1.0 Receiver overview

1) Full-Range telemetry and receiver with diversity antenna capable of transmitting or receiving signal via both antennas for diversity scheme with maximum coverage.

2) Receiver sensitivity maximized for retrieving data with very weak RF signal by the newly designed LNA stage. Majority of users should experience very noticeable range improvement over pervious succession of Lemon Rx receiver or ANY brands of DSM2, DSMX or DSMX compatible receivers for the same class.

3) Included sensors / interface: Receiver voltage, Battery voltage, Temperature (Internal automatically selected when external temperature probe is not used), RSSI out (3V to 0V)

4) Optional sensors: Current sensing with up to 60A available for purchase in Lemon Rx website under accessories page.

5) True RSSI (0 to 100) displayed on transmitter under flight log page in parameter "A". (*Approximately 7dBm / count after the LNA stage.)

6) Extended antennas for many type of applications (Receiving element is the last 32mm of the antenna wire with semi-transparent white PVC shield)

7) For use with channel 7 (AUX2), servo can be connected after binding or a Y-cable can be used to connect to servo and bind plug when binding is required.

8) See label for PPM connection if the receiver is set as PPM mode to work with 3rd party flight controller.

> PPM-J output format is in the following sequence with indication of solid blue LED:
>
> Throttle, Aileron, Elevator, Rudder, Gear, Aux1, Aux2
>
> PPM-F output format is in the following sequence with indication of flashing blue LED:
>
> Aileron, Elevator, Throttle, Rudder, Gear, Aux1, Aux2

*This is not guaranteed but may be used as approximate figure as being the receiver signal strength in terms of dBm

Button

Satellite connection (Satellite is not

available under PPM-J / PPM-F mode)

Temp/RSSI out

V/I sensing

Signal rail

Vcc rail

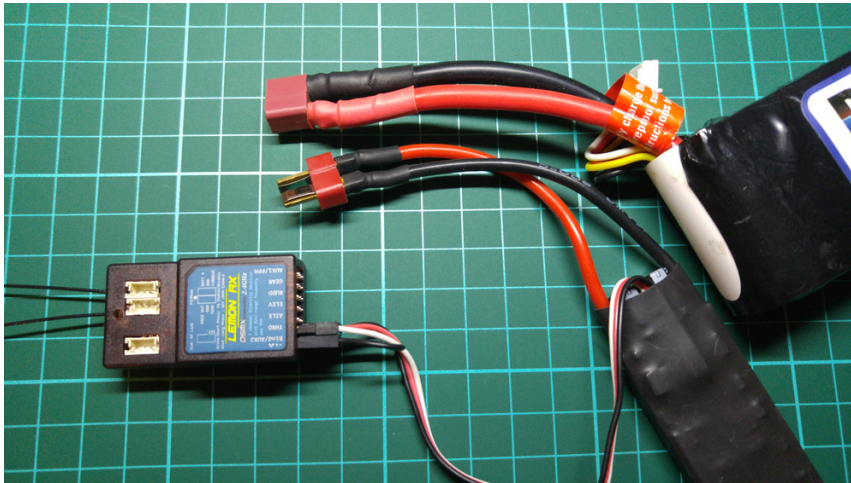Gnd rail

Figure 1 – Receiver overview

2.0 Binding

Figure 2.1 – Bind plug inserted with power disconnected

Figure 2.2 – Solid red light indicates successful binding

1) Insert bind plug with no power connected (Figure 2.1)

2) Provide power via BEC. Observe red LED flashing beneath the receiver for engaging binding mode. (Figure 2.2)

3) Turn on transmitter in binding mode with approximately 2 meters away from receiver. Receiver will be changing from slowly flashing to steady red indicates successful binding.

4) Remove bind plug for receiver normal operation.

3.0 Failsafe

Failsafe will be activated while receiver is unable to receive signal for approximately 1 second. User preset failsafe position will be available to all 7 channels until valid signal is received to resume transmitter control.

1) Follow binding procedure from 2.1 to 2.3. DO NOT remove bind plug or power at this point.

2) Adjust the transmitter stick position (all 7 channels' position) to the desired failsafe position.

3) Press the button briefly and release. Green light on means the failsafe position is memorized and failsafe is enabled. Press the button again will cause the green light to turn off in order to disable failsafe function.

Note: If you press the switch for more than about 1 second, you will activate PPM mode, as indicated by a blue light. See section 7.0

4.0 Telemetry / RSSI

The receiver will start to transmit telemetry packet to any Spektrum / Spektrum compatible transmitter with telemetry option. It is important to enable the transmitter's telemetry option in order to monitor the following parameter.

- Battery voltage (Require voltage sensing wire to be connected to battery V+.

  Provided as standard accessories)

- Receiver voltage (Automatic, no sense lead required)

- Temperature (For maximum accuracy, the provided temperature sensor should be

  connected. If temperature sensor is not connected internal sensor will be automatically

  selected with less accuracy)

- RSSI (Displayed automatically on transmitter under parameter "A")

- RSSI out for FPV OSD connection (Analog voltage output of 3.0V to 0V with

  respective to RSSI. See receiver label for the wire lead that provides RSSI voltage

  in the temperature probe wiring harness)

5.0 Voltage sensing wire connection or re-calibration

Receiver is pre-calibrated for voltage sensing and voltage sensing wire is provided as a standard item. If for some reasons the voltage sensing wire needs to be calibrated, please follow the procedure listed below.
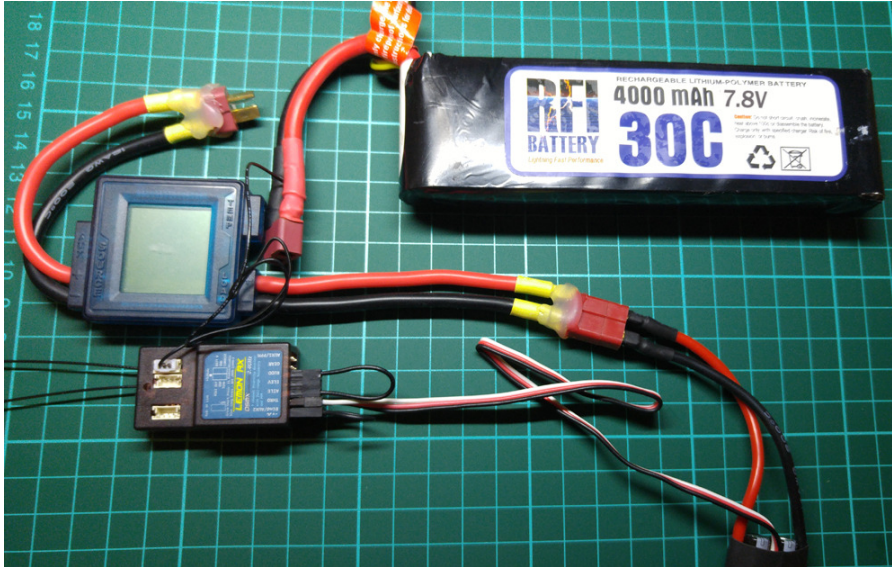

Figure 5.1 – Voltage sensor connecting to battery V+ with 2nd bind plug inserted between the top pins of the Aileron and Rudder channels. The green device is a voltage and current measurement device (Wattmeter) to confirm the actual battery voltage.

Figure 5.2 – Voltage sensor calibrated at 8.4V. The green device is a voltage and current measurement device (Wattmeter) to confirm the actual battery voltage.

1) Insert bind plug vertically at bind location just like the normal binding procedure with no power connected.

2) Insert 2nd bind plug horizontally between aileron and rudder.

3) Connect the voltage sensing wire to 8.4V. A 2 cells, full charged Lithium battery is very close to 8.4V. User may follow the connection as in figure 5.1 for simplified hookup when a high precision voltage source is not available.

4) Connect BEC to receiver.

5) Provide power to BEC with the same voltage source used. Observe red LED flashing beneath the receiver for engaging binding mode.

6) Turn on transmitter in binding mode with approximately 2 meters away from receiver. Receiver will be changing from slowly flashing to steady red indicating successful binding. At this point please make sure the receiver is successfully bound with indication of a steady red light. Make sure transmitter telemetry is setup that allows for battery voltage inspection. Continue to step 7.

7) Press the button briefly (less than 1 second). Green light on means voltage source is calibrated. Transmitter telemetry page should display either 8.3V or 8.4V as battery voltage**.

8) Press the button until blue LED is turned on to indicate that current sensing is not available (approximately 1.5 second of press is required). If for some reasons the blue LED is not turned on because the button was accidentally released prior to blue LED turns on, user at this point may briefly press the button a few times until both green and blue LED are off, and then starting setup at step 7.

9) Turn off the receiver and remove 2 bind plugs to complete voltage calibration.

**Please note: 8.39V will display as 8.3V because of the lack of a second decimal digit in the Spektrum transmitter display. 8.39V is a very accurate calibration although it may possibly display as 8.3V on the transmitter. The actual logging (logging on SD card with Spektrum transmitter) will provide more precise information.

6.0 Voltage and current sensing calibration

Receiver is NOT pre-calibrated for use with the Lemon Rx V/I (battery voltage and current sensing) sensing module. When user purchase this sensor for the first time, the following calibration procedure should be done once.
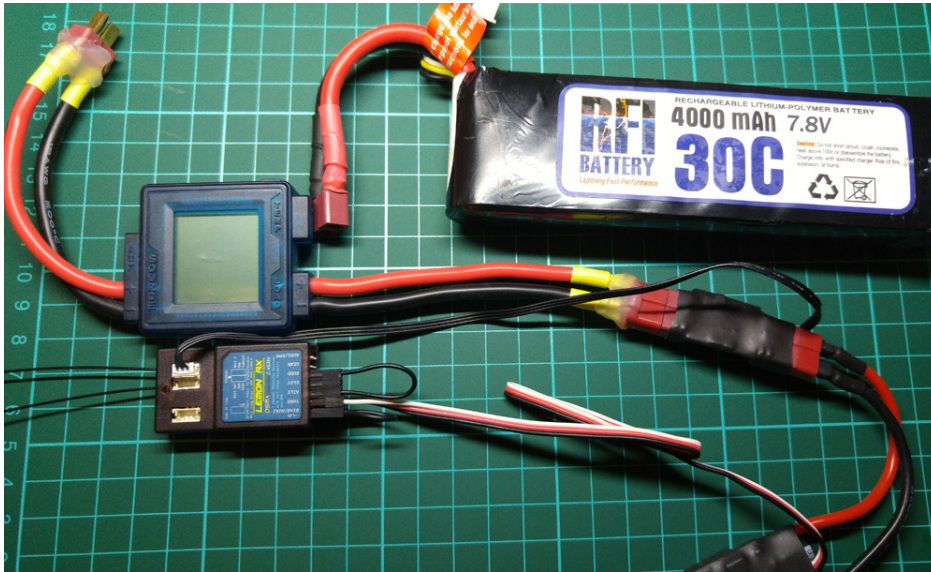

Figure 6.1 – V/I sensor connecting to battery V+ with 2 bind plug inserted. The green device is a wattmeter to confirm the actual battery voltage and current.

Figure 6.2 – V/I sensor calibrated at 8.4V and 4A. The green device is a wattmeter to confirm the actual battery voltage and current.

1) Insert bind plug vertically at bind location just like the normal binding procedure with no power connected.

2) Insert 2nd bind plug horizontally between aileron and rudder.

3) Connect the V/I sensor to 8.4V. A 2 cells, full charged Lithium battery is very close to 8.4V. User may follow the connection as in figure 6.1 for simplified hookup when a high precision voltage source with 10A output capability is unavailable. A wattmeter that is capable of measuring voltage and current is recommended. At least a current meter is required to connect in series the system as shown in figure 6.1.

4) Make sure the ESC is connected to the receiver and a brushless motor that is known to draw higher than 4 amps.

5) Connect ESC (with internal BEC) to receiver.

6) Provide power to ESC with the same voltage source used. Observe red LED flashing beneath the receiver for engaging binding mode.

7) Turn on transmitter in binding mode with approximately 2 meters away from receiver. Receiver will be changing from slowly flashing to steady red indicating successful binding. At this point please make sure the receiver is successfully bound with indication of a steady red light. Make sure transmitter telemetry is setup that allows for battery voltage and current inspection. Continue to step 8.

8) Press the button briefly (less than 1 second). Green light on means voltage source is calibrated and current sensing bias at 0A is calibrated. Transmitter telemetry page should display either *8.3V or 8.4V as battery voltage. and 0A for current.

9) Move the throttle stick and adjust until the current is draw at or very close to 4.0A constantly. Keep the system drawing at this current and continue on step 10.

10) Press the button until blue LED is turned on to indicate that current sensing is calibrated at 4A. If for some reasons the blue LED is not turned on because the button was accidentally released prior to blue LED turns on, user at this point may briefly press the button a few times until both green and blue LED are off, and then starting setup at step 8.

11) Check the transmitter telemetry page when the system is still drawing 4A, transmitter telemetry page will 3 or 4A for current***.

12) Turn off the receiver and remove 2 bind plugs to complete voltage calibration.

*1 - Please note: 8.39V will display as 8.3V because of the lack of a second decimal digit in the Spektrum transmitter display. 8.39V is a very accurate calibration although it may possibly display as 8.3V on the transmitter. Same case for current. 3.9A will display as 3A because of the lack of a digit in the Spektrum transmitter display. The actual logging (logging on SD card with Spektrum transmitter) will provide more precise information.

7.0 PPM mode (PPM-J/PPM-F) or Servo mode

The receiver is shipped with preset in servo mode. User may change it to PPM-J or PPM-F format for 3rd party flight controller. See label for PPM connection. Please note that when PPM is enabled, satellite will have no effect to the receiver as a diversity receiving device when PPM-J or PPM-F mode is set.

PPM-J output format is in the following sequence with indication of solid blue LED:

Throttle, Aileron, Elevator, Rudder, Gear, Aux1, Aux2

PPM-F output format is in the following sequence with indication of flashing blue LED:

Aileron, Elevator, Throttle, Rudder, Gear, Aux1, Aux2

NB: A satellite connection cannot be used when in PPM mode.

1) Follow binding procedure from 2.1 to 2.3. DO NOT remove bind plug or power at this point.

2) Press the button (~1.5 second) until blue LED changes it status. Release and press the button again (~1.5 second) to select the desired mode required.

- Blue LED off: Servo mode. All 7 channels can be connected to initial servos

- Blue LED on: PPM-J mode

- Blue LED flashing: PPM-F mode

3) Remove bind plug and power source.