ALLTECH

T460-HD UAV Transmitter

User Manual

Shenzhen Keweitai Enterprise Development Co., Ltd.

About This Manual

This user manual is only used as a guide. Product images and description only for reference purpose, detailed information is in accordant with the final product. This User Manual is subject to change without prior notice. You can visit http://en.keweitai.com for the latest updated version. Please read this user's manual carefully before using it.

Keweitai provide a full technical support to customers, users can contact the local office and also the company headquarters directly.

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Shenzhen Keweitai Enterprise Development Co., Ltd.

Address: 2F, Building C3, Hengfeng Industrial Area, Baoan District, Shenzhen.

Zip code: 518126 http://en.keweitai.com

Tel: 0755-27364977 Fax: 0755-27364601

Customer service email: mail@keweitai.com

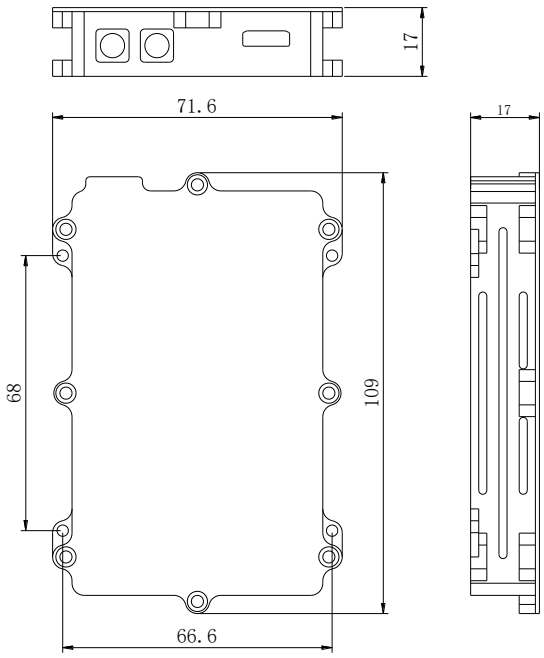
Content

1 Functions & Features

- AES encrypted video transmission
- Aluminum alloy casing with good shock resistance
- External digital frequency controller; lithium battery replaceable
- Mobile video transmission in NLOS (No line of sight) condition
- COFDM modulation and H.264 compression for stable and high-quality audio and video signal
- Support HDMI signal input
- Multiple bandwidth adjustable, 1.5/2/4/6/7/8MHz
- Video input PAL/NTSC optional (PAL as default)

2 Product Dimensions

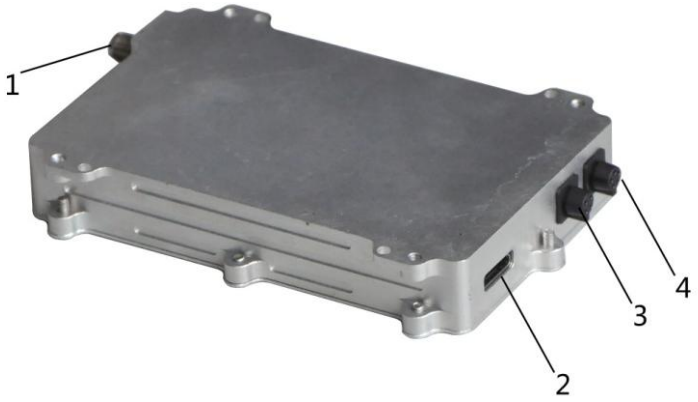
2.1 Transmitter Dimension



Dimension（mm）

Weight：56g

2.2 Interface Definition



2.2.1 RF OUT

RF output interface, external connecting to antenna or amplifier. Interface mode is SMA.

2.2.2 HDMI input interface

HDMI signal input interface. Interface mode is MINI-HDMI（HDMI C Type）.

2.2.3 4-core socket

From left, the first needle is the first pin (leg), the second needle is the second pin (leg) , the interface definition as below:

Pin	Definition	Function	Remarks
1	VIN	Power input	External DC7V~16V power input
2	GND	Power input ground	External power input ground

2.2.4 5-core socket

From left, the first needle is the first pin (leg); the second needle is the second pin (leg), the interface definition as below:

Pin	Definition	Function	Remarks
1	VIN	Power input	External power input
2	GND	Power input ground	External power input ground

3	TX1	Serial configuration T	External digital frequency modulator R
4	RX1	Serial configuration R	External digital frequency modulator T

3 Hardware installation and attention

NOTICE: The device should be first connected to the antenna and then turn on the power to begin to work, while the power should be switch off before dismantle the system. If not, the system will be broken.

3.1 Power Supply

Before device is powered on, ensure the transmitter has connected with antennas or load to avoid short-circuit or open circuit.

3.2 Antenna Selection

Select antennas with a 2400~2483 MHz frequency range and 5dBi connect with transmitter directly.

3.3 Environment

The device is dust-proof and water-proof, try to avoid getting close to radiator, and do not put in the high temperatures place for long time. Electromagnetic environment testing is recommended before use to guarantee there is no channel interference.

3.4 Remarks

All parameters have been set for default. Any adjustment is not allowed without good understand of this manual.

3.5 Accessories

Digital tuner: Used to change the work frequency and parameters of the transmitter, more details in chapter 5.

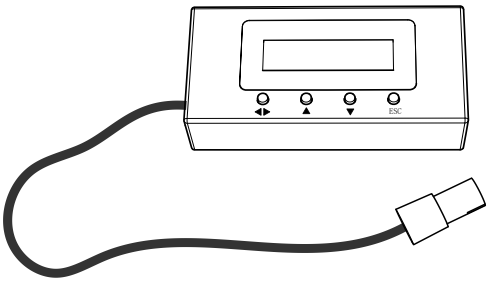
Power line: Used to supply power to transmitter.

4 In the Box

- 1 X Transmitter
- 1X User Manual
- 1X Digital Frequency Modulator
- 1X Power Line

5 The frequency adjuster user operation

5.1 LCD modules



LCD modules are combined with LCD display and three buttons. From the left to right there are menu button ◄ ► , up key ▲ , down key ▼ and cancel button **ESC**, 4-core plug interface.

NOTE: make sure there is an antenna or load in the antenna interface BEFORE turn on the transmitter or the system broken.

5.2 LCD handing precautions

The transmitter is in default setting before shipping out from the factory. If there is no special requirement, please do not modify. For more technical question, please contact with our local agent or our sales engineer directly.

5.3 Detailed Operation Table of Display Board

5.3.1 LCD Display Initial Interface

T460 Control
V5.0-2012.11.01

The device operational procedure name and version are different according to the production date.

5.3.2 Main menu interface

Fre :2430MHz HDMI OK

Fre: 2400MHz, the current video transmitting frequency;

HDMI OK: the current video source and its lockout state.

5.3.3 Frequency Setting

Press MENU under main menu interface to enter frequency setting:

Frequency :
2430MHz

Press UP and DOWN to change the frequency. For instance: from 2400MHz to 2410MHz, press UP with 1MHz step and then press MENU to store the change; return to the main menu interface, until now the frequency adjustment is finished.

Fre :2440MHz

The current transmitter frequency is adjusted as 2410 MHz.

5.3.4 Exit from Menu

Press ESC under any sub-menu to return to the main menu without storing the current menu settings

5.4 Detailed Configuration Instructions of Tx Module

5.4.1 Power Output

Long press UP ▲ about 5s under the interface above to enter the transmitter power output setting:

Attenuation：
3

It shows the current adjustable attenuator with range 0~15 and default setting 1; IL: the number adds 1, it means 1db attenuator increased, the power output get smaller; the larger number is, the smaller power output gets while the smaller number is, the larger power output gets, in this way, the power output is maximum when the number is 0 and power output minimum when the number is 15.

5.4.2 Bandwidth

Press MENU ◄ ► under the above interface to store the configured attenuator and then to enter the bandwidth setting:

Bandwidth：
2MHz

It shows the current bandwidth that could change by UP ▲ and DOWN ▼ with options: 1/1.5/2/4/6/7/8MHz.

Note: 1MHz is not available now.

5.4.3 Modulation

Press MENU ◄ ► under the above interface to store the bandwidth mode and enter modulation setting:

Mode：
QPSK

Press UP ▲ and DOWN ▼ to change the transmitter modulation under the current interface with QPSK, 16QAM and 64QAM three modes optional.

5.4.4 FEC

Press MENU ◄ ► under the above interface to enter transmitter FEC setting:

FEC：

1/2

The transmitter FEC could be changed by UP ▲ or DOWN ▼ with 1/2, 2/3, 3/4, 5/6 and 7/8 five modes optional.

5.4.5 GUI

Press MENU ◄ ► to store the adjusted FEC and enter the transmitter GUI setting:

GUI:
1/32

The transmitter GUI could be changed under the current interface by UP ▲ and DOWN ▼ with 1/32, 1/16, 1/8 and 1/4 four modes optional.

5.4.6 FFT

Press MENU ◄ ► to store the adjusted GUI under the above interface to enter FFT setting:

FFT:
2K

The transmitter FFT could be adjusted by UP ▲ or DOWN ▼ under the current interface with 2K and 8K two modes optional.

Note: 8K is not available now.

5.4.7 Video Input

Press MENU ◄ ► to store the configured FFT and enter the video input:

Video Input:
HDMI

The transmitter video input could be adjusted under the current interface by UP ▲ or DOWN ▼ with HDMI, CVBS, SDI and AUTO four modes optional.

5.4.8 Audio Input

Press MENU ◄ ► to store the video input mode and enter audio input setting:

Audio Input:
Stereo

The transmitter audio input could be adjusted by UP ▲ or DOWN ▼ with stereo and single-track two modes optional.

5.4.9 MIC Input

Press MENU ◄ ► under the above interface to store the adjusted parameter and enter MIC input:

Mic_Input:
On manual

There are three modes optional under such interface:

On manual: manual mode. MIC and right channel are all in effect; MIC gain could be manually adjusted with range {0, 40} dB and 0.5dB step, right channel gain 0dB.

OFF: left channel and right channel are in effect with 0dB gain.

On auto: MIC and right channel are all in channel. MIC maximum gain 12dB while right channel gain 0dB.

5.4.10 Audio Bitrate

Press MENU ◄ ► to store the configured parameter under the above interface and enter the audio bitrate setting:

Audio_BitRate:
384 Kbps

It shows the current audio input bitrate, which is only readable under AUTO mode, adjustable by UP and DOWN under Manual Mode. The single-track audio bitrate range: 32kbps, 48kbps, 56kbps, 64kbps, 80kbps, 96kbps, 112kbps, 128kbps, 160kbps and 192kbps; dual track bitrate range: 64kbps, 96kbps, 112kbps, 128kbps, 160kbps, 192kbps, 224kbps, 256kbps, 320kbps and 384kbps.

5.4.11 Video Input Bitrate

Press MENU ◄ ► to store the configured parameter under the above interface and enter the video input bitrate setting:

Video_BitRate:
4780 Kbps

It shows the current video bitrate which is only readable under AUTO mode and adjustable by UP and DOWN under MANUAL mode.

5.4.12 Video Standard

Press MENU ◄ ► to store the configured parameter under the above interface and enter the video standard setting:

Video_Std:
PAL_BGHID

It will show the current video format which is only readable; the device could not read such parameter if the video source set as AUTO.

5.4.13 Data Baudrate

Press MENU ◄ ► to store the configured parameter under the above interface and enter the data baudrate setting:

Data_Baudrate:
9600

It shows the current data baudrate which could be adjusted by UP and DOWN.

5.4.14 Return to Main Menu

Press MENU ◄ ► to store the configured data status and return to main menu:

Fre :2430MHz HDMI OK

5.4.15 Transmitter Upper Frequency

Long press **ESC** about 5s under the above interface to enter transmitter upper frequency setting:

UpFrequency:
350MHz

The transmitter upper frequency could be adjusted by UP ▲ or DOWN ▼ with step 1MHz and range 100-3000MHz.

5.4.16 Transmitter Down Frequency

Press MENU ◄ ► to store the configured parameter under the above interface and enter the transmitter down frequency setting:

DownFrequency:
340MHz

The transmitter down frequency could be adjusted by UP ▲ or DOWN ▼ with step 1MHz and range 100-3000MHz.

5.4.17 A/V Bitrate

Press MENU ◄ ► to store the configured parameter under the above interface and enter the A/V bitrate setting:

BitRate_Set：
Auto

It shows the current device data bitrate with AUTO and MANUAL two modes optional; bitrate adjustable under AUTO mode while and configurable under MANUAL mode (AUTO mode is suggested).

5.4.18 Device ID:

Press MENU ◄ ► to store the configured parameter under the above interface and enter the device ID setting:

Device_ID:
0

It shows the current device ID with 0~255 optional;

5.4.19 Device Version

Press MENU ◄ ► to store the configured parameter under the above interface and enter the device version setting:

Version:
1.1/1.2

1.1 is the software version while 1.2 is the hardware version.

5.4.20 Device Serial Number

Press MENU ◄ ► to enter serial number display interface:

Serial Number
A0BC4569

This is the only factory number of the device.

5.4.21 Protocol Package

Press MENU ◄ ► to enter data package under the above interface to select whether to precede data KTSPD protocol package.

Note: it has been set well before delivery ; any adjustment is not suggested.

InnerPacked
YES

5.4.22 HD Authorization

Press MENU ◄ ► to enter device HD authorized sign display interface:

HD_flag
1

0: the device supports only SD mode without wide band authorization;

1: the device supports HD/SD modes.

5.4.23 CPU Temperature

Press MENU ◄ ► to enter the device CPU temperature display interface:

CPU_Temperature:
37℃

5.4.24 Return to Main Menu

Press MENU ◄ ► to return to main menu again.

Note: press ESC under any sub-menu to directly return to main menu without storing the current settings.

5.4.25 Adjuster encryption Settings

Press UP▲ and DOWN▼ for 5 seconds to enter the adjuster encryption settings：

Encrypt :
AES256

The transmitter encryption could be adjusted by UP▲ or DOWN▼ with OFF(No encryption)；AES128，AES256，three modes optional.

5.4.26 Password input

Choose encryption mode to enter the password input setting as below:

Password :
-

Password operation method is as follows:

1. Press up ▲ and down ▼ to change a code, range "0 to 9, a to z, A to Z", waiting for a second when getting the target number, then cursor "_" will jump to the next, and then continue the same operation；

2. After setting, press ◄ ► to store. For example, setting password “123456”, just input the "123456 _" and press ◄ ► to store.Password can be set maximum 16 digits.

3.If incorrectly setting and want to change the last code, press **ESC** to backspace.

5.4.27 Return to the main menu interface

press ◄ ► to return to the main menu interface.

Note: press **ESC** under any sub-menu to directly return to main menu without storing the current settings.

6 Technical Parameters

SN	PARAMETER NAME	PARAMETER INDEX
Power	Working voltage (V)	DC7V-16.8V
	Working current (A)	≤0.6A@DC12.5V
RF	Frequency range	2.42-2.44GHz
	Channel center frequency MHz	2.43GHz
	Center frequency shift	±20Hz
	RF bandwidth MHz	1.5/2/3MHz，4MHz，6/7/8MHz
	Output power dBm	≥22dBm/Attenuation=1
	Power adjustable range	15dB

	C/N	≥28dB @ 22dBm
	Spurious emission	≤-36dBm(outside the range of carrier center frequency fc±10MHz)
	Modulation	COFDM
	Constellation	QPSK，16QAM，64QAM Optional
	FEC	1/2， 2/3， 3/4， 5/6， 7/8 Optional
	Guard interval	1/4， 1/8， 1/16， 1/32 Optional
HDMI	Video input format	PAL/NTSC
	Encoding format	H.264
	Video input interface	Micro HDMI interface
	HDMI	HDMI 1.3 Versions, support HDCP protocol
	Audio coding standard	ISO/IEC11172-3 MPEG-1、ISO/IEC13818-3 MPEG-2（Layer I&II)
	Video Resolution	1920×1080i@60Hz/50Hz and 1920×1080p@30Hz downward compatibility
	Video rate	500kbps-16.68Mbps
Interface	RS232 control interface	Standard RS232 level

7 Fault Detection

Fault	Solution
Receiver cannot receive image or sound	1. Verify that the receiver is properly cabled and powered on. 2. Verify all the cable connection and antenna has been set correctly and if the antenna terminal is normal. 3. The location of transmitter is in the effective range of radio frequency. 4. Verify that the transmitter works normally. 5. Check if there is the same-frequency signals interference. 6. Check whether the receiver at the same frequency as

	transmitter.
Receiver cannot receive image, but sound is normal.	1. Verify that the video cable is properly cabled between TV and recorder.
Receiver cannot receive sound or noise, but image is normal.	1. Verify that the audio cable is properly cabled. 2. Verify that the transmitter properly connects with audio output. 3. Verify the transmitter front-end has pickup device (MIC)
Image continued, then pause and black screen, finally be normal	1. The signal is bad, it is normal. 2. Verify if there is interphone or broadcasting station interruption.
Image is black, sometimes appear flashing horizontal stripes.	1. Verify that the video cable and interface is properly cabled between transmitter and camera. 2. Check if shielded wire of video-out cable is normal.
Images show green or blurred screen color-block	1. Video connector of transmitter come off, fixed it.
Coverage suddenly become narrower	1. Verify transmitter module works normally. 2. Verify antenna connected normally between transmitter and receiver. 3. Verify battery or voltage of power switch of transmitter module works normally. 4. Verify power amplifier works normally. 5. Check if there is the same-frequency signals interference.
Point-point transmitting, black images repeated in a certain period	1. Special Situation for some type of receiver, caused by environmental conditions change. It is normal.
Narrow coverage and short	1. Check the antenna installation site and increase the

distance transmission	height of the receiving antenna.
There are images and sounds, but the image is blurred	1. Ensure the camera focus is accurate.

FCC statements:

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications or changes to this equipment. Such modifications or changes could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-Consult the dealer or an experienced radio/TV technician for help.

Federal Communication Commission (FCC) Radiation Exposure Statement

When using the product, maintain a distance of 20cm from the body to ensure compliance with RF exposure requirements.

Note: Max. gain of the approved antenna is 5dBi.