RC Electronics Raven2 Onboard Air-Data Measuring System User Manual

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Introduction

The “Raven 2” is one component of RC Electronics model aircraft telemetry system. The unit is the “on-board” unit intended to be used with the “Snipe / Finch” “ground station”. The unit is designed to measure many parameters of an R/C model aircraft and transmit them to the ground station via the telemetry link working on 433 MHz frequency. The unit is capable of measuring sink/climb rate (Vario), altitude, acceleration of the plane in all axes, noise level, servo pulse on servo input, GPS data with 18Hz refresh rate and supply voltage. For storage it has internal fast solid state storage which is will record up to 20h of flying.

Key features of the Raven

- Integrated fast solid state memory for up to 20h of logging
- Latest pressure sensor for ultra fast detection of climb / sink
- Two pressure sensors for altitude and Vario measuring
- 3 axes accelerometer
- Enl – Environment noise level detection to detect working electric, impeller or jet motor.
- FHSS – Frequency Hopping Spread System on 433MHz telemetry channel to eliminate frequency conflicts.
- 18 Hz GPS working with GNSS, Glonass and prepared for Galileo global positioning satellites.
- Various telemetry protocol supported over one of servo input (JetiEx, PowerBox System, Hott …)

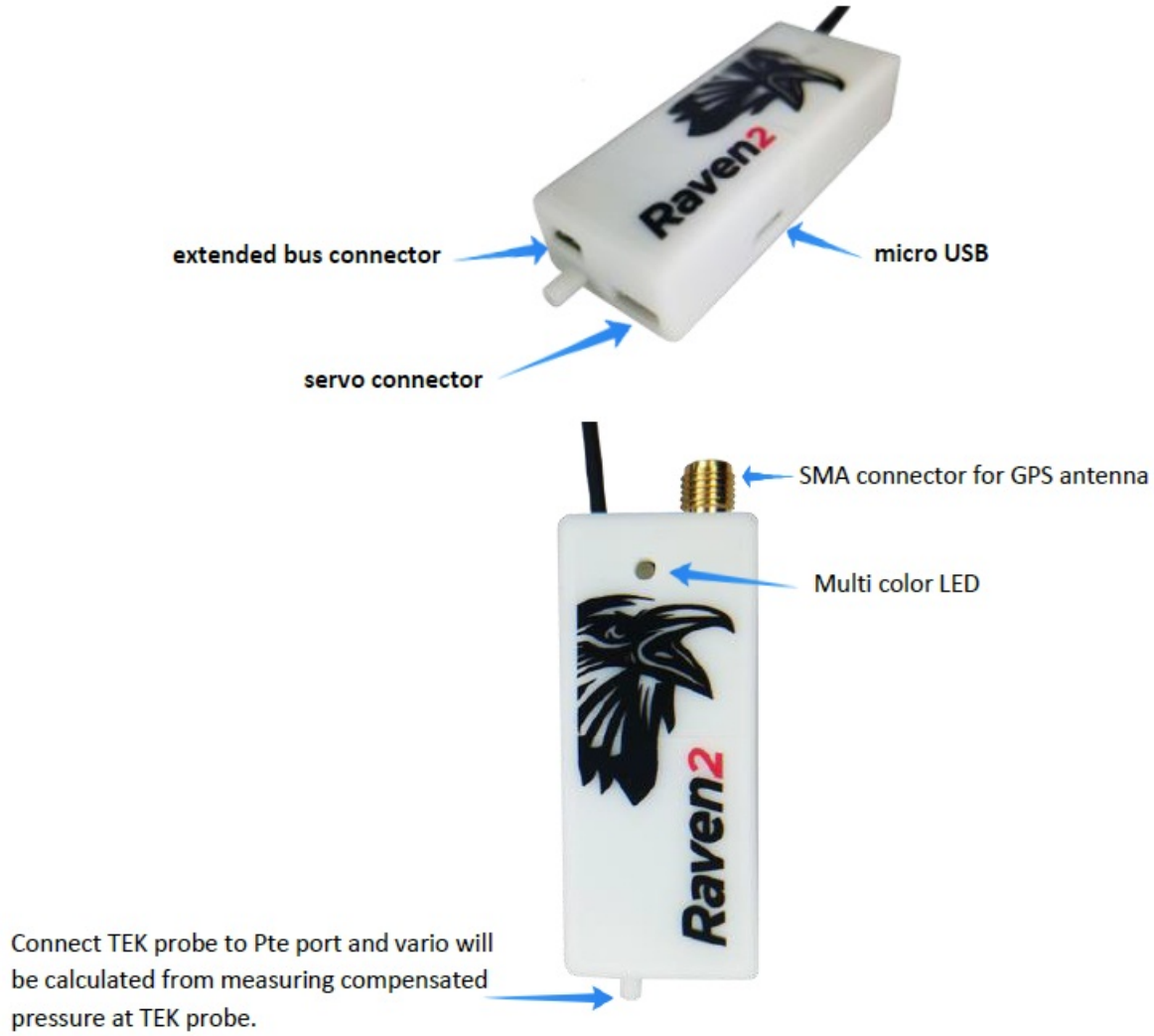
Specifications

Unit Dimensions	63 mm x 22 mm x 13 mm
Weight	16 grams (without GPS antenna)
Temperature Range[1]	-10°C ~ +60°C
Input Voltage Range	4.0 – 12.0 volts DC
Input Current	80 milliamps @ 8V DC
Measured Voltage	4.0 – 12.0 volts DC
Memory capacity	Up to 20h of flying

1 Specifications are taken from component ratings and system limits and may not have been tested to the full extent of the specified ranges.

Physical Overview

Pictures bellow are showing the Raven 2 unit. It has one SMA connectors for active GPS antenna, one pressure port (Pte – total energy compensated pressure from TEK probe) and a multi-color LED to show the status of the unit. It also has 3 connectors. The micro USB is used for future updates, settings and flight log download. The 4 pin connector is prepared for future use (extended bus). JR 3-pin servo input is used to measure normal PWM servo pulse or to transmit 3rd party telemetry protocol on it (depends on unit setting). The Raven 2 gets power from USB or JR connector.
Important: Be careful on polarity when connecting power to the unit. Improper connection can damage unit! Correct polarization is marked on side of the unit by the servo connector!



Using the Raven 2 module

Powering the module

To power the module plug the 3 pin female connector cable into servo connector and the other end to the R/C aircraft receiver. Be sure to observe proper polarity when plugging the connector into the module and receiver. You can also power it directly from a battery. Please respect max voltage input of 12V and correct polarity.
When power on the LEDs will flash red, green, blue and white to confirm its operation. During operation LED status is:

- **red –** module is waiting for GPS signal
- **green –** module is ready for flight
- **blue –** onboard logger is running
- **white –** not yet implemented.

Mounting the module

The Raven 2 module and the gps antenna can be mounted using double-sided tape, cable ties or Velcro. Velcro is recommended, so that the module can be easily removed and interfaced with the PC for downloading flight data. Be sure that the module is not touching any metal surfaces. Although unlikely, there is a possibility of shorting the metal contacts on the module, which could result in a radio system failure. The Raven 2 RF antenna should be located so there is no carbon or large metal items blocking its line of sight to the ground station.
Do not mount the module on top of power batteries when using electric motors, because they get hot and this can affect the altitude readings by up to 30m.
Be sure to keep the module away from water, fuel and other liquids. Always range check and test the aircraft's radio systems before flying with the Raven 2 module installed, to verify that all connections have been made correctly and there is no system interference.

GPS antenna has to be mounted where there is no metal or carbon above it and must be turned in such direction that GPS label written on antenna is facing towards the sky.

Correct position of GPS antenna

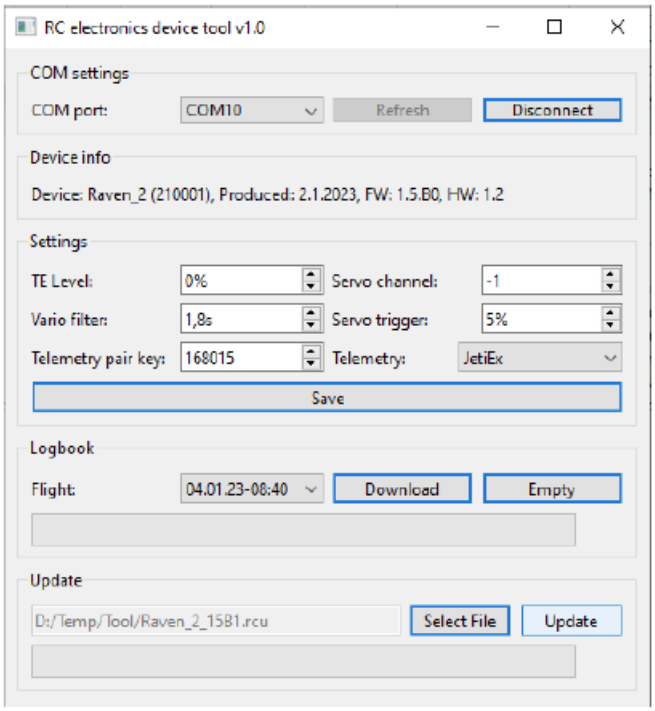
Connecting module to PC

Connect the Raven 2 module to a PC using a cable with a micro USB connector inserted into the micro USB connector on the Raven 2. When connected to the PC the module will power up and will create a new Virtual COM port.
Run RC electronics device tool software (published on our website under Download / Software section)
Select correct COM port and then press select.

- to edit setting, you must press Save button to store it in device
- to download flight, select it from a list in Logbook section and press Download. Empty button will erase

logbook.

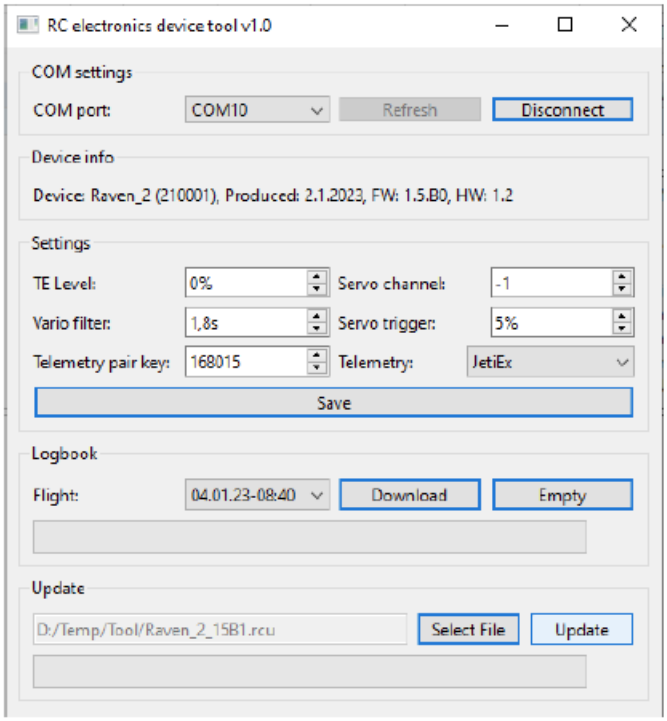
Important settings:



- **Telemetry pair key:** Enter here yours ground unit serial nr to have a valid RF link.
- **Telemetry:** Select which 3rd party telemetry protocol will be used on Servo connector.
- **Servo channel:** Servo channel for servo control. If -1 is used then normal PWM servo input on device is used, else servo channel from 3rd party telemetry data will be used for servo pulse measurements. Following units are set in Albatross and will be synced via RF link. Set them only in case of standalone usage or no RF link usage.
- **TE Level:** not supported on Raven 2 module, it is common setting for Raven 2 PRO.
- **Vario filter:** Vario response time in seconds.
- **Servo trigger:** Servo trigger in % for arming the task for GPS triangle flying. When such level of servo pulse is detected, additional record is stored in IGC file.

Firmware update

1. Download latest firmware for Raven 2 from our web site. Firmware should have name Raven_2.rcu
2. Connect Raven to PC via USB cable
3. Use RC electronics device tool software. Can be downloaded from our web site
4. Select correct COM port and press Connect button
5. Wait until you see Device Info (connected device and FW version of it)
6. Select update file in Update section and press Update
7. After update you should see new FW version for device. Update takes around 10s



Revision history

26.02.2023	v1.0	– initial version

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Documents / Resources

	RC Electronics Raven2 Onboard Air-Data Measuring System [pdf] User Manual Raven2 Onboard Air-Data Measuring System, Raven2, Onboard Air-Data Measuring System, Air-Data Measuring System, Measuring System

References

- Price request of this domain - Domeinenbank
- Home ~ RC Electronics