RF DESIGN

RFD TX Module

User's Manual

RF DESIGN

Table of contents

1   Introduction

1.1   Product Description

The RFD TX Module has been designed to work in conjunction with the Taranis X9D Radio Controller (RC) from FrSky and other compatible controllers. The RFD TX Module transmits the PPM stream from the controller to the vehicle via the RF Design long range telemetry modems while also receiving telemetry data received from the aircraft which can be broadcast to a computer or smart device through the TX Module's built in WiFi module.
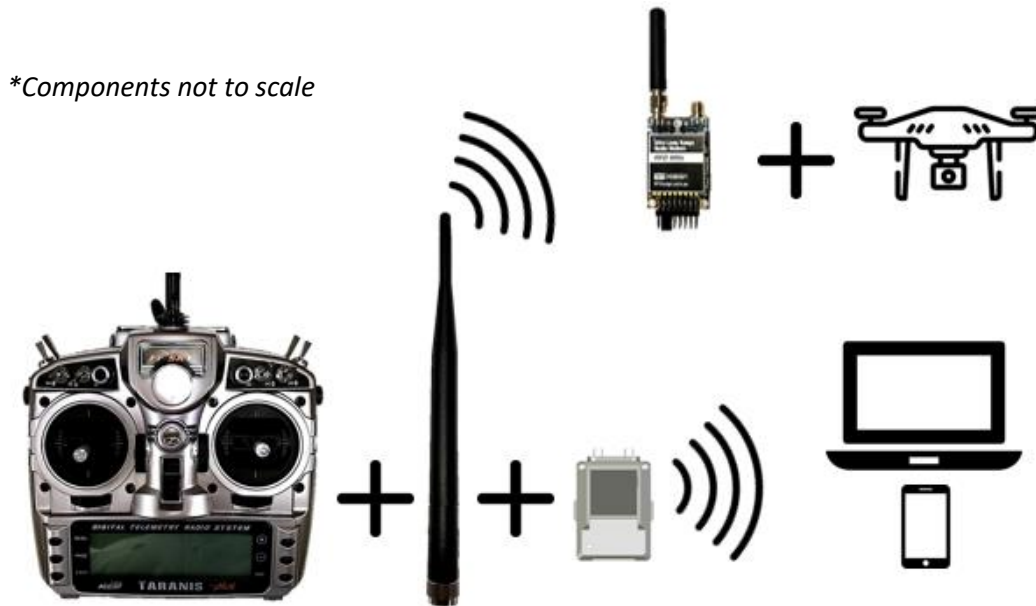
*Components not to scale

Figure 1 - Typical Application Diagram.

1.2   Getting to know the product
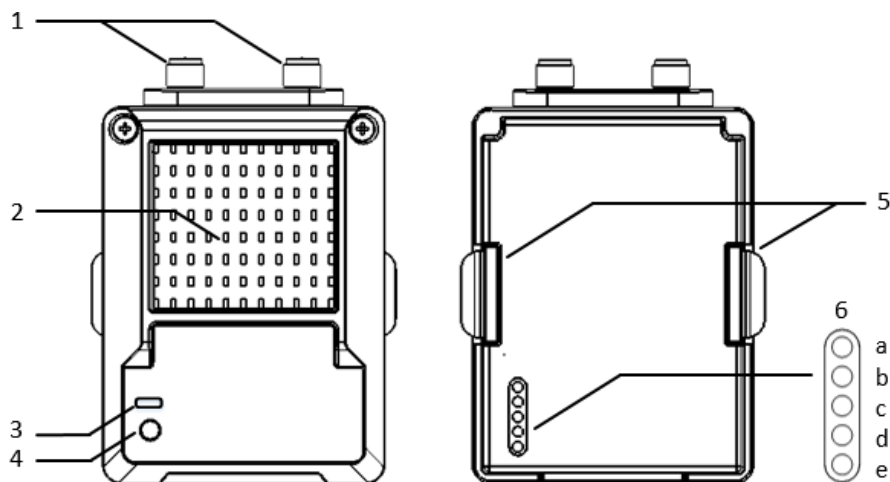
Figure 2 - TX Module Part Description

Table 1 - TX Module Description

#		Description /Note		
1	**Antenna connectors**	For further information about the antennas, refer to section 5 in this document or to the RFD 900x Modem datasheet linked in section 7.		
2	**Heat sink**	The heatsink, visible through the top cover is required for proper operation and should not be covered while the unit is in use.		
3	**Status LEDs**	Red	Blinks slowly a few times - indicates establishing link to a WiFi client. Blinks rapidly for some time - flashing the modem firmware Solid - device initialisation has completed	
		Green	Blinking – RFD modem looking for a link Solid – RFD modem bound to another modem	
4	**Button**	Press 5 times within 5 seconds to reset all WiFi settings to default values.		
5	**Tabs**	To lock the TX Module into the radio control socket.		
6	**RC and TX Module Interface.** *	a	PPM	Sends RC data into TX Module.
		b	+6 V	6V supply positive terminal (not used by the module)
		c	+Bat	Positive battery terminal (supply for the module)**
		d	GND	Ground
		e	-	Not connected

*Interface between RC and TX Module is done through a female 0.1" pitch connector.

** See Table 2 below for module supply ratings and section 6.1 for the relation between battery voltage and current draw with different battery types.

Table 2 - TX Module Supply Ratings

Parameter	Minimum	Maximum	Units
Supply Voltage (+Bat relative to GND)	+5	+18	V
Operating Current Draw	N/A	1.2*	A

*Rating for TX Module with RFD modem set for maximum 1W transmit power measured at 5V supply.

2   RC – TX Module Compatibility

The TX Module has been designed to fit into the rear expansion bay of an FrSky Taranis X9D Plus. However, it might be compatible with other transmitters. To ensure compatibility, check that the dimensions of the slot and the pin configuration of the connector at the back of your RC match those specified for the module in this section and *Table 1*. For detailed information on the TX Module dimensions refer to section 6.5.
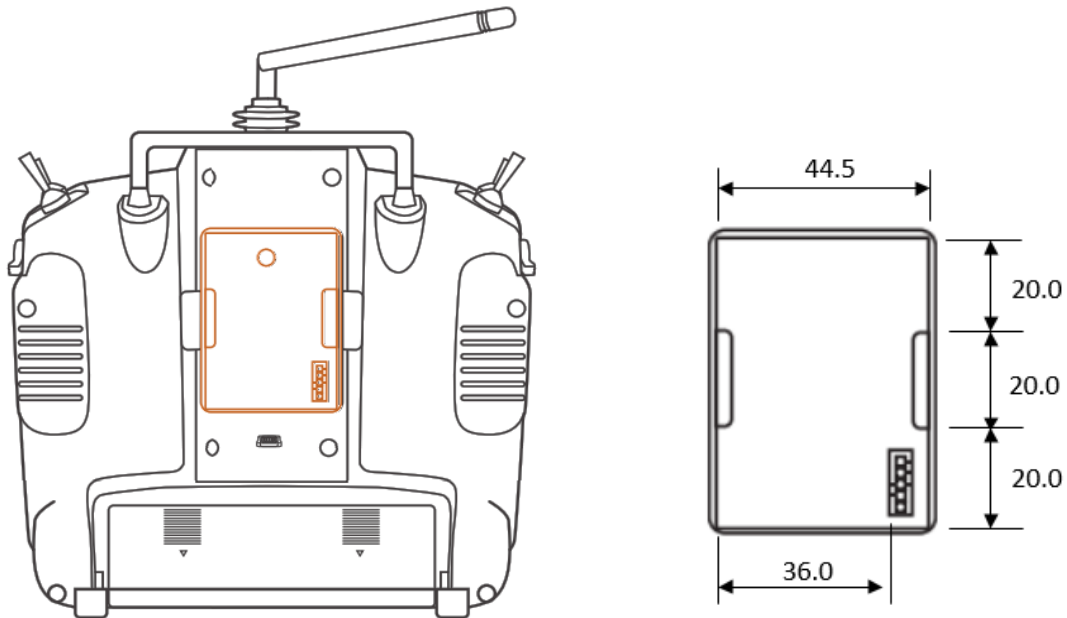

Figure 3 - RC External RF module slot dimensions.

3 Getting Started

The RFD TX Module has five elements requiring configuration before operating.

- Radio Controller (RC) configuration
- TX Module Wi-Fi access configuration
- TX Module RFD900x Radio Configuration
- Vehicle (paired) RFD 900x modem configuration
- Ground Control Station (GCS) configuration

3.1 Radio Controller Configuration

a) Enable PPM mode on radio controller

The TARANIS X9D PLUS radio controller (RC) is used as a guide to describe this section. For specific instructions on activating this mode on other RCs refer to the manufacture's manual for the device. Please check for transmitter - RFD TX Module compatibility and ensure it supports the same interface pinout specified in *Table 1* and physical dimensions described in section 2 and section 6.5.

For a TARANIS X9D PLUS switch on the RC and choose the vehicle you intend to operate. Navigate to the *Model Setup* submenu and scroll down until you find the *External RF* configuration section, as shown in figure 4, then choose "Mode PPM" to enable external PPM stream for the TX Module.
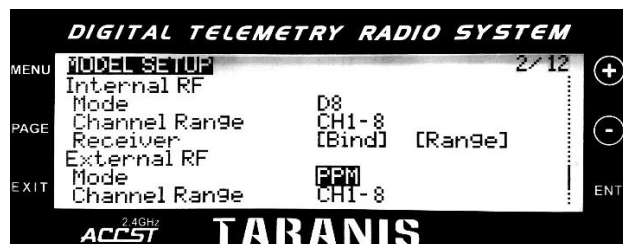

Figure 4 - PPM mode configuration on TARANIS X9D PLUS RC.

3.2 TX Module Configuration

With the RC switched off, remove the rear protective cover from the radio controller and insert the TX Module. Ensure the TX Module is inserted fully into the opening and the two tabs have locked the in place.

Switch on and observe the TX Module's LEDs. The red LED will blink and then go solid during the power up sequence, as per *Table 1*, and the green LED will indicate the state of the modem link.

The communication settings for both the WiFi and RFD telemetry links are described below.

3.2.1 Configuration Webpage

Figure 6 Configuration home page

The configuration home page provides basic information on the RF Design TX module, such as software versions and MAC and IP addresses, as well as links to the various configuration pages. It can be accessed by directly addressing the IP address of the module, by default in access point (AP) mode this is 192.168.4.1, in a web browser. Alternatively, it can be accessed by the address http://TXMOD-XX-XX-XX.local where the Xs are the same as the Xs in the access point network name i.e. the last 6 digits of the MAC address. It should be noted that this will require the installation of some support software for correct operation, for detail please see section 3.2.2 d) TX module as station.

3.2.2 WiFi Configuration

An active WiFi connection is used to configure the TX Module. On first power up, the TX Module will default to Access point mode, with SSID of the format 'TXMOD-XX-XX-XX', where the XX are unique hexadecimal characters relating to the unit MAC address.

a) Connect to TX Module Access Point

Use your computer or smart device to search for and connect to the access point WiFi network generated by the TX Module (use 'txmod123' as default password). It may be necessary to disable mobile data on tablets and phones to force the browser to use the TX Module network.
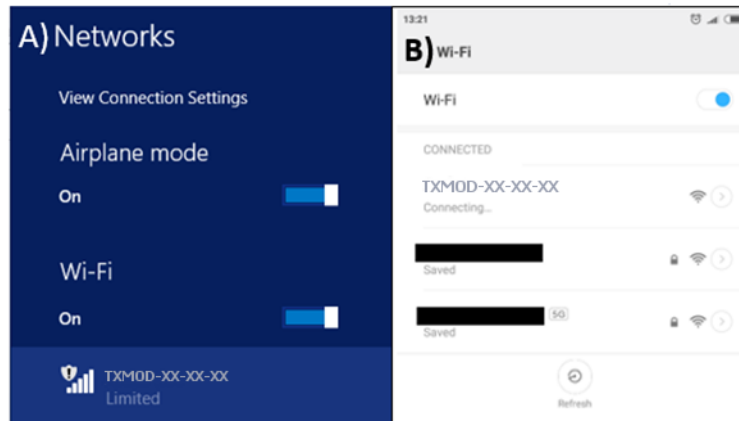
Figure 7 - Network settings. A) Windows 8.1. B) Android.

b) First run wizard

The easiest way to set up your TX Module for its initial use is with the First Run Wizard from the home page. See figure 6.
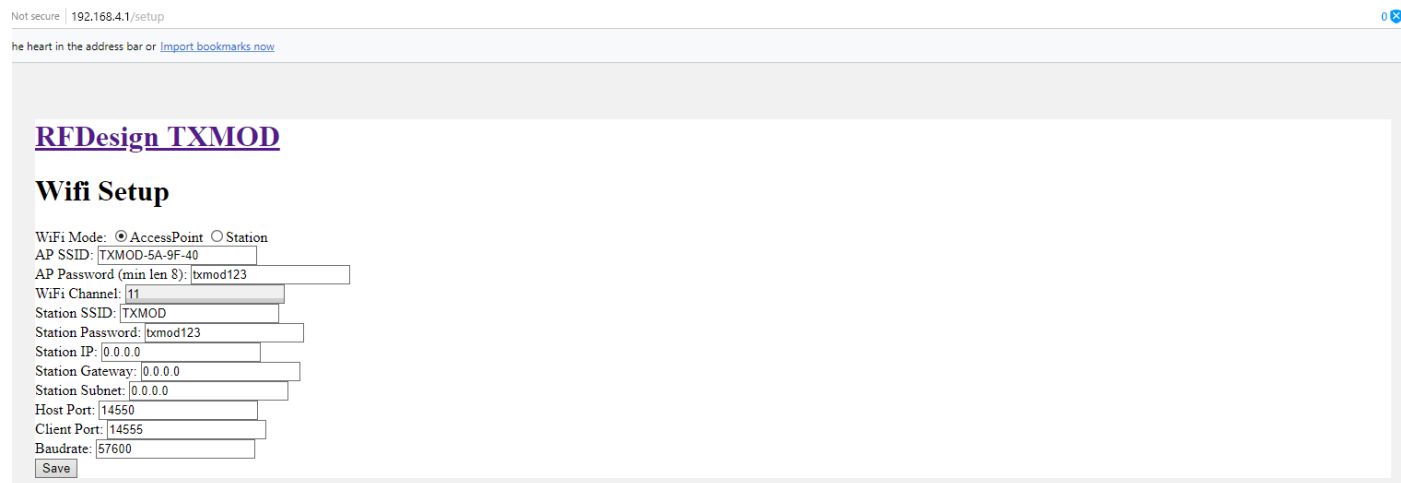
The wizard, see figure 8, will guide you through several steps for getting your module configured for use.

Figure 8 - First run wizard

c) Change Network Settings

To change the SSID or password, open a web browser and enter the module's IP address by default in AP mode *http://192.168.4.1/* This will display the TX Module configuration. To change the WiFi settings click on 'Edit WiFi/Network Setup' to access the WiFi setup interface of figure 9.

Figure 9 -WiFi settings configuration page.

Table 2 - WiFi Settings Description

Parameter	Description
WiFi mode	This sets the module to act as an access point (default) or as a station on an existing access point, such as a home network.
AP SSID	Is the SSID used for creating the access point.
AP Password	This is the password that will be used for the access point. It must be a minimum of 8 character long
WiFi Channel	Allows the user to set the channel as per the WiFi 802.11 standard definitions this can be used as needed to prevent interference or meet the requirements of the network that the module is joining. The default is channel 11 a part of the most commonly used channel set of 1, 6 and 11.
StationSSID	The SSID of the network that the TX Module should attempt to join.
Station Password	The password of the network that the TX Module should attempt to join.
Station IP	The static IP address to assign the TX Module when joining the network. (Note this may require appropriate settings to be made on the network router. Once assigned as a station the landing page for the TX Module settings becomes the Station IP address that was assigned.)
Station Gateway	The Gateway IP address of the network that the TX Module should attempt to join.
Station Subnet	The Subnet Mask of the network that the TX Module should attempt to join as a station.
Host Port	This is the UDP host port number. This is the port that you will direct a connection to in UDP mode
Client Port	This is the UDP client port number.
Baudrate	Baudrate of the serial link with the modem. It must match the modem serial speed setting to allow the two to communicate.

After changing the desired settings, press save. To finalise the changes power cycle the transmitter. Note that changes to the network settings may result in you needing to change the WiFi connection that you use in order to connect to the module e.g. selecting the new WiFi name or force the system to forget an old password then enter the new one.

d) TX Module as a station

To use the TX Module on an existing WiFi network to provide telemetry data to a GCS while still allowing access to the internet, for example to download maps, there are a couple of possible implementations.

Basic users

For Windows and Linux users this will require the installation of some support software Bonjour Services from Apple for Windows (https://support.apple.com/kb/DL999?locale=en_US) and Avahi for Linux. Windows users may also need to use to use Chrome (or Chrome based) browser as this has good support for the Apple software.

Once this has been installed connect to the TX Module in default AP mode go to WiFi settings and choose 'Station' in 'WiFi Mode', set the correct SSID (in StationSSID) and password of the network in

"Station Password", leave "Station IP", "Station Gateway" and "Station Subnet Mask" as 0.0.0.0 then press "Save" and finally reboot the device. You can connect the to the WiFi network with the TX Module on it then open the browser and enter the following address http://TXMOD-XX-XX-XX.local where the Xs are the same as the Xs in the access point network name.

Advanced users

The module must be set up by choosing 'Station' in 'WiFi Mode', set the correct SSID (in StationSSID) and password of the network in "Station Password".

You will need to find the Gateway and Subnet mask of the network then to write the appropriate values in 'Station Gateway', 'Station Subnet'. Assigning the 'Station IP' requiring that a static IP is set on the DHCP server, normally the network router, this is so the device will be at a known address on the network allowing for the user to connect using this new fixed IP in place of the 192.168.4.1 of access point mode. Network information such as the Subnet Mask and Gateway address can be found on a network connected device. For instance, in windows launch a command prompt, type *'ipconfig'* and press enter. Information similar to figure 10 will be shown. In linux based devices typing *'ifconfig'* *to the terminal should give similar results.*

Figure 10 – Command Prompt.

Default Gateway ->'Station Gateway'

Subnet Mask ->'Station Subnet'

e) Firmware Update:

To update the WiFi firmware on the TX Module, follow the links in section 7 to find and download the required firmware version. Then, on the browser configuration landing page, as per figure 7, select 'Update Firmware'. Updating the WiFi interface uses two different files; the ESP8266 'firmware.bin' and the 'spiffs.bin' files. These files should not be uploaded and flashed simultaneously. Click first on the 'Choose File' button in the ESP8266 section, then on 'Update & Reboot' and follow on-screen instructions. See figure 11 below. After that, proceed to upload the 'spiffs.bin' file by selecting it using the 'Choose File' button and then on 'Update SPIFFS' at the very bottom section of the page. Follow commands and you'll have successfully updated the WiFi firmware on the TX Module.

Figure 11 TX Module update page

f) WiFi Troubleshooting:

If you forget your settings or the device is not available on the network, it is possible to reset the module to its default settings by pressing the button 5 times rapidly. It can then be accessed using the default settings.

In some cases, user connection settings may prevent devices from accessing the WiFi addresses. It may therefore be necessary to do some basic troubleshooting such as removing the existing network settings from device memory, resetting the wireless adaptor, turn off mobile data and disconnect other networking devices such as LAN cables. In other cases, running the Windows Network Diagnostics may help.

3.2.3   TX Module Internal RFD900x Modem settings

The TX Module has an RFD900x series modem internally pre-configured with the parameters of figure 12. A description of this parameters can be found in *Table 3* - **RFD900x parameters**. For further information regarding the internal modem refer to the *RFD900x Peer to Peer Firmware* and *RFDesign Modem 900x Datasheet* documents using the links in section 7.

These internal settings and the settings of any paired modem can be modified using several methods which will be described throughout this section

- Through the module web interface under '*Edit 900x Radio Setup*'
- Using TCP link and the RFD modem tools
- Using TCP or UDP link and Mission Planner (MP) Sik Radio page

- Using a Telnet compatible serial terminal programme such as putty [1]

Notes:

[1] This method is for advanced users and involves setting modem AT and RT commands via a remote terminal as such the exact method is not included in this document.

When setting up the power level and the frequency band, please check the radiofrequency spectrum plan in your area to operate in compliance with its legislation.

In order to avoid communication incompatibilities, it is important that both the TX Module modem and the vehicle modem have the same firmware version and it is v2.55 or higher of the RFD SiK. Uploading the firmware onto the TX Module modem is covered in this section; how to update the firmware onto the vehicle modem, is covered in section 3.3 and the modem datasheet in the useful links of section xxxx

Table 3 - RFD900x parameters

Reg #	S Register Description	Default Value	Maximum Value	Minimum Value	Must be the same at both ends of the link?
S0	**FORMAT** This is for EEPROM version, it should not be changed. It is set by the firmware	Firmware dependant	N/A	N/A	No
S1	**SERIAL_SPEED** Serial speed in 'one-byte form'. Accepted values are 1, 2, 4, 9, 19, 38, 57, 115, 230, 460 corresponding to 1200bps, 2400bps, 4800bps, 9600bps, 19200bps, 38400bps, 57600bps, 115200bps, 230400bps, 460800bps and 1000000bps respectively.	57	1000^3	1	No
S2	**AIR_SPEED** Air data rate in 'one-byte form'. Accepted values are 4,64,125,250,500, 750 corresponding to 4000bps, 64000bps, 125000bps, 25000bps, 500000bps and 750000bps respectively.	64	750^3	4	Yes
S3	**NETID** Network ID. The same on both modems in the pair	25	255	0	Yes
S4	**TXPOWER** Transmit power in dBm. Maximum is 30dBm	30	30	0	No
S5	ECC[1] Enables or disables the Golay error correcting code. When enabled, it doubles the over-the-air data usage	0	1	0	Yes
S6	MAVLINK[2] Enables or disables the MAVLink framing and reporting	1	1	0	No
S7	OP_RESEND Opportunistic resend allows the node to resend packets if it has spare bandwidth	0	1	0	No
S8	**MIN_FREQ**	$915000 /868000^4$	$927000 /869000^4$	$902000 /868000^4$	Yes

	Min frequency in KHz				
S9	**MAX_FREQ** Max frequency in KHz	928000 /869000[4]	928000 /870000[4]	903000 /869000[4]	Yes
S10	**NUM_CHANNELS** Number of frequency hopping channels	20	50	1	Yes
S11	**DUTY_CYCLE** The percentage of time to allow transmit	100	100	10	No
S12	**LBT_RSSI** Listen before talk threshold (This parameter shouldn't be changed)	0	220	25	Yes
S13	**RTSCTS** Ready-to-send and Clear-to-send flow control.	0	1	0	No
S14	**Max Window** Max transit window size used to limit max time/latency if required otherwise will be set automatically	131	400	20	Yes
S15	**Encryption Level** Encryption level 0=off, 1=128bit AES	0	1	0	Yes
S16	**R/C input GPIO1.1** Set GPIO 1.1 as R/C(PPM) input	0	1	0	No
S17	**R/C output GPIO1.1** Set GPIO 1.1 as R/C(PPM) output	0	1	0	No
S18[5]	**ANT_MODE** 0= Diversity, 1= Antenna 1 only, 2= Antenna 2 only, 3= Antenna 1 TX and antenna 2 RX	0	3	0	No
S19[5]	**PKT_DROP_RSSI** Sets a RSSI threshold below which the packet will be discarded. 0 disables the feature	0	255	0	No
R0	**TARGET_RSSI** Optimal RSSI value to try to sustain (255 disables the feature)	255	50	255	No
R1	**HYSTERESIS_RSSI** Amount of change before power levels altered	50	20	50	No

Table 3: RFD900x SiK firmware parameters

Notes:

[1] ECC - Software Detection and correction, extra packet information, twice the packet length, is sent to allow the recovery of corrupted packets.

[2] Injects RSSI packet when MAVLink protocol used and heartbeat packet detected.

[3] Maximum from version 2.60 onwards

[4] 868 modems

[5] Introduced in V2.55

a) Modifying parameters with the TX Module web interface

Point your preferred browser to the module's IP address (if not changed as described in Section 3.2.2, by default in AP mode it is http://192.168.4.1/) to access the TX Module web interface of figure 8-A. *Click on 'Edit 900x Radio Setup'* to access the modem's setup interface of figure 8-B. If the TX Module has not been paired yet with any other modem, the remote side will appear empty and the message "Sorry no parameters available" will be shown.
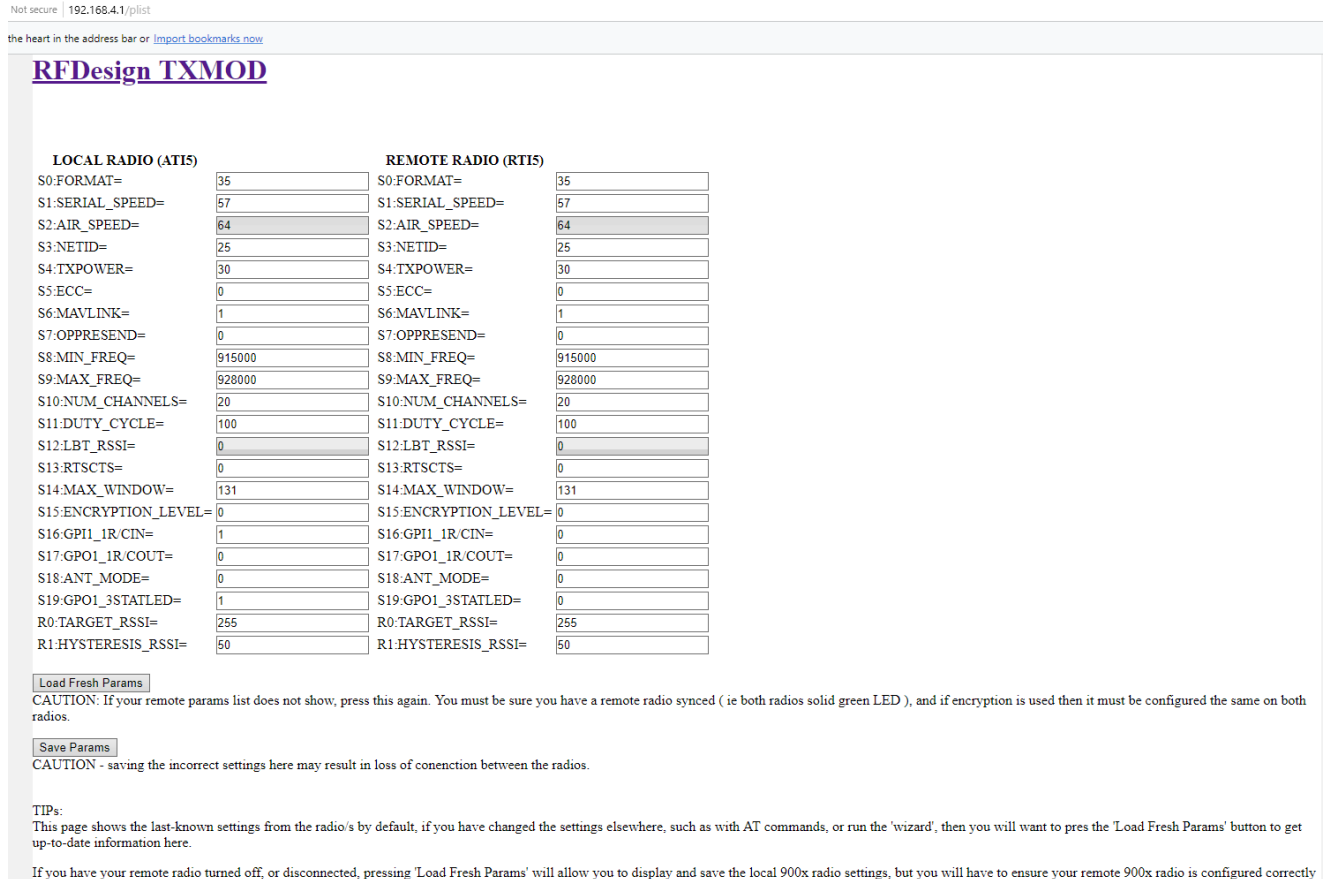
Figure 12 - TX Module modem configuration page.

Settings can be refreshed using the 'L*oad Fresh Params*' button. Parameters can be adjusted in the text boxes as required and then applied by means of the '*Save Params*' button.

To flash a new firmware, first download the required version of the peer to peer SiK firmware using the links in section 7. Do not flash the TX Module with a version below v.2.55. Then, point your browser to the modules IP address (*http://192.168.4.1/* by default in AP mode) and on the landing page click on 'Update Firmware' and follow the on-screen instructions to finish the process. To update the firmware on the vehicle modem, refer to section 3.3.

b) **RFD900 Tools**

The software and manual can be found through the links in section 7. Download the latest version of the RFD900 Tools, save the *.zip file in your computer, extract it and install the setup.exe file. Please note that this software is currently only available for windows. Run through the installation process and launch it. The interface, see figure 13, should pop up.
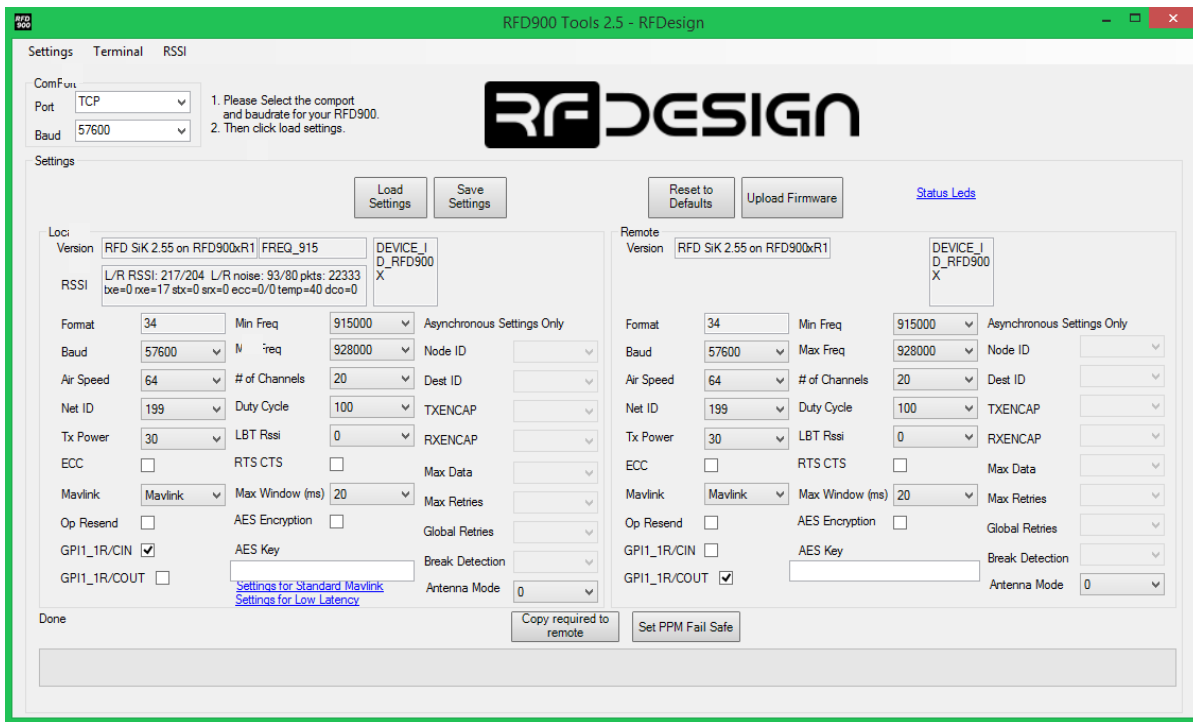
Figure 13 - TX Module modem configuration on RFD900 tools.

Connect your computer to the network with the TX Module on it. Then choose Transmission Control Protocol (TCP) in the port field and leave the 'Baud' field as default. Press connect and fill in the pop-up boxes with the TX Module IP address, by default in AP mode 192.168.4.1, and the TCP port number, by default is 23, as per figure 14.

Figure 14 - Remote host and remote port configuration prompts on RFD900 tools.

Now you can use the '*Load Settings*' button to display the current modem settings. After changing the desired parameters described in *Table 3* **- RFD900x parameters**, press on 'Save Settings' buttons to upload them onto the modem. A message at the bottom of the page saying "Done" will indicate the parameters have been saved successfully.

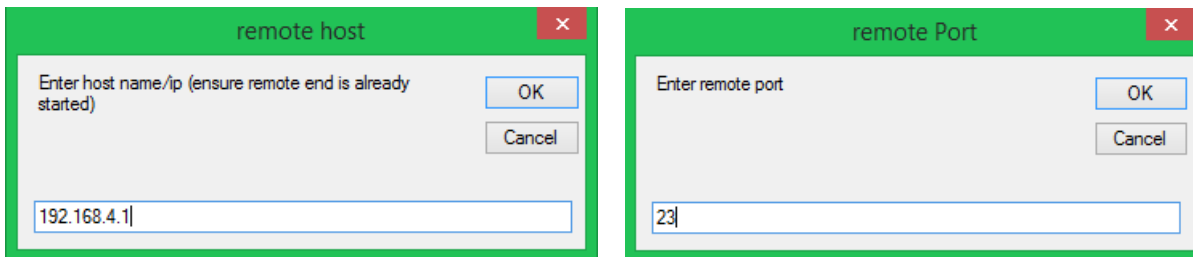To flash a new firmware, first download the latest version of firmware using the links in section 7. Do not flash the TX Module with a version below v.2.55 SiK. Click on the 'Upload Firmware' button and select the *.bin file. The message "Programming firmware into device" will show up at the bottom of the page. Wait until the process finishes (full green bar and "Programmed firmware into device), then power cycle the TX Module. The firmware has been successfully flashed into your device.

This process does not allow flashing the firmware onto the remote modem. To do so, refer to section 3.3.

c) Mission Planner

Choose TCP or UDP from the drop-down menu and press 'CONNECT' button as per figure 13.
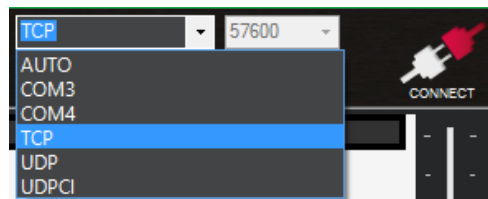
Figure 15 – Mission planner connection options.

As with the modem tools you will need to enter the IP address, by default in AP mode 192.168.4.1, and port number in the pop-up boxes, see figure 12. TCP port number is 23 and UDP is set in WiFi settings, by default it is 14550.

Go to Initial Setup/Optional Hardware/Sik Radio section as seen in the screenshot in figure 16 and click on *Load Settings* button. You can then use the drop-down boxes and buttons to manage the modem settings described in *Table 3* - **RFD900x parameters**. Press 'Save Settings' to upload the changes to the modem.

Figure 16 - Modem configuration on Mission Planner.

To flash a new firmware, first download the latest version of firmware using the links in section 7. Do not flash the TX Module with a version below v.2.55 SiK. Then click on 'Upload Firmware (Local)' and choose the *.bin file you just downloaded. Wait until the process finishes (a message will appear at

the bottom of the page) and reboot the TX Module. You have successfully updated the firmware. To update the firmware on the vehicle modem, refer to section 3.3.
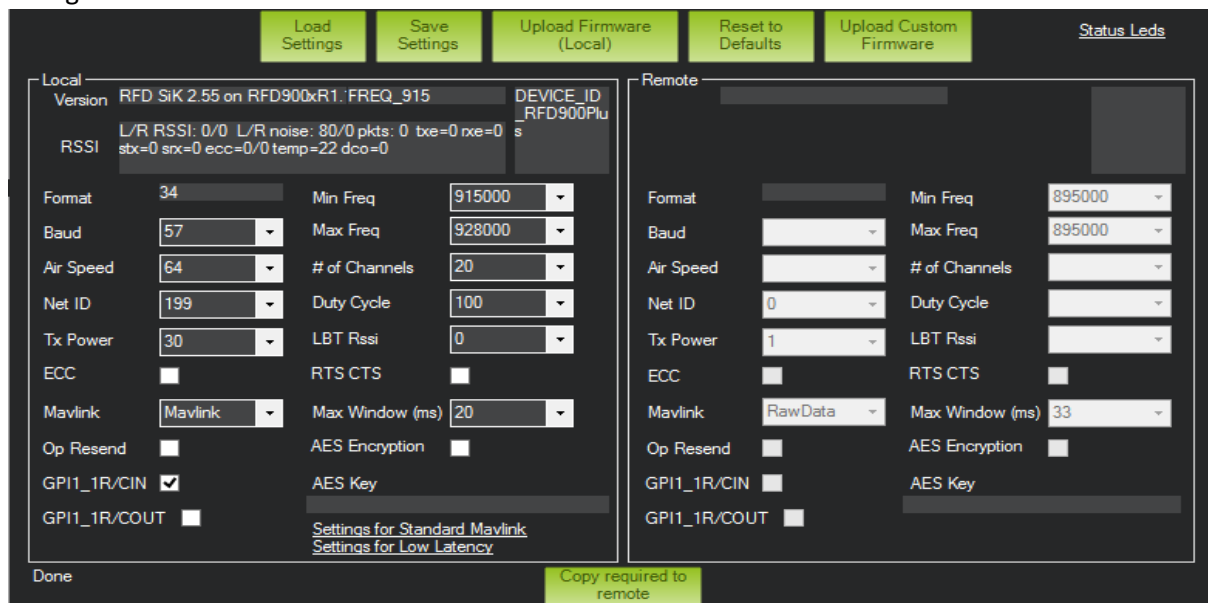
3.3   Vehicle Modem

The modem chosen on the vehicle side should be an RFD900x and should be flashed to the same firmware version than the one in the TX Module and it should be higher than v2.55 in order to ensure proper communication.

Initial configuration of the vehicle modem should be done connecting an FTDI cable as per figure 17. The black cable of the FTDI, i.e. pin 1, should connect to pin 1 on the modem, and using the RFD tools or a serial terminal programme, download links can be found in section 7, the settings can be applied. This is required when pairing with a new modem not supplied with the kit, as the default settings of a new modem will not match with the TX module modem, or after changing TX Module modem setting. A jumper between pins 2 and 3 on the top row is necessary when powering the modem from the FTDI.

*Figure 17 - Modem connected to FTDI cable (pins 1,3,5,7,9,11) to enable serial communications. **Jumper (pins 4&6)***.

To configure the modem using the RFD900 tools, download and install the software using the links on section 7 if it is not installed on your computer yet. Launch the programme and the configuration interface of figure 13 should pop-up. Use this interface to configure the parameters described in *Table 3* - **RFD900x parameters**. When connected directly through the FTDI cable the vehicle modem will appear as local.

An important setting on the vehicle modem is to set modem GPIO1.1 as a PPM output. This allows the modem pin 15 to output the PPM stream received from the TX Module modem. To enable this, check the 'CPI1_1R/COUT' box in any and ensure 'CPI1_1R/CIN' is unchecked (on the TX Module modem this is already set the other way around by default). Then save the settings to upload the configuration onto the modem.

To flash a new firmware, first download the latest version of firmware using the links in section 7. Do use a version below v.2.55. Then on RFD900 tools click on 'Upload Firmware (Local)' and choose the *.bin file you just downloaded. Wait until the process finishes (a message will appear at the bottom of the page) and reboot the TX Module. You have successfully updated the firmware.

After the modem has been configured correctly it will be able to link with the TX Module modem, indicated by a solid green LED on both devices. From this point onwards the FTDI cable is no longer needed to configure the vehicle modem. Instead this can be done over the air via the TX Module using the remote modem settings any of the methods described in section 3.2.2. This only works while the modem in the vehicle and TX Module are linked as indicated by a solid green LED.

4   Ground control station software

Once the modem and WiFi communications are configured it is possible to use the telemetry data stream. The example software used in this section is Mission Planner for Windows and Tower for Android. However, this process can be extrapolated to other software supporting Transmission Control Protocol (TCP) or User Datagram Protocol (UDP).

Connect your computer or smart device to the configured WiFi network; that is either the TX Module Access Point or the linked network when using the module as a station. Then open Mission Planner on your computer or Tower App on your Android device and choose TCP or UDP and press the button "CONNECT" as per figure 18.
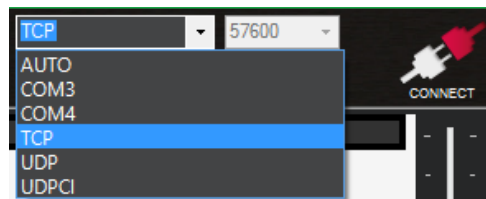
Figure 18 – Mission planner connection options.

Then, when asked for, enter the IP address and port number in the pop-up boxes. Default values in AP mode are IP *192.168.4.1,* TCP port number 23 and UDP 14550. After that, if properly connected, telemetry data should be available, and the control software should run missions as normal.
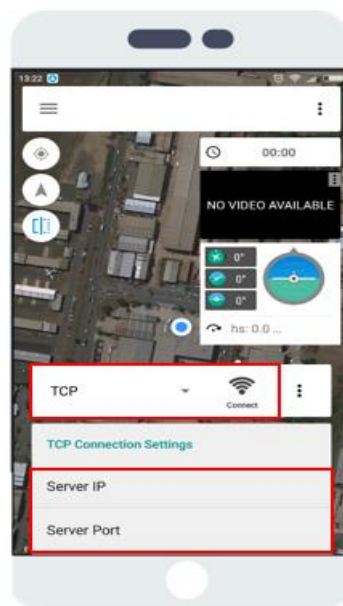
Figure 19 - Tower configuration on Android.

5   Antenna Recommendation

Any antenna with a male RPSMA fitting and matched to the 902-928MHz ISM band can be used however, the recommended antenna for the TX Module is the 3 dBi half wave dipole which is provided in the kit and is available for purchase on the RF Design store.

Figure 20 -: 900MHz Half Wave Dipole Antenna 3 dBi.

When assembling/disassembling the TX Module to/from the transmitter, be aware the antenna may have to be removed then reattached due to mechanical restraints.

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6   Technical Specifications

6.1   TX Module Power Consumption

The graph indicates the current consumption of the TX Module vs the supplied battery voltage. It should be noted that this graph is generated with the RFD modem configured for 30dBm, or 1 W, transmission. Changing the modem power will significantly affect the current draw. The graph has been divided to illustrate some common RC battery configurations.
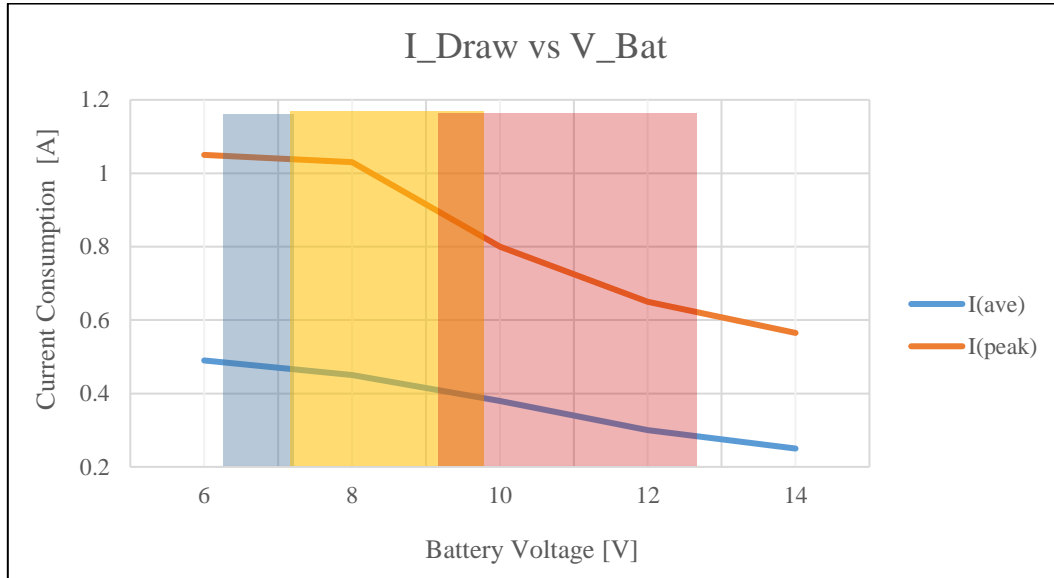
*Figure 21 - TX Module current consumption vs RC battery voltage. **A)** (Blue area) 6S Ni-MH **B)** (Orange area) 3S LiFe **C)** (Red area) 3S LiPo.*

6.2   Modem Specification

Table 4- Performance	
Supported RF Data Rates	4, 64, 125, 250 and 500 kbits/sec
Indoor Range	500 m – 1 km
Line-Of-Sight Range	40km or more depending on antennas
Transmit Power	0 to 30dBm in 1dBm steps
Receiver Sensitivity	>121dBm

Table 5 - Features	
Configuration Method	AT Commands, APM Planner, Customized Configuration Tool
Frequency Band	902 MHz – 928 MHz
Interference Immunity	FHSS (Frequency Hopping Spread Spectrum)
Serial Interface Data Rate	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400, 450800, 1000000 baud/s
Compliance Standards	

Table 6 - Networking and Security	
Addressing Options	Network ID: 0 –255
Channels	Up to 50 Frequency Hopping Channels
Supported Network Topologies	Point to point

6.3 WiFi Specifications

Table 7 - WiFi Parameters	
Certificates	FCC CE 0890 RoHS
WiFi Protocols	802.11 b/g/n
Frequency Range	2.4GHz-2.5GHz (2400MHz-2483.5MHz)
Wi-Fi mode	station/softAP/
Security	WPA/WPA2
Encryption	WEP/TKIP/AES
Firmware Upgrade	OTA (via network)
Network Protocols	IPv4, TCP/UDP/HTTP/FTP
User Configuration	Browser interface

Table 8 – ESP8266 Receiver Characteristics

Parameters	Min	Typical	Max	Unit
Input frequency	2412		2484	MHz
Input impedance		50		Ω
Input reflection			-10	dB
Output power of PA for 72.2Mbps	15.5	16.5	17.5	dBm
Output power of PA for 11b mode	19.5	20.5	21.5	dBm
Sensitivity				
DSSS, 1 Mbps		-98		dBm
CCK, 11 Mbps		-91		dBm
6 Mbps (1/2 BPSK)		-93		dBm
54 Mbps (3/4 64-QAM)		-75		dBm
HT20, MCS7 (65 Mbps, 72.2 Mbps)		-72		dBm
Adjacent Channel Rejection				
OFDM, 6 Mbps		37		dBm
OFDM, 54 Mbps		21		dBm
HT20, MCS0		37		dBm
HT20, MCS7		20		dBm

6.4 Radio Controller Interface

Table 9 - RC Parameters

Parameters	Min	Typical	Max	Unit
Latency	-	45	78	ms
TX Module Supply Voltage	+5	-	+18	V
Current Draw (peak at input voltage of 5V)	-	-	1.2	A

6.5 Physical Dimensions

This section provides the TX Module dimensional drawings. The module it has been designed to fit into the rear expansion bay of an FrSky Taranis X9D Plus, however users may find that it can be fitted to other transmitters. To ensure functionality check the physical dimensions and electrical interface are compatible and follow the information described in sections 1.2 and section 2.
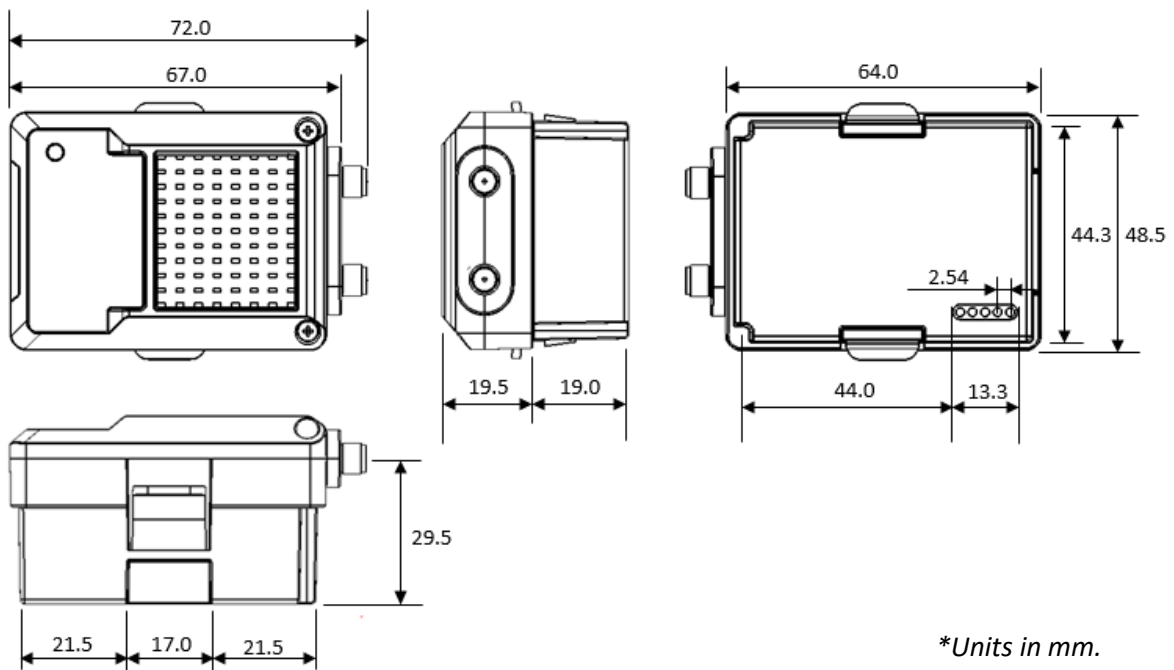

Units in mm.

Figure 22 - TX Module physical dimensions.

7   Useful Links

TX Module WiFi firmware –

RFDesign Modem 900x Datasheet

http://files.rfdesign.com.au/Files/documents/RFD900x%20DataSheet.pdf

RFDesign Modem Firmware
http://files.rfdesign.com.au/firmware/

RFD900x Peer to Peer firmware - User Manual

http://files.rfdesign.com.au/Files/documents/RFD900x%20Peer-to-peer%20User%20Manual%20V1.1.pdf

RFDesign Programming Tools
Software: http://files.rfdesign.com.au/tools/

Manual:
http://files.rfdesign.com.au/Files/documents/RFD%20Modem%20Tools%20Manual%20V1.1.pdf

CoolTerm
http://freeware.the-meiers.org/

Mission Planner
http://ardupilot.org/planner/index.html

FrSky Taranis X9D Plus
https://www.frsky-rc.com/taranis-x9d-plus-2/

Mission Planner
http://ardupilot.org/planner/docs/common-install-mission-planner.html

8   Revision History

Version	Date	Changes
1 Alpha	07 - 03 - 2019	Prerelease document