FIP-2405 User Manual

TX   **RX**

Contents

I. Disclaimer

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II. Precautions for integration

1) Be sure to use the parts provided by IWAVE.

2) Before powering on please make sure the antenna are in good connection and not install or remove the antennas with power on.

3) Given that the carbon fiber body and metal load may have shielding effects on antenna signals, they should not be installed between the antenna and ground terminal. Keep the antenna on board free from winding or blocking by obstacles. The antenna end should be vertically downward without bending to prevent shortening communication distance and failure communication.

4) Antennas on board should be kept away from other radio antennas to avoid electromagnetic noise and interference. We recommend to make full use of data and video transmitting function of FIP-2405 to minimize the radio devices quantity on board.

5) Do not disassemble or modify IWAVE FIP-2405. Any problem occur during installation, contact IWAVE or IWAVE local branch office.

6) Keep appropriate distances between different electronic devices during installation to minimize the electromagnetic interference.
7) Before using, please make sure all cables are in good connection and all components can work

properly.

8) After starting the product, the self-test indicators of FIP-2405 will continuously blink for 30s and then keep bright. Only after the video from the camera shown on the display, then you can confirm that the device work properly now.

9) Check the surrounding environment to ensure there is no other 2.4GHz devices to cause interference.

10) If you use the Futaba remote controller, the controller should be adjusted into the French mode.

11) **Adjust the Futaba controller into French mode as following steps:**

[LINKAGE MENU]→FRQUENCY→ RTN b→ [AREA]→[FRANCE]

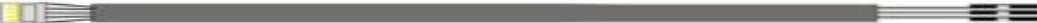**Or connect FIP-2405 S1 serial port with trainer interface on back side of Futaba by TTL cable. And set the Futaba RF as OFF. Through the S1 port uplink the PPM/SBUS signal.**

12) Before using, please check the power of RX and TX. If the receiver power off, transmitter on board will lose connection.

13) Adjusting RX antenna inclination can improve the signal strength and image quality.

14) The camera should be fully charged to ensure normal video output.

15) FIP-2405 support video and duplex data communication. If the video stuck or stopped for more than 10s. It means the radio signal is weakened or the radio channel is narrowed. In this case, the aircraft need to fly back to short the distance between TX and RX. Otherwise the TX will lose connection.

16) Please use good electromagnetic shielding accessories(such as HD displays, Network cables, etc.)

Notes: Improper operation of FIP-2405 may cause personal injury or damage to properties. Please pay high attention to operation safety.

III. List of in-box items

On board x1	Ground terminal x1
On board antenna x1	**Ground antenna x1**

DC to DC power cable x2

Network cable x4

Serial port cable x1 (Length: 20cm)

Serial port cable x1 (Length: 1500cm)

USB cable of serial port 2 x1

SMA Cable(Copper wire tinned shield semi-soft line) x1

IV. Interface Definition

4.1. RF Interface
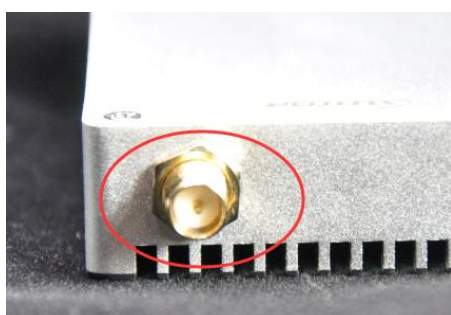
RF: Standard SMA to connect with antenna or feeder cable

4.2. Ethernet Port

ETH: EZH 4P 1.5mm

No	ETH Signal Definition
1	TX+
2	TX
3	RX+
4	RX
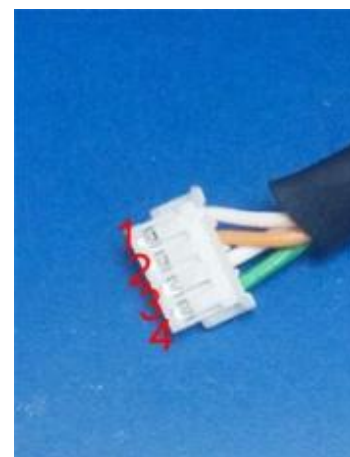
4.3. Power Input Interface

DC: 3.5×1.35(Male) to 5.5×2.1(Female)

4.4. Serial Port: : H 1.0mm 5P

SH 5P NO.	Definition
1	TXD
2	RXD
3	3.3V
4	GND
5	No Definition

V. Operating Instructions & Steps

5.1. Make TX and RX and accessories ready.

Besides the whole equipment we supply, you also need to make sure the IP Camera, display and power ready before operating.

5.2. Connection

Make the power cable, Ethernet cable, serial port cable and antenna in good connection.
(the serial port cable is for data links)

5.3. Power on

After checking all the connections are in good condition, turn on the the video source, LCD display, transmitter and receiver. The indicators will bright and the whole system starts work.

5.4. Definition of indicators

When the device begin to normally start work, all indicators status is described as follow:

1)   After powering on, light 1,2,3 turn green, light

6 turns blue and light 8 turns red.

2) After 1 second, light 1(Green), 2(Green), 3(Green) and 6(Blue) start to blink. Light 5 (Green) and 8(Red) will keep constant light.

3) After the starting completed. Light 1(Green), 2(Green), 3(Green), 4(Red), 6(blue) and 8(Red) will keep constant bright. By the way, when you use the the ETH1, 7 (Green) will blink frequently.

5.5. Start completed

The default IP address of the transmitter is **192.168.55.1 and** the receiver is **192.168.55.2.** You can match the IP camera with the devices, then you can see the video in the screen which is transferred from the IP camera.

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Remark: In UAV application, please make the connection successfully and the video show on ground station smoothly then fly the UAV. About how to install the antenna on UAV please refer the following description.

# VI. Antenna Installation

6.1. Multi-rotor UAV

SMA Feeder Cable

1) Using SMA metal shielded semi-flexible blue feeder cable provided by IWAVE to connect the TX SMA port with antenna.

2) The antenna needs to be mounted vertically downwards.

3) The best installation location is UAV ground bracket. With antenna inside, the bracket can only use fiberglass material.

4) If the ground bracket is automatically retracted, the antenna can be installed in the lower part of the aircraft.

5) If the antenna is intercepted by the camera or pod or the loudspeaker, the video on RX will appear image stuck or mosaic.

6.2. Fixed Wing UAV

1) Using SMA metal shielded semi-flexible blue feeder cable provided by IWAVE to connect the TX SMA port with antenna.
2) The antenna needs to be mounted vertically downwards.
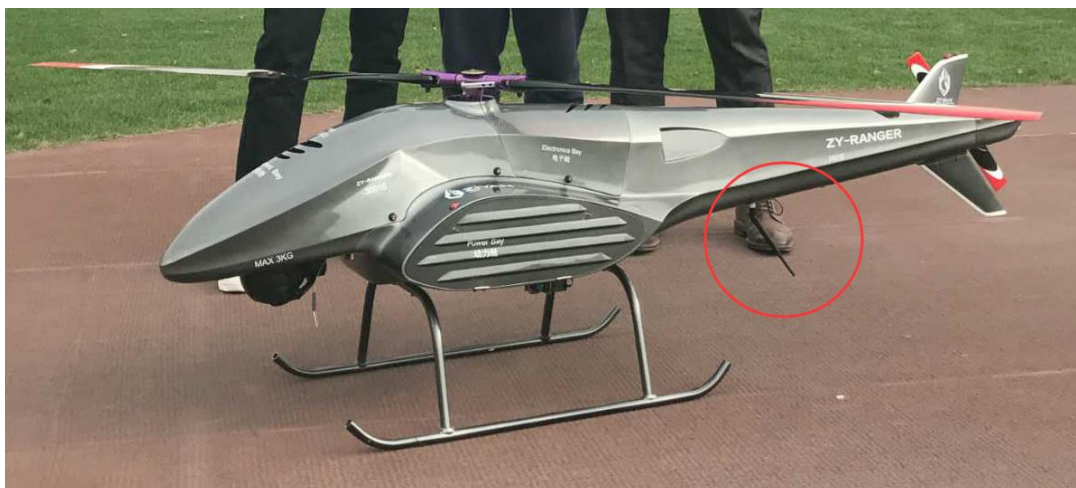
3) The best installation position is center of UAV tail, prominent outside the body and vertical downward.

4) The second optional mounting position is located below the wing and body joints, vertical down, as far as possible away from the wing but near the machine abdomen, protruding below the abdomen level.

VII. Software Operation

Notes：As for one pair of our devices, their parameters should be consistent, which means when

you

change one of them, you have to change another one, or they will lose connection.

There are two ways to modify the parameters.

1) Connect Transmitter or Receiver to PC one by one then change the parameters.
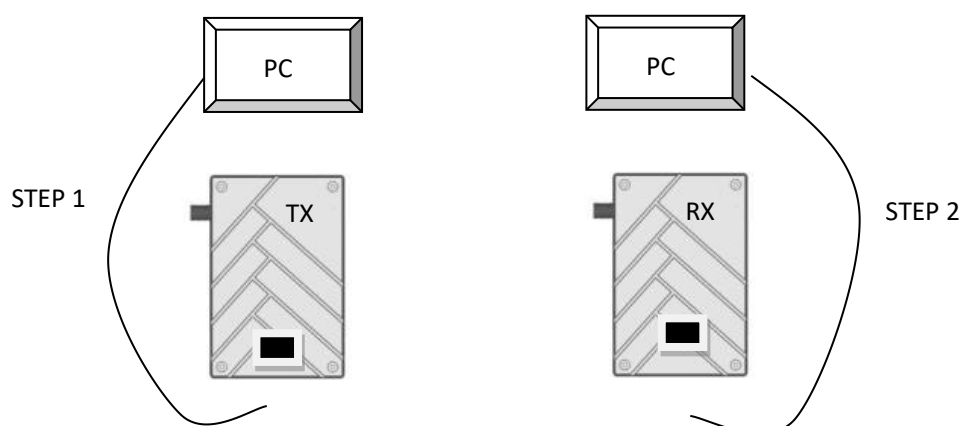
2) when Tx and Rx are working and the communication between them is successful, you can remotely change one's parameters which is not connected to the PC through another one which is connected to PC.

If you find the devices cannot connect with PC, first you can wait for a moment so that the device can finish running, then try again. Secondly, check whether the distance between transmitter and receiver is too close, Change their position and connect again. If not these reason, change another Ethernet cable.
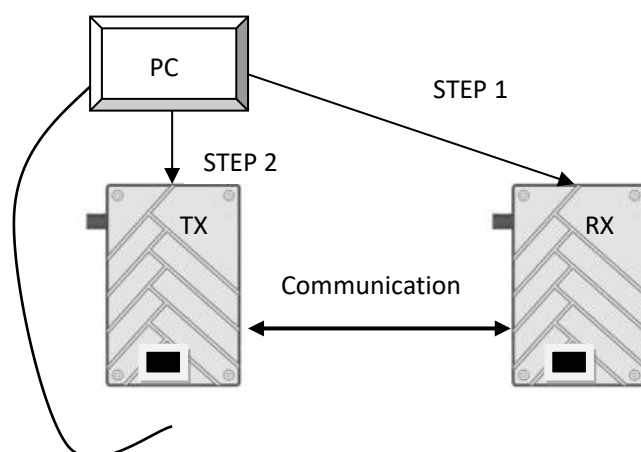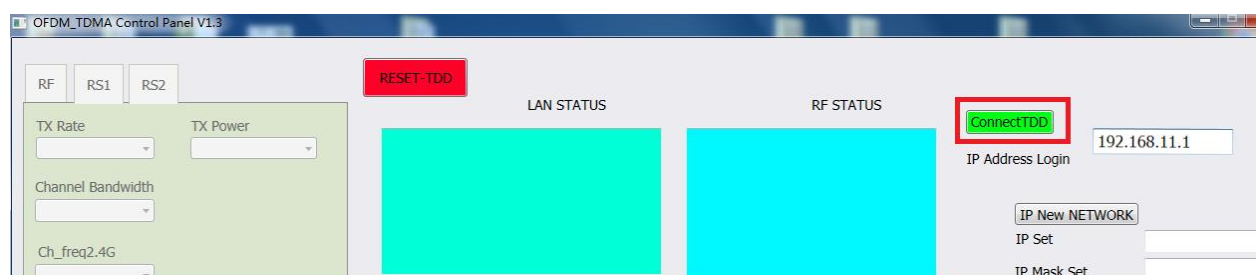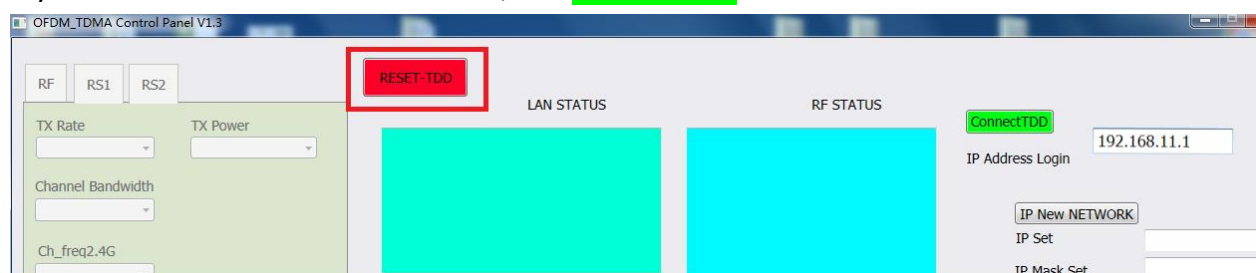

1. Start Connecting OFDM equipment
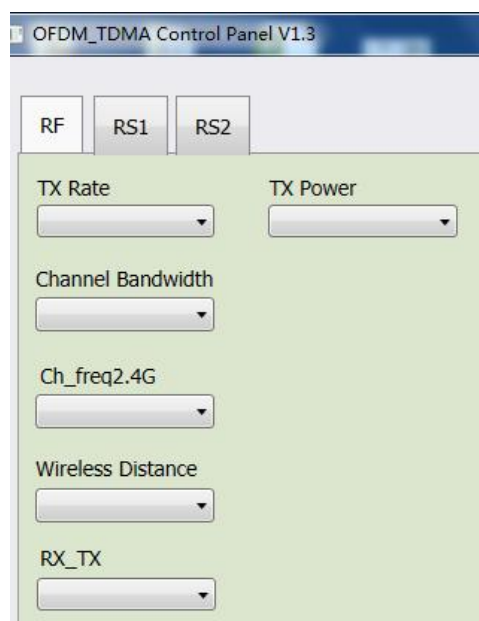
1) Right-click the icon to choose "Run as administer" .
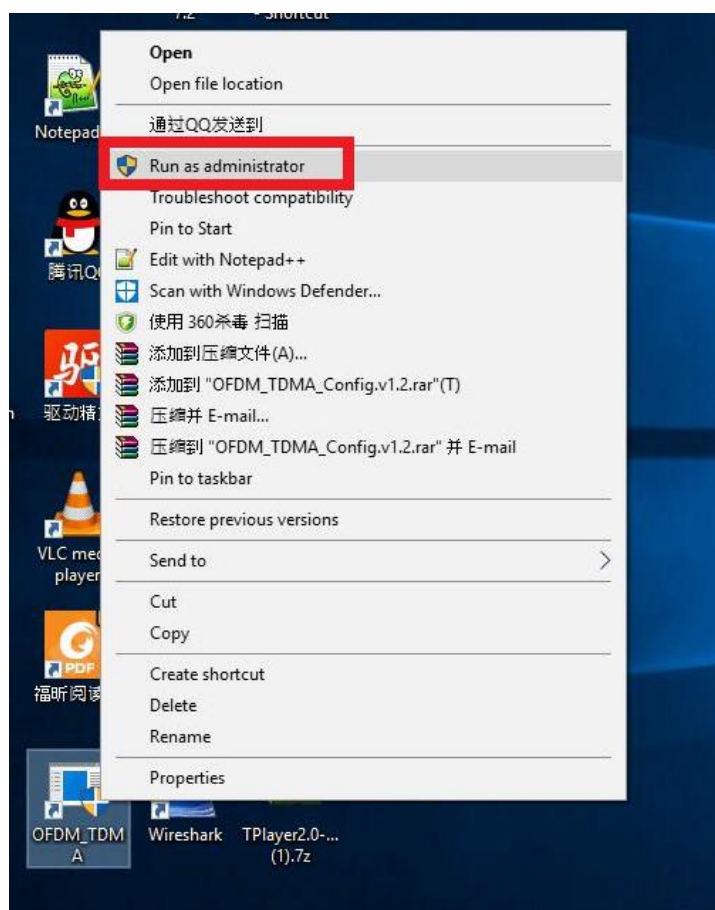
3) Enter the IP address（**Tx IP: 192.168.11.1 ; Rx IP: 192.168.11.2**），Next click Connect TDD button.

If you want to Restart OFDM software, click Restart-TDD button.

2. RF Configuration Method

In this section, you can modify six parameters.

2.1. TX Rate(Default: QPSK FEC 1/2)

This setting determines the modulation type and in turn the rate at which the data is to be wirelessly transferred. For example:

QPSK FEC 1/2: when the bandwidth is 4Mhz, the bit rate that allowed to pass by is half of the bandwidth, namely 2Mhz.

QPSK FEC 3/4: when the bandwidth is 4Mhz, the bit rate that allowed to pass by is three-quarter of the bandwidth, namely 3Mhz.

However, the bigger bit rate, the shorter distance. The same to bandwidth. Setting to the highest rate with a poor link may result in reduced performance.

2.2.Channel-Frequency(Default:2479Mhz)
You can choose from 2402 to 2482.

2.3. Wireless Distance(Default: 5000m)
The Wireless Distance parameter allows a user to set the expected distance the wireless signal needs to travel. The OFDM sets various internal timeouts to account for this travel time. Longer distances will require a higher setting, and shorter distances may perform better if the setting is reduced.

2.4. RX TX Mode:
TX Access Point - A Master may provide a wireless data connection to one slave.
**RX Client** - A Salve may sustain one wireless connection,i.e. to an Master.

2.5. TX Power(Default: 27dbm)
This setting establishes the transmit power level which will be presented to the antenna connector of the RD_COFDM.Unless required, the Tx Power should be set not for maximum, but rather for the minimum value required to maintain an adequate system fade margin.
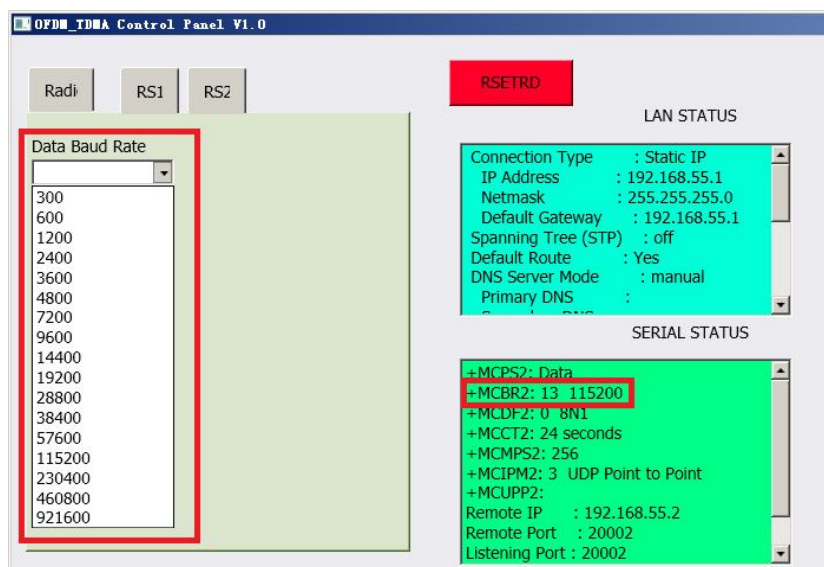
3. RS1 Configuration method

In this section, you can modify two parameters listed in the following picture.
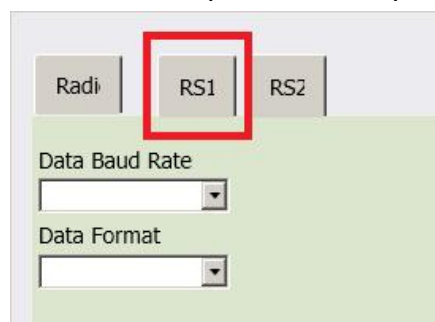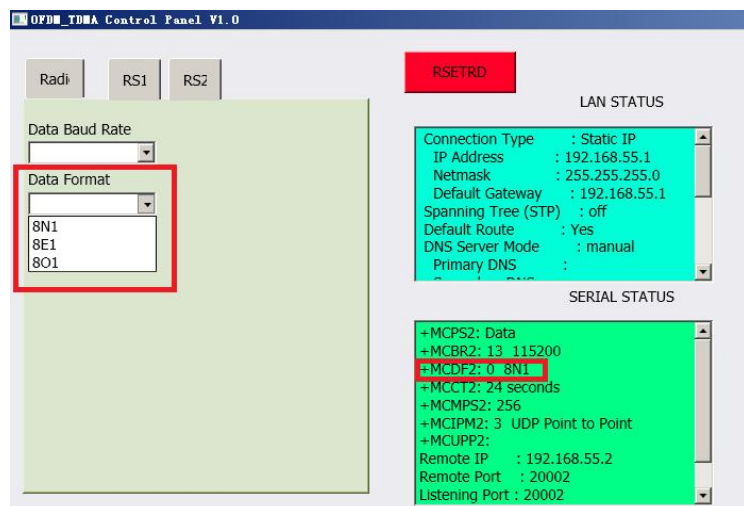

3.1. Data Baud Rate(Default: 115200)
The serial baud rate is the rate at which the modem is to communicate with the attached local asynchronous device.

3.2 Data Format(Default: 8N1)

This setting determines the format of the data on the serial port.The default is 8 data bits, No parity, and 1 Stop bit.

4.RS2 Configuration method

This setting determines which protocol the serial server will use to transmit serial port data over the OFDM network.

- **Remote IP Address**

IP address of distant device to which UDP packets are sent when data received at serial port.

Default: **192.168.11.2(master)**

192.168.11.1(slave)

- **Remote Port**

UDP port of distant device mentioned above.

Default: **20002**

- **Listening Port**

UDP port which the IP Series listens to (monitors).

UDP packets received on this port are forwarded to the unit's serial port.

Default: **20002**
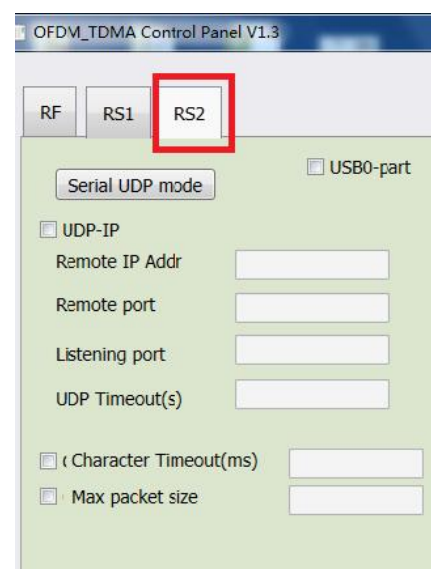
- **UDP Timeout(s)**

UDP Timeout in second.

Default: **10**

- **Character Timeout(ms)**

Character   Timeout in millisecond.

Default:1

- **Max Packet size**

Default: 256

Notes: If you want to change parameters here, for example *UDP IP , not only* you have to write a new address into the first blank, but also should tap into all the following three parameters into the blanks, then click the button <mark>**Serial UDP mode .**</mark>

5.IP New Network Configuration method

This setting helps you to change the IP address of devices .The default of master's IP address is **192.168.11.1**,the default of slave's   IP address is **192.168.11.2**.

For example,you want to change the master's IP address to "192.168.11.5". Then do as the following steps.

IP Set : 192.168.11.5
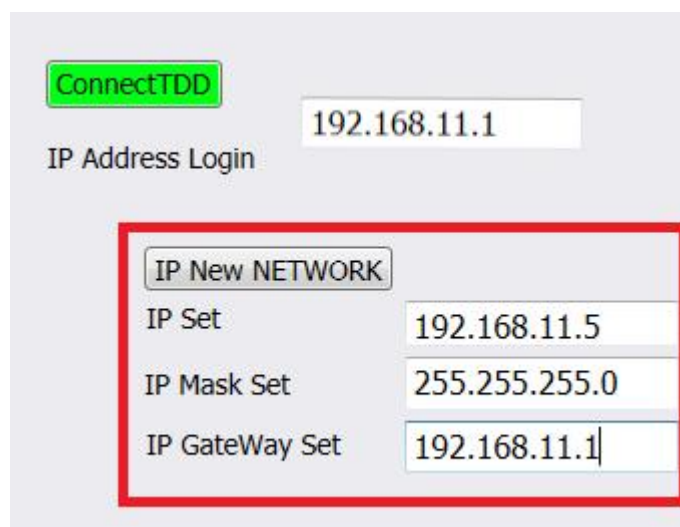
IP Mask Set: 255.255.255.0

IP Gateway Set: 192.168.11.1

Next Connect **IP NEW NETWORK** button.

Attention! When you have changed the IP address, you should correct another device 's "Remote IP Addr" into the same "IP SET", or the serial port will lose connection.

For example, you have changed the master's IP address to "192.168.11.5", the you should correct the salver's "Remote IP Addr" to   "192.168.11.5".
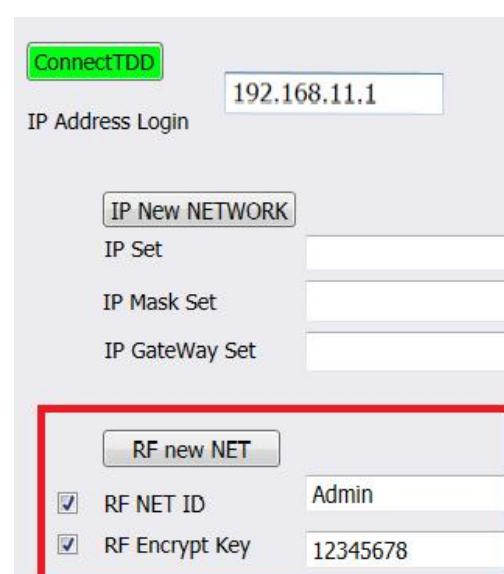

6.RF New NET Configuration Method

6.1 RF Net ID:

Each network of OFDM modules must have a unique Network ID. This Network ID must be set in each unit on the network.

6.2 RF Encrypt KEY

This is the password, or preshared key that is required by any device to connect to the wireless interface of the OFDM. It is   to always have a password defined, and changed from the factory default.
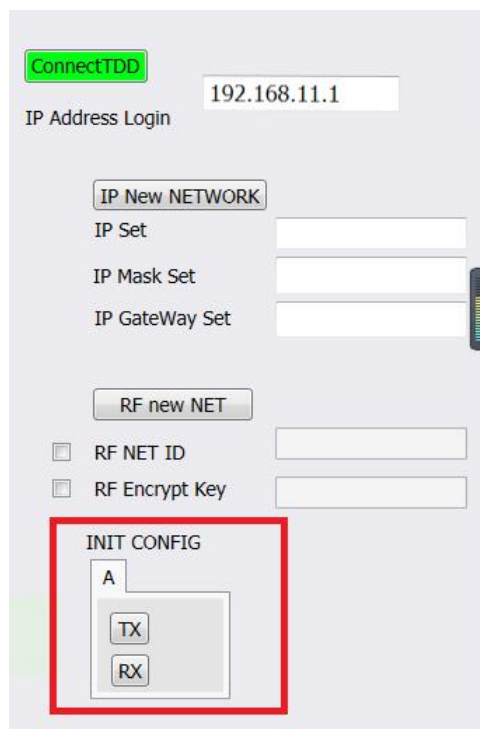
6.3 INIT CONFIG

Initialization setting .

TX for transmitter initialization, and RX for receiver initialization.

We suggest that when you initialize one device, initialize aonther one at the same time.