

DroneCAN F9P

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Overview

Overview

Overview

The DroneCAN H-RTK F9P is the latest differential high-precision GNSS positioning system from Holybro. This system provides multi-band RTK with fast convergence times and reliable performance, concurrent reception of GPS, GLONASS, Galileo and BeiDou, and a fast update rate for highly dynamic and high volume applications with centimeter-accuracy. It has adopted the DroneCAN protocol for communication.

With the adoption of the DroneCAN Protocol, it has up to an 8 Hz navigation update rate, upgradeability, noise immunity, real-time features, and is more robust than UART due to its increased resistance to electromagnetic interference. It does not occupy any serial port of the flight controller, and multiple CAN devices can be connected to the same CAN bus via a hub.

The DroneCAN-F9P uses a u-blox F9P module, a BMM150 compass, and a tri-colored LED indicator. It is equipped with either the STM32G4 processor running at 170 MHz with 512 KByte Flash or 96KByte RAM or the the [NXP S32K14 processor](#) with 1MB Flash and 128 KB RAM. Compatible with the open source *Pixhawk* series flight controller with both PX4 & Ardupilot Firmware

Features

We have designed two models of DroneCAN H-RTK F9P for you to choose, each with different form factor and antenna design to meet different customer needs.

DroneCAN F9P Rover




The Rover model has a flatter profile and stronger water resistance. It uses a dual band patch antenna and comes with an integrated cable to connect to the CAN bus. It excels in spaces where there are few obstructions.

DroneCAN F9P Helical

This model uses a helical antenna, which has slightly better performance in space with obstructions than the Rover version. The antenna of this module can either be attached to the module directly or connected via a SMA cable, giving you the ultimate flexibility. It also has a UART2 port exposed,

allowing you to do YAW/Heading (aka moving baseline).

This model can be used either on the rover (aircraft) or as a base station. However, when used as Base Station, RTK communicate with the Ground Control Station via USB, so the DroneCAN protocol is not used. You can consider using the standard H-RTK Helical Base model as Base Station.

>  >  > 

“  *[Image — to be added]* ”

Specification

Specification

Hardware Specification

Product Model	DroneCAN H-RTK F9P Rover	DroneCAN H-RTK F9P Helical
Intended Application	Rover (aircraft) only	Rover (aircraft) or Base station
GNSS Receiver	U-blox ZED-F9P high precision GNSS module	U-blox ZED-F9P high precision GNSS module
Antenna	Ceramic Patch Antenna with 20dB LNA	Helical Antenna with 36dB LNA
Processor	STM32G473	Available with <ul style="list-style-type: none">• STM32-G473or• NXP-S32k146
Magnetometer	BMM150 or IST8310	BMM150 or IST8310
GNSS	BeiDou, Galileo, GLONASS, GPS / QZSS	BeiDou, Galileo, GLONASS, GPS / QZSS
GNSS Band	B1I, B2I, E1B/C, E5b, L1C/A, L1OF, L2C, L2OF	B1I, B2I, E1B/C, E5b, L1C/A, L1OF, L2C, L2OF
Positioning accuracy	3D FIX: 1.5 m / RTK: 0.01 m	3D FIX: 1.5 m / RTK: 0.01 m
Communication Protocol	DroneCAN 1Mbit/s	DroneCAN 1Mbit/s
Antennas Peak Gain (MAX)	L1: 4.0dBi L2:1.0 dBi	L1: 2dBi L2: 2dBi
Time-TO-First Fix	Cold start: $\leq 29s$ Hot start: $\leq 1s$	Cold start: $\leq 25s$ Hot start: $\leq 1s$
Navigation Update Rate	RAW: 20Hz Max RTK: 8Hz Max	RAW: 20Hz Max RTK: 8Hz Max Moving Base RTK: 5Hz Max
Cable Length	27cm or 50cm	N/A
Antenna Connection Type	N/A	Board: SMA female Antenna: SMA male

Product Model	DroneCAN H-RTK F9P Rover	DroneCAN H-RTK F9P Helical
Working voltage:	4.75V~5.25V	4.75V~5.25V
Current Consumption	~250mA	~250mA
Dimensions	Diameter: 80mm Height: 20mm	Board (G4): 51.1*35*22.9mm Board (S32k1): 51.1*35*24.3mm Antenna Diameter: 27.5mm Antenna height: 59mm
Weight	123g	58g
Operating Temperature	-20°C to 85°C	-20°C to 85°C

Pinout

Pinout

“ [Image: DroneCAN F9P Rover — to be added]

“ [Image: DroneCAN F9P Helical — to be added]

“ [Image: DroneCAN F9P Helical (S32K1 Version) — to be added]

Dimension

Dimension

“ [Image: DroneCAN F9P Rover — to be added]

“ [Image: DroneCAN F9P Helical — to be added]

“ [Image: DroneCAN F9P Helical (S32K1) — to be added]

Setup & Getting Started

Setup & Getting Started

“ i Info

The setup process is the same as the ZED-F9P, please refer to the link below.

{% content-ref url="/pages/tV9bcdRhYS4L8MWIaGBU" %} [Setup & Getting Started \(PX4\)](#) {% endcontent-ref %}

{% content-ref url="/pages/P59ZJKFtlbTcjwM0HIUe" %} [Setup & Getting Started \(Ardupilot\)](#) {% endcontent-ref %}

DroneCAN FW Upgrade

DroneCAN FW Upgrade

“ i Info

For U-blox Firmware Upgrade, please see [here](#).

“ i Info

As of September 1, 2024, the Holybro AP-Periph DroneCAN stable firmware does not support the IST8310 and RM3100 sensors. However, support is available in the latest (master) firmware and will be included in the upcoming stable release.

You can download the latest firmware here: [HolybroG4_GPS Latest Firmware](#).

If you are working with a custom firmware, you can refer to the following pull request for the necessary code changes: [ArduPilot Pull Request #27878](#).

DroneCAN MCU Firmware Upgrade


Please use Mission Planner 1.3.74 or higher.

Close the parameter setting page, click “Menu>Update” to check available updates. Update the DroneCAN MCU firmware.


After clicking “Update”, it will ask whether to search for updates from the Internet. Click “Yes”. (Automatically searches for upgrades to the latest stable version firmware).

“ □ [Image — to be added]

If “No update available” appears when searching updates. You can try to turn off your firewall in the system setting and try again.

> _ [Image — to be added]_

Alternatively, If you have already downloaded the firmware on your local computer from [ArduPilot Firmware](#) (name of firmware folder is “HolybroG4-GPS” , and file to download is “AP_Periph.bin”) , Click “No” and you will be presented with a selection dialog box and then select the firmware file from your local drive.

“  [Image — to be added]

After the upgrade, check whether the version is successfully upgraded.

“  [Image — to be added]

Download

Download

H-RTK F9P Helical CAD Files

“ [Downloadable file — to be added]

“ [Downloadable file — to be added]

H-RTK F9P Rover CAD Files

“ [Downloadable file — to be added]