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> Caruner MAX SOLO 5.8GHz 2.5W 48CH VTX Instruction Manual

Caruner CN ZWX Rush Max Solo VTX 48CH

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Model: CN ZWX Rush Max Solo VTX 48CH

1. INTRODUCTION

Welcome to the instruction manual for the Caruner MAX SOLO 5.8GHz 2.5W 48CH VTX. This video transmitter is designed for RC FPV racing drones and quadcopters, offering robust performance and advanced features for enthusiasts. Please read this manual thoroughly before installation and operation to ensure proper use and safety.



Image 1.1: Caruner MAX SOLO VTX. This image displays the top view of the MAX SOLO VTX, highlighting its compact design and integrated cooling fan.

2. WARNINGS AND SAFETY GUIDELINES

Read this user manual before use.

- The user needs to have relevant professional knowledge while mounting or operating the VTX product. Any illegal use may cause potential danger. Please ensure that you have the skills of operating radio equipment, or operate under the guidance of a professional. Read this manual carefully before you use it. For those who ignore the following statement or violate the operating regulations, the user assumes the responsibility for any personal injury and property damage.
- The VTX will generate a lot of heat while manual working, please ensure adequate airflow to provide a well-ventilated environment. Over-direct airflow may cause burns. Please ensure all the cables and plugs are installed correctly. Before powering up, please ensure the antenna has been installed correctly to the VTX. If outputs there are a large number of precision components in the VTX, please do not disassemble, repair or modify this product personally. Contact your dealer for technical support when the VTX breakdown.
- Users must follow the local radio regulations. HAM license is required for operating on HAM channels, and HAM power levels. Some channels need to be notified to the local radio regulatory agency before

use. Ensure you are in accordance with all local laws and regulations about the drones and radio. It is strictly forbidden to fly in the no-fly zone such as airport, military facilities and over crowds.



MAX SOLO

MAX 2.5W

Image 2.1: Excerpt from the official manual detailing warnings and product features.

3. FEATURES

- Developed for extreme long-range pilots, compact and efficient active cooling design unleashes the full performance of the VTX.
- LOCK-ON technology with jitter-free transmit channels and no sweep interference for multi-pilot flights.
- Factory power consistency calibration for all channels.
- Low noise DC-DC power supply design for clean screens.
- Power Level: Pit-25mW-500mW-1000mW-Max*.

4. SPECIFICATIONS

Parameter	Value
Channel	48CH / 37CH (US)
Power Level	Pit-25mW-500mW-1000mW-Max*
Input Voltage	DC 7-36V (6S LiPo)

Output Voltage	DC 5V (Max 500mA)
Video Input	CVBS PAL/NTSC
Audio Input	6.5m Mono
Antenna Connector	MMCX 50Ω
External Control	Smart Audio
Dimensions (H x W x D)	40mm x 24mm x 10.5mm
Weight	15g (Without cable)

*MAX Power level can provide 2500mW (34dBm) or more power depending on the environment's ability to dissipate heat.

5. SETUP AND INSTALLATION

5.1 Wiring Diagram

Connect the VTX to your flight controller and camera according to the diagram below. Ensure all connections are secure and correctly polarized to prevent damage.

POWER/FREQUENCY DISPLAY

CAUTION: The selection in require a HAM License to operate legally. Selections are ONLY available by special request. (The US version does NOT include these channels.)

FREQUENCY TABLE

CH	BAND A	BAND B	BAND E	BAND F	RACEBAND	LOWRACE
1	5865	5733	5705	5740	5658	5362
2	5845	5752	5685	5760	5695	5399
3	5825	5771	5665	5780	5732	5436
4	5805	5790	5645	5800	5769	5473
5	5785	5809	5885	5820	5806	5510
6	5765	5828	5905	5840	5843	5547
7	5745	5847	5925	5860	5880	5584
8	5725	5866	5945	5880	5917	5621

The chosen channel and band will be displayed in sequence. The number of flashes in red will indicate the channel and blue will flash for the band.

POWER LEVEL

LED COLOR	GREEN	BLUE	RED	PURPLE
POWER	25mW	500mW	1000mW	MAX

PIT MODE = flashing Power LED

EXIT PIT MODE = press and HOLD Power Button to use selected Power Level.

Overheated = Power LED flashes rapidly and the VTX slowly reduces transmit power

When the VTX cools down, it will resume transmitting power and the power LED will stop flashing

SMARTAUDIO

RUSH TANK has built-in SmartAudio Control Protocol. After the VTX is connected to the FC or CRSF, the VTX parameters can be quickly set via the OSD or radio control.

1. Connect the smartaudio port to the Flight controller Free UART-TX .



2. Open BetaFlight configurator, Goto the Ports tab, Under peripherals next to the UART which is connected to the RX pad of the VTX select TBS SmartAudio (Speed can be left at <auto>). Save the settings.

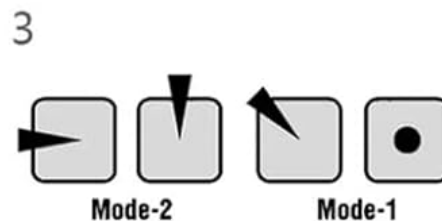
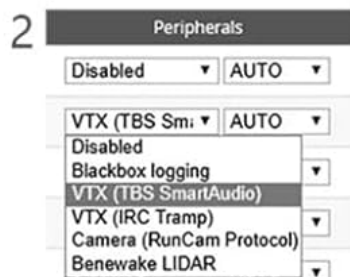


Image 5.1: Wiring diagram for connecting the MAX SOLO VTX to a flight controller and camera. This image illustrates the

5.2 SmartAudio Setup

The MAX SOLO VTX supports SmartAudio for remote control of VTX parameters via your OSD or radio control. Follow these steps for setup:

1. Connect the SmartAudio port on the VTX to a free UART-TX pad on your flight controller.
2. In the Betaflight configurator, navigate to the Ports tab. Under peripherals next to the UART which is connected to the RX pad of the VTX, select TBS SmartAudio. The speed can be left at <auto>.



Image 5.2: SmartAudio configuration in Betaflight. This image shows the steps for enabling SmartAudio in the Betaflight configurator.

6. OPERATION

6.1 Channel and Band Selection

The VTX features 48 channels across multiple bands. The chosen channel and band will be displayed in sequence by the LED. The number of flashes in red indicates the channel, and blue flashes indicate the band.

CH	BAND A	BAND B	BAND E	BAND F	RACEBAND	LOWRACE
1	5865	5733	5705	5740	5658	5362
2	5845	5752	5685	5760	5695	5399
3	5825	5771	5665	5780	5732	5436
4	5805	5790	5645	5800	5769	5473
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7	5745	5847	5925	5860	5880	5584

8	5725	5866	5945	5880	5917	5621
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CAUTION: The selection in the frequency table may require a HAM License to operate legally. Selections are ONLY available by special request. (The US version does NOT include these channels).

6.2 Power Level Adjustment

The VTX offers multiple power levels: Pit, 25mW, 500mW, 1000mW, and MAX. The current power level is indicated by the LED color.

LED Color	Power
Green	25mW
Blue	500mW
Red	1000mW
Purple	MAX

- **PIT Mode:** Flashing Power LED.
- **Exit PIT Mode:** Press and hold the Power Button to select the desired power level.
- **Overheated:** Power LED flashes rapidly, and the VTX slowly reduces transmit power. When the VTX cools down, it will resume transmitting power, and the power LED will stop flashing.

7. MAINTENANCE

To ensure the longevity and optimal performance of your MAX SOLO VTX, follow these maintenance guidelines:

- **Cleaning:** Periodically clean the VTX, especially the cooling fan and heatsink fins, to prevent dust and debris buildup. Use a soft brush or compressed air. Ensure the device is powered off before cleaning.
- **Inspection:** Regularly inspect all cables and connectors for signs of wear, damage, or loose connections. Replace any damaged components immediately.
- **Storage:** When not in use, store the VTX in a dry, cool environment, away from direct sunlight and extreme temperatures.
- **Firmware:** Check the manufacturer's website for any available firmware updates. Updating firmware can improve performance and add new features.

⚠ WARNINGS Read this user manual before use.

- The user needs to have relevant professional knowledge while mounting or operating the VTX product, any illegal use may cause potential danger. Please ensure that you have the skills of operating radio equipments, or operate under the guidance of a professional. Read this manual carefully before you use. For those who ignore the following statement or violate the operating regulations, the user assumes the responsibility for any personal injury and property damage.
- The VTX will generate a lot of heat while normal working, please ensure adequate airflow to provide a well-ventilated environment, and direct touch may cause burns. Please ensure all the cables and plugs are installed correctly. Before powering up, please ensure the antenna has been installed correctly to the VTX RF output. There are a large number of precision components in the VTX, please do not disassemble, repair or modify this product personally. Contact your dealer for technical support when the VTX breakdown.
- Please follow the local radio regulations, HAM licensed is required for operating on HAM channels, and HAM power levels, some channels need to be notified to the local radio regulatory agency before use. Ensure you are in accordance with all local laws and regulations about the drones and radio. It is strictly forbidden to fly in the no fly zone such as airport, military facilities and over corwds.

Feature

- Developed for extreme long-range pilots, compact and efficient active cooling design unleashes the full performance of the VTX.
- LOCK-ON technology with jitter-free transmit channels and no sweep interference for multi-pilot flights.
- Factory power consistency calibration for all channels
- Low noise DC-DC power supply design for clean screens.

Specification

CHANNEL: 48CH / 37CH (US)

POWER LEVEL: PIT-25mW-500mW-1000mW-MAX*

INPUT : DC 7-36V (6S LiPo)

OUTPUT : DC 5V (Max 500mA)

VIDEO IN : CVBS PAL/NTSC

AUDIO IN : 6.5M MONO

ANTENNA CONNECTOR : MMCX 50Ω

EXTERNAL CONTROL: Smart Audio

SIZE: H 40mm* W 24mm* D 10.5mm

WEIGHT:15g (With out cable)

*MAX Power level can provide 2500mW(34dbm) or more power depending on the environment's ability to dissipate heat.

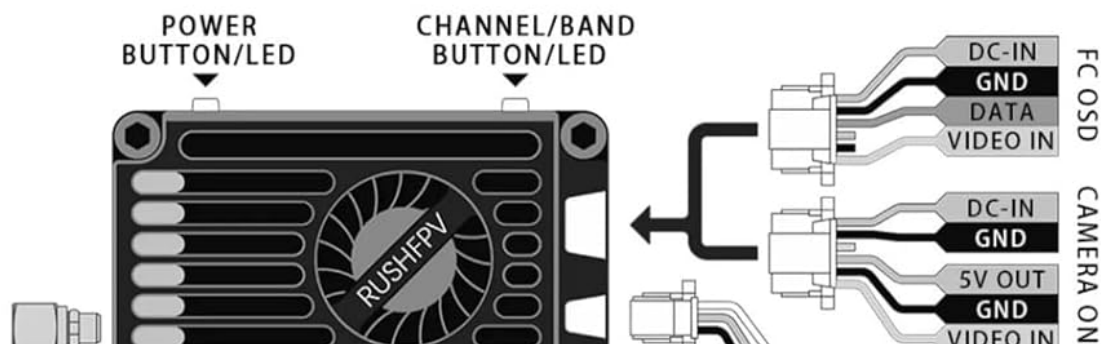


Image 7.1: Caruner MAX SOLO VTX connected to an antenna. This image shows the VTX with its MMCX antenna connector and a connected FPV antenna.

8. TROUBLESHOOTING

If you encounter issues with your MAX SOLO VTX, refer to the following common troubleshooting steps:

- **No Video Signal:**

- Verify that the VTX is powered on and receiving adequate voltage.
- Check all video input and output connections between the camera, VTX, and flight controller.
- Ensure your FPV goggles/receiver are on the correct frequency and band.
- Confirm the antenna is securely attached to the VTX.

- **Poor Video Quality/Range:**

- Check for obstructions between your drone and receiver.
- Ensure the VTX power level is set appropriately for your flying environment.
- Inspect antennas on both the VTX and receiver for damage.
- Avoid flying near sources of strong electromagnetic interference.

- **Overheating:**

- Ensure sufficient airflow around the VTX.
- Reduce the VTX power level if operating in a confined space or high ambient temperatures.
- Verify the cooling fan (if present) is functioning correctly.

- **SmartAudio Not Working:**

- Double-check the SmartAudio wiring to the flight controller's UART-TX pad.
- Confirm that SmartAudio is enabled on the correct UART in Betaflight configurator.
- Ensure your flight controller firmware supports SmartAudio.

9. WARRANTY AND SUPPORT

Caruner products are manufactured to high standards. For specific warranty information, please refer to the documentation provided at the time of purchase or visit the official Caruner website. If you encounter any issues not covered in this manual or require further assistance, please contact Caruner customer support through their official channels.

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