

**SIYI**

---

# **FTM30 RADIO MODULE USER MANUAL**



**SIYI Technology (Shenzhen) Co., Ltd.**

**[SIYI.biz/en](http://SIYI.biz/en)**

Thank you for purchasing SIYI Technology's products.

FM30 Radio Module is based on SIYI Tech's industry-level radio frequency technology, accumulated for years. The built-in Bluetooth function supports outdoor wireless FC settings and real-time flight status monitoring. The module is tiny and compatible with standard JR slot. FM30 also supports multiple signal input and communication protocols, users will have an unprecedented experience of manipulating their model craft, exploring range limits, and having fun.

To maintain a safe and orderly public space and to ensure you a good using experience of FM30 radio module, please read this manual carefully. If you have any issues using the product, please consult the manual or check online pages of FM30 on SIYI official website (<http://en.siyi.biz/>). You can also send an email to SIYI official A/S center ([support@siyi.biz](mailto:support@siyi.biz)).

# SIYI

---

Contact Us: **SIYI Official Website** (<https://SIYI.biz/en>)

SIYI User Group - Facebook	
Facebook	
LinkedIn	
YouTube	

## Manual Version Update Record

<b>Version Number</b>	<b>Update Date</b>	<b>Update Content</b>
1.1	---	---


## CONTENT


READ TIPS .....	6
Icons .....	6
Safety .....	6
Storage/Carrying/Recycling .....	8
1 INTRODUCTION .....	9
1.1 Features .....	9
1.2 Parts .....	12
1.2.1 At a Glance .....	12
1.2.2 FR Receiver .....	13
1.2.3 FR Mini Receiver .....	14
1.3 Technical Specification .....	15
1.4 LED Indicator .....	17
1.5 Packing List .....	18
2 GET READY TO USE FM30 .....	19
2.1 How to Place Antenna Right .....	19
2.2 Binding FM30 Transmitter with FR / FR Mini Receivers .....	19
3 SIGNAL INPUT .....	22
4 DATALINKS .....	25
5 RSSI .....	27
6 ExpressLRS .....	28
7 FAIL-SAFE .....	29
8 FIRMWARE UPGRADING .....	32
8.1 USB Firmware Upgrading .....	32
8.2 OTA Firmware Upgrading .....	34
8.2.1 Receiver and transmitter are bound. ....	34
8.2.2 Receiver and transmitter are not bound. ....	35
9 After-sale Service .....	36


## READ TIPS

### Icons

Please pay more attention to content indicated with the following marks:

 **DANGER** Dangerous manipulation that probably leads to human injuries.

 **WARNING** Warnings on manipulation that possibly leads to human injuries.

 **CAUTION** Cautions on what manipulation may lead to property loss.

 **Prohibited**    **Mandatory**    **Mark**

### Safety

FM30 Radio Module is designed for hobbyists, users who approaches to the device should have at least the basic knowledge to operate it. Irregular or irresponsible manipulations to the device may cause damage, property loss, or human injuries. Users under 14 years' old should follow an experienced trainer's guide. Disassembling or modification to the system is prohibited without permission from its manufacturer, SIYI Technology.

To maintain a safe and orderly public space and to ensure you a good using experience of SIYI's products, please read the prohibited and mandatory terms carefully.

⊘ Do not use any SIYI radio system to operate your aircraft/vehicle/model at places with intensive crowd (a square, a park), or at places with many obstructions (a street, a parking lot), or in fields with strong magnetic or interference (an electricity plant, a radar station, railways), or in any other fields where an irregular flight/operation may cause property loss or human injuries.

⊘ Do not hold or cover transmitter antenna or obstruct its transmission by any means in a flight or an operation.

⊘ Never point your transmitter antenna's upper ends straightly to your aircraft/vehicle while it is working, they are the weakest parts for transmission.

⊘ Do not start your aircraft/vehicle/model when you are tired, drunk, in sickness or any circumstances you are not feeling good.


⊘ Do not fly an aircraft/model when it is rainy, windy or at night.


⊘ Do not power off the transmitter while your aircraft's/vehicle's/model's engines and motors are still working.


❗ Please always try to operate your aircraft/vehicle/model within sight range.

❗ Do not forget to check battery level of the transmitter and the receiver before starting your aircraft/vehicle/model.

❗ Always power off your aircraft/vehicle/model first, FM30 radio module the second.

 Before changing any settings on the transmitter, make sure your aircraft's/vehicle's/model's engines are powered off and their motor wires are off connection, in case of a sudden switch-on.

 When you start your aircraft/vehicle for the first time, make sure that the fail-safe settings in your transmitter is activated.

 Always switch on the transmitter first and hold the throttle joystick at its bottom position, then power on your aircraft/vehicle/model.

## **Storage/Carrying/Recycling**

When your SIYI radio system is stand idle, or you are bringing it outdoors, or the system reached service life, then please do read the precautions below.

### **CAUTION**

Always place your SIYI radio system and its parts at places where babies or kids do not reach.

### **DANGER**

SIYI radio system should be placed as below:

Not too hot (above 60°C) or too cold (under -20°C).

Not under direct sunshine or too dusty or too wet.

Not on an unstable holder which lacks solid supports or may cause vibration;

Not nearby steam or other heat sources.

## 1 INTRODUCTION

### 1.1 Features

#### 30KM Long Range

Applied with lately developed technologies, such as super long distance, self-adaptive bandwidth, interference avoidance frequency hopping, and two-way telemetry, equipped with industry-level RF hardware which is capable to counter high power electromagnetic interference, FM30 radio module's maximum control distance can reach up to 30 kilometers and more, which can effectively guarantee the low-altitude manipulating stability crossing among trees, through racing panels, in garage and other concrete buildings with many obstacles, shelters, and heavy interference.

#### Bluetooth/Telemetry Configuration

FM30 comes with built-in Bluetooth function and supports Mavlink protocol, which makes it possible for users to monitor real-time flight status and do configuration through the ground control software.

*\*FM30 supports popular GCS such as QGroundControl, Speedy Bee, Mission Planner, Fish Drone, etc.*

#### Receiver OTA Wireless Upgrading, Wireless Binding

# SIYI

---

The way of upgrading receiver firmware wirelessly let users get rid of complex wire connection.

Through a combination of manipulation, receiver actively enters binding mode without disassembling your drone/aircraft.

## **RSSI Signal Telemetry**

FM30 supports RSSI output in S.Bus mode, providing real-time status information as reference for long-range flight.

## **2.4 GHz ISM Frequency Band**

FM30 uses 2.4 GHz band, which is legal to use in any countries. Under 2.4 GHz and working with Fast Hopping technology, FM30's transmission speed is fast and stable.

## **USB Simulator (In development)**

FM30 will come with built-in simulator driver. Use a USB cable and connect remote controller to PC, then open the simulator software, users can start flying in the simulator immediately.

## **FR Receiver**

Model power battery voltage and receiver power supply voltage real-time telemetry.

FR Receiver can receive and analyze data telemetry from flight controller based on Mavlink protocol.

Multiple signal output modes: 16CH S.Bus, 8CH PWM, 8CH PPM.

Firmware upgrading through PC USB port and OTA wireless upgrading from FM30 radio module.

## **FR Mini Receiver**

Model power battery voltage and receiver power supply voltage real-time telemetry.

FR Mini Receiver can receive and analyze data telemetry from flight controller based on Mavlink protocol.

Multiple signal output modes: 16CH S.Bus, 8CH PWM.

OTA wireless firmware upgrading from FM30 radio module.

## 1.2 Parts

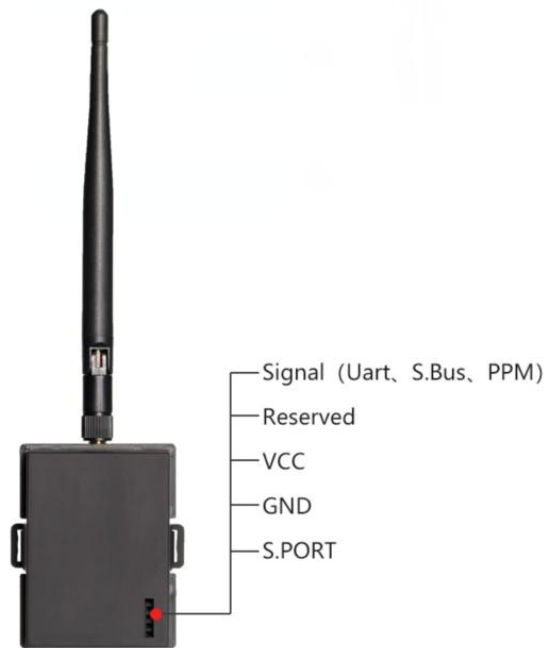
### 1.2.1 At a Glance



Overview – Transmitter Front

### Port Function

Mini-USB: Firmware upgrading



Overview – Transmitter Back

## 1.2.2 FR Receiver



### Port Function

- S.Bus: 16 channels of S.Bus signal output.
- PWM: PWM channel 1 to 8 output.
- UART: Flight controller data port.
- PWR: Voltage telemetry (compatible with FT24 transmitter, not compatible with

FM30 radio module at this moment).

## Pin Out

- UART Port

Red: +

Black: -

Yellow: TX

Blue: RX

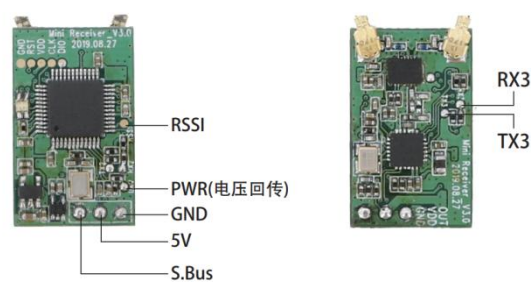
- PWM Ports

3 set of pins 1-8 CH out, from bottom GND, VDD, and Signal

9<sup>th</sup> set of 3 pins are reserved.

10<sup>th</sup> set of 3 pins outputs PWM CH9, PPM, and S.Bus

## 1.2.3 FR Mini Receiver



## Port Function

- S.Bus: 16 channels of S.Bus signal output.
- RX3/TX3: Data port.
- RSSI: RSSI signal output

# SIYI

---

- PWR: Voltage telemetry (compatible with FT24 transmitter, not compatible with FM30 radio module at this moment).

## Pin Out

- S.Bus
- 3 Pins: GND, VDD
- S.Bus Out
- RX3/TX3: Data Port (RX3 to RX port of flight controller, TX3 to TX port).

## 1.3 Technical Specification

### Overall

<b>Channels</b>	16 Communicational Channels
<b>Supported Models</b>	Multi-rotors, Planes, Gliders, Helicopters, Cars, Boats, Racing Drones
<b>Frequency Band</b>	2.400 ~ 2.483 GHz
<b>Max Transmission Distance</b>	30 km / 18.6 miles (unobstructed, free of interference)
<b>Latency</b>	10 ms (protocol mode)
<b>Signal Input</b>	UART, S.Bus, PPM
<b>PC Software</b>	SIYI Assistant
<b>Packing Size</b>	14X9X4 CM
<b>Packing Weight</b>	0.22 kg (0.25 kg by volume)

### FM30 Transmitter

<b>Antenna Connector</b>	SMA Male
--------------------------	----------

<b>Antenna Gain</b>	3 dBi
<b>Power Input</b>	5 – 10 V
<b>Power Consumption</b>	0.7 W
<b>Dimensions</b>	70 x 20 x 33 mm (antennas folded)
<b>Compatible Slot Size</b>	59 x 43 x 18.5 mm
<b>Net Weight</b>	36 g
<b>Operating Temperature</b>	-10 ~ 55 °C

## FR Receiver

<b>Signal Output</b>	S.Bus: 16 channels PPM: 8 channels PWM: 8 channels
<b>Data Port</b>	UART
<b>Antenna Gain</b>	2 dBi
<b>Working Voltage</b>	5 ~ 8.4 V
<b>Telemetry Voltage</b>	0 ~ 50 V
<b>Operating Temperature</b>	-10 ~ 55 °C
<b>Dimensions</b>	51.5 x 38 x 13 mm (antenna excluded)
<b>Net Weight</b>	20 g (antenna excluded)

## FR Mini Receiver

<b>Signal Output</b>	S.Bus: 16 channels PPM: 8 channels
<b>Data Port</b>	UART
<b>Antenna Gain</b>	2 dBi
<b>Working Voltage</b>	5 V
<b>Telemetry Voltage</b>	0 ~ 26 V
<b>Operating Temperature</b>	-10 ~ 55 °C

<b>Dimensions</b>	24 x 15 x 3 mm (antenna excluded)
<b>Net Weight</b>	1.5 g (antenna excluded)

## 1.4 LED Indicator

The LED indicator inside of the power button has three colors and different frequencies to indicate FM30 transmitter's different system status.

### STA Indicator

- Solid Yellow: No communication between transmitter and receiver.
- Solid Green: Good communication.
- Fast Red Blinks: Transmitter is binding with receiver.
- Slow Red Blinks: Transmitter firmware does not match.
- ● ● Triple Red Blinks: RF initialization failed.
- ● Double Yellow Blinks: Bluetooth communication failed.

### RF Indicator

- Solid Red: Transmitter RF OFF.
- Solid Green: Good communication.
- Green Blinks: Blinking frequency indicates FM30 transmitter's RF signal strength. The faster it blinks, the worse the signal is.
- ● ● Red-Green-Yellow Blinks in every 5 seconds: Receiver under wireless upgrading.

## 1.5 Packing List

### **FM30 Radio Module**

1 x FM30 Transmitter

1 x Mini-USB Cable

### **FM30 Radio Module with FR Receiver**

1 x FM30 Transmitter

1 x FR Receiver

1 x Mini-USB Cable

### **FM30 Radio Module with FR Mini Receiver**

1 x FM30 Transmitter

1 x FR Mini Receiver

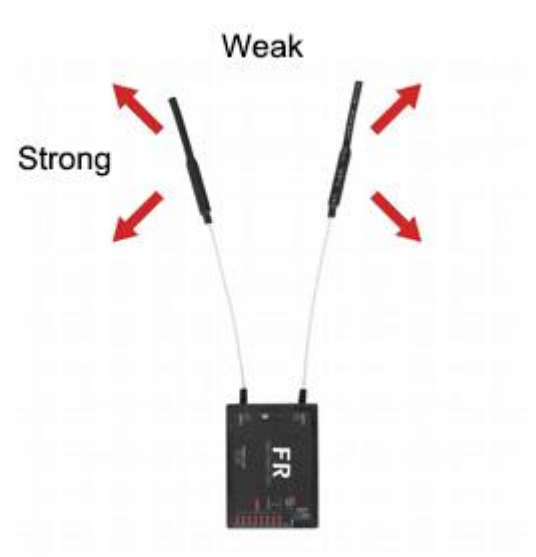
1 x Mini-USB Cable

### **Mark**

Before using FM30 radio module, please confirm if the declared items are included in the box. If there were any missing items, please contact your dealer immediately.

## 2 GET READY TO USE FM30

### 2.1 How to Place Antenna Right



### WARNING

Do not fold or cover antennas and avoid any obstruction between the transmitter and the aircraft in flight, otherwise there will be an obvious decrease to transmission signal quality.

### 2.2 Binding FM30 Transmitter with FR / FR Mini Receivers

Each unit of FM30 transmitter is assigned with a unique ID code. Before binding receiver to transmitter, receiver identifies the transmitter ID (**Binding**). When the first-time binding is done, transmitter ID will be stored in receiver so that you don't

have to repeat binding before the next flight (except when your transmitter must be bound with a new receiver).

With OpenTX transmitter, assign unique Receiver Number at Model setup menu per model (1 to 8), so that FM30 will match bound receiver.

## **Steps of Using Binding Button**

### ***\*For FR Receiver***

1. Power on the receiver. Press the binding button, receiver indicator turns to blink red fast, receiver ready for binding. Under protocol mode, go to “External RF” page in your radio transmitter and enter...
2. “Bind”. Under S.Bus/PPM mode, press the binding button on FM30 transmitter for 5 seconds to start binding.
3. FR Receiver / FM30 Transmitter turns to blink green; communication is normal, binding is successful.

## **Steps of Wireless Binding**

### ***\*For FR / FR Mini Receiver***

Power on the receiver. After 5 seconds, plug in and out power wire for 3 times (with power connected for...

1. at least 1 second each time). Receiver indicator turns to blink red fast, receiver ready for binding.

2. With OpenTX transmitter under protocol mode, go to “External RF” page in your radio transmitter and enter...

“Bind”. Under S.Bus/PPM mode, press the binding button on FM30 transmitter for 5 seconds to start binding.

3. Receiver/transmitter turns to blink green; communication is normal, binding is successful.



## **WARNING**

Before binding, please make sure motors are not powered (E.S.C are off connection).

Reboot receiver when binding is finished and try to manipulate on transmitter to confirm if binding is successful.

## 3 SIGNAL INPUT

FM30 supports three modes of signal input: Protocol, S.Bus, and PPM.

### About Signal Input Modes

#### Protocol Mode

Transmitter supports binding operation, RSSI telemetry and alert, fail-safe settings, etc. OpenTX transmitters use this mode.

#### S.Bus / PPM

Transmitter outputs and transfer channel value.

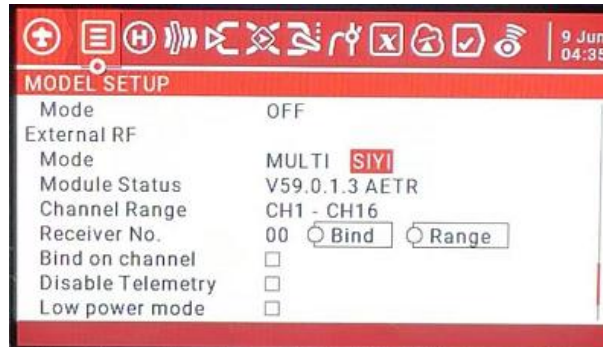
### Steps of Setting Protocol Mode

1. Mount FM30 transmitter into your OPENTX radio transmitter.
2. Turn the “Mode Switch” to “UART”.



3. Go to “Model Setup – External RF” page.

4. Enter "Mode" as "MULTI - SIYI".



5. Bind FM30 transmitter with FR / FR Mini receiver and test if it works normally.

## Steps of Setting S.Bus / PPM Mode

1. These modes are for non-OpenTX transmitters. Decide either S.Bus or PPM mode according to your transmitter specification.
2. Turn the "Mode Switch" to "S.Bus" or "PPM".



For radio transmitters without a JR bay nor external interface, wire...

3. FM30 transmitter with power and S.Bus / PPM signal.

4. Go to the page for signal output settings in your radio transmitter and set it as S.Bus / PPM output.
5. If the STA Indicator turns to Solid Green, it means that your radio transmitter signal output is recognized and received.
6. Bind FM30 transmitter with FR / FR Mini receiver and test if it works normally.

## **Mark**

Setting steps may be different for different OPENTX version or different radio transmitters.

Products are designed for OpenTX 2.3. Please refer to their manuals for detail.

## 4 DATALINKS

FM30 transmitter comes with built-in Bluetooth. When your GCS is connected with FM30 through Bluetooth, you can configure GCS and monitor flight data.

*\*The built-in Bluetooth in FM30 transmitter supports two protocols, Mavlink and SpeedyBee.*

### Steps of Using FM30 Radio Module with QGroundControl

Wire “TX” and “RX” in your flight controller’s UART port to “RX” and “TX” in FR Receiver’s UART port or “RX3” and “TX3” on FR Mini Receiver.

1. Set flight controller baud rate to “57600”, protocol type Mavlink 1 or 2.
2. Enable Bluetooth function on your mobile device and search the 10-digit Bluetooth ID starting with “59\*\*\*\*\*” and pair. Password is “1234”.
3. Open QGroundControl and go to “Connection”. Add a new connection and set as Bluetooth connection. Select the paired Bluetooth ID and connect.
4. Finished.

## Steps of Using FM30 Radio Module with Speedy Bee

1. Wire “TX” and “RX” in your flight controller’s UART port to “RX” and “TX” in FR Receiver’s UART port or “RX3” and “TX3” on FR Mini Receiver.

*\*Wiring sequence is “TX to RX” and “RX to TX”.*

2. Set flight controller baud rate to “57600”.
3. Open Speedy Bee and search the 13-digit Bluetooth ID starting with “59\*\*\*\*\*BLE” and connect.
4. Finished.

## 5 RSSI

FM30 supports RSSI output through S.Bus channels.

*\*Working with FR Mini receiver, FM30 will output ADC RSSI.*

### About RSSI

#### Protocol Mode

Receiver CH16 is defaulted to output RSSI.

#### PPM Mode

Receiver CH8 is defaulted to output RSSI.

#### S.Bus Mode

Receiver CH16 is defaulted to output RSSI.

### Steps of Setting RSSI

Let's take protocol mode and UART connection as an example.

1. Power on your radio transmitter, connect FM30 transmitter with radio transmitter under protocol mode.
2. Open your GCS and go to RSSI settings.
3. Change channel to CH16 and check if RSSI displays normally.

## 6 ExpressLRS

Thanks to ExpressLRS Team's hard work, FM30 radio system can work with ELRS firmware now.

Please follow the guide in the below link for detail:

[http://www.jupacreations.com/ExpressLRS with SIYI FM30 TX and RX-23-4-2021.pdf](http://www.jupacreations.com/ExpressLRS_with_SIYI_FM30_TX_and_RX-23-4-2021.pdf)

### Mark

Special thanks to @JupaCreations from RCGroups for dedicating his time into making the guide.

Special thanks to @CapnBry for his great help to make the ELRS firmware.

## 7 FAIL-SAFE

FM30 supports Fail-Safe function. If your transmitter lost control to receiver, Fail-Safe function runs automatically and immediately to protect your model from a crash.

### About Fail-Safe

- **S.Bus Communication**

No Fail-Safe channel value is required. S.Bus protocol supports marking the “Fail” position.

When FM30 transmitter lose control to receiver, receiver outputs “Fail-Safe” commands to flight controller for RTH or landing.

- **PPM / PWM Communication**

Fail-Safe channel value is required.

When FM30 transmitter lose control to receiver, receiver outputs the Fail-Safe channel value to command flight controller for RTH or landing.

Let's take an example of PIX / APM flight controller. The condition that flight controller enters "Fail-Safe" is "throttle channel output lower than 975". So, we should set a signal in our radio transmitter that throttle channel outputting is lower than 975 for entering "Fail-Safe".

## **Mark**

Setting steps are different for different flight controllers. Please refer to manuals of flight controllers or aircrafts for detail.

## **Steps of Setting Fail-Safe**

It is necessary to keep FM30 transmitter and FR / FR Mini receiver in communication before Fail-Safe Setting.

## **Protocol Mode**

1. Go to "External RF" page and find "Failsafe Mode".
2. "Hold": If transmitter lost control to receiver, the receiver will output the last channel value before losing control.
3. "Custom": Users can custom the "Fail-Safe" channel value. Tap on "Set" to enter channel settings and set your required channel value.

## **S.Bus / PPM Mode**

Under S.Bus / PPM mode, it is impossible to do Fail-Safe settings on radio transmitter. So, we should set FM30 Fail-Safe by reading current channel output value.

1. Let the throttle channel outputs your required channel value for Fail-Safe.
2. Press binding button once, then press again quickly and hold it till STA Indicator and RF Indicator are OFF.
3. Fail-Safe setting is finished when STA Indicator blinks green twice.

## 8 FIRMWARE UPGRADING

FM30 transmitter with FR receiver supports both USB / OTA firmware upgrading.

FM30 transmitter with FR Mini receiver supports OTA firmware upgrading only.

Before upgrading firmware for FM30 radio module, it is necessary to prepare the tools and software below.

- SIYI Assistant v1.2.7
- FM30 Transmitter Firmware
- FR / FR Mini Receiver Firmware

*\*All files can be downloaded from SIYI Official website (<http://en.siyi.biz/>) or the SIYI Google Drive Link for FM30 Radio Module and FT24 Radio System (<https://drive.google.com/drive/folders/1DUxOYszp7zNk7u3byXO3rH4UgD3K4PI4?usp=sharing>) or got from your dealer.*

- Mini-USB to USB Cable

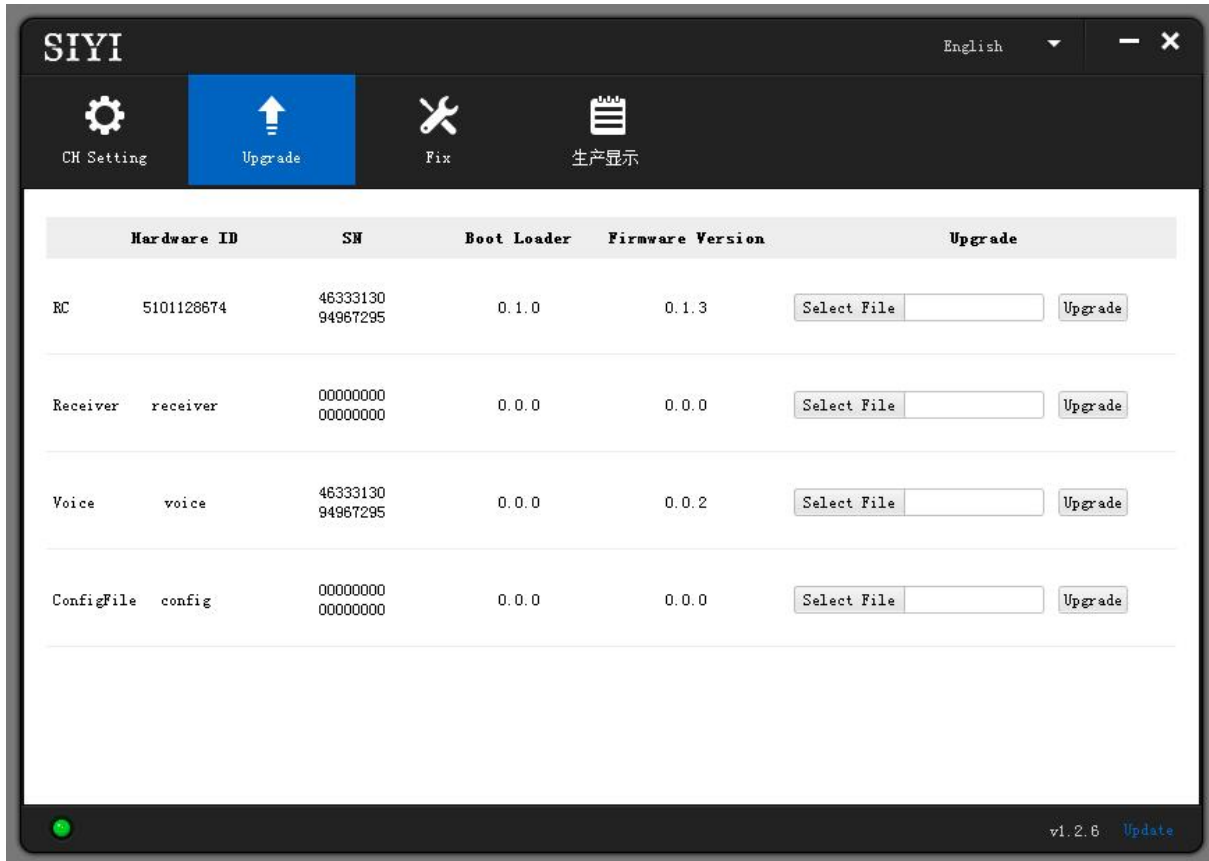
*\*Came with FM30 package*

### 8.1 USB Firmware Upgrading

#### Steps

1. Install "SIYI Assistant v1.2.7" in your computer.

2. Connect FM30 transmitter to your computer.
3. Run “SIYI Assistant v1.2.7” to check the transmitter’s current firmware version.



4. Upload the latest firmware files for FM30 transmitter (RC) and click on “Upgrade”. Then wait till the process is 100% finished.
5. Plug out FM30 transmitter and connect FR receiver to your computer. Then repeat Step 3 & 4 to upgrade receiver firmware.

## Mark

After installing “SIYI Assistant”, if the software didn’t read your SIYI device through USB, then please go to...

“Your System Disk (Usually Disk C) – Programs (x86) – STMicroelectronics – Software – Virtual Comport Driver – Win 7 / Win 8 – dpinst\_x86.exe / dpinstamd\_x86.exe”

After installing the driver, your PC should be reading SIYI devices successfully.

## **Mark**

If your FM30 transmitter and FR receiver are bound and you can check receiver firmware when only the transmitter is connected to your computer, then FR receiver firmware can be upgraded right after upgrading FM30 Transmitter while the transmitter is still connected.

## **8.2 OTA Firmware Upgrading**

### **8.2.1 Receiver and transmitter are bound.**

1. Connect FM30 transmitter to your computer.
2. Run “SIYI Assistant v1.2.7” to check the transmitter’s current firmware version.
3. Upload the latest firmware files for FR / FR Mini receiver and click on “Upgrade”.  
Then wait till the process is 100% finished.

## 8.2.2 Receiver and transmitter are not bound.

1. Connect FM30 transmitter to your computer.
2. Power on FR / FR Mini receiver and wait for 5 seconds.
3. Cut and connect receiver battery power for 6 times (1-second interval of each time). Receiver status indicator blinks red and green fast. Receiver is standby for firmware upgrade.
4. Run “SIYI Assistant v1.2.7” to check the transmitter’s current firmware version.
5. Upload the latest firmware files for FR / FR Mini receiver and click on “Upgrade”. Then wait till the process is 100% finished.

## 9 After-sale Service

Please visit the SIYI Technology support page at [Service and Support - SIYI Technology | Empowering and Building an Intelligent Robot Ecology](#) for the latest after-sales and warranty information.