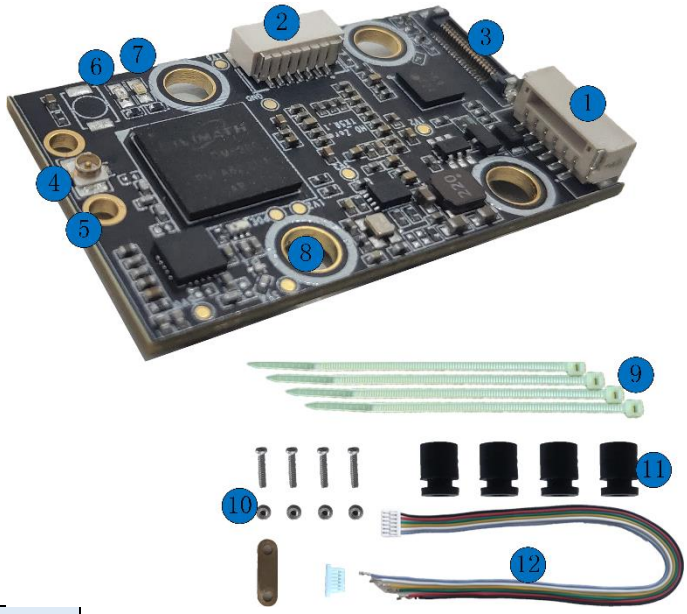
Shark Byte Video Transmitter TX5R.1

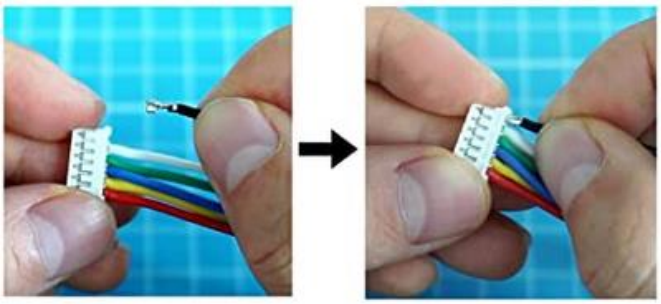
The Shark Byte TX5R.1 is a digital HD 720p 60fps video transmitter capable of delivering up to 200mw on 5.8GHz. The TX5R.1 works with the Shark Byte RX5.1 goggle module to transmit video, and with a remote controller to wirelessly control the parameters for the transmitter and camera.

The power input range is 7V – 26V (2S – 6S). Though the TX5R.1 has integrated surge protection circuit, a large capacitor (220+uF) parallel with battery leads is recommended to smooth the power supply of the whole quad.

1	Power/UART Connector
2	FW Update Connector
3	MIPI Connector
4	u.FL Antenna Connector
5	u.FL Antenna Retention Holes
6	Power on LED (red)
7	Status LED (blue)
8	Mounting Holes (20x20 M4)
9	Zip Ties (4x)
10	u.FL Antenna Retention Screws(4x)/Nut(4x)/Plate
11	Rubber Grommet (M4 to M3 4x)
12	Power/UART harness (20cm) and a PH2.0 connector (6P)



Power/UART Connector	Cable Color	Connected with
Ground	Black	Ground
Power	7-26V (2S-6S)	Power
T1	Green	FC.RX
R1	Yellow	FC.TX
T2	White	DO NOT CONNECT
R2/SA	Gray	FC.SA (TX)



Connection between TX5R.1 and FC

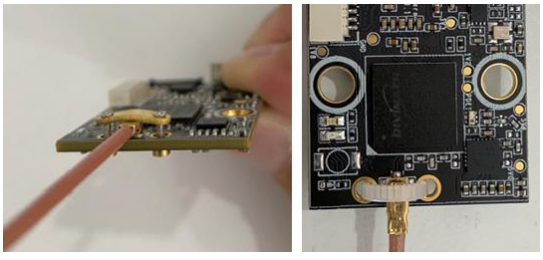
There are 3 methods to connect the TX5R.1 and flight controller:

- Plug the included harness, cut the cables to
- appropriate length, and solder them on FC
- Use solder pads on the back of the connector
- For FCs having BEC and UART connector, install harness to the included PH2.0 connecor (Shown above), and connect the harness with FC without any welding.

Mounting an u.FL antenna or pigtail

There are 2 methods to mount antenna on TX5R.1:

- Use included retention screws, nuts and plate;
- Use included zip-ties.



Using SmartAudio to control TX5R

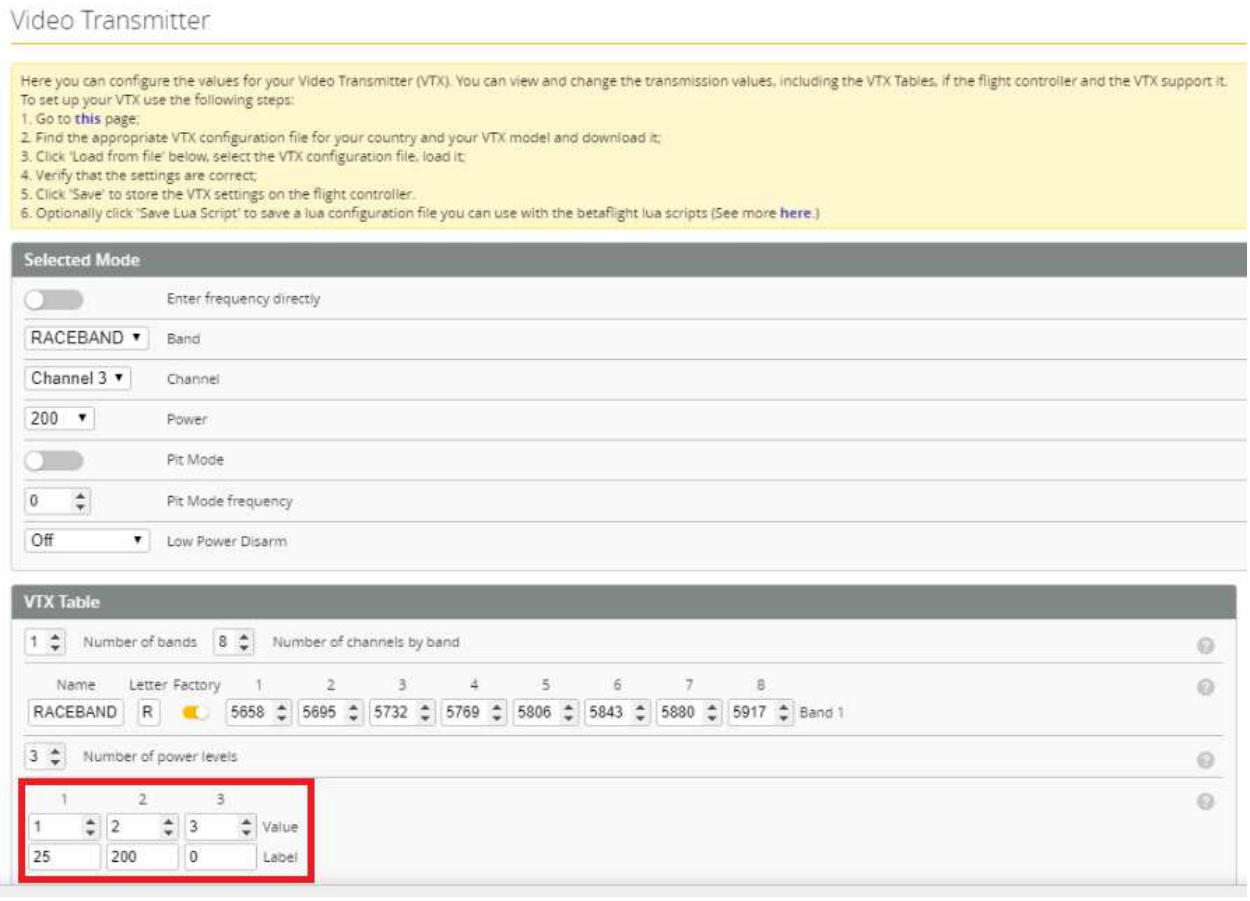
TX5R.1 can be controlled by FC using the TBS SmartAudio V2.1.

Notes:

1. TX5R.1 supports SmartAudio PIT mode, it is 0.1mW RF output when PIT mode is ON.
2. TX5R.1 doe ***not*** support SmartAudio out range PIT mode.
3. When TX5R.1 boots up, it will automaticlly detect the existence of a valid SmartAudio link with FC. If the link exists, FC will fully control TX5R.1's RF output power via SmartAudio. Otherwise, TX5R.1 will use its own RF power management which is descripted on ***RF Power Management for TX5S.1/ TX5M.1/ TX5R.1 (w/o SmartAudio).***

To enable SmartAudio, connect the SA pin of TX5R.1 to an available UART port of FC and assign that port as peripheral "VTX(TBS SmartAudio)". TX5R.1 needs another full UART port for MSP canvas mode.

In order to FC controls TX5R.1, frequency and power table are needed to be set as below. Please note that TX5R.1 only supports Race Band.



3 different RF power levels are specified on the above table. #1 and #2 specify 25 mW and 200mW RF power respectively, and #3 is to turn off RF output completely.

TX5R.1 will become very hot if it is on bench without airflow even it is on 25mW or PIT mode. It is recommended to put TX5R.1 on #3 while quad is waiting on the line.

When #3 is selected from SmartAudio menu by mistake, the receiver will lose video feed for VTX is not transmitting. Use stick command  to exit #3 mode.

The above setting can also be done with the following CLI commands:

```
vtxtable bands 1
vtxtable channels 8
vtxtable band 1 RACEBAND R FACTORY 5658 5695 5732 5769 5806 5843 5880 5917
vtxtable powerlevels 3
vtxtable powervalues 0 1 2
vtxtable powerlabels 25 200 0
save
```

With SmartAudio, user can change channel number and power level even when quad is on air.

Example 1: Map a 3-phase button (aux channel 3) to 3 different RF power levels (25mW, 200mW, and 0mW).

VTX	<index>	<aux_channel>	<vtx_band>	<vtx_channel>	<vtx_power>	<start_range>	<end_range>
vtx	0	2	0	0	1	900	1300
vtx	1	2	0	0	2	1300	1700
vtx	2	2	0	0	3	1700	2100
		(aux ch -1)	0 means no change				

```
vtx 0 2 0 0 1 900 1300
vtx 1 2 0 0 2 1300 1700
vtx 2 2 0 0 3 1700 2100
save
```

Example 2: Map a 3-phase button (aux channel 4) to Channel 1, 2 and 3.

VTX	<index>	<aux_channel>	<vtx_band>	<vtx_channel>	<vtx_power>	<start_range>	<end_range>
vtx	3	3	0	1	0	900	1300
vtx	4	3	0	2	0	1300	1700
vtx	5	3	0	3	0	1700	2100
			0 means no change				

```
vtx 3 3 0 1 0 900 1300
vtx 4 3 0 2 0 1300 1700
vtx 5 3 0 3 0 1700 2100
save
```

RF Power Management for TX5S.1/ TX5M.1/ TX5R.1 (w/o SmartAudio)

All Shark byte VTXs have the following settings for its RF power level management. These setting can be changed over VTX menu.

POWER: The desired RF power level is selectable between 25mW, 200mW (and 500mW for TX5M.1). The actual RF power level depends on the other settings and quad status.

PIT_MODE: The three modes of this setting are:

1. P1mW: The output RF power will be 0.1mW (in order to not interfere with other pilots) in this mode. If the quad is armed, RF output power will be automatically set to the *POWER* setting within one second.
2. 0mW: There will be zero RF output in this mode. If quad is armed, RF output power will be automatically set to *POWER* setting within one second.
3. OFF: The output RF power will be set to *POWER* setting.

Please note that TX5R.1 will still become hot even on P1mW mode. To avoid overheating, make sure to keep TX5R.1 on 0mW mode when it will be idle for a while. Though the receiver will not have live video on this mode, it will come back as soon as the quad is armed.

LP_MODE: If *PIT_MODE* is OFF and the quad is disarmed, the RF power level will be forced to 25mW (regardless of *POWER*). It can be changed on the VTX menu only.

Note:

1. VTX Menu is ***not*** accessible when SmartAudio is detected for TX5R.1
2. *Power/PIT_MODE/LP_MODE* is VTX internal settings which can be changed over VTX menu only.