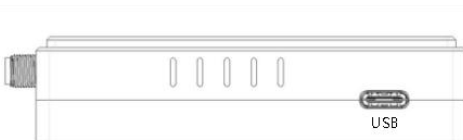
- ① Data receiving indicator: light will flicker in the condition of data receiving.

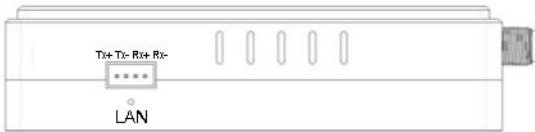
- 
- ② Date transmitting indicator: light will flicker in the condition of data transmitting.
  - ③ Signal strength indicator: S3 ON, signal is weak; S3 and S2 ON, signal is moderate; S3, S2 and S1 ON, signal is strong.
  - ④ SET button: used for firmware upgrading, serial port baud rate setting, Failsafe protection setting

Side View



- ① TTL port: full duplex serial port
- ② S-BUS1 port: SBUS input(ground unit);SBUS output(airborne unit)
- ③ S-BUS2 port: SBUS input(ground unit);SBUS output(airborne unit)
- ④ Power supply port: 7.4-12V
- ⑤ TTL signal indicator: light will flicker when there is data input
- ⑥ SBUS1 indicator:
  - ❖ Ground unit: SBUS1 indicator will flicker when there is data input of SBUS1.
  - ❖ Airborne unit: SBUS1 indicator will flicker when there is data output of SBUS1.
- ⑦ SBUS2 indicator:
  - ❖ Ground unit: SBUS2 indicator will flicker when there is data input of SBUS2.
  - ❖ Airborne unit: SBUS2 indicator will flicker when there is data output of SBUS2.





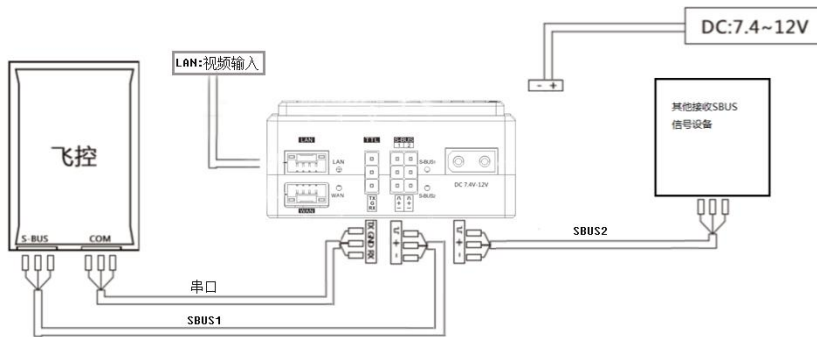
LAN port: for video input or output

USB port: debugging interface, for video output

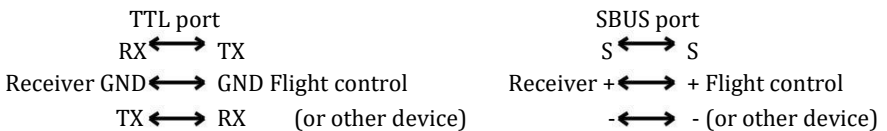
⚠️ ❖ By default, the S-BUS1 and S-BUS2 interfaces output the CH1 to CH16 of the remote control to 1-16 channels.

## 5.2.2 V21 Receiver Installation and Connection

1. Connecting antennas to SMA port of Rx.
2. Fix the receiver to the appropriate position of the aircraft by using double-sided tape.



3. As shown in the above photo, connecting TTL port and S-Bus port of the V21 receiver to your device by lead wire of servo.



- 
4. With 7.4-12v DC power supply, S1-S3 indicators ON, it indicates the successful connection between transmitter and remote control
  5. Video interface is LAN port, LED light of LAN port will flash after the successful connection.
  6. If you are using a dual S-BUS receiver. Both S-BUS1 and S-BUS2 can output the CH1 to CH16 of the remote control. The output of S-bus1 and S-bus 2 can be mapped separately. Pls refer to the output mapping description.
- 



- ❖ The receiver power is 1W by default, please keep the receiver antenna away from other electronic devices (GPS, compass, etc.) to avoid interference with it and affect the flight.
- ❖ Make sure to install the antennas before power-on, otherwise it may burn out the radio module.
- ❖ When using, the antenna, try to make the antenna downward and no obstacle blocking, to avoid the communication distance is shortened due to blocking, or even unable to communicate.
- ❖ Be sure to use the specified type of antenna and install it correctly. It is forbidden to use other types of antennas.

## 5.3 V30 Receiver

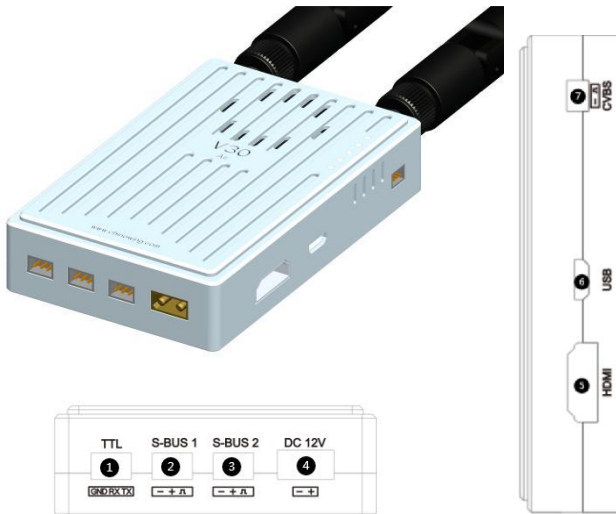
### 5.3.1 V30 Receiver Indicator&Port Instruction

Front view



- 
- ① Video link CPU indicator: light will be continuously **ON** in normal working condition.
  - ② Data link indicator: indicator will be continuously **ON** when the connection of TX and RX is successfully established.
  - ③ Signal strength indicator: S3 **ON**, signal is weak; S3 and S2 **ON**, signal is moderate; S3, S2 and S1 **ON**, signal is strongest.

*Side View*



- ① Data transmission port: TTL level, in transparent transmission with the COM6 in the computer
- ② SBUS 1 port: used for connecting flight controller or payload
- ③ SBUS 2 port: used for connecting flight controller or payload
- ④ Power supply port: 7.4-12V
- ⑤ HDMI video input interface: connecting camera



⑥ USB port: used for firmware upgrading and parameters setting

⑦ CVBS video input interface: used for analog video input.

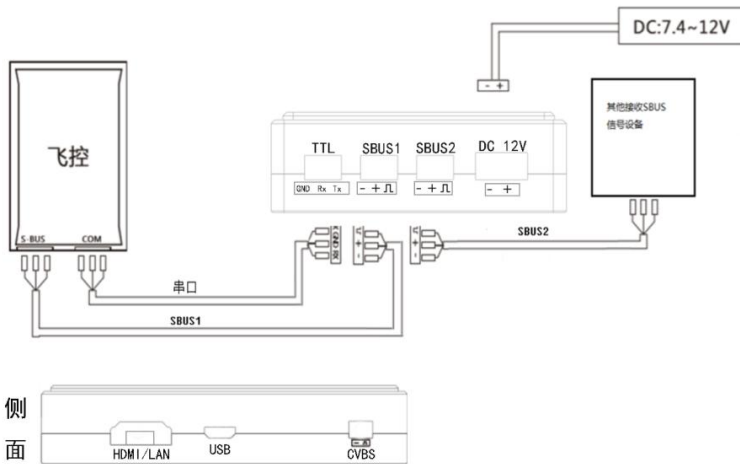


❖ By default, the S-BUS1 and S-BUS2 interfaces output the CH1 to CH16 of the remote control to 1-16 channels.

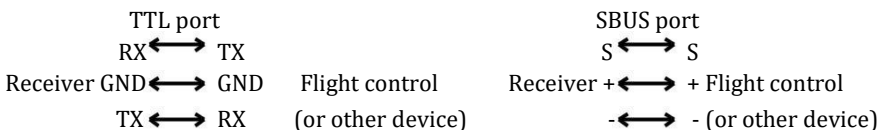
## 5.3.2 V30 Receiver Installation and Connection

1. Connecting antennas to SMA port of Rx.

2. Fix the receiver to the appropriate position of the aircraft by using double-sided tape.



3. As shown in the above photo, connecting COM port and S-Bus port of the V30 receiver to your device by lead wire of servo.



4. Connect the camera to V30 HDMI interface, CPU indicator will be continuously ON with successful video input.

5. Power on by 7.4-12V DC power supply, LINK indicator will be continuously ON. It means the successful connection between Receiver and Remote Control.

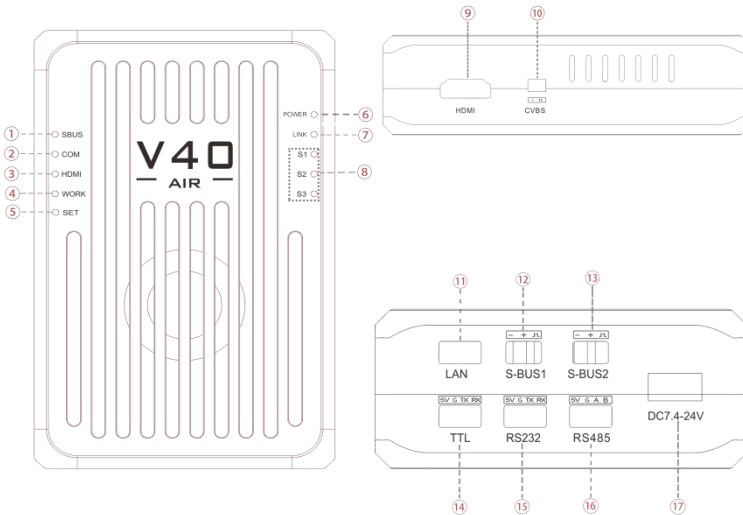
6. If you are using Receiver with dual SBUS output. SBUS1 and SBUS2 will output control signal of (CH1-CH16) channels from Remote Control. And SBUS1 and SBUS2 can be mapped separately.



❖ By default, the S-BUS1 and S-BUS2 interfaces output the CH1 to CH16 of the remote control to 1-16 channels.

## 5.4 V40 Receiver

### 5.4.1 V40 Receiver Indicator&Port Instruction



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① SBUS status indicator

Indicating data status of SBUS1 and SBUS2

② COM serial port module indicator

Serial port module self-check indicator

③ HDMI signal indicator

HDMI signal input status indicator

④ Work self checking status indicator

Self-checking indicator is always on, which means normal operation, OFF means start-up or failure

⑤ SET button

For out-of-control protection Settings

⑥ POWER indicator

⑦ Data link establishing indicator

Indicator to indicate the data link connection status between the airborne unit and the ground unit

⑧ Signal strength indicator

Indicator S1, S2, S3 are used for indicating signal strength

⑨ HDMI interface

HDMI video input

⑩ CVBS video input interface

CVBS video input

⑪ LAN port

Used for transmit the video or read the V40 parameters

⑫ SBUS1 interface

For Sbus1 signal output

⑬ SBUS2 interface

For Sbus2 signal output

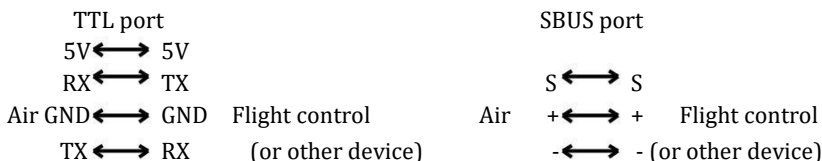
⑭ TTL port: Full-duplex serial port

- 
- ⑮ RS232 port: Full-duplex serial port
  - ⑯ RS485 port: Half-duplex serial port
  - ⑰ Power supply interface: support 7.4v-24V input

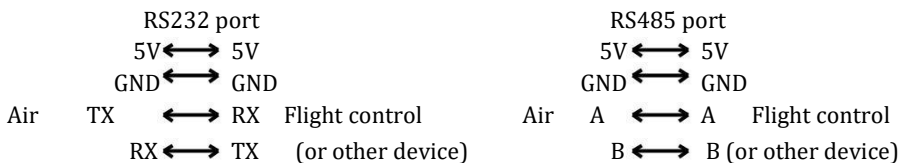
## 5.4.2 V40 Receiver Installation and Connection

After the connection is completed, please refer to the following steps to check the connection status. (This step may vary depending on the ground connection or flight control)

### 1. TTL port and SBUS port connection sequence



### 2. RS232 port and RS485 port connection sequence



3. With a stable 7.4-24V DC power supply, POWER indicator ON, indicates that the transmitter is normally powered on; when the LINK indicator is always on, it means the successful connection.

4. When the COM indicator is on, it means that the serial module starts normally, and when the WORK indicator is on, it means that the self-test of the airborne


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unit is completed and can work normally.

5. Video interface is HDMI, HDMI indicator will be continuously ON if there is video input.

## 6. T40 Secondary Screen Instruction

T40, after power-on, the secondary screen is, by default, for the computer extension screen, the secondary screen for the computer extension screen when the upper screen can only use touch. Touch is only available on the upper screen when the secondary screen is an extension of the computer.

When there is external HDMI video input, press  to switch external video source display.

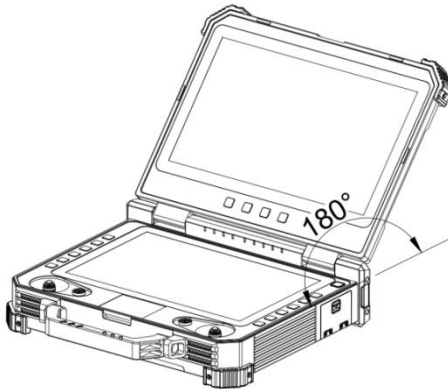


buttons, they are used to adjust the brightness of the upper screen.



button: upper screen Menu, it used to adjust the screen configuration parameters

The maximum axis of rotation of the secondary screen is 0-180 degrees, as follows



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## ***6.1 Secondary-Screen Touch Calibration***

If the touch is not sensitive for the first use, pls follow the below steps to calibrate

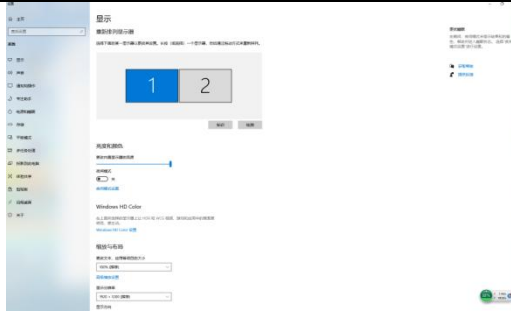
1. Open the control panel, find the "Tablet PC Settings" in the control panel.
2. Click "Settings" in the "Configuration" section of the tablet settings (an external keyboard is needed at this time).
3. As shown below, just follow the computer prompts.



4. In the "Display Options", select "1. Mobile PC Display" and "2. LONTIUM" respectively for calibration, and then the user can do the calibration normally. After calibration, it can be used normally.

## ***6.2 Split Screen Settings***

Screen display factory settings is for the upper and lower split screen. If the user is not used to it, pls right-click on the desktop and select "display settings" as follows, No. 1 for the main screen, No. 2 for the secondary screen.



The secondary screen can be dragged in any direction according to the usage habit and can be set in any direction of the main screen.

## 7. T40 GCS Operation

### 7.1 Remote Control Power-on and Power-Off



Please pay attention to the power button, power indicators, and 4 power indicators(25%, 50%, 75%, 100%), 5 data link indicators(RS1, RS2, RS3, TX, RX) during the switching process of T40.

1. Long press the power button, the power indicator light is **on**, and then according to the speed of the release action of the button to decide whether the computer is turned on or not.

- 
2. Release the power button after the first short sound of the buzzer. At this time, the remote control is switched on and the computer is not switched on.
  3. After hearing the second short sound of the buzzer, loosen the power button. After starting up the remote control, the computer will display the starting interface and start up.
  4. After using the computer, the computer can be shutdown through shutdown interface or the power button.
  5. Long press the power button to turn off. In the process of shutdown, if the system detects that the computer is in the boot state, the system will first shut down the computer before shutting down the remote control
- 



- ❖ *When you do not use your computer for a long time, please turn it off in time to avoid the power consumption.*
- ❖ *If it is found that the long press the power button cannot start up the system, it is likely that the battery is with low capacity. Please charge it by standard adapter*

## 7.2 Indicator Instruction of GCS and Receiver

### 7.2.1 GCS indicator Instruction

Indicator	Status	Define
Receiving and transmitting indicator TX	flicker	V21: the module with data transmitting V30: working indicator
	OFF	V21: the module without data transmitting V30: connection failure
Receiving and transmitting indicator RX	flicker	V21: the module with data receiving V30: Indicator OFF



	OFF	V21: the module without data receiving V30: Indicator OFF
Signal strength indicator RS1, RS2, RS3	RS1,RS2,RS3 ON	Strong signal
	RS1, RS2 ON, RS3 OFF	Moderate signal
	RS1 ON, RS2, RS3 OFF	Weak signal
	RS1,RS2,RS3 OFF or Show the running horse lights	No connection
PWR power indicator	flicker	Firmware upgrading status in configuration mode
	Flicker, with a continuous short sound of the buzzer	Low power alarm
	On	The radio is on, in normal working condition.
	Off	The radio is off, in the condition of power off.
Power indicator light	25% flicker, other 3 Off	Less than 25% power capacity
	25% ON, other 3 Off	Power capacity between 25% ~ 50%
	25%, 50% ON, other 2 Off	Power capacity between 50% ~ 75%
	25%, 50%, 75% ON, 100% OFF	Power capacity between 75% ~ 100%
	25%, 50%, 75%, 100% ON	Full capacity 100%
	4 lights flicker and the buzzer with continuous short sound	High temperature protection condition
Indicator light shows normal, buzzer with continuous short sound		Remote controller idle alarm

## 7.2.2 Indicator Instruction of V21 Receiver

Indicator	Status	Define
TXD	Flashing	There is data transmitting

	OFF	There is no data transmitting
RXD	Flashing	There is data receiving
	OFF	There is no data receiving
TTL/RS232	Flashing	Serial port data is in the communication
	OFF	No serial port data
SBUS 1	Flashing	SBUS1: there is signal transmission
	OFF	SBUS1: there is no signal transmission
SBUS 2	Flashing	SBUS2: there is signal transmission
	OFF	SBUS2: there is no signal transmission
LAN	Flashing	LAN port has been connected.
Signal strength indicator RS1, RS2, RS3	RS1&RS2&RS3 ON	Strong signal
	RS1&RS2 ON, RS3 OFF	Moderate signal
	RS1 ON,RS2&RS3 OFF	Weak signal
	RS1, RS2, RS3 OFF or Show the running horse lights	No connection
S1&S2&S3	Sharp-flash	Outputting Failsafe protection data

## 7.2.3 Indicator Instruction of V30 Receiver

Indicator	Status	Define
CPU	Flashing	No video signal input
	Continuously ON	There is video signal input
LINK	OFF	No link connected
	Continuously ON	The successful connection of the airborne unit and the ground unit
Signal strength indicator RS1, RS2, RS3	RS1&RS2&RS3 ON	Strong signal
	RS1&RS2 ON, RS3 OFF	Moderate signal
	RS1 ON,RS2&RS3 OFF	Weak signal

	RS1, RS2, RS3 OFF or Show the running horse lights	No connection
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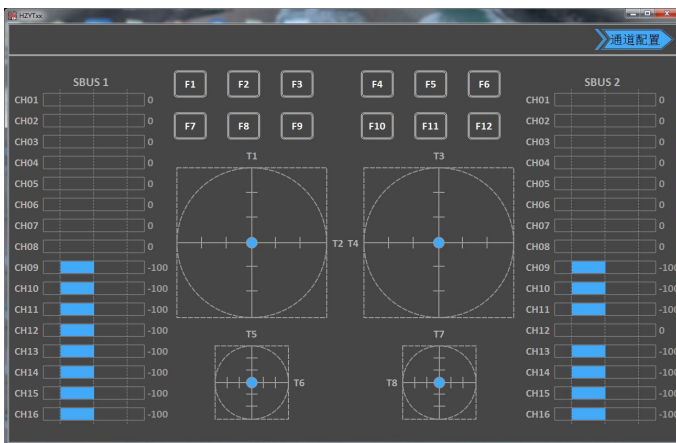
## 7.2.4 Indicator Instruction of V40 Receiver

Indicator	Status	Define
SBUS light	OFF	SBUS1&SBUS2: there is no signal transmission
	One flash at a time	SBUS1: there is signal transmission
	Two flashes at a time	SBUS2: there is signal transmission
	Continuously ON/Slow flashing	SBUS1&SBUS2: there is signal transmission for both SBUS.
COM Light	OFF	Serial port module to be started or failed
	Continuously ON	Serial port module is working normally
HDMI Light	OFF	HDMI port without video source input
	Continuously ON	HDMI port with video source input
WORK Light	OFF	System self-check or system failure
	Continuously ON	The system self-check is normal and able to work
RXD Light	Flashing	The receiver with data reception
TXD Light	Flashing	The receiver with data transmitting
S1&S2&S3 ON		Strong signal
S1 OFF, S2&S3 ON		Moderate signal
S1&S2 OFF, S3 flashing		Weak signal

# 8. T40 GCS <Parameters Setting Software> Operation

## 8.1 <Parameters Setting Software> Instruction

T40 <Parameters Setting Software>“CHINOWING”Version no.“V1.0”. Power on GCS, open CHINOWING software, then enter the main interface as shown above.



## 8.2 Channel Monitoring and Calibration



---

The figure above shows the **channel monitoring interface**, showing the status of each channel of the remote control. When the remote control is in the wrong position or there is a rudder phenomenon, click the red box position in the upper left corner three times to bring up the option of remote control calibration function, and calibrate each analog channel.

Click **<Joystick Calibration>** to start calibration; toggle all the joysticks and knobs, including T1, T2, T3, T4, T5, T6, T7, T8 to ensure that all analog channels touch the maximum value, the minimum value of stroke and then finally to the middle position. Click to complete the calibration. After the calibration is completed, toggle each joystick to see if the parameters setting software display matches the action to verify that the calibration was successful.



---

*The channel display of the remote control is divided into three parts. The left part shows the output value of SBUS-1, the middle part shows the corresponding status of each channel, and the right part shows the output value of SBUS-2. SBUS1 and SBUS2 can be configured separately.*

### **8.3 Channel Configuration**

1. Click the channel configuration button, the above figure shows the configuration interface, you can configure SBUS1 and SBUS2 respectively. Each S-BUS channel CH01-CH16, can freely correspond to T1 , T2 , T3 , T4 , T5, T6, T7, T8, F1, F2, F3, F4, F5, F6, F7, F8, F9, F10, F11, F12. T1 , F1, F2, F3, F4 are main joysticks. T5, T6, T7, T8 is auxiliary joysticks. F1, F2, F3, F4, F5, F6, F7, F8, F9, F10, F11, F12 are buttons.

2. CKey1 - CKey5 are virtual key combinations, SCKey1 and SCKey2 are virtual super key combinations; mapping a virtual channel requires setting the channel

first.

3. **Failsafe protection settings**: click on the small white box, when there is a



<math>\sqrt{</math> in the white small box, the failsafe protection function of the current channel works; set the value of the corresponding dialog box, the current value is the pwm value of the out of control (after setting, please verify by flight control, ground station or servo).

4. There are three operation modes: American mode, Japanese mode and Chinese mode

1) American mode



2) Japanese mode

通道	舵机相位	中点微调	舵机行程量		失控保护	设置
CH01:	正	0	100	100	<input type="checkbox"/> 0	To: T4
CH02:	正	0	100	100	<input type="checkbox"/> 0	To: T1
CH03:	正	0	100	100	<input type="checkbox"/> 0	To: T3
CH04:	正	0	100	100	<input type="checkbox"/> 0	To: T2

### 3) Chinese mode

通道	舵机相位	中点微调	舵机行程量		失控保护	设置
CH01:	正	0	100	100	<input type="checkbox"/> 0	To: T2
CH02:	正	0	100	100	<input type="checkbox"/> 0	To: T1
CH03:	正	0	100	100	<input type="checkbox"/> 0	To: T3
CH04:	正	0	100	100	<input type="checkbox"/> 0	To: T4

<CH1-CH16> in the red mark in the above figure is the configuration output of the physical joystick, which can correspond to the physical channel or multiple CHxx to one physical channel.

Read data: Click once to re-read configuration data

Write data: Click once to write a new configuration data

Load configuration: call different storage profiles

Save configuration: save the current configuration as a configuration file for easy finding

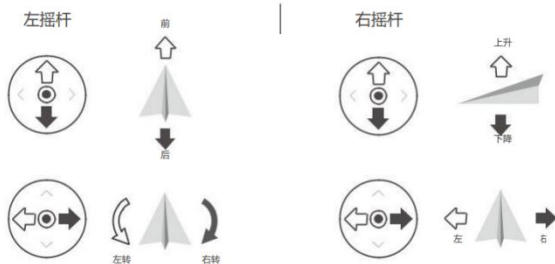
Restore default: restore all parameters of the current page to default values



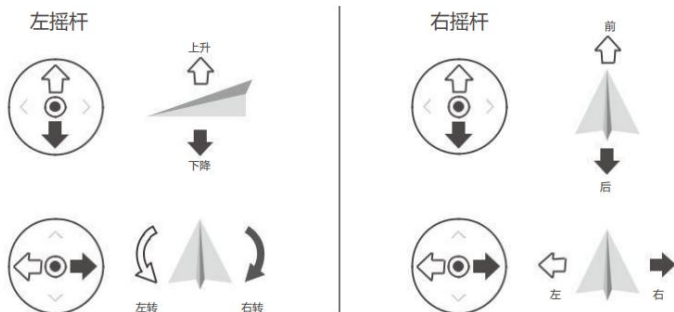
*After each configuration change, click <write data button> and the changed configuration can take effect.*

*When the remote control mode is configured as American mode, Japanese mode and Chinese mode, the control mode is shown below.*

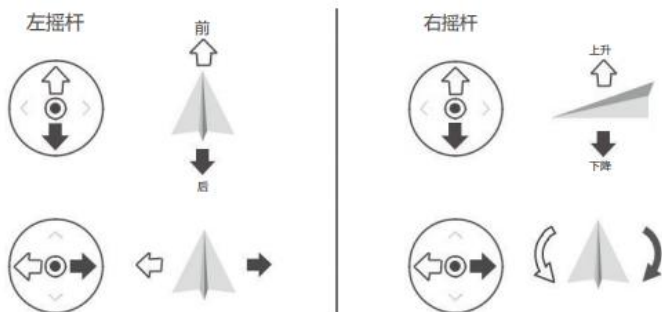
## Japanese mode



## American mode



## Chinese mode



The default control mode of T40 is the American mode. This manual uses the American hand as an example to illustrate how the remote control is operated.



---

## 8.4 Key Setting

### 1. Key Combination setting

Click Channel Configuration-> Key Setting->Key Combination Setting



**CKey is Combination key**, max 5 groups can be set.

Any combination of 2 physical keys, one incremental and one decremental.

Single step increment: sets the value, incrementing that value or decrementing the value each time it is pressed. After setting, set the key combination as (ckey1-ckey5) and then it can be output. Red light always on when pressed, red light not OFF when released, red light off when pressing other Combination Buttons.

### Super Combination Key Settings

Click Channel Configuration-> Keys Setting->Super Keys Combination Settings



### SCkey is super Combination key.

Max 2 groups can be set: SCKey1, SCKey2

Any combination of up to 6 physical keys that can be used as a super combination. Self-define keys, set fixed output value. Set the super combination key as (SCKey1-ScKey2) in SBUS channel setting interface and then it can be output.

When the button is pressed, the corresponding output fixed value can be output; press this button, red led light will be ON; release, the light will be OFF.

**Set key attributes**, click Channel Configuration->Key Settings->Key Attribute Settings

12 buttons, each button can be set to mono-state, bi-state, tri-state.

SBUS channel is set to the corresponding key, when pressed, it will output the value corresponding to the state of the button.



**Mono-state:** press, then output 100, Green light ON; release, then output -100, Green Light OFF

**Bi-state:** press, then output 100, Green light ON; release, keep the previous status; press again, then output -100, green light OFF

**Tri-state:** No press , the channel output 0, green light OFF; press, the channel output 100, green light and fast flashing; press again, the channel output 0, green light OFF; press again, channel output -100, slow flashing.

## 8.5 Failsafe Setting

1. Failsafe setting, click on the white box in front of the channel that needs to open the failsafe function. When there is a  $\sqrt{\quad}$  in the white box, it means the current channel failsafe function is started.



2. Once the failsafe function has been started, the user can set the output value of the failsafe in the corresponding dialog box. When setting the value, click on the value box and a virtual keyboard will pop up, enter the value.

3. After setting the value, the user needs to click on "write data". After writing, click on "read data" to check if it is the data just written. If not, the setting is failed and needs to be set again. After successful setting, the output value will be the pwm value. (After setting, please verify with the flight control ground station or servo).



- ❖ The failsafe data is only output by receiver when there is no signal transmission.
- ❖ Each time the configuration is successfully set up, it can be verified by the flight control, ground station or servo.
- ❖ If the airborne unit is disconnected or the SBUS signal cable is unplugged in the middle of the verification process, third party equipment will not receive the failsafe data.

## 8.6 External SBUS Input



Firstly, set the output external SBUS in the upper computer software and input SBUS data in the external SBUS interface, in this way, the output data is the external SBUS data, otherwise the output is still the SBUS data of the internal remote control. The following figure shows the upper computer setting to output external SBUS data.

## 8.7 Other Settings

1. "Alarm time" is the alarm time for long time no operation of the joystick. Default is 10 minutes, adjustable from 0 to 120 minutes.
2. "Alarm voltage" is the low battery alarm voltage of the GCS. Default 13.2V, adjustable.
3. "Hardware Voltage" is the real-time voltage value of the GCS battery.
4. "Transparent transmission baud rate" is the baud rate of the transmission port between video&data link and the computer, the default is 115200, adjustable.


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5. Restore factory settings.

## ***8.8 T40 Alarm Instruction***

**Joystick long time not working alarm:** The remote control will emit a continuous alarm sound of "didi" when all joystick or dial lever fails to work for long time beyond the set alarm time (**the default time is 10 minutes**, which can be adjusted in the adjusting software). At this time, stir any joystick or dial lever and the alarm sound will be automatically turned off. When the "alarm time" is set to 0 minutes, the alarm function will be canceled.

**Low power alarm** The battery voltage is lower than the set **alarm voltage** (default:13.2V) , the GCS will issue "didi" alarm, power indicator will flashing in red. When the battery voltage rises to **alarm recovery voltage**, the alarm will stop. In the alarm process, before the battery voltage drops to "low voltage shutdown voltage", the buzzer will be faster than the normal alarm frequency, 5-10 minutes without charging ground station will automatically shut down to protect and stop working.

- 
-  ❖ T40 "alarm recovery voltage" is 0.3V higher than the set "alarm voltage"
- ❖ T40 "low voltage shutdown voltage" is 0.3V lower than the set "alarm voltage"

## ***8.9 T40 Charging Instruction***

T40 is built-in 17000mAH lithium battery, video&data link works normal under 1W power , T40 can work about 3.5hs with full load. If the power indicator shows low power, please stop flying and charge the T40 in time.

1. Plug the standard adapter of GCS into a 220V socket, and the output of the adapter into the T40 battery charging port for charging (adapter output: 16.8V)

---

2. When the adapter indicator changes from red to green, the battery is fully charged. You can also check the charging status according to the T40 power indicator.

**Note:**

Please use the factory standard adapter for charging, do not use other types of chargers that do not meet the specifications for charging.

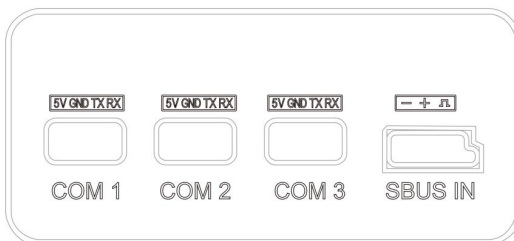
To extend the working time, the external battery also can be used to increase the endurance time

## 9. T40 GCS External Ports Instruction

### 9.1 COM Port Connection Instruction

T40 computer comes with 6 COM ports, among which COM5 and COM6 are for internal use only, COM5 is a special port for Parameters Setting Software, COM6 is a serial data transmission port for remote control, COM4 is an aviation plug, other COM ports are converted to different signals by hardware and lead to data communication with the external devices through the 4 Pin interface on the back of the remote control.

The 4 Pin interface on the back is shown below:



The relation between the interface and port as below:

4 Pin interface at the back	Corresponding port	4 pin line sequence(from top to bottom)
RS232	COM1	pin1-5V, pin 2-GND, pin 3-TXD, pin 4-RXD
RS232	COM2	pin1-5V, pin 2-GND, pin 3-TXD, pin 4-RXD
RS485	COM3	pin1-5V, pin 2-GND, pin 3-A, pin 4-B
SBUS IN	SBUS 2	Pin1- GND, pin 2-5.5V, pin 3-SBUS

## 9.2 Aviation Plug Output Instruction

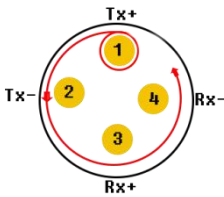
T40 without communication version is with 1 channel of LAN signal, 2 channels of SBUS signal and 1 channel of RS232 signal to communicate with external devices.

T40 with communication version, 4-Pin LAN port no output; among 6-Pin port, 2 channels of SBUS signal and 1 channel of RS232 signal to communicate with external devices.

### Aviation Plug

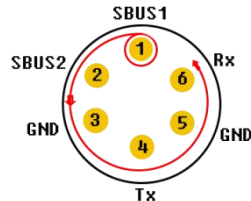
4pin is LAN port, 6pin is 2\*SBUS signal and RS232 signal.

The internal line sequence of the aviation plug is as follow:



LAN口信号线序

LAN port line sequence



SBUS 信号或 RS232 信号线序

SBUS signal or RS232 signal line sequence





- 
- ❖ Welding requirements, iron temperature  $350^{\circ}\pm 10^{\circ}$ , contact time can not exceed 4s.
  - ❖ For welding RS232 signal, TX needs to be connected to RX of user device, RX needs to be connected to TX, GND connected to GND.

## 10. V21 Video Link Module Operation and Use

### 10.1 V21 Connection Instruction

Switch on the remote control, power on the V21 receiver. After the successful connection of two modules (S1, S2 and S3 lights are always on and the signal indicator is constant, this process takes about 20-30 seconds), the device can be used normally.

All parameters of the remote control and receiver module have been configured well at the factory and can be used directly. If you want to modify the serial port baud rate and the IP address of the LAN port, please refer to the corresponding chapter.

#### **Video&data link default parameters:**

User name: admin123

Password: admin123

LAN port IP: 192.168.168.2 (receiver); 192.168.168.1(GCS)

Serial port baud rate: 115200, 8N1

---

## 10.2 V21 Serial Port Use

Default baud rate of Serial Port is 115200, pls refer to below steps to connect flight control and GCS software.

1. Connect the flight control to the airborne unit, note that the line sequence and the baud rate of the flight control port must be the same as the baud rate of the serial port.
2. Connect the ground station software to the ground unit, note that the cable sequence and baud rate of the selected port of the ground station software must be the same as the baud rate of the serial port.
3. If you need to use other baud rate, simply change the baud rate of airborne unit or the device connected to the airborne unit. The ground unit does not need to change the baud rate, just open the ground station and select 115200 to connect.

### Serial Port Baud Rate Change

Press and hold the SET key (approx. 2 seconds) after power on the airborne unit. Release when RX and TX are illuminated, it indicates entering the serial port baud rate change mode. After entering the mode, press the SET key briefly (<1 second) to switch the corresponding baud rate. The corresponding LED is always on to represent the corresponding baud rate, as follows.

Indicator Status	Baud Rate
Rx continuously ON	9600bps
Tx continuously ON	19200bps
S1 continuously ON	38400bps
S2 continuously ON	57600bps
S3 continuously ON	115200bps

After setting, press and hold the SET key (about 2 seconds) and release the key when TX and RX light up at the same time. After releasing, the indicator will

return to normal working status. The baud rate can only take effect after the modification is completed and the power is re-energized.



- ❖ The baud rate of the airborne unit must be changed to the same as that of the flight control or other equipment in order to communicate.
- ❖ The ground unit does not need to change the baud rate, just select 115200 when connecting to the ground station.
- ❖ The baud rate will only be effective after the modification is completed and the power is reapplied.

### 10.3 V21 LAN Port Use

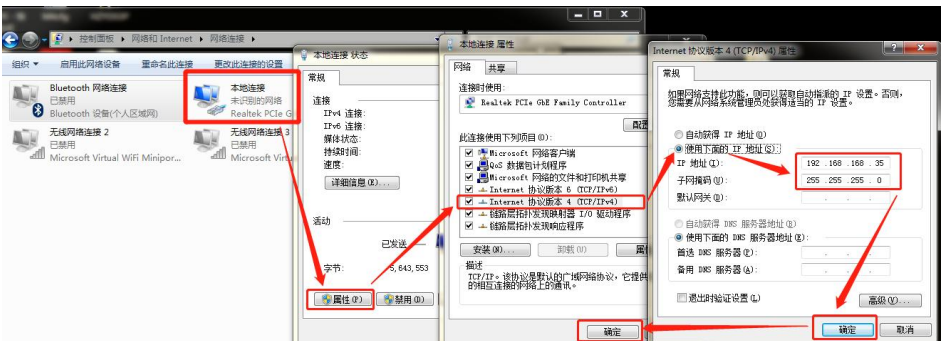
#### 1. Default IP address

Airborne unit: 192.168.168.2 Ground unit: 192.168.168.1

2. Connect the V21 and LAN camera, by 4pin-to-LAN cable. And then power on by 7-12V power supply. LAN port of T40 internal module has been connected to the LAN port.

3. To connect the LAN camera, the IP address of your LAN camera is needed.

Open the computer network settings (TCP/IPV4 properties) and set it to the same network segment as the LAN camera (as shown in the picture below).



- 
4. Select Internet IPV4 protocol, set a fixed IP that is in the same network segment with the camera. For example: the camera IP is 192.168.167.10, set the local IP to 192.168.167.xxx (0 ~ 255) except for these local addresses, 1, 2, 10. Click "OK" after the change is complete.
  5. Use a streaming software such as VLC media player to capture and play the video data.
  6. Open the network pulling player. Here take VLC for example, the first step to open the VLC software, the second step in the "media" to open the "network streaming" as follows



7. Enter the LAN camera address  
`rtsp://192.168.168.20:554/user=admin&password=&channel=1&stream=0.sdp?`
8. The other characters are filled in according to the camera's setup parameters, which are usually equipped with software for viewing or setting, such as the following examples  
`rtsp://192.168.168.20:554/user=admin&password=&channel=1&stream=0.sdp?`

**Instruction:**

192.168.168.20The IP address of the connected device

---

:554 This is the port number of the RTSP service, which can be changed in the network service of the device

user=adminLogin username of the device

password= (empty), If LAN camera has a password, the user needs to fill it in.

channel=1 the first channel

stream=0.sdp? It is the main data rate.

Input and wait for a few seconds to get the video normally.

---

操作  
提示

- ❖ The IP address setting of the V21 can be ignored. When pulling streams to get video. Change the local IP of the computer to the same network segment as the IP camera.
- ❖ Please visit our website "www.chinowing.com" for video tutorials.

## ***10.4 V21 Video&Data Link Quick Reset and Configuration***

If the video&data link becomes unresponsive during use, it is needed to restore the module to factory settings and then configure the parameters. Configure the airborne unit as the master mode and configure the the ground unit as the slave mode.

### **10.4.1 V21 Video&data link quick reset**

**Take the below as an example:**

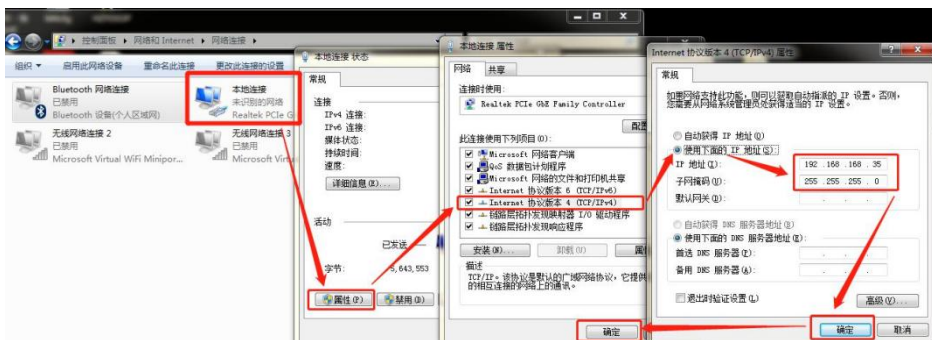
**LAN port IP of the airborne unit: 192.168.168.1;**

**LAN port IP of the ground unit: 192.168.168.2**

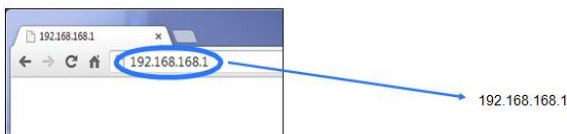
- ① Power on the module normally, wait for the module to start (about 1 minute), connect the PC to the LAN port of the ground unit through the LAN cable to access

the airborne unit directly through the ground terminal, the user can also assess the airborne unit by connecting it directly to the computer.

② Set the local IP to static IP in the PC network sharing centre, the IP is in the same network segment as the IP of the airborne unit, for example: 192.168.168.15.

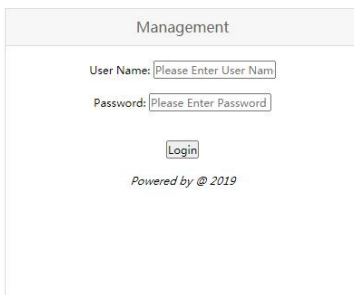


③ Open a browser and enter IP: 192.168.168.1 in the address bar



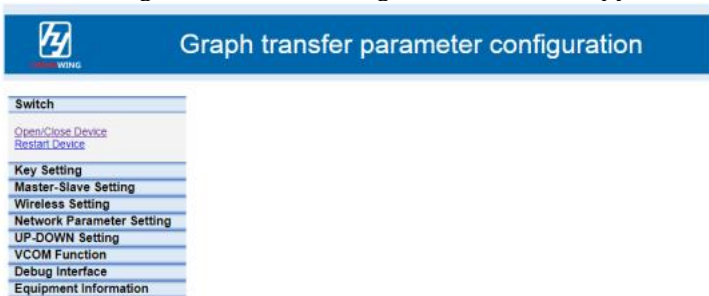
④ When the login screen of the device pops up, click Administrator Login, user name: admin123, password: admin123.

If the login does not respond or if you are prompted with "This browser does not support ActiveObject", please download another browser (e.g. Sogou or Microsoft Edge) or update your browser version and try again.

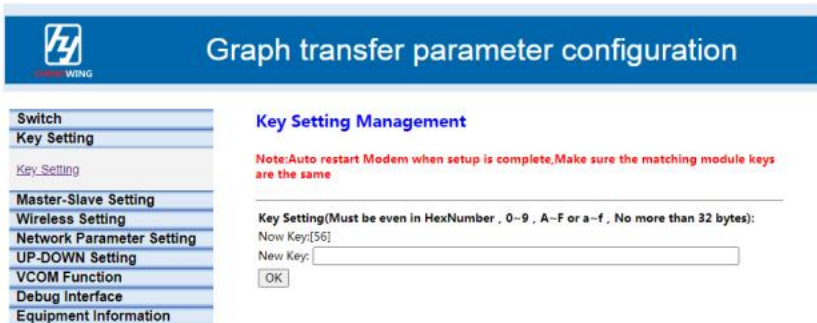




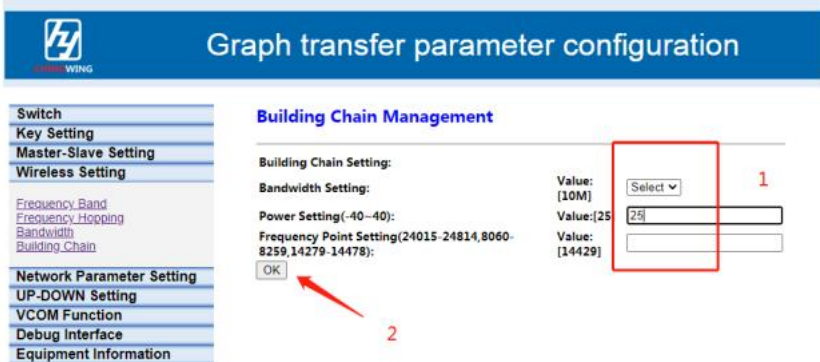
⑤ After successful login, the module configuration interface appears.



➤ The "Key Setting Management" allows you to set the secret key, which must be the same for both the airborne unit and ground unit to communicate.



- "It is recommended not to change the "Wireless parameter settings" master and slave settings to avoid the possibility of poor communication quality due to improper settings.
- **<Wireless Parameters Configuration>** can modify the frequency band, bandwidth, power and frequency hopping. When modifying the frequency band and bandwidth, please make sure the frequency band and bandwidth of the airborne unit and ground unit should be the same, the antenna model used is consistent with the frequency band. The modification of power can be made in **<Building Chain Management>**. For example, changing "-10dbm" to "10dbm" in the power range of <-40db ~ 25dbm>.

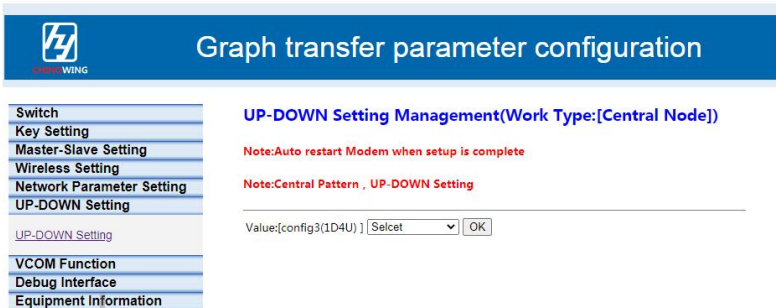


- **<IP Address Change Management>** can modify IP addresses. It is not recommended to change the IP address randomly. If the user wants to change it, please make sure that the ground unit and the airborne terminal are on the same network segment.



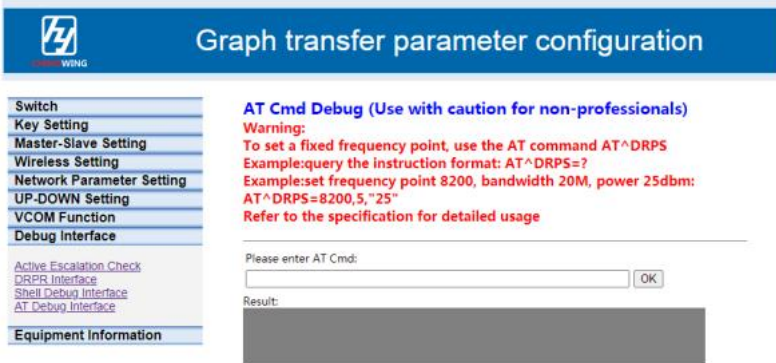


- **<UP- Down Settings Management>** allows the user to change the ratio of uplink rate to downlink rate. If there is not any question, it is not recommended to modify it. If it is needed, the airborne unit setting is valid, **<1D4U>** means the ratio of downlink and uplink is 1:4.



- The **<Debug Interface>** should be modified at the developer's guidance. If the user needs a fixed-frequency point output, use the AT command: AT^DRPS.
- ❖ The first parameter is the frequency point range, please set it according to the frequency point range of different frequency bands.
- ❖ The second parameter is the bandwidth, 1 is 3M; 2 is 5M; 3 is 10M; 5 is 20M;
- ❖ The third parameter is the power, which ranges from **<40db ~ 25dbm>**.

As show below:



⑥ <Equipment Information> shows the current module version number. Please make sure that the version number of the airborne unit and ground unit is the same.

## 11. V30 Video Link Module Operation and Use

V30 HDMI version, in the operation, pls enter the IP address 192.168.168.13 in the browser to set the corresponding parameters.

### 11.1 V30 Video Link Connection Instruction

1. After powering on the airborne unit, connect V30 HDMI port to the camera, and the CPU indicator is continuously ON when there is video input.
2. The LAN port of the internal module of the T40 remote control has been connected to the network port. After the successful connection, check that the computer and set its network settings (TCP/IPV4 properties) to "192.168.168.xxx" (xxx is the address value in the middle of 0 to 255, where 192.168.168.11 and 12,13 addresses are reserved), the default gateway address is set to "192.168.168.1". This IP should be in the same network segment as the airborne unit(as shown in the figure below)



Let's take VLC software as an example,

- 1) the first step is to open the VLC software,
- 2) the second step is to open "Network Streaming" in "Media" as shown below

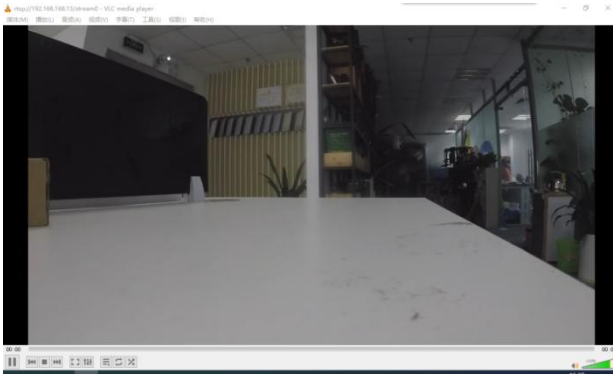


3) Step 3: Enter the pull stream IP address. **Note:** the default IP address of the V30 receiver in the factory setting is "192.168.168.13" enter the following address.

---

**rtsp://192.168.168.13:554/stream0**

After entering the correct URL for the video stream, the video image will be available.



- 
- ❗ ❖ When using the transparent transmission to connect the flight control, pls pay attention to the wire sequence.
  - ❖ Connecting V30 Tx to the Rx of the flight control or other equipment, Rx corresponding to Tx and GND corresponding to GND.
  - ❖ When linking, note that the baud rate of the flight control and the V30 or ground station need to be the same, otherwise the link cannot be established.

## ***11.2 Display the Video in Mission Planner***

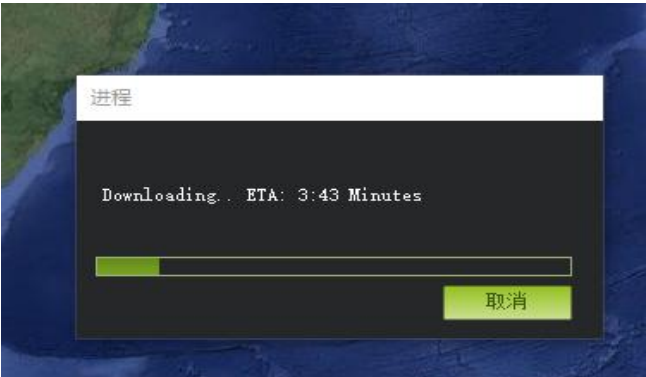
First, verify that the video stream is available in video software such as VLC and open MISSIONPLANNER;

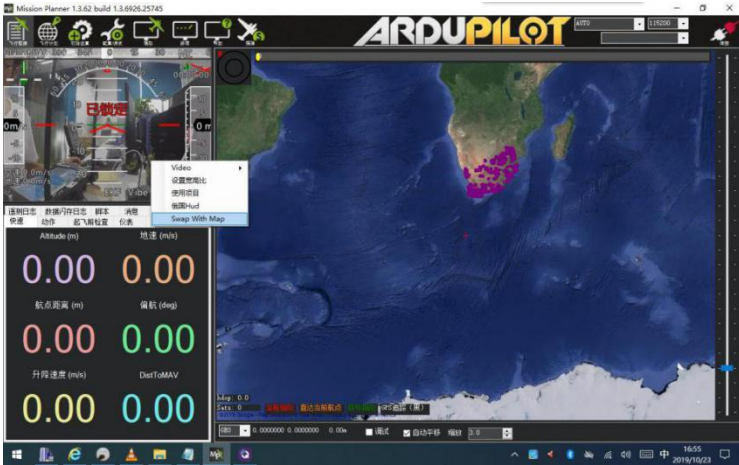
- 1.Press the right mouse button (or long press) in the HUD window
  - 2.Click VIDEO
  - 3.Click GetGstreamer source
  - 4.Enter the following address (Note size set and half symbols)
- rtspsrc location=rtsp://192.168.168.13/stream0 latency=0 ! decodebin !  
videoconvert ! video/x-raw,format=BGRA ! appsink name=outsink

5. For the first time usage, download the relevant software package and wait for the download to complete. Restart software.

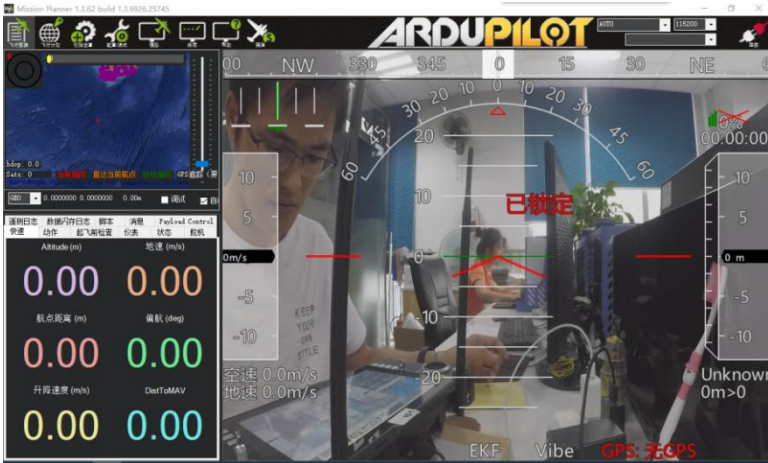


6. After finishing steps 1-4, the camera video source can be obtained.





7.The video interface and mission planning interface can be switched by right click.

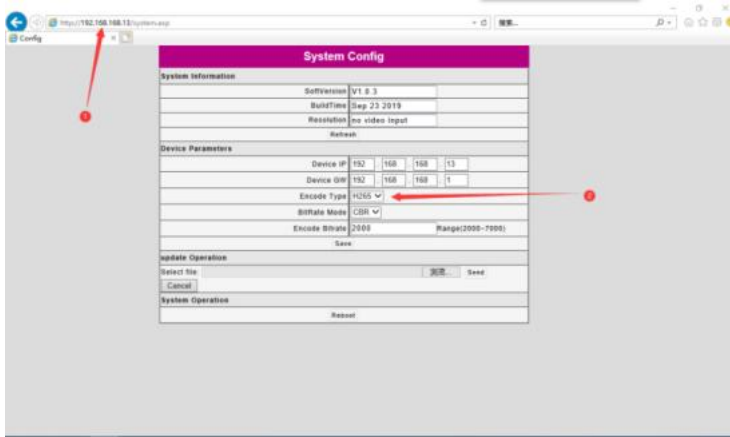


### 11.3 Display Image in QGC Software

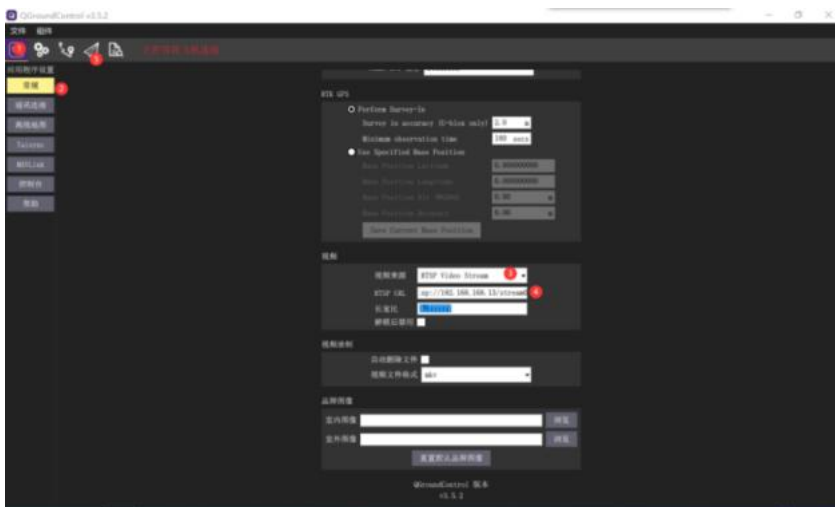
First, verify the video stream can be obtained in video software such as VLC and open QGC;

1. Currently, QGC does not support H.265 encoding, it is needed to input in the browser IP:192.168.168.13 to log in V30 Transmitter.

2. Change the video encoding mode to H.264



3. Open QGC software, Click general and find video. VIDEO source chooses RTSP VIDEO STREAM; in RTSP URL, input RTSP: // 192.168.168.13 / stream0



# 11.4 V30 Parameters Configuration

## 1.Connecting the device

The V30 or ground unit can be configured via serial port. Power on V30 and connect V30 serial port. Start T40 directly and open the serial port assistant.

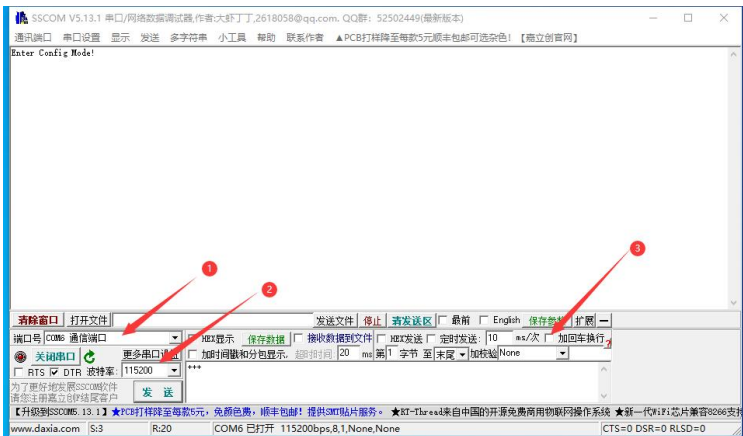
## 2.Power on the device and wait for device initialization

About 3s after the device is powered on, the CPU light flashes, indicating the successful device initialization.

## 3.Enter serial port configuration mode

Note that the COM6 port is used for the T40 and the port number of the tool is used for the V30 receiver. Use the serial port tool on the computer, set the baud rate to 115200bps, the data bit to 8, the stop bit to 1, no parity bit and no flow control.

After opening the serial port, enter "++++" three plus characters in the serial port tool, the terminal will display "Enter Config Mode!"







**Note:** Line feeds and carriage returns cannot be sent in the configuration.

#### 4. Enter configuration command

Enter the corresponding configuration command and wait for the device to return **OK**, indicating that the command was sent successfully.

As shown in the figure below, configure the serial port baud rate to 115200, enter the command "AT^SBR=115200".

The device returns <**OK**> to indicate successful modification. If showing <**ERROR**>, it indicates the command input is wrong or the parameter is invalid.



## 11.5 Supporting Instruction Sheet

Type	Command	Parameters Value	Parameter instruction
Setting RF transmitting power	AT^SPWR=	1	Low power 15DBm
		2	Moderate power 20DBm
		3	High power 25DBm
Setting baud rate of serial	AT^SBR=	9600	Baud rate 9600
		14400	Baud rate 14400

port		19200	Baud rate 19200
		38400	Baud rate 38400
		56000	Baud rate 56000
		57600	Baud rate 57600
		115200	Baud rate 115200
		128000	Baud rate 128000
Carrier frequency	AT^SCHN=	1	800MHZ
		2	1.4GHZ
		3	2.4GHZ
BIND KEY	AT^SKEY=	6001	To communicate, the KEY of airborne end and terminal end must be same.
Bandwidth	AT^SBW=	1	3M
		2	5M
		3	10M
		5	20M
Set the master-slave mode	AT^SMOD=	1	Central node(main mode)
		2	Slave node(slave mode)
Set the fixed frequency mode	AT^SFIX= type,Freq	0	Type=0: cancel the fixed frequency mode
		1	Type=1, set the fixed frequency mode
		Freq	8060-8259,14279-14478,24015-24814,17850-18050

Query the setting value of the current configuration of the device, enter the following command.

Type	Command	Parameter value	Parameter instruction
Query RF transmitting	AT^GPWR	1	Lower power
		2	Moderate power

power		3	High power
Query frequency	AT^GBW	800MHz	800MHz
		1.4GHz	1.4GHz
		2.4GHz	2.4GHz
Query baud rate of serial port	AT^GBR	xxxxxx	Current baud rate value
Query KEY	AT^GKEY	XXXXX	Current KEY
Query fixed frequency status	AT^GFIX	xxxxxx	Return fixed frequency status
Query bandwidth	AT^GBW	xxxxxx	Return the current bandwidth value
Query main/slave mode	AT^GMOD	^DDTC:1,1	Main mode
		^DDTC:2,2	Slave mode
Query software version no.	AT^GVER		Return the MCU firmware version no. info. of the current device

Exit the serial configuration mode

Type <ATE> in the serial port tool. Wait for the device to return to <Exit Config Mode!>, indicating successful exit of serial port configuration mode.



---

## 12. V40 Video Link Module Operation and Use

### 12.1 V40 Connection Instruction

Switch on the remote control, power on the V40 receiver. After the successful connection of 2 modules (the V40 LINK light is always on and the T40 S1-S3 signal indicators are constantly ON, this process takes about 1 minute), the self-test is completed when the work light is always on and the device can be used normally.

The V40 video link has been set at the factory, and by default the ground unit and the airborne unit can be communicated directly. If you would like to change the serial port baud rate and the LAN Port IP address of data link, please refer to the corresponding sections.

#### Video Link&Serial Port IP address:

Name	IP Address
Video link Ground IP	192.168.168.1
Video link Airborne IP	192.168.168.2
Serial Port Airborne IP	192.168.168.19

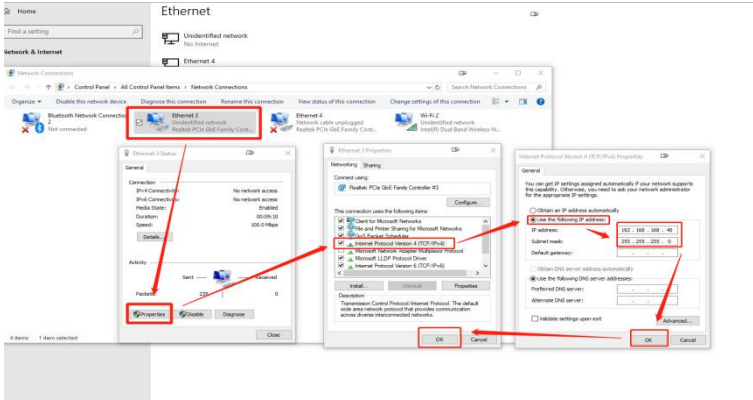
All of the above IP addresses can be accessed in the PC's browser and able to do the parameters configuration.

In order to prevent users from having problems such as not being able to search, not being able to ping, and not being able to open web pages in the application.

After the successful connection of the hardware, pls do the following:

- ① Turn off your computer's firewall and antivirus software (usually in the control panel).

- ② Turn off network cards not related to this test and keep only one local connection or WIFI.
- ③ The IP of the computer must be set to a static IP in the same network segment as the IP /\*f the V40, e.g. 192.168.168.35.



**V40 video link web login:** user name: admin123; password: admin123  
**Serial port web login:** user name: admin; password: admin

## 12.2 Serial Port Configuration Instruction

Baud rate of V40 all serial ports : 115200,

**Default IP address:** 192.168.168.19

Operating mode: TCP Server

### Serial port operating mode

Item	Operating mode	Local port	External port
Airborne unit	TCP Server	10	TTL
		20	RS232
		30	RS485

---

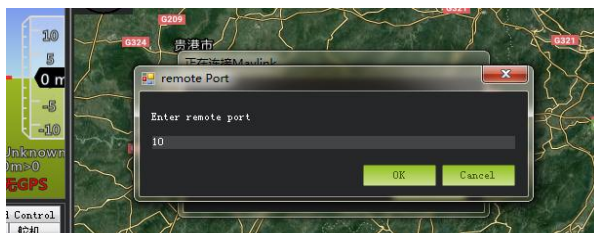
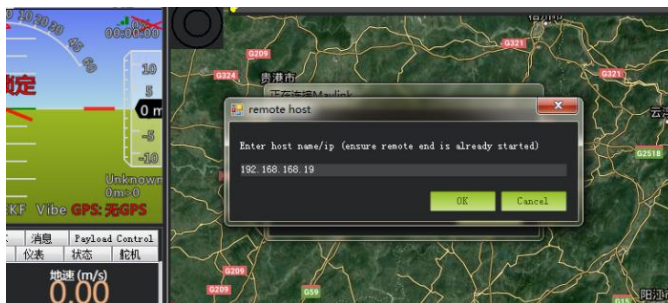
After the successful connection of T40 and V40, the serialdata transmission can be done via TCP protocol or virtual port.

### 12.2.1 TCP connection

Take TTL port 10 as an example,

if you use TCP protocol for communication, open the Mission Planner, select TCP communication method, enter the airborne unit serial port IP address 192.168.168.19.

The port should be selected as the external interface corresponding to the airborne uni. Establish the connection (baud rate does not need to be selected). If you are using RS232, port number is 20, RS485 corresponding port number is 30.

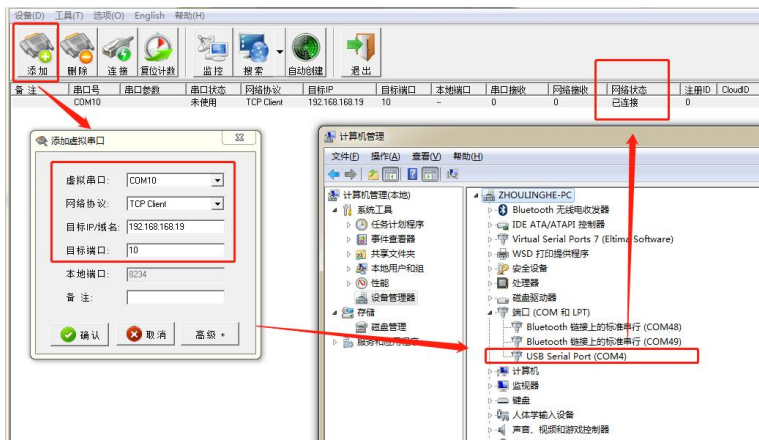


### 12.2.2 Virtual Serial Port Connection

Install the Virtual Port Toolkit; click **Add** to bring up the <Add Virtual Serial Port> interface; select an unused port number; select **TCP Client** for the network protocol; enter the IP address and corresponding port number of the serial module of the airborne unit, click **Confirm** to see a new port <ELTIMA Virtual Serial Port> added to the Device Manager. This port is the virtual serial port of the network.

If you are using a COM port for communication, the user can use the virtual port tool to virtualize the network connection as a port.

Click on "Add", protocol TCP client, select the virtual serial port COM4, network protocol **TCP Client**, target IP: 192.168.168.19 (this IP is the IP of the module), target ports 10\20\30 (corresponding to the TTL/RS232\RS485 of the airborne unit), create the serial port com4.

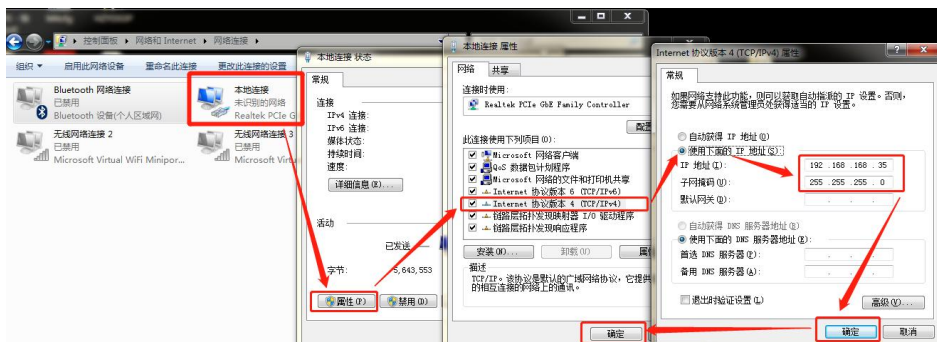


The above is the TTL virtual serial port added for port 1

## 12.3 Serial Port Configuration Modification Instructions

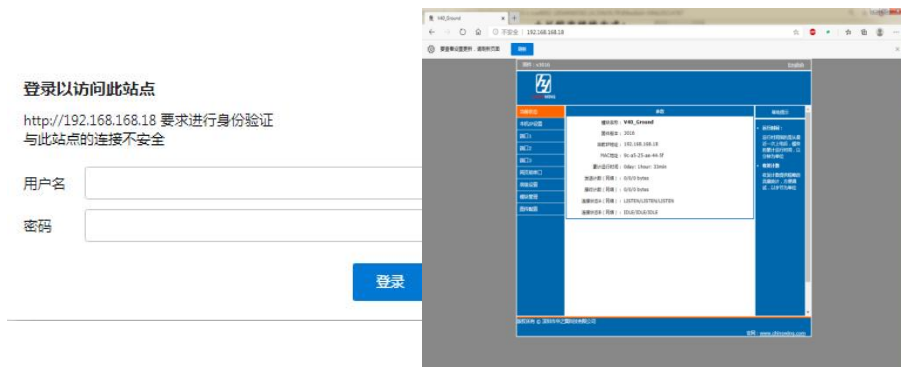
If the user needs to change other configurations, connect V40 to the computer via WIFI or the LAN cable.

① The IP of the T40 computer must be set to a static IP in the same network segment as the IP of the V40, then open the network adapter and select the network adapter connected to the V40 to set a static IP address, e.g. 192.168.168.35



② Open the browser and enter "192.168.168.19" to connect to the ground unit serial port module to enter the web configuration interface.

User name: admin Password: admin; After entering, in the upper right corner, Chinese and English versions can be switched.



③ 3 channels of serial port settings corresponding to the V40 external interface: port 1 → TTL, port 2 → RS232, port 3 → RS485; if the user needs to change the



baud rate as shown below, enter the corresponding baud rate to save the settings, the baud rate supports 600-230400bps.



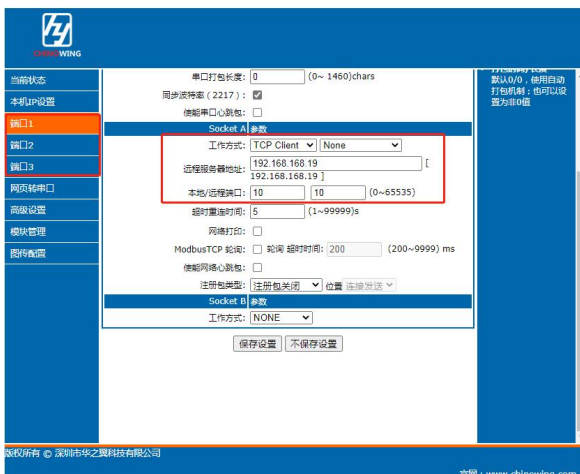
④ Serial ports supports TCP Server, TCP Client, UDP, Httpd Client, WEB to Serial (Websocket), etc.

Default working mode:

airborne unit: TCP Server local/remote, 3 ports are 10, 20, 30.



The ground unit can access any port of the airborne unit (TCP Server) using (TCP Client) and can support up to 8 TCP Client mode accesses at the same time. If the user's computer can access any port via WIFI, just fill in the port number of the remote (airborne unit) port number in the ground end.



If the connection is made via the device's external interface, it is necessary that the serial signals on both sides of the V40 are identical otherwise no communication can take place.

⑤ Advanced settings where the module name, user name and password can be changed and the data reset time defaults: 60 seconds, do not change this parameter.



## ⑥ Video link configuration

Click on the "Jump" button in the configuration of the serial port, and then the page will be automatically redirected to the corresponding log-in interface of the video link configuration.

Login username: admin123 Password: admin123



Please refer to the section of V21 module configuration for configuration of V40 module.

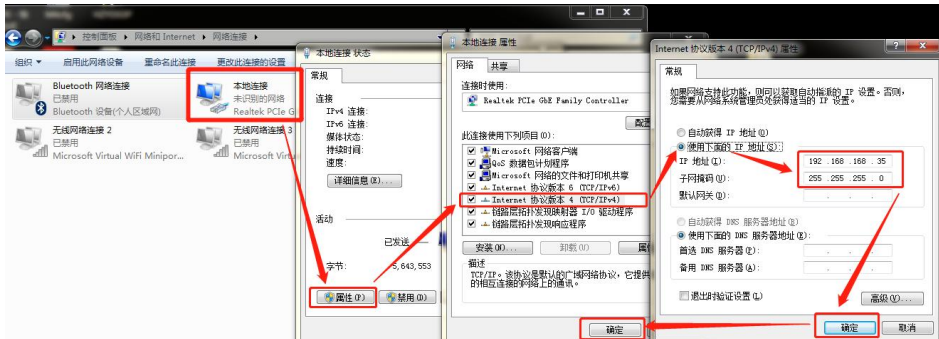
## ***12.4 V40 HDMI Operation Instruction***

Connect the HDMI video source from the camera to the HDMI port V40 Air, the HDMI indicator will always be on when the video source input is normal, off means no video source input.

### **The methods to obtain HDMI video streaming**

First connect the V40 Ground to the computer by WIFI or LAN port, or the user can connect the LAN port on airborne unit directly to the computer for access.

After connecting the V40 to the computer, check that its network settings (TCP/IPV4 properties) and set it to "192.168.168.xxx" (xxx is the address value in the middle of 0 to 255, where 192.168.168.1 and 2, 19, 13 addresses are reserved and cannot be used )



Let's take VLC software as an example,

the first step is to open the VLC software, the second step is to open "Network Streaming" in "Media" as shown below



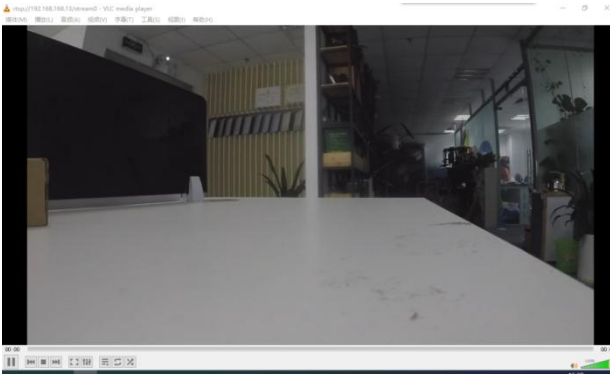
The third step: Enter the pull stream address, note: the V40 HDMI module is factory set with a default IP address of "192.168.168.13"

Enter the following address:

**rtsp://192.168.168.13:554/stream0**

---

Enter the correct video stream address URL, the video image can be obtained.



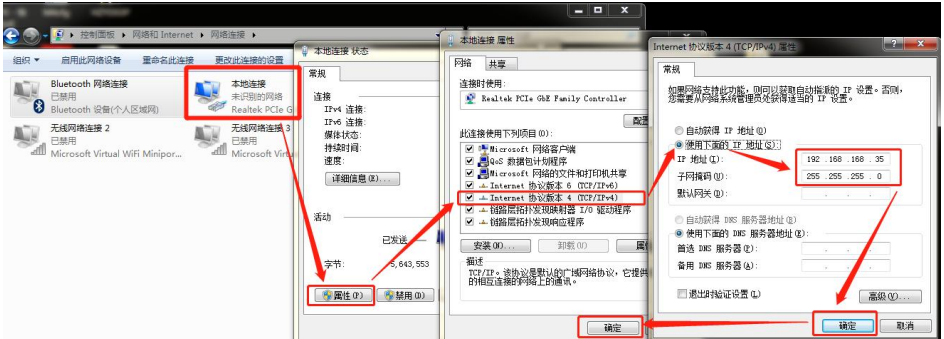
## ***12.5 Airborne LAN Port Operation***

The LAN port of the airborne unit can be connected to your IP camera by LAN-to-GH 4pin cable for video transmission.

Pull stream operation at the ground end.

1. In order to have a better experience, change the IP address of the IP camera to the same network segment "192.168.168.XX" as the V40. This will allow you to access the serial port, HDMI and LAN devices at the same time.

2. After the IP address is changed, the computer can choose to connect with the ground en by LAN cable or by WIFI. After connection, the computer also needs to be changed to the same network segment as the V40, the user can pull the stream operation.



3. Open the network streaming player, here take VLC for example, the first step to open the VLC software, the second step in the "media" to open the "network streaming" as follows



4. Enter your IP camera video streaming address  
 rtsp://192.168.168.20:554/user=admin&password=&channel=1&stream=0.sdp?

---

5.The other characters are filled in according to the camera's setup parameters, which are usually available with software to view or set them, as in the following example

rtsp://192.168.168.20:554/user=admin&password=&channel=1&stream=0.sdp?

### **Instruction**

192.168.168.20 The IP address of the connected device

:554This is the port number of the RTSP service, which can be changed in the network service of the device

user=admin Login username of the device

password= 密码空 (empty)

channel=1 the first channel

stream=0.sdp? It is the main data rate.

## **13. Video Link Parameters**

### ***13.1 V40 Video Link Parameters***

Frequency	2.304 - 2.390GHZ 2.402 - 2.482GHZ 2.500 - 2.570GHZ	adjustable
RF power	300mW	
Transmission range	10km grade@LOS condition	Depend on the environment
Serial port	TTL, RS232, RS4845	Able to work simultaneously
Bandwidth	3M/5M/10M/20M	adjustable
Video input	LAN*1, HDMI*1, AV*1	
SBUS output	SBUS*2	

Power supply port	XT40	
Power supply voltage	12-24V	
External interface	GH1.25	
Operating temperature	-35°C-+60°C	
Antenna	ZYJB antenna 3dB	
Operating current	12v 560mA	
Weight	230g	Exclude antennas
Dimension	116mm*69mm*31.5mm	

### ***13.2 V21 Video Link Parameters***

Frequency	800MHz(806-826MHz) 1.4GHz(1427.91447.9MHz) 2.4GHz(2401.5-2481.5MHz)	Modify in the software
Bandwidth	3-20MHz	adjustable
Video input interface	LAN port	
CODEC	H.265/H.264	adjustable
Video data rate	2~12Mbps	adjustable
Modulation	OFDM	
Output power	Max 25 dBm	
Data/control interface	UART *1/SBUS *2	
Video definition	1080p60 max	
Antenna interface	SMA	
Power supply voltage	9~24V	Recommend 3S battery power



		supply
Weight	100g(exclude)	
Dimension	85mm(L)*55mm(W)*20mm(H)	
Operating temperature	-10~+50°C	

### ***13.3 V30 Video Link Parameters***

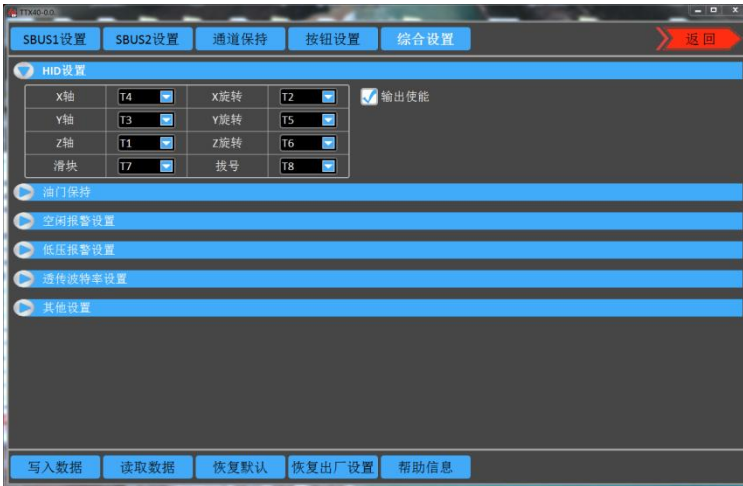
Frequency	800MHz/1.4GHz/2.4GHz	
Bandwidth	10MHz/20MHz	adjustable
Video input interface	HDMI port, CVBS port	Cannot work simultaneously
CODEC	H.265/H.264	adjustable
Data rate	2~12Mbps	adjustable
Modulation	OFDM	
Output power	Max 25 dBm	
Date/control interface	UART *1/SBUS *2	
Video definition	1080p60 max	
HDMI port	Type A	
Antenna interface	SMA	
Power supply voltage	9~12V	Recommend 3S battery power supply
Weight	120g(exclude antennas)	
Dimension	364mm(l)*190mm(w)95mm(h)	
Operating temperature	-10~+50°C	

## 14. HID Controller Instruction

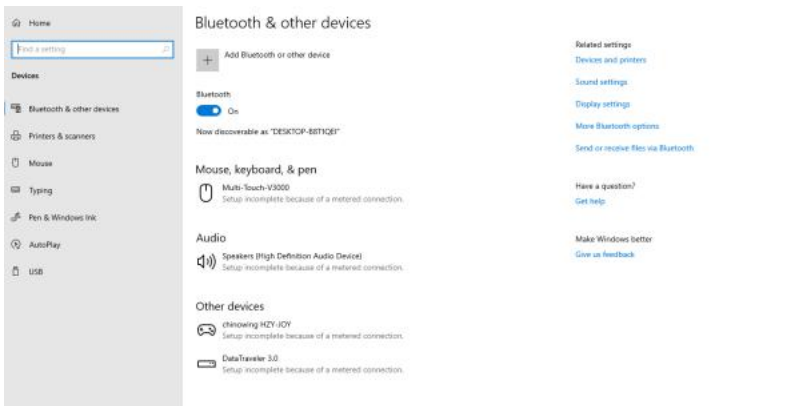
In order to meet more requirement of the customers, we integrated all channels into HID device controller in T40. If your remote control does not find HID device controller, please do not be confused, you may be using the old hardware version of T20 or T21 that does not support HID function.

Pls refer to below to check HID usage: Open T40 upper computer software, Channel Configuration-> Comprehensive Configuration-> HID setting. Set the

channel, enable , and then close upper computer software.



1. Open the control panel, locate the device bar, and click and enter.

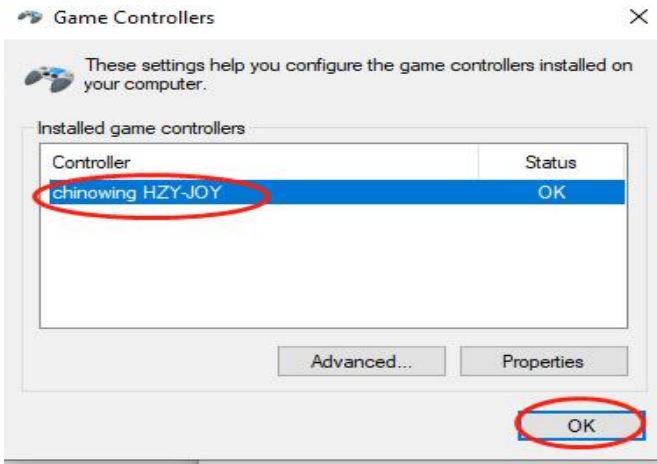


2. Enter Devices and printers.

3. If there is a device called "chinowing HZY-JOY" in the device list, it means that your remote control has HID gamepad function. If not, it does not support.



4. Click the right mouse button and select "Game Controller Settings".



5. Select "chinowing HZY-JOY", click on properties and the user will see the individual channels in the test bar. When you move the joystick, the status of the corresponding channel will change. The X/Y axis, Z axis, X-rotation, Y-rotation, Z-

rotation, dials and sliders are mapped to analogue channels, the visual headset is mapped to one of the joysticks, and the buttons are mapped to digital channels such as three-position switches and buttons. The exact mapping relationships can be determined by testing.



**Note:** The gamepad currently only supports use with the Parameters Setting Software turned off.


## 15. Firmware Upgrading Operation Steps

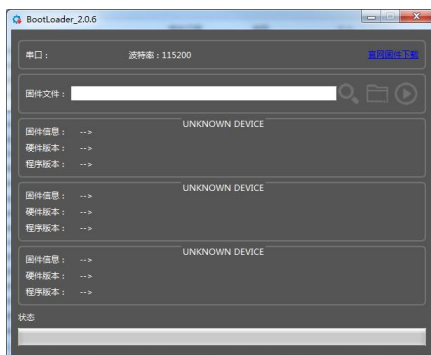
Pls use the firmware upgrade tool to upgrade the firmware of the remote control and the receiver separately.

### 15.1 T40 GCS Firmware Upgrade

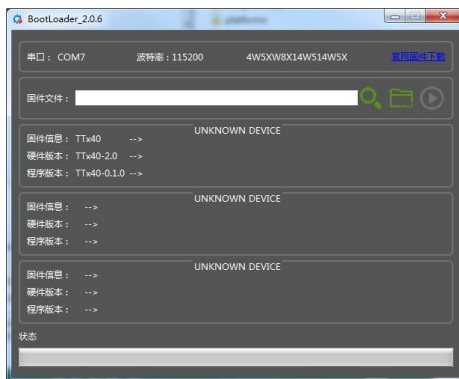
1. Click on the official website to download the firmware, select the appropriate version of the firmware and save it locally.
2. Dial the joystick as the below picture, press T40 power button simultaneously. At this time, power indicator begins to flashing.



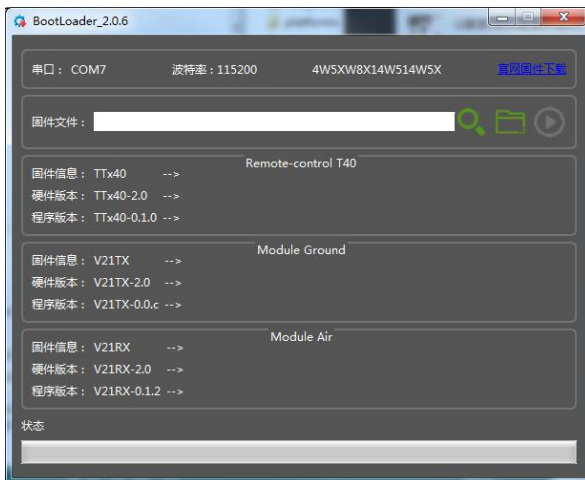
3. After the PC boot is completed, open the firmware upgrade in the tool platform 



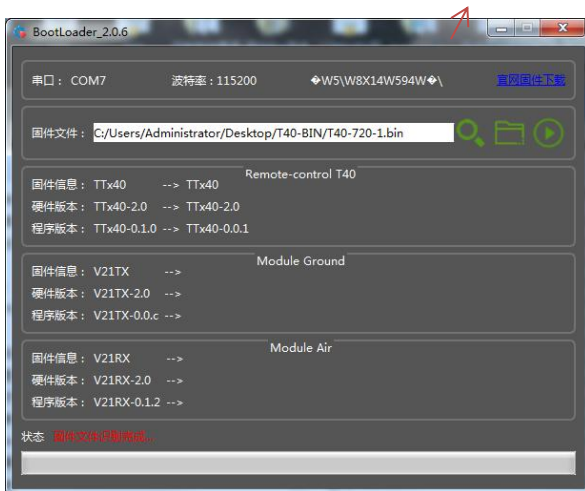
4. At this time, the serial port of firmware upgrade tool has been connected, and the current hardware, firmware and other information of the GCS are displayed, as shown in the figure below:



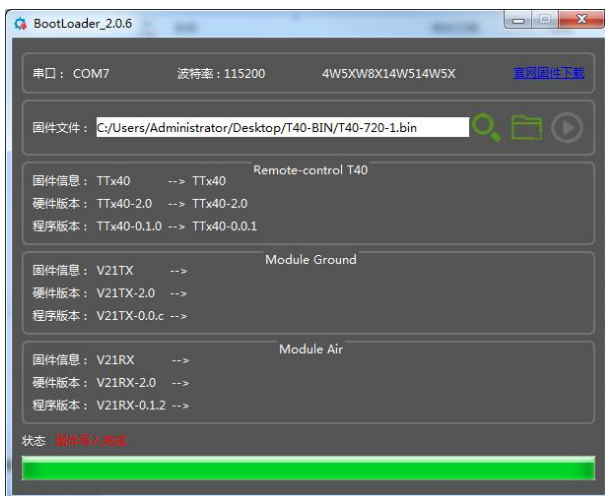
5. Click the search symbol to search out the datalink that have been linked on, as T40 below, Module ground, Module Air.



6. Click on the folder symbol, select the link file you want to upgrade, as shown below to upgrade the T40 ground station




7. Click the Start menu to start the firmware upgrade, the green progress bar at the bottom shows the progress of the upgrade.



## 15.2 V21 Receiver Firmware Upgrade

1. Click on the official website to download the firmware, select the appropriate version and save the firmware to your local area.
2. With the receiver disconnected, connect the receiver's TTL interface to the PC via the receiver's frequency pairing cable.
3. Press and hold the SET button on the receiver while powering up the receiver.
4. The indicators RX and TX indicator light ON long enough to release the button.
5. Open the upgrade software tool within 1 minute.
6. After a successful connection, it can be seen that the firmware upgrade tool serial port is connected and shows the current version of the receiver, firmware and other information.
7. Open the path to the firmware file you have just saved, confirm that it is correct and click the Start button.
8. Wait for the firmware upgrade until the firmware upgrade completion dialog box pops up, close the firmware upgrade tool, firmware has been upgraded successfully



- 
- 
-  ❖ Please strictly follow the operation steps and make sure that all other software that use the port, such as serial debugging assistant, are closed to release the occupation of the port, otherwise the upgrade may fail.
- ❖ Please select the corresponding firmware, if the firmware does not match, the upgrade will fail

## 16. Common Questions

1. Press and hold the power switch on the remote control, no "didi" sound is heard and the red power light only lights up once

Pls ensure whether T40 power supply is normal

2. The receiver is powered up normally, but there is no signal output

Pls ensure whether ID, Channel, bandwidth of the receiver and remote control are the same.

3. The receiver SBUS has signal output, but the serial port cannot be connected, or the transmission signal is garbled

Please check that the baud rate of the serial port of the remote control and the receiver are the same; and set it to the baud rate corresponding to the ground station software.

4. There is interference when two or more devices are started up at the same time

Please check that the ID of each set must be different and the channel must be set differently to avoid interference of the same frequency.

5. The parameters setting software shows <Remote control port not found>

Verify that the remote-control port number is correct.

# 17. T40 Specification

GCS T40			
Overall weight	5980g	Dimension	354mm(L)*280mm(W)*80mm(H)
Operation temperature	-20℃-+60℃	Remote control latency	30ms
Battery capacity	16.8V/13600mAh (external battery also supported)	Endurance	3h@full battery capacity
Physical channel	27	Touch pad	10-finger capacitive touch screen
	Main joystick*2 (industrial joysticks with hall sensors) Auxiliary rocker*4 Key buttons*12 Simulate keystrokes*7	Display screen	13.3inch 1920*1080 1000CCD (top screen) 12.1inch 1280*800 1500CCD (bottom screen)
Remote control function	Dual SBUS independent output, able to control the vehicle and the payload simultaneously	Human interface	USB HID device
CPU	Intel i7 8565U/10500U	Memory	8GB
Operating system	Win7/win10/Linux	Storage	256GB SSD
Serial port	RS232*3, SBUS in/out	Network port	WIFI/Bluetooth/4G
External interface	USB3.0, LAN, HDMI in, VGA out, Hi-fi	Charging port	DC16.8V
Antennas	4dBi rod antenna/10dBi fiber-glass epoxy antenna (other antennas also can be connected externally)	Communication system	V30(10km grade) V21(10km grade) Supporting the 3 <sup>rd</sup> party communication