DragonLink

DragonLink V3 Advanced Complete System

DragonLink OSD

User Guide v0.1 – April 2018

UI: 3.0.1.8 Firmware: 2.9

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1 Introduction

1.1 Overview

The DragonLink V3 System has been constructed from the best performing, highest quality components, using the latest and most advanced technology available. This system is built to outperform everything else on market and will last for many years. It is not cheap, but it will be the best FPV investment you will make.

Some of the DragonLink V3 features include:

- Typical range of more than 60 KM with stock antennas
- Full bi-directional telemetry - telemetry range varies with receiver type and data rate used
- Built in serial radio modem
- Full MavLink support, works with Tower, Mission Planner, and others
- Built in Bluetooth for display of telemetry on any android Smartphone or Tablet
- Fully configurable using PC software
- Can serve as a lost plane finder using optional GPS hardware and a telemetry-compatible controller
- Easy-to-see multi-color LEDs for instant status monitoring
- Audible alarms (for low voltage, low RSSI, etc.)
- Logging of flight, position, etc. to Micro-SD card (in development)
- RF Spectrum Analyzer
- Super-fast update rates available for racers and obstacle flyers
- Hassle free, bind-and-fly operation for those that want a basic experience
- Fully compatible with existing Dragon Link Micro Receivers (full bi-directional)

The Dragon Link complete system is proudly made in the USA, and is fully guaranteed in the USA. The system includes everything you need for long range, high performance RC control, and there is nothing additional to purchase. To get started with the best RC control money can buy, just order a complete DragonLink system and choose the correct options for your RC transmitter connection cables and airplane antenna options to suit.

NOTE: FPV video transmission is not a function of the DragonLink System and will require the purchase of additional equipment.

1.2 Package Contents

"DragonLink V3 Advanced Complete System" package contents include:

- ⊃ 1x Long Range V3 Advanced Slim Transmitter
- ⊃ 1x Long Range Receiver (Micro or Advanced)
- ⊃ 1x Genuine Nagoya Transmitter Antenna
- ⊃ 1x High Performance FPVPro Receiver Antenna
- ⊃ 1x Connection Cable for Transmitter Module (type included according to selection made at time of purchase)

This user guide also covers the use of the following optional DragonLink products:

- ⊃ DragonLink Transmitter (non-slim)
- ⊃ DragonLink Advanced (high-power) Receiver
- ⊃ DragonLink 100 amp Current Sensor
- ⊃ DragonLink high-accuracy GPS position sensor
- ⊃ DragonLink Micro OSD

1.3 Specifications

DragonLink V3 Advanced Transmitter (Slim)

Input Voltage	5 – 18v (2 – 4 cell LiPo)
Operating Frequency	433MHz (frequency hopping in ARS band)
Typical Range	40km (using supplied antennas)
Weight	90g
Length	79mm
Width	60mm
Thickness	15mm

DragonLink V3 Advanced Transmitter

Input Voltage	5 – 18v (2 – 4 cell LiPo)
Operating Frequency	433MHz (frequency hopping in ARS band)
Typical Range	40km (using supplied antennas)
Weight	150g
Length	86mm
Width	75mm
Thickness	30mm

DragonLink V3 Micro Receiver

Input Voltage	5 – 9v (UBEC or 2 cell LiPo)
Operating Frequency	433MHz (frequency hopping in ARS band)

Transmit Power	25mW
Weight	g
Length	52mm (not inc. SMA)
Width	23mm
Thickness	9mm (14mm inc. pin headers)

DragonLink V3 Advanced (high-power) Receiver

Input Voltage	5 – 9v (UBEC or 2 cell LiPo)
Operating Frequency	433MHz (frequency hopping in ARS band)
Transmit Power	1500mW
Weight	g
Length	70mm (not inc. SMA)
Width	36mm
Thickness	11mm (14mm inc. pin headers)

1.4 Software Updates

For instructions on how to apply software or firmware updates, please see sections 2.3 and 2.4, respectively.

1.4.1 Changelog

An up-to-date changelog for both firmware and software can be found on the welcome screen of the DragonLink GUI software.

This is version 1.0 of the DragonLink User Guide.

1.4.2 Known Issues and Limitations

⊃ When configuring "External connections" on the Transmitter, assigning the same function to more than one connection will cause one or more of those connections to not work.

⊃ When using MavLink Decoded telemetry, Mission Planner will endlessly attempt to retrieve parameters. As this is not possible without a bi-directional telemetry link, the user will need to click "Cancel" to proceed. This is a limitation of Mission Planner and not a fault with your DragonLink system.

⊃ Elements positioned on the DragonLink OSD within the GUI will not always show the correct location on the FPV video feed. The OSD is still largely under development.

1.5 Product Support

Your Dragon Link system is fully guaranteed and we will be happy to repair, test and upgrade it to the latest firmware free of charge. If you have exhausted the troubleshooting procedures in section [to be added] at the end of this manual and still have no success getting your DragonLink system to work, send your transmitter and receiver ONLY (NO antennas, NO accessories or other items) to us for repair. It is VERY IMPORTANT that you include a note explaining what is wrong so that we can correctly diagnose your system. Also remember to include your full name and return address on the note so that it can be sent back to you.

If you are outside the USA, you can use the cheapest way possible to send it to us in a small padded envelope, or very small box to keep the postage cost low. The mail is very reliable and fast in the USA so there is no need to pay extra for express mail, or very expensive tracking.

Shipping address:

ROSA YSLA
PO BOX 388
CORTARO AZ 85652
USA

Support contact:

support@fpvpro.com

1.6 Warnings and Safety

⊃ The DragonLink system is for hobby use only, in radio-controlled planes, copters, boats, and cars. Use of the system for any other than its intended purpose may cause damage to property, personal injury, or death.
⊃ Always observe proper use of the DragonLink system and ensure that all appropriate safety measures are taken during use and when setting up (eg. when soldering), in accordance with the user manuals for any other applicable products.
⊃ Always observe safety precautions for Lithium Polymer and other battery types. Improper use of batteries can cause fires, serious burns, and explosions. Never use or charge a damage or puffed battery.
⊃ Always observe local and national laws regarding the use of radio transmitters and remotely piloted vehicles.
⊃ DragonLink and FPVPro will not accept any liability for any loss, fines, or damage that may result from the use of this system.

2 Software Installation

This chapter outlines the procedures for installing the DragonLink GUI onto a Microsoft Windows PC and then using the DragonLink GUI to load the latest firmware onto your DragonLink hardware.

2.1 Minimum System Requirements

Component	Requirement
Computer / Processor	Pentium 4, Athlon 64, or equivalent
Memory (RAM)	2 gigabytes (GB) or greater
Operating System	Microsoft™ Windows™ 7, 8, 8.1, 10
Video	Display with resolution 1024x768 or greater
Internet Connectivity	256kbit/s or faster recommended

2.2 Obtaining the Latest Software / Firmware

It is strongly advisable to check for firmware and software updates regularly as they may include bug fixes, new features, and performance improvements. Before flying your DragonLink system for the first time, it is necessary to apply the latest firmware and obtain the newest version of the DragonLink GUI software for PC.

1. To begin checking for updates, visit this section of the DragonLink website:

   http://www.dragonlinkrc.com/instructions/

2. From there, select your applicable DragonLink system:

3. Then select **Complete Systems**:

ALL DRAGON LINK V3 COMPLETE
SYSTEMS INSTALLATION

4. Lastly, click on the download link near the top:

Dragon Link V3 Advanced Complete System

System Configuration and Firmware Update Software

*** CLICK HERE TO DOWNLOAD ***

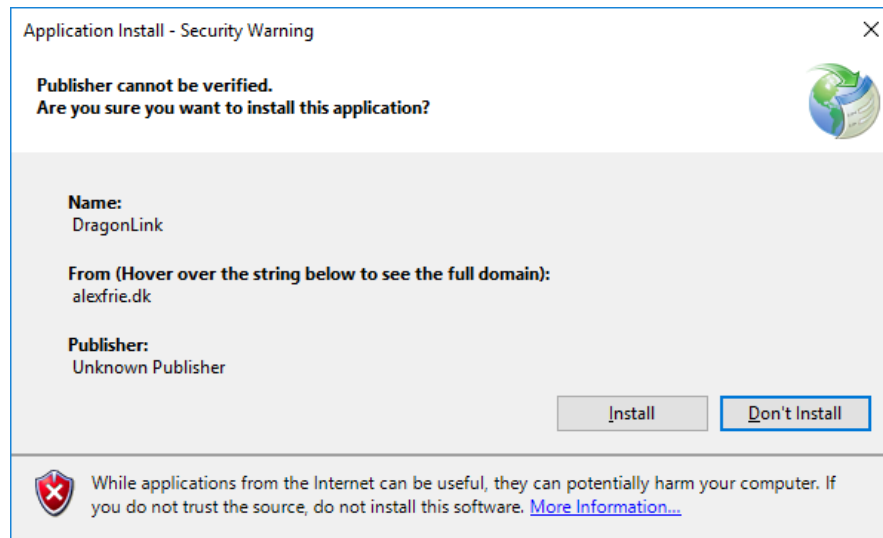5. Once the compressed (.zip) has downloaded, extract it by right-clicking the file and selecting **Extract All…**

2.3 Software Installation

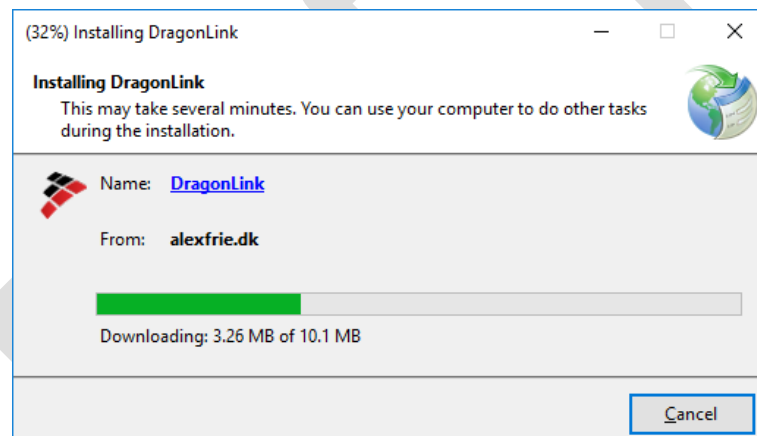1. The compressed (.zip) file obtained from the DragonLink website contains the following files:

Driver	25/01/2018 10:15 …	File folder	
DragonLink_GUI_Setup.exe	26/11/2017 9:43 AM	Application	511 KB
FirmwareReceiver26Nov2017.MicroRx	16/08/2017 5:09 PM	MICRORX File	68 KB
FirmwareTransmitter26Nov2017.V3Tx	26/11/2017 9:27 AM	V3TX File	53 KB

NOTE: You will require an internet connection in order to perform the installation as the installer needs to download additional software components.
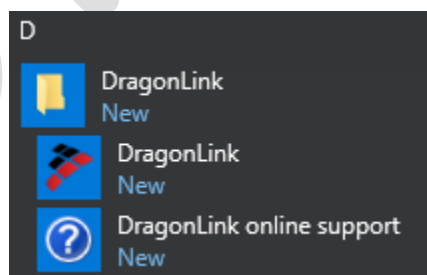
2. Double-click the **DragonLink_GUI_Setup.exe** file to begin the installation of the DragonLink software. At the prompt, select "Install".

3. Please wait for the download to complete.

4. Once the installation is complete, the software can be launched from the DragonLink shortcut on the Start Menu.
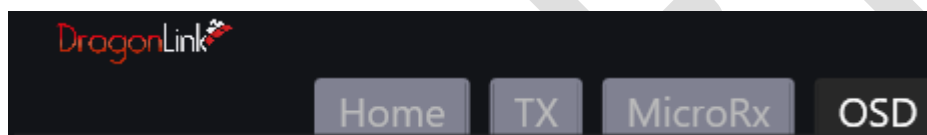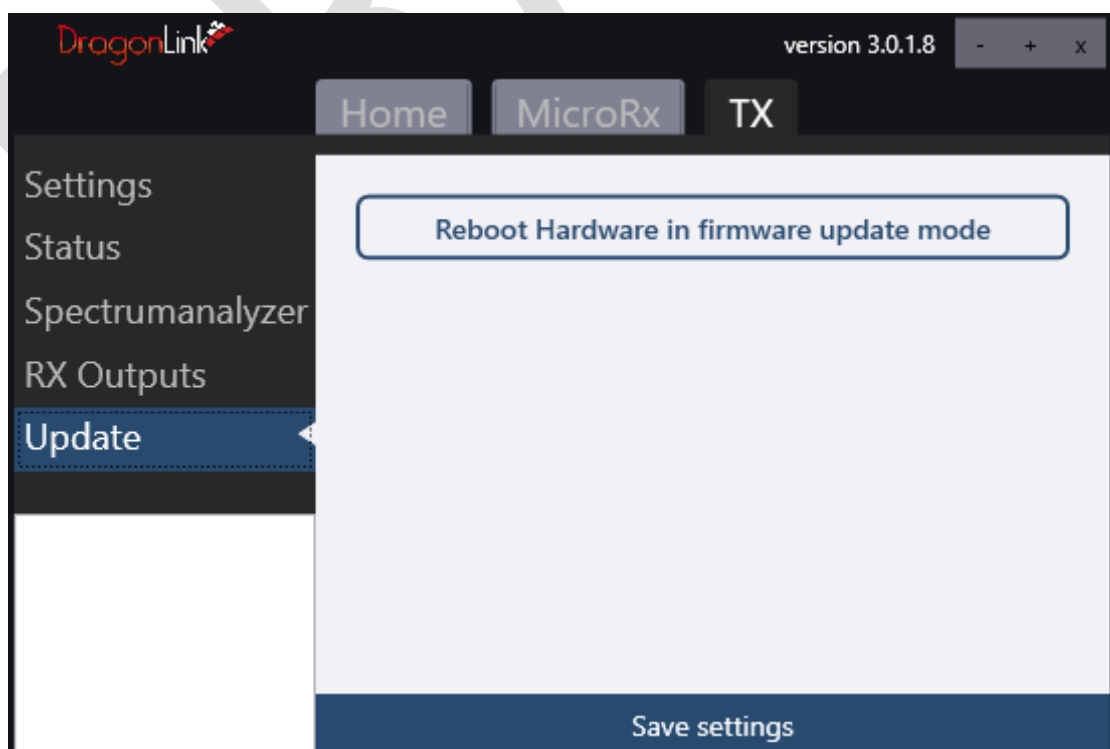
2.4 Applying Firmware Updates

Firmware updates can be easily applied to your DragonLink transmitter, receiver, or OSD, using the DragonLink GUI software.

WARNING: It is important not to interrupt the firmware update process as this has the potential to cause hardware damage and render your device unusable.
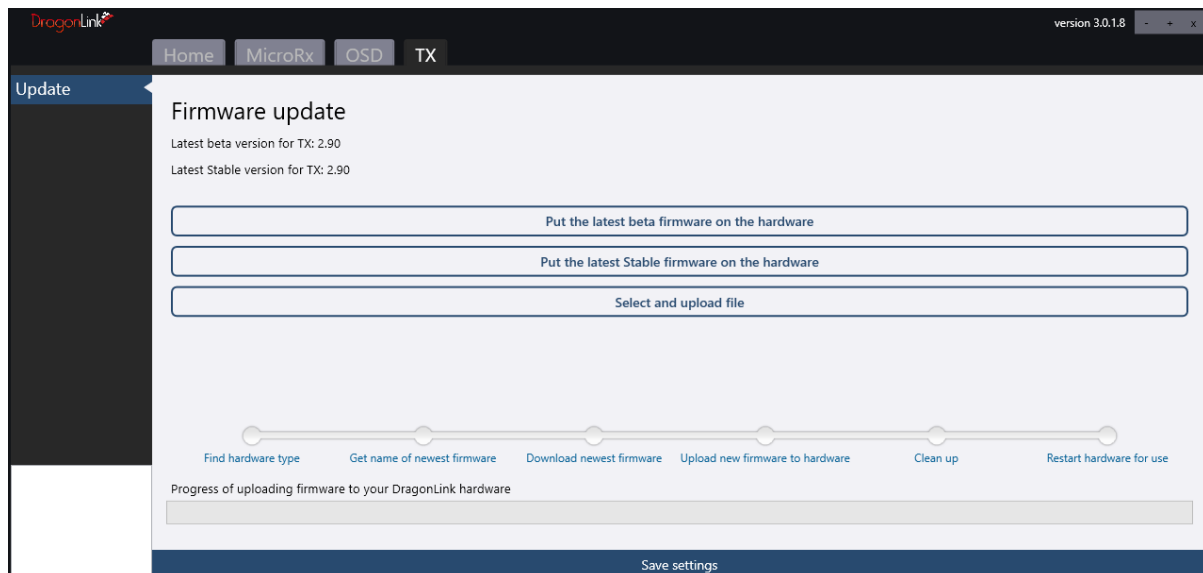
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1. First, connect your DragonLink transmitter, receiver, or OSD to your PC using a micro-USB cable. Ensure the device tab appears in the DragonLink GUI software. It may take a moment for drivers to install before the tab appears. If it does not appear, please follow the Driver Installation Troubleshooting guide in section [to be added].

2. Select the relevant tab for the device you wish to update. Then, select the **Update** page and click **Reboot Hardware in firmware update mode**

3. Once the hardware has rebooted you will be presented with the below screen, which offers a number of firmware options.

-Select "**latest beta firmware**" if you wish to try out the most up-to-date features and / or bug fixes.

-Select "**latest Stable firmware**" if you wish to use the most up-to-date firmware that is known not to have any major bugs.

-Select "**Select and upload file**" if you wish to manually specify a firmware file to upload to your device. (This is used in such instances as when you may wish to downgrade to a previous version of firmware.)

After selecting one of the options, the software will automatically download the firmware from the internet (or allow you to navigate to the firmware file and select it), then begin applying it to your DragonLink device.
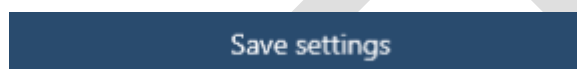
NOTE: While every precaution is taken to prevent serious bugs making it into any version of our firmware, it is possible that 'beta' firmware may contain bugs which have the potential to cause the loss of control of your model aircraft. At the time of writing, no such bugs are known to exist, however please proceed with the appropriate level of care as DragonLink cannot accept any responsibility for any damages or the loss of your model aircraft.

3 Configuration – DragonLink GUI

NOTE: After changing settings relating to update-rate, bandwidth allocation, use of narrow-band, no. of channels, hardware IDs, or the enabling or disabling bi-directional data, it will be necessary to re-bind your DragonLink transmitter and receiver.
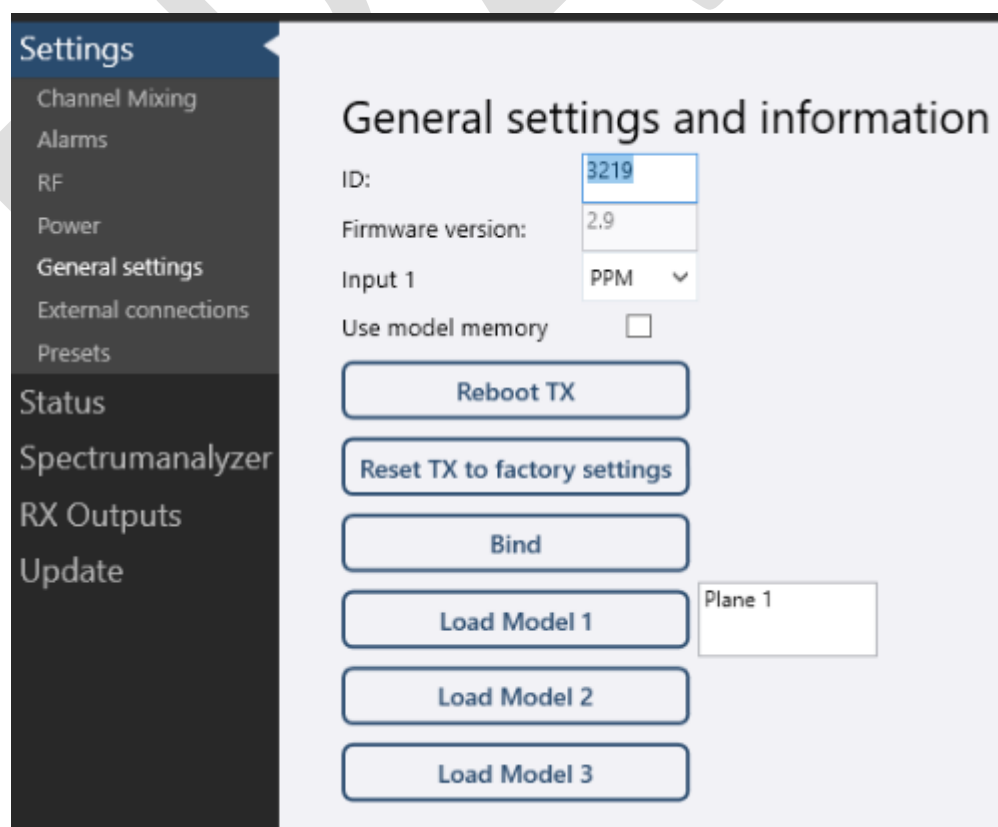
Saving Settings

Before disconnecting or rebooting your DragonLink device, ensure that any changes to the configuration are not lost by clicking **Save Settings** at the bottom of the DragonLink GUI window. Some pages have additional save buttons – ensure you click these as necessary.
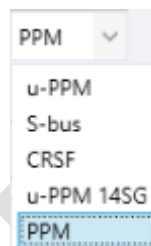

3.1 DragonLink Transmitter

3.1.1 General Settings

ID: This number should be changed to something unique before your DragonLink system is used for the first time. It is used as an identifier to encode the transmission data so the receiver does not suffer interference from other DragonLink systems during flight. Once changed, re-binding with the receiver is necessary.

Firmware version: This field displays the version of firmware currently applied to the DragonLink transmitter.

Input 1: Specifies the protocol used by the controller to talk to the DragonLink transmitter. This must match the protocol used by the controller's trainer jack or module-bay port.

Use model memory: Enables the use of model memory, which allows switching between 3 different saved configuration 'profiles' so that the settings do not need to be adjusted manually each time for use with different model aircraft.

When enabled, the desired model can be selected by setting the switch position before powering on the transmitter (Switch Ex3 on large transmitter, or switch Ex1 on the Slim). Once the transmitter is powered on, the switch can then be used normally for other functions without affecting the model selection.

Reboot TX: reboots the DragonLink transmitter. Required for some changes to take effect.

Reset TX to factory settings: Restores all settings back to factory default. A recommended first-step when troubleshooting the DragonLink system.
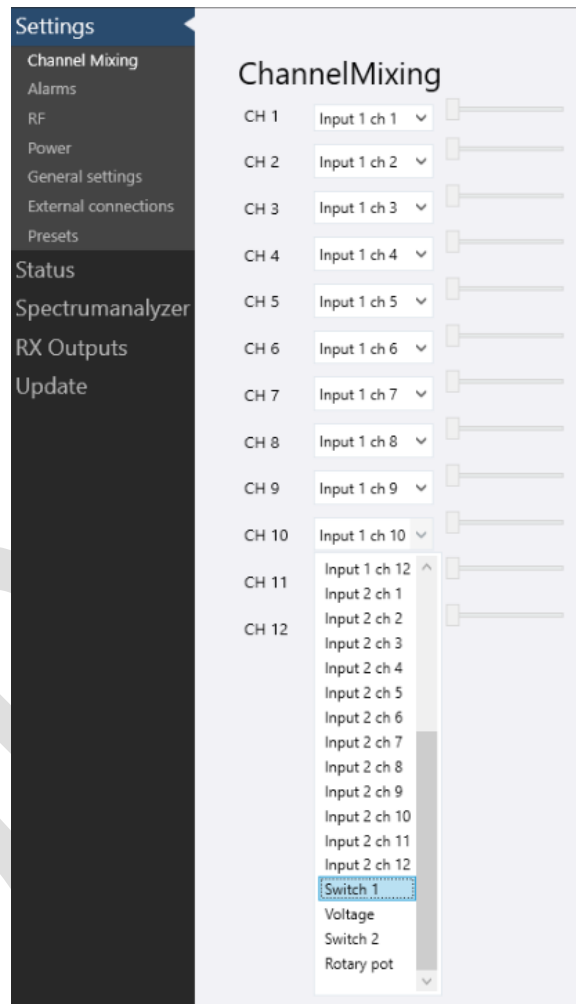
Bind: Places the DragonLink transmitter in binding mode. To complete the binding process once this mode has been activated:

1. Power on the DragonLink receiver. The receiver's blue and green LEDs should flash alternately, indicating a successful bind.
2. Power off the receiver and reboot the transmitter.
3. The receiver's blue LED should now be lit, indicating a successful link to the DragonLink transmitter. The transmitter's LED(s) will not be lit unless connected to an external power source.

Load Model 1 – 3: These buttons switch between saved model configurations. Before changing to another Model, ensure settings are saved as any unsaved changes will be lost.

3.1.2 Channel Mixing / Assignment

The Channel Mixing settings page allows you to map channels from your controller, as well as the DragonLink transmitter's switches or the rotary pot (large transmitter only), to any of the 12 channels on the DragonLink system. In addition, the sliders to the right of each channel show the position of each channel, live, so you can confirm their functionality without needing the receiver or additional hardware connected.

CH 1 – 12: The drop-down menus on this screen allow you to assign an input to each of the 12 channels that the DragonLink transmitter communicates to the receiver. The available options for each channel include:

- ⊃ Channels 1 – 12 from Input 1
- ⊃ Channels 1 – 12 from Input 2*
- ⊃ Switch 1 (Ex1)
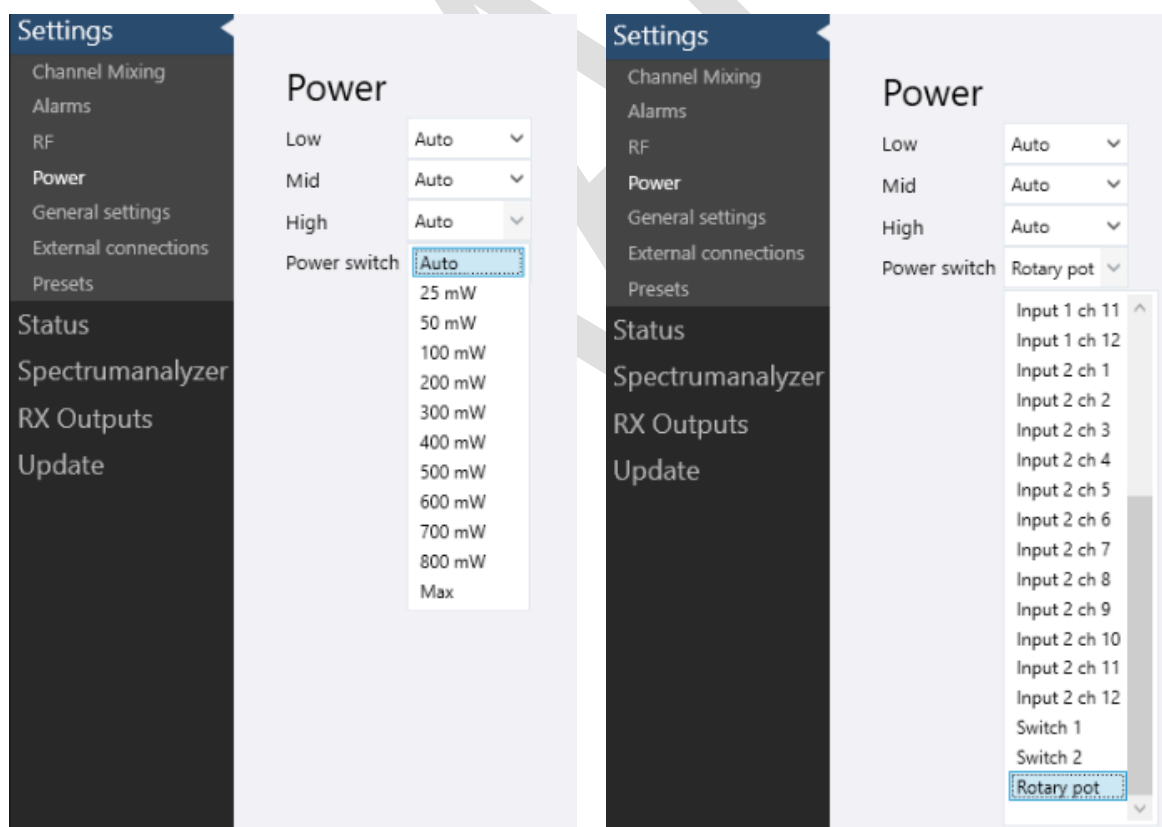- ⊃ Switch 2 (Ex3)*
- ⊃ Rotary pot (Ex2)*
- ⊃ Voltage

not available on DragonLink V3 Slim transmitter

NOTE: Configuration of the receiver is also required in order to complete the channel mapping / mixing setup. See chapter 3.5.

Assigning **voltage** to a channel will cause that channel's position to move in conjunction with the DragonLink transmitter's input voltage. This could, for example, be used by the model aircraft to display an indication on the OSD of the transmitter's voltage, or for an RTL mode to be set based on low TX voltage, or for a physical servo to perform some function once the TX battery reaches a certain level.

The channel will move from minimum to maximum positions based on a voltage range of approximately 5v – 16v.

3.1.3 Power Settings

The DragonLink transmitter's RF output power can be controlled automatically or set to a fixed milli-watt value manually by the user.

NOTE: Auto mode increases the RF power as-needed in order to maintain a stable RC link and reduces it when not needed to maintain efficiency. It does so very quickly – far quicker than the user could adjust it manually – and in much finer increments. For this reason, Auto is the recommended mode.

Low: sets the transmit power level when the switch, RC channel, or rotary pot is in the *lower third* of the channel range

Mid: sets the transmit power level when the switch, RC channel, or rotary pot is in the *middle third* of the channel range

High: sets the transmit power level when the switch, RC channel, or rotary pot is in the *upper third* of the channel range

Power switch: Defines the switch, RC channel, or rotary pot that will be used to alter the transmit power.

At the time of writing, there is no option to remove the assignment of a switch or RC channel to the power setting, however, if the **low, mid,** and **high** settings are all set to **Auto** (or an identical fixed value), the settings on this page will have no effect. In addition, the assignment of a switch or channel here will not prevent it from being assigned to other functions elsewhere.

3.1.4 RF Settings

The RF settings page controls how the DragonLink transmitter talks to the receiver. Changing these settings can affect the control range and telemetry range, as well as the responsiveness of control over the model aircraft. For example, lowering the

number of channels sent to the receiver will improve the responsiveness, while decreasing the bi-directional bandwidth and lowering the update rate to its minimum setting will greatly increase the range at which telemetry can be received.

At the bottom of the page, the approximate update rate (hertz) is displayed, along with the radio modem's uplink and downlink data rates (bytes per second). These values can be used to gauge the effect that changing the settings will have.

In real-world usage situations, any gain to be had by lowering the number of transmitted channels or bi-dir bandwidth will be marginal, and may result in compromised performance. Only lower these settings below 'normal' in cases where extreme range and link stability are required.

NOTE: MavLink telemetry streams require a relatively high data rate. Without altering the configuration of the flight controller, MavLink typically only works with 'bidir bandwidth' set to 'High' and 'RF preference' set to 'Fastest update-rate'.

RF Band: [to be added]

Use bi-dir: Enables or disables bi-directional communication between the transmitter and receiver. Disabling this setting will disable all telemetry and radio-modem functionality.
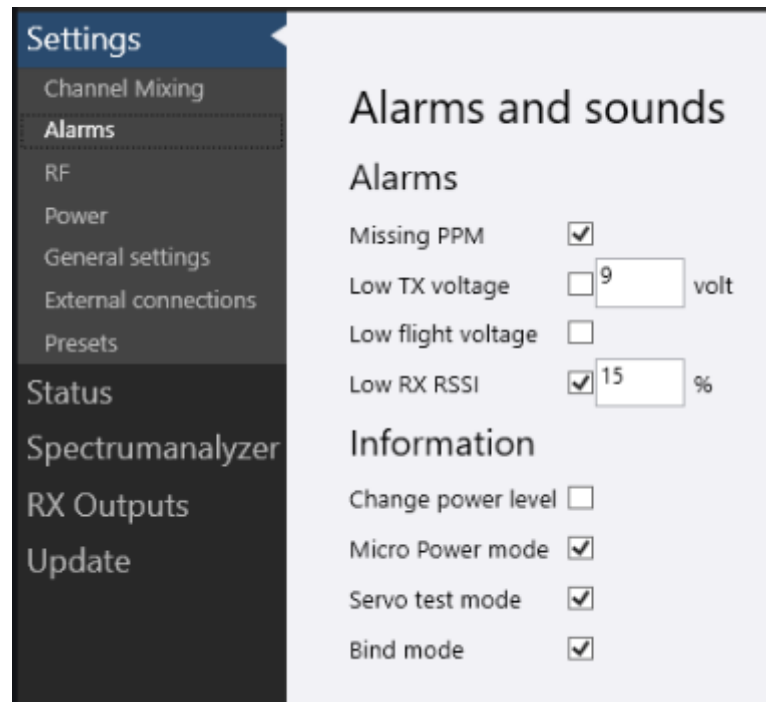
Trans. channels: Specifies how many channels to transmit to the receiver.

Bidir bandwidth: Specifies how much bandwidth to allocate to bi-directional communication. Maximum value is required for stable MavLink.

RF preference: Specifies how rapidly to update the channel positions.

Use narrowband: Effectively uses half the normal bandwidth, allowing much tighter internal RF filters for a cleaner signal.

3.1.5 Alarms and Sounds

The DragonLink transmitter is capable of providing a range of audible warnings to the user.

Missing PPM: Triggered by a loss of input from the radio controller's trainer jack or module bay connection.

Low TX voltage: User-configurable low input-voltage alarm.

Low flight voltage: Triggered by low voltage reading from optional DragonLink Voltage Sensor (requires active telemetry link).

Low RX RSSI: User-configurable low signal strength alarm.

Change power level: Either one, two, or three beeps will be played to correspond with the selection of either **low**, **mid**, or **high** power levels, respectively. When using Auto power level modes only, disabling this alert is recommended (see section 4.1.3).
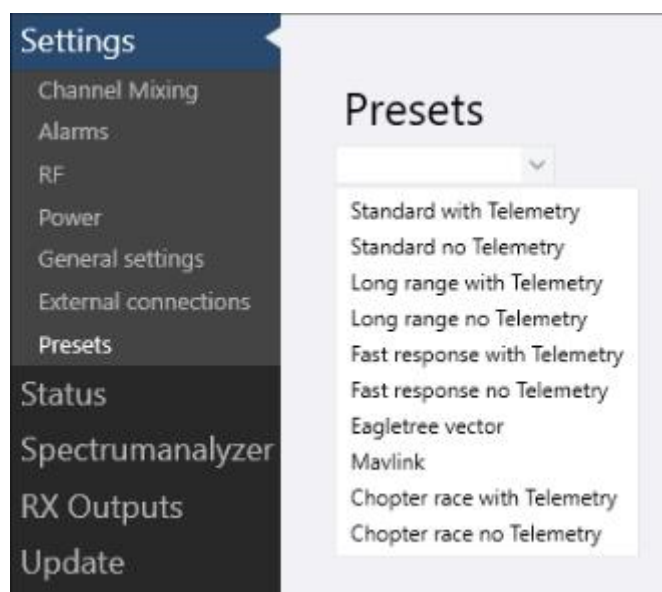
Micro Power mode*: Plays a repeating audio reminder while the transmitter is in micro power (range test) mode.

Servo test mode*: Plays a repeating audio reminder while the transmitter is in servo test mode.

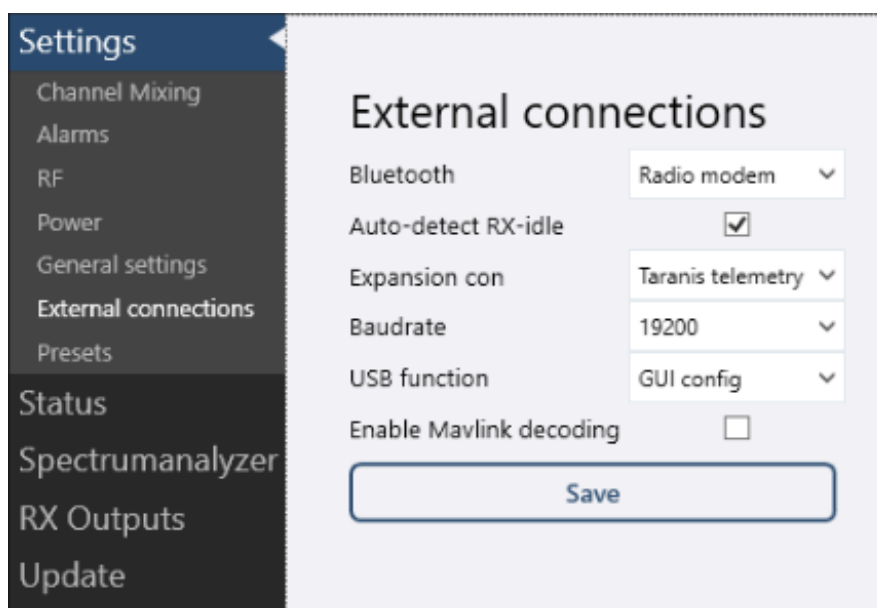**Bind mode*:** Plays a repeating audio reminder while the transmitter is in bind mode.

* It is recommended that these reminders be enabled to ensure the model aircraft is not inadvertently launched while the transmitter remains in a mode that may cause loss of control or damage.

3.1.6 Presets

The Presets page can be used to apply a range of configuration templates to your DragonLink transmitter. These won't alter general settings, such as channel and switch assignments, model ID, or alarms, however it will alter settings to do with bi-directional data, update rate, and bandwidth in order to optimise performance for the use-case determined by the preset. After applying a preset, it will be necessary to check all of the settings to confirm they are suitable.
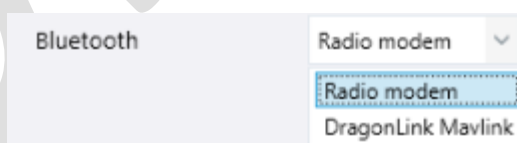
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3.1.7 External Connections

The External Connections page is used to assign functions to the physical and wireless connections on the DragonLink transmitter.

NOTE: Chapters [to be added] contain instructions and example configurations for using your DragonLink transmitter to send telemetry for some of the more common flight controller and ground-station setups.

Bluetooth (on supported models): Sets the type of data that will be streamed to the Bluetooth virtual COM port.

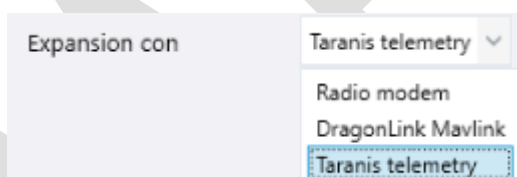| Option	Function	Bi-directional
Radio modem	Passes raw serial data directly to and from the connected device.	Yes
DragonLink Mavlink	Encodes non-MavLink telemetry from the aircraft into a MavLink-compatible telemetry stream for use with ground stations.	No

Auto-detect RX idle: When enabled, the DragonLink transmitter looks for data (eg. MavLink heartbeats) coming from the device connected by bluetooth. If the

upstream data stops (ie. the bluetooth device is disconnected), downstream telemetry data is no longer sent to the bluetooth connection. This setting is designed to prevent overflow of the bluetooth module's buffer which occurs when data is sent to the module and no device is connected to receive it. When this happens, bluetooth will not work until the DragonLink transmitter has been power-cycled (reset).

In order to use receive-only telemetry (ie. with a device that does not send MavLink heartbeats) this setting should be **disabled.** In this state, the user should be aware that disconnecting the bluetooth device while the telemetry stream is active will cause the module to crash and require reset of the DragonLink transmitter.

NOTE: This issue does not affect newer Slim transmitters with an updated bluetooth module and thus, this setting has no effect.
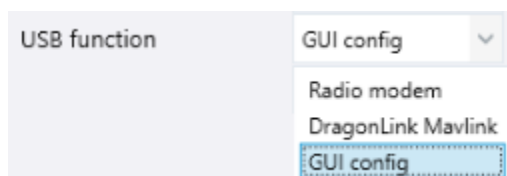

Expansion con: Sets the type of data that will be streamed to the UEXP port on the base of the transmitter.

Option	Function	Bi-directional
Radio modem	Passes raw serial data directly to and from the connected device.	Yes
DragonLink Mavlink	Encodes non-MavLink telemetry from the aircraft into a MavLink-compatible telemetry stream for use with ground stations.	No
Taranis telemetry	Encodes either MavLink or non-MavLink telemetry data into an S.Port telemetry stream for use with a FrSky Taranis controller	No

Baud rate: Sets the serial baud rate of the UEXP expansion connector.

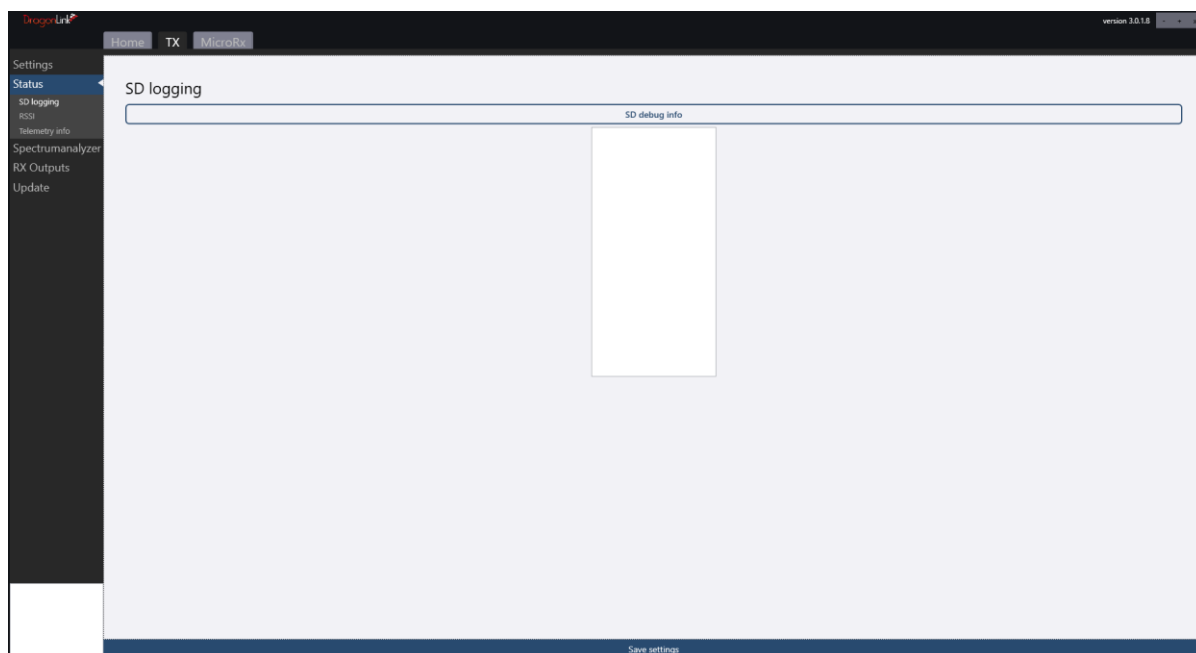**USB Function:** Sets the type of data that will be streamed to the USB virtual COM port.

WARNING: Changing the USB function setting will prevent the DragonLink GUI from being able to connect to the transmitter for configuration purposes. See section 3.3.5 for instructions on how to change this setting back to the default.

Option	Function	Bi-directional
Radio modem	Passes raw serial data directly to and from the connected device.	Yes
DragonLink Mavlink	Encodes non-MavLink telemetry from the aircraft into a MavLink-compatible telemetry stream for use with ground stations.	No
GUI config	Allows the connected device to configure the transmitter using the DragonLink GUI	N/A

NOTE: Baud rates do not apply to the USB virtual COM port. As long as the baud rate is correct on the receiver, and the receiving software matches that setting, the data will parse successfully.
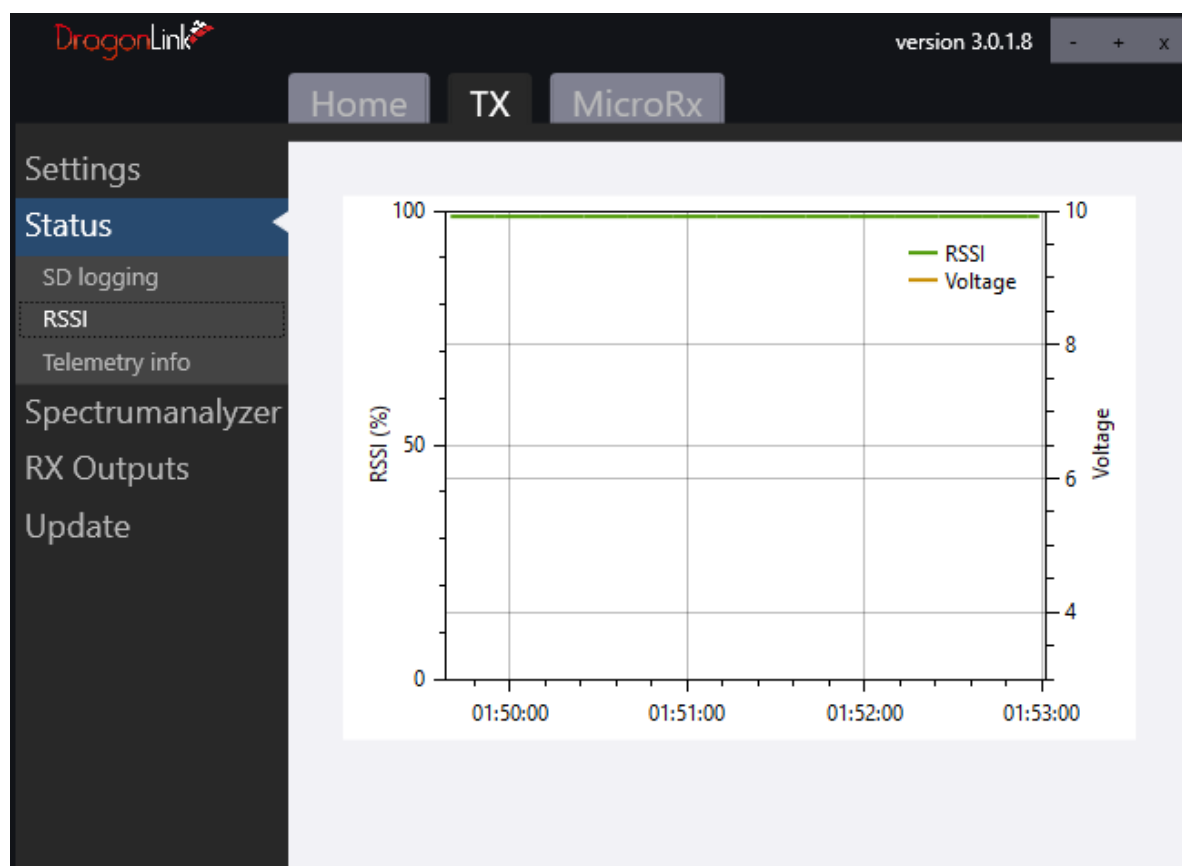
Enable MavLink decoding: This setting enables decoding of an incoming MavLink telemetry stream so that certain sensor values can be passed to external, non-MavLink devices.
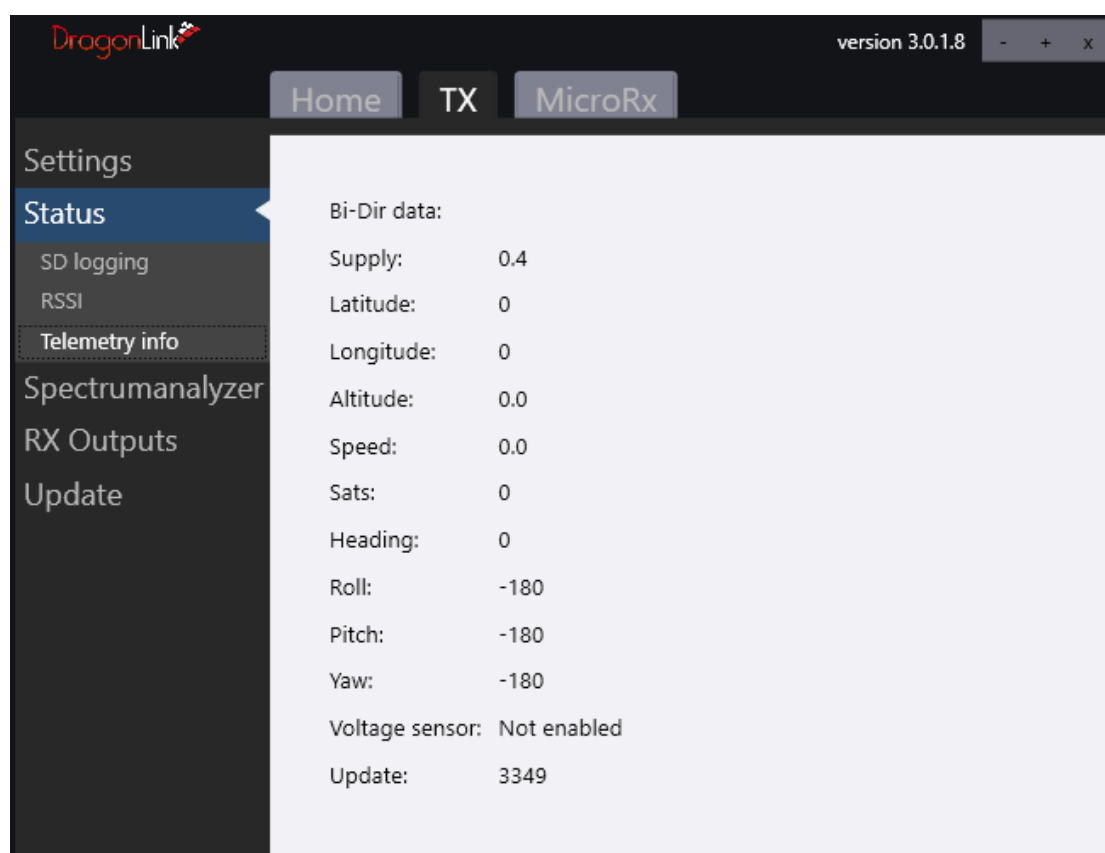
3.2.8 SD Logging

This page allows you to see diagnostic information regarding the logs that have been saved to the SD card (not included). At the time of writing, support for logging is still in development.
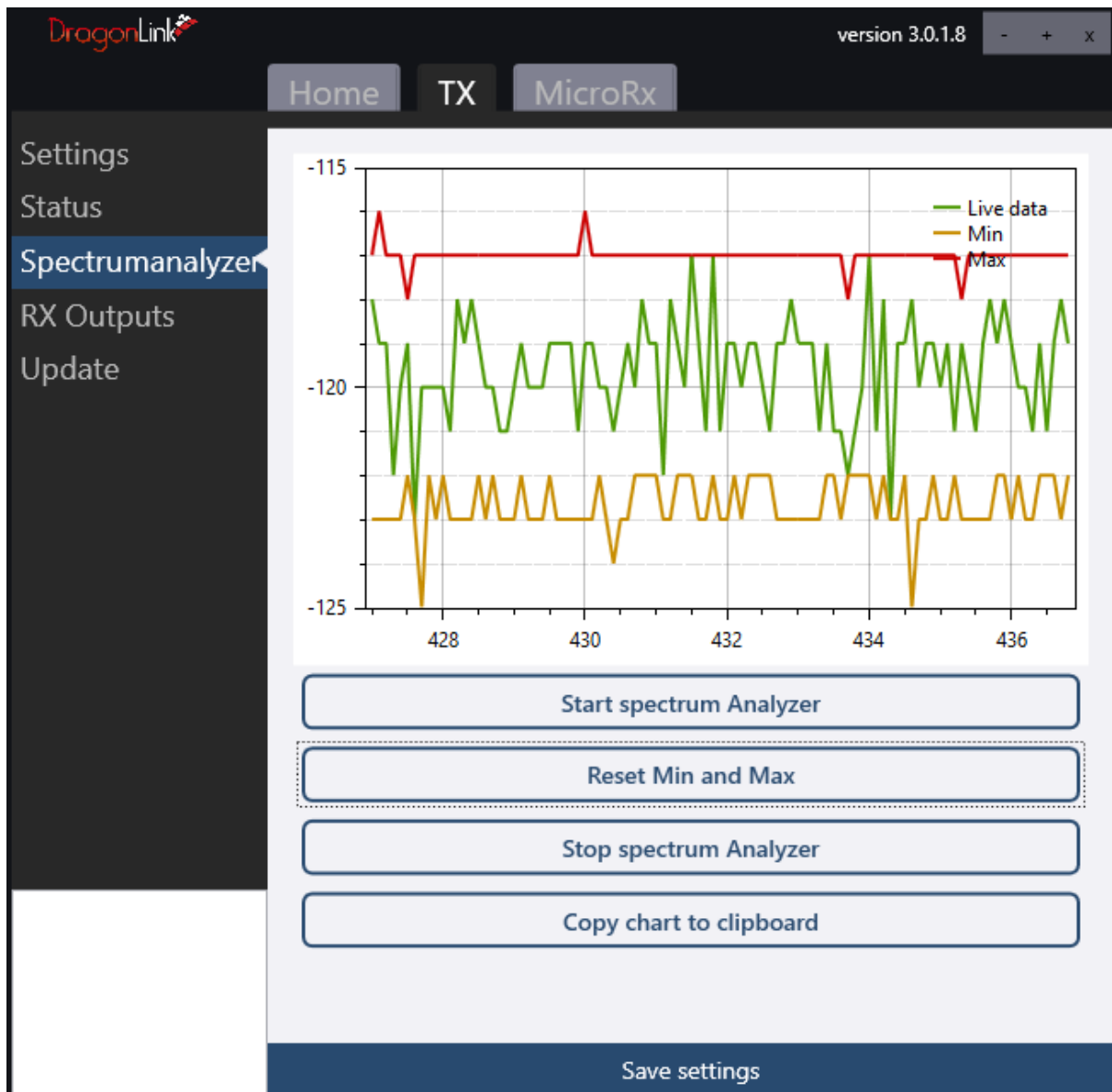
3.2.9 RSSI

On this page, the RSSI (received signal strength indication) is displayed in live graph view, along with the transmitter input voltage. This indication of RSSI represents the strength of the **telemetry signal** sent from the receiver to the transmitter, and not the strength of the **RC signal** sent from the transmitter to your model aircraft.

3.2.10 Telemetry Info

When a compatible GPS, voltage sensor, or OSD are connected to the DragonLink receiver and the pin assignments are correctly configured, or when MavLink Decode is used to capture telemetry from a valid MavLink stream, the incoming telemetry data will be visible on this tab for diagnostic purposes.

3.2.11 Spectrum Analyzer

The spectrum analyzer can be used to assess the RF spectrum to look for any unexpected radio interference prior to flight or to diagnose the cause of any radio interference from other components on your model aircraft. The example screenshot above shows an RF noise floor (the signal strength of average background noise) of approximately -120dBm across the 433mHz band (427 – 437mHz), which is ideal.

It is normal to see a spike on the spectrum analyzer when your DragonLink receiver is powered on and within range.

WARNING: A noise floor significantly higher than -110dBm indicates a potential issue that may result in reduced range and loss of control over your aircraft, so should be investigated and resolved prior to flying.

3.3 DragonLink Transmitter – Using Menu Button

The DragonLink transmitter allows for certain functions to be performed using the **Menu** button on top of the unit.

3.3.1 Range Test

Conducting a range test before each flight is an important step in ensuring that there are no faults, interference, or misconfigurations that could result in the loss of your model aircraft. In range test mode, the RF transmit power is greatly reduced to simulate the effects of extreme range. Range tests should be conducted on-location, with a clear line-of-sight and with environmental conditions matching those of the planned flight.

To conduct a range test:

1. Hold down the **Menu** button on the DragonLink transmitter and turn on the power.
2. After the power-on sound is played, the LED(s) will turn **green** accompanied by **1 beep**.
3. Release the **Menu** button.
4. The transmitter will continue to play **1 beep** (if the **range test mode** alarm is enabled) and the LED(s) will **flash green** to indicate it is in **range test mode.**
5. Position the transmitter with the antenna vertical.
6. Carry the model aircraft away from the transmitter, ensuring that the receiving antenna is also kept in its flight orientation, and monitor the **blue** LED on the **receiver**.
7. The receiver's blue LED turning off indicates a temporary loss of signal from the transmitter. Brief flickers are normal during operation even at close range. Once the LED is in an off state approximately 50% of the time, measure the distance from the transmitter to the model aircraft.
8. To exit range test mode, press the **menu** button.

In normal conditions, the range test should yield a distance of approximately **10 metres, or 30 feet**. 5 metres, or 15 feet, is acceptable for shorter range craft that will operate up to a maximum distance of 5km.

3.3.2 Bind Mode

It is possible to bind the transmitter to the receiver without using the DragonLink GUI. To do so,

1. Ensure the receiver is powered **off.**
2. Hold down the **Menu** button on the DragonLink transmitter and turn on the power.
1. After the power-on sound is played, continue to hold the **menu** button until the LED(s) on the transmitter turn **blue** accompanied by **2 beeps**.
2. Release the **Menu** button.
3. The transmitter will continue to play **2 beeps** (if the **bind mode** alarm is enabled) and the LED(s) will **flash blue** to indicate it is in binding mode.
4. Power on the receiver.
5. The receiver's blue and green LEDs should both begin flashing to indicate a successful bind.
6. Power off both the receiver and the transmitter to save the binding.

3.3.3 Servo Test

In servo test mode, the DragonLink transmitter will continuously sweep all channels back and forth from minimum to maximum positions.

1. Hold down the **Menu** button on the DragonLink transmitter and turn on the power.
2. After the power-on sound is played, continue to hold the **menu** button until the LED(s) on the transmitter turn **yellow** accompanied by **3 beeps**.
3. Release the **Menu** button.
4. The transmitter will continue to play **3 beeps** (if the **servo test mode** alarm is enabled) and the LED(s) will **flash yellow** to indicate it is in servo test mode.
5. To exit servo test mode, press the **menu** button.

3.3.4 Change Transmitter ID

Before operating the DragonLink system for the first time, the transmitter ID must be changed as not doing so presents the possibility of interference if another system with the default ID is used within range.

1. Hold down the **Menu** button on the DragonLink transmitter and turn on the power.
2. After the power-on sound is played, continue to hold the **menu** button until the LED(s) on the transmitter turn **red** accompanied by **4 beeps**.
3. Release the **Menu** button.
4. The transmitter's LED(s) will **flash red** to indicate the ID has been changed.
5. To exit ID change mode, you will need to power-cycle the transmitter.

NOTE: You will need to re-bind your receiver(s) after changing the transmitter ID.

3.3.5 Exit USB Telemetry Mode

After changing the **USB function** setting on the DragonLink transmitter, it will no longer be possible to configure the transmitter using the USB port and GUI software. To restore the default USB mode:

1. Hold down the **Menu** button on the DragonLink transmitter and turn on the power.
2. After the power-on sound is played, continue to hold the **menu** button until the LED(s) on the transmitter turn **white** accompanied by **5 beeps**.
3. Release the **Menu** button.
4. The transmitter will play the power up sound and the LED(s) will **flash white** to indicate the USB mode has been changed.
5. Power-cycle the transmitter for the change to take effect.
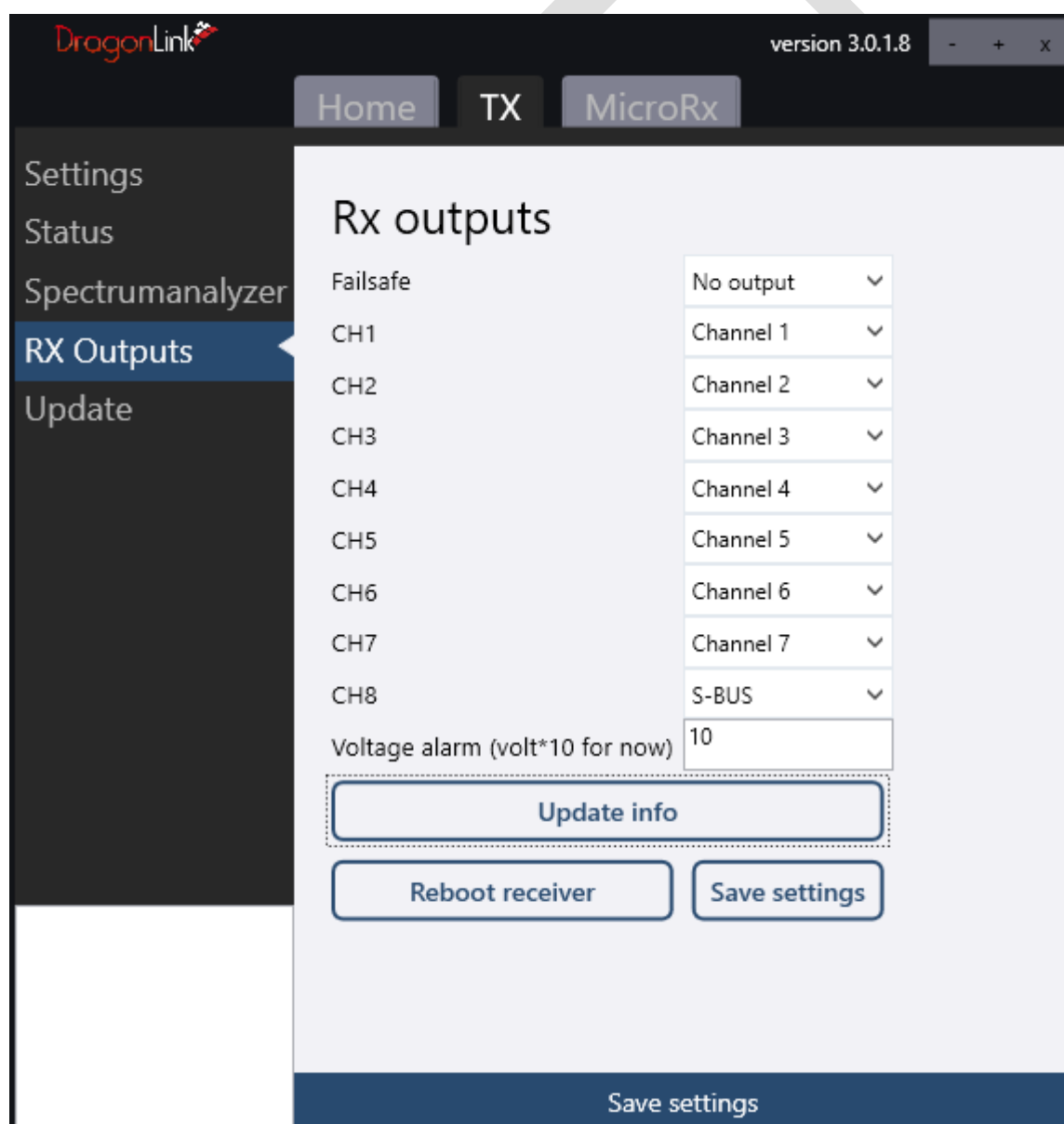
3.3.6 Set Failsafe Channel Positions

When the **Normal** failsafe mode is applied to the DragonLink receiver, it will move all of the channels to a pre-configured position upon loss of signal.

1. With the DragonLink transmitter and receiver powered on, check that both the transmitter and receiver are displaying **blue** LEDs to indicate an active link.

2. Press and hold the **Menu** button until **1 beep** is heard and the LED(s) momentarily turn **blue-green.**
3. The position of all sticks, switches, and rotary pots should now be saved to the receiver.

WARNING: Prior to setting the failsafe channel positions, ensure the position of any mode switches, such as "arm" or "return-to-home" are in the position you wish them to remain should the R/C link be lost.
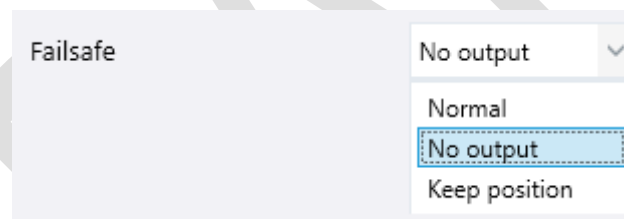

3.4 DragonLink Receiver (via Transmitter)

The DragonLink receiver can be configured using the GUI (to a limited extent) while the DragonLink **transmitter** is connected to the PC and the receiver is powered on.

At this time, it is not possible to configure the PPM / SBUS output, the UEXP port, or to select certain other RX pin assignments through this page. For those items, the PC will need to be directly connected to the receiver.

If the fields on this page are blank, settings can be retrieved from the receiver using the "Update info" button. If this does not work, ensure the receiver is powered on and has been bound to the transmitter.

NOTE: Ensure settings are saved on this page using the dedicated "Save settings" button.

3.4.1 RX Failsafe Behaviour

See section **3.5.1 – Receiver Outputs** – subheading **Failsafe**.
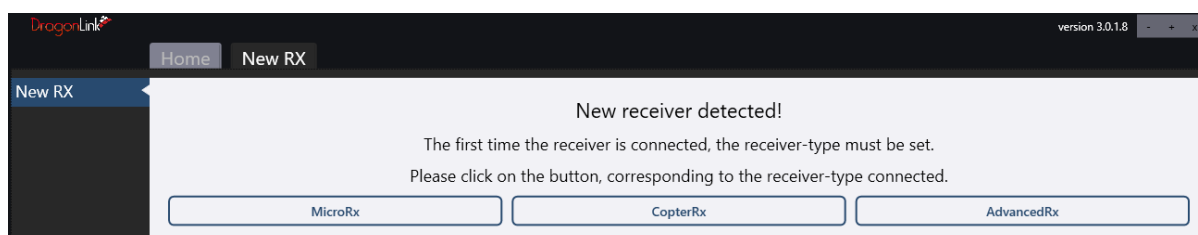
3.4.2 Channel Assignment (RX Outputs)

CH1 – X: These drop-down menus allow the assignment of a function to each of the physical pins on the DragonLink receiver.

*NOTE: Analogue RSSI **is only selectable on CH8 of the Micro receiver. On the Advanced (high-power) receiver, there is a dedicated set of pins (CH 13) for this function.***
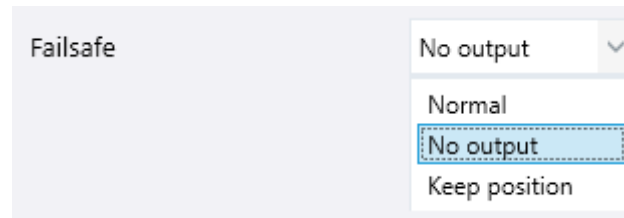
3.5 DragonLink Receiver

The first time you connect your DragonLink receiver to the DragonLink GUI, you may be prompted to set the receiver type. Ensure that you select this correctly as an incorrect selection may result in unusable channels.

3.5.1 Receiver Outputs

Failsafe:

The failsafe setting determines how the receiver behaves during fail-safe (loss of signal from the DragonLink transmitter).

Normal: The receiver's outputs (PPM / SBUS / PWM) remain active and the channels (sticks, switches, etc.) positions will move to saved positions set by the user during failsafe configuration. See section **3.3.6** for instructions on setting up and saving these channel positions.
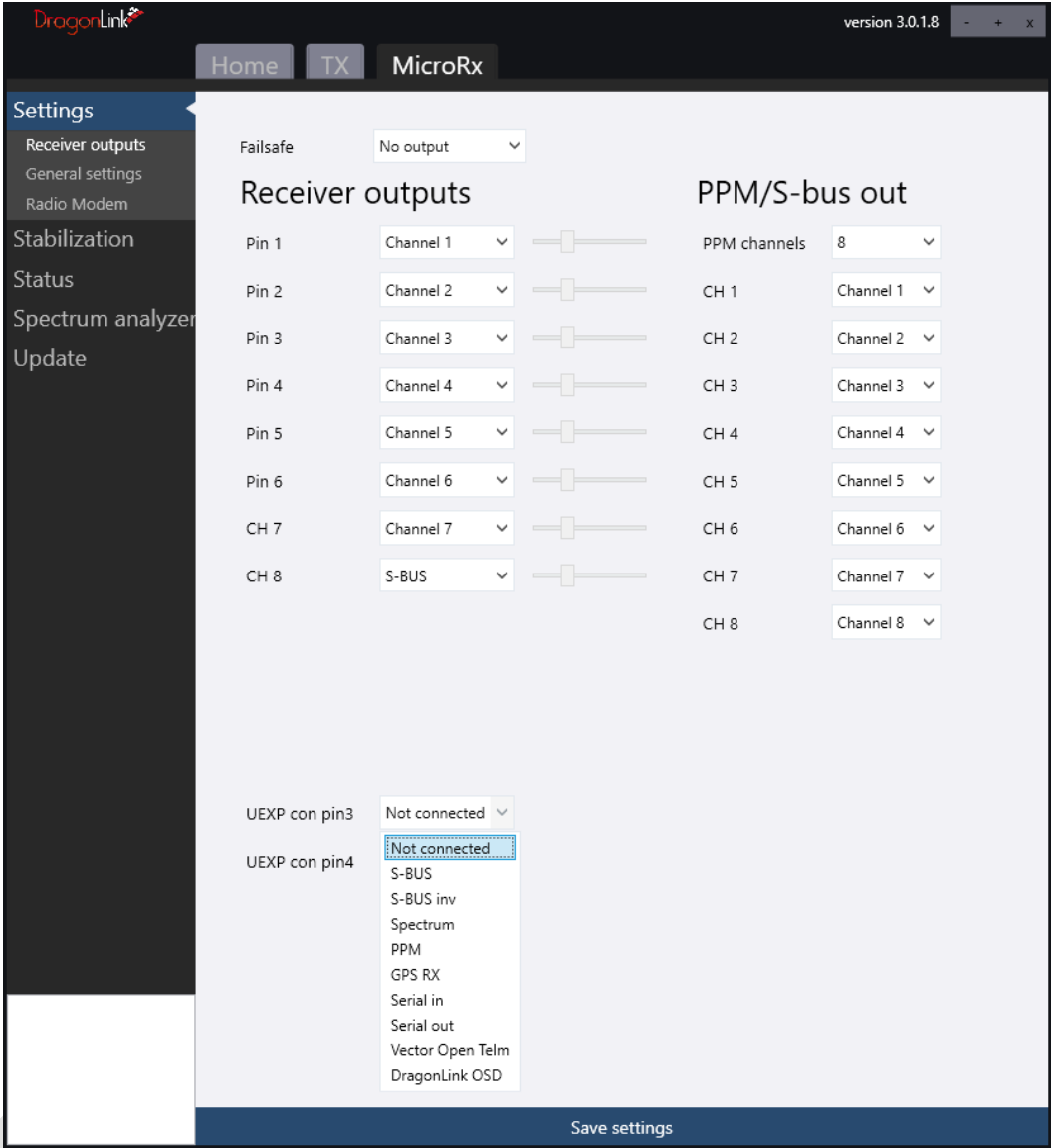
No output: The receiver's outputs (PPM / SBUS / PWM) outputs will deactivate when a fail-safe occurs.

WARNING: If using Digital RSSI, that value will also no longer be updated until the signal from the transmitter is re-acquired.
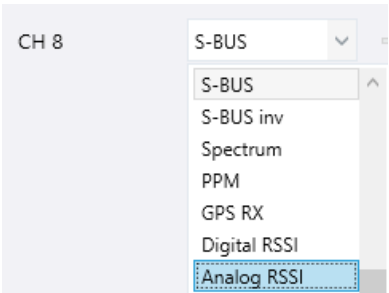

Keep position: All channels will hold their last-known position until signal is re-acquired.

WARNING: Where applicable, if using Keep position *you may need to ensure that your flight controller is correctly configured to monitor the DragonLink receiver's RSSI value in order for it to correctly identify when a fail-safe event has occurred.*

Receiver outputs: The Receiver outputs section allows you to assign functions to each of the pin headers on your DragonLink receiver. Pictured below is the configuration page for the **Micro receiver,** which has 8 multifunction pin headers. In the example below, channel 8 (CH 8) has been assigned to output S-BUS, while the remaining 7 channels output a standard single-channel PWM signal.

NOTE: Analog RSSI is only selectable on channel 8 (micro RX) or channel 13 (advanced RX).

NOTE: For use with MavLink data, it is possible to select the "Serial in" and "Serial out" channel assignments (for bi-directional telemetry and mission planning) or the "MavLink Decode" assignment (for decoded telemetry only – provides maximum range). The MavLink Decode assignment functions as a Serial input from the flight controller only – no output is required as it is not bi-directional.

An additional 4 channels are visible in the GUI when connected to an **Advanced** receiver.

PPM/S-bus out: These drop-down menus allow you to assign channels to the PPM or S-BUS stream and select the number of channels to include. The maximum number of channels for either protocol is 12.

UEXP con pin3/4: These connectors can also be assigned various functions, including S-BUS, PPM, GPS input, Serial communications and OSD data for the DragonLink OSD.

NOTE: Some S-BUS devices require a signal with inverted logic. For these devices, select S-BUS inv.

3.5.2 General Settings

ID: Displays the Transmitter ID (previously set by you) that the receiver is currently bound to.

Firmware version: Displays the version of currently applied firmware.

Volt Cal Calue: This value allows calibration of the DragonLink Voltage Sensor (sold separately). If you measure the voltage of your flight battery and discover it to be incorrect, this value, which is a percentage of the sensed voltage, can be adjusted to correct it.
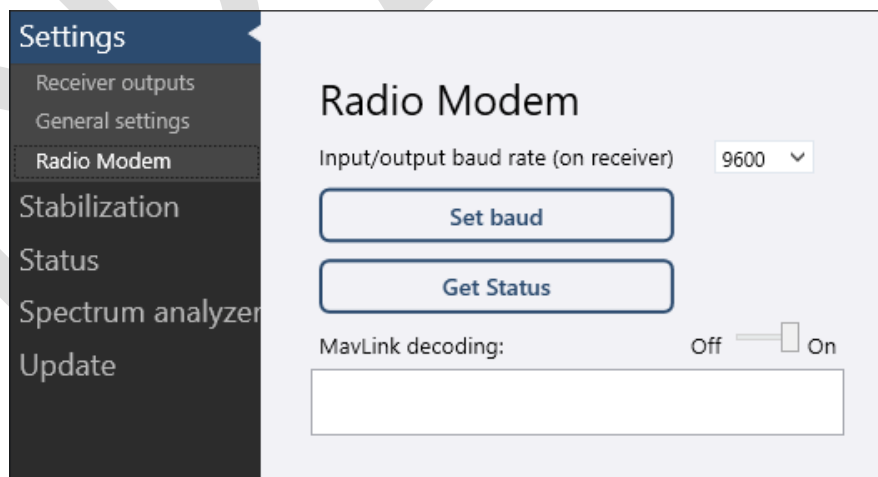
Rf Band: Displays the selected RF Band as set on the transmitter prior to binding.

Hardware ID: This setting tells the receiver which type of receiver it is and as such it should never need to be changed. This configuration is needed internally for the firmware to handle pin assignments and configuration. This is normally set once when first connected to a PC, however it can be changed here if it is inadvertently set incorrectly.

Set hardware ID: Confirms the change to the above setting.

Reset hardware to Factory Settings: Restores all of the configuration to factory default settings.
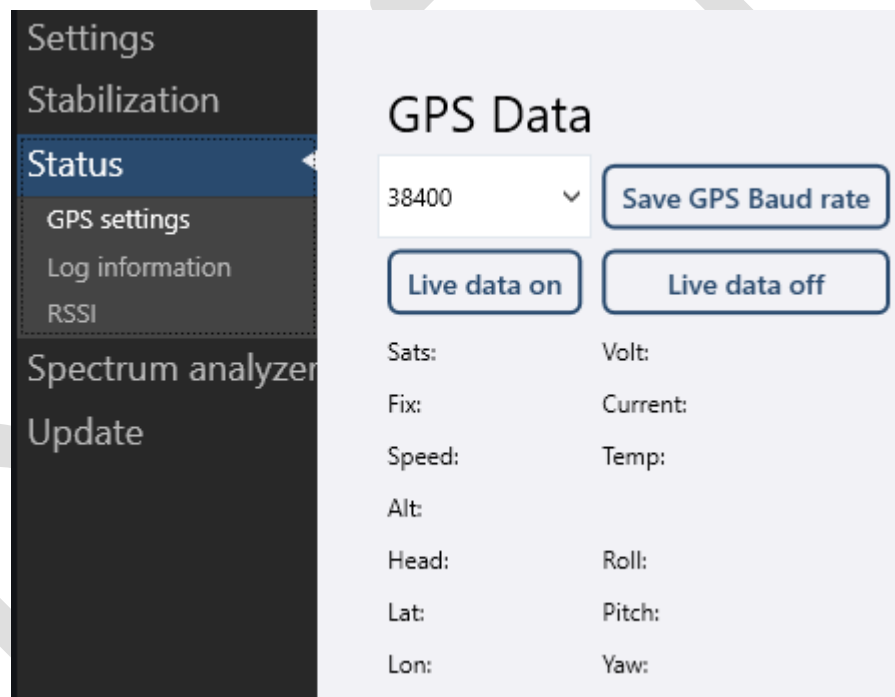
3.5.3 Radio Modem

Input / output baud rate (on receiver): Specifies the baud rate for the Receiver to use for serial radio modem communication. This must match the baud rate set for the device(s) attached to the Receiver and on the receiving ground station. It must also match the Transmitter's UEXP baud rate, if that connection is to be used on the receiving end.

Set baud: Saves changes to the above setting.

Get Status: Displays in the text box the current bytes-per-second average being sent via the radio modem.

MavLink decoding: Enables decoding of a MavLink telemetry stream being sent via the radio modem. This function converts certain telemetry data to DragonLink's proprietary telemetry format which supports significantly greater range and robustness of data. Please see chapters [to be added] which contain detailed instructions for correctly applying this setting.
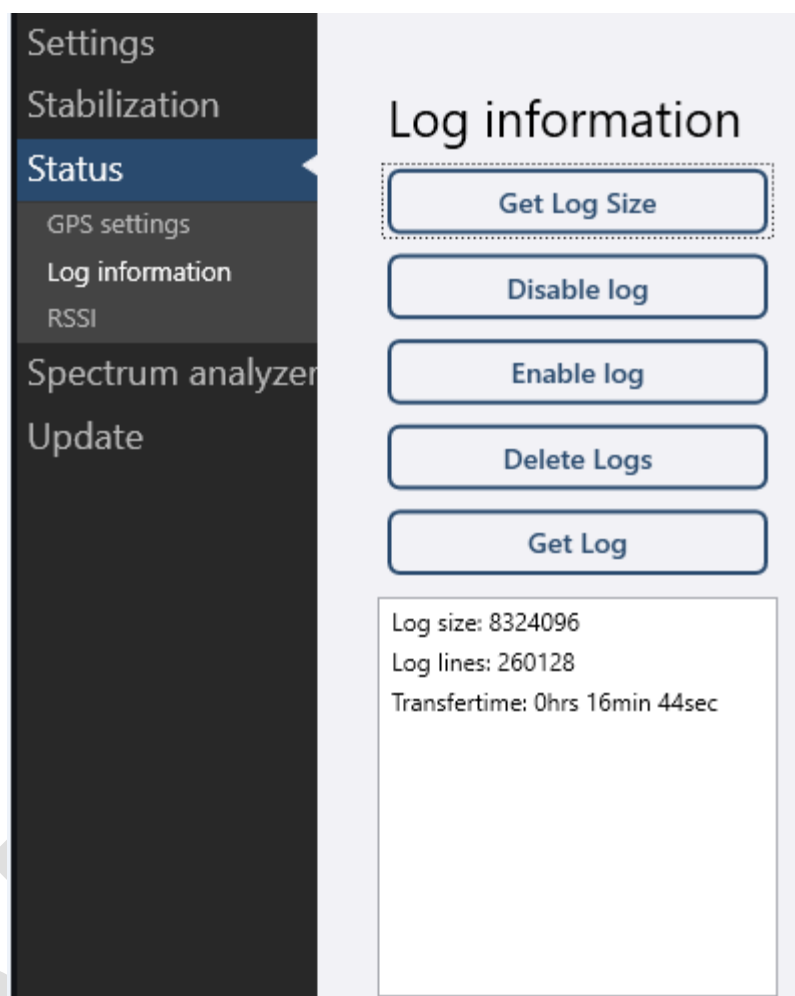
3.5.4 GPS Settings

A GPS receiver can be directly connected to the DragonLink Receiver for telemetry purposes. You will need to know the baud rate for the GPS receiver attached receiver, which is set using the drop-down menu and saved by clicking **Save GPS Baud rate.**
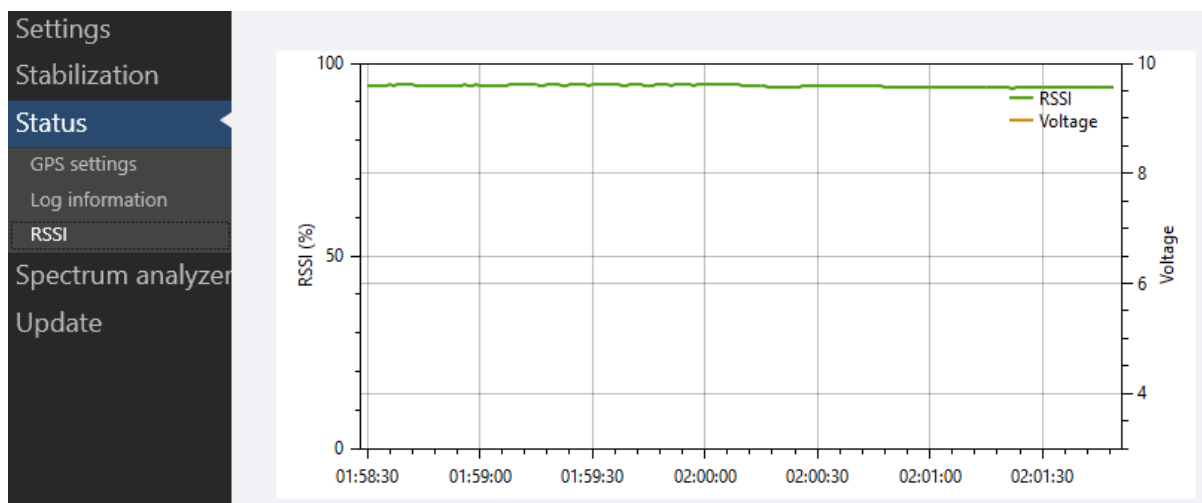
Live data on, Live data off: Toggles the display of live data sent by the attached GPS, as well as data from any attached MavLink telemetry stream.
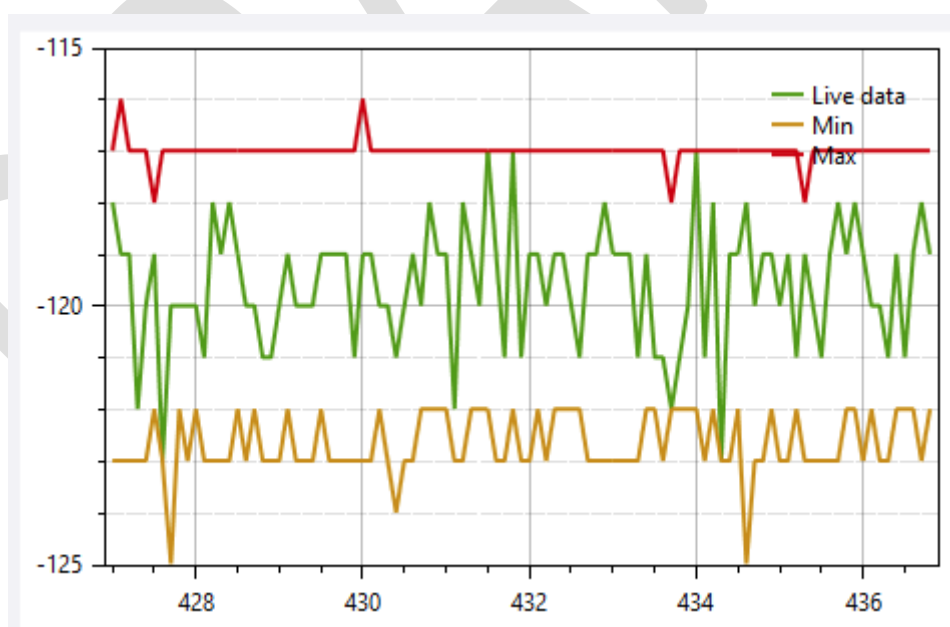
3.5.5 Log Information

The Log Information page is used to store certain flight data regarding channel positions, RF transmit power, GPS and telemetry data, and link state. This can be enabled, disabled, deleted, and retrieved using the controls on this page.

3.5.6 RSSI

The RSSI page displays a graph of the current signal strength for the radio control link. This can be used for troubleshooting or testing. In addition, the voltage supplied to the Receiver is super-imposed on the graph in orange.

3.5.7 Spectrum Analyzer

This feature is identical to the feature of the same name found in the Transmitter configuration pages. Please see chapter **3.2.11** for further information.

3.5.8 Stabilization

[to be added]

4 Installation

Warning: Always observe correct polarity when making electrical connections. Reversed polarity or incorrect wiring may result in damage to your DragonLink or third-party equipment.

4.1 DragonLink Transmitter

The DragonLink Slim transmitter includes quality hook-and-loop pads with self-adhesive backing, which can be used to fix your transmitter to the back of your controller, as per the below image. If this method is not suited to your controller, other mounting hardware may be required (not included).
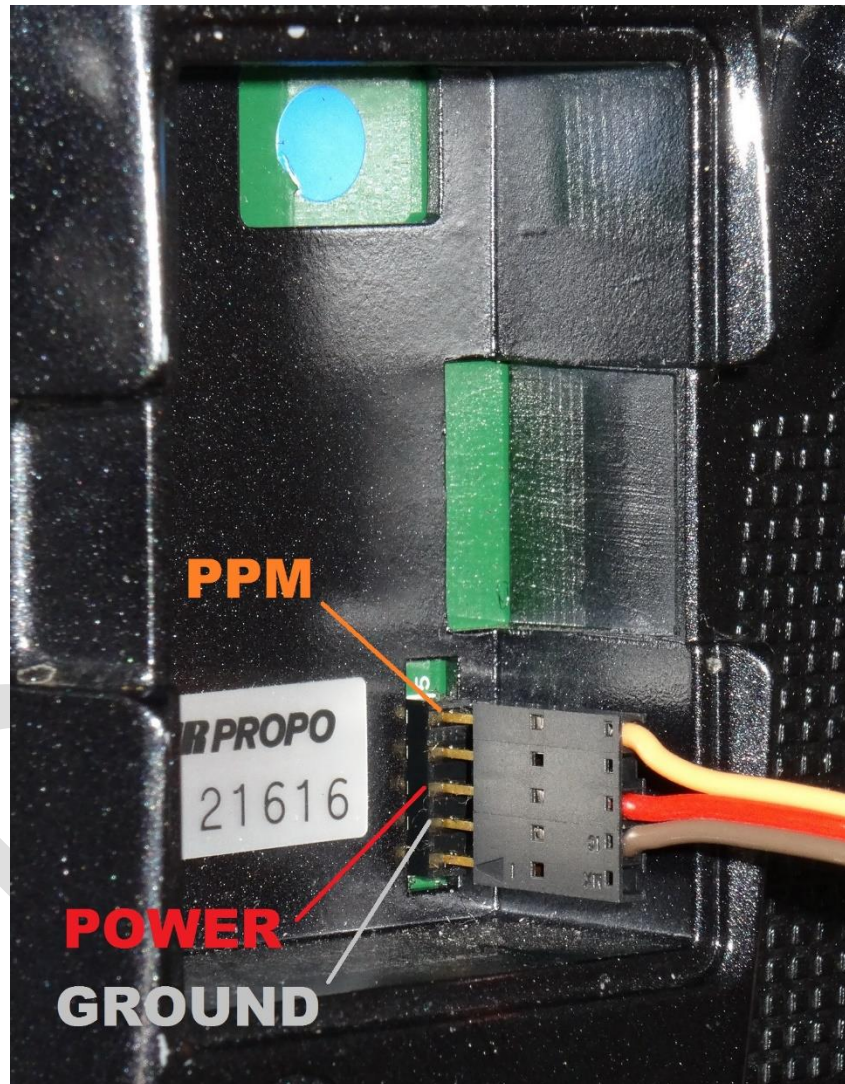

Connection to Trainer Port

The trainer port is the output on your controller which sends the positions of the channels to the DragonLink Transmitter. On most controllers, this also provides power to the DragonLink Transmitter.

RF Module pins

The Taranis, Turnigy 9x, and other RC transmitters with a removable RF module can be connected using the RF module Pins. This is generally the simplest method of connection as the RF module pins supply both power and signal to the DragonLink transmitter. If the "RF Module cable" option was selected at the time of purchase, you should have received the cable with one end having a plug matching the picture below. This can be connected directly onto the RF module pins as shown. Ensure the cable is not connected to the module bay pins in reverse.

3.5mm Jack Connector

This is the most common type of connection for Spektrum, JR, Walkera, Hitech, and other brands of RC controllers. Two connections are required for the DragonLink Transmitter when using this type of cable:

⊃ PPM input from your RC Transmitter. This is provided using the 3.5mm jack.

⊃ - 18 volts. This is provided using the red connector.

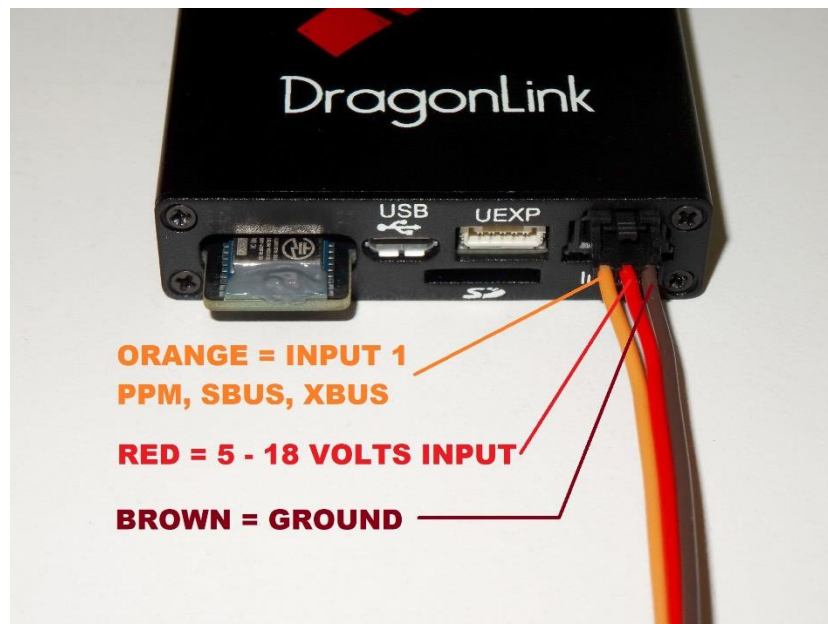**Futaba Square Trainer Port**

The Futaba square trainer cable will supply both signal and power to the DragonLink Transmitter, and cannot be connected with incorrect polarity.

DragonLink Transmitter

Once connected to your controller, the other end of the cable can be connected to the DragonLink Transmitter if not already done so. This should be connected to Input 1.

Note that on the Large DragonLink Transmitter that Input 2 does not supply power to the unit.

Configuration

The controller must be configured to output a signal matching one of the selectable options found in **chapter 3.1.1.**