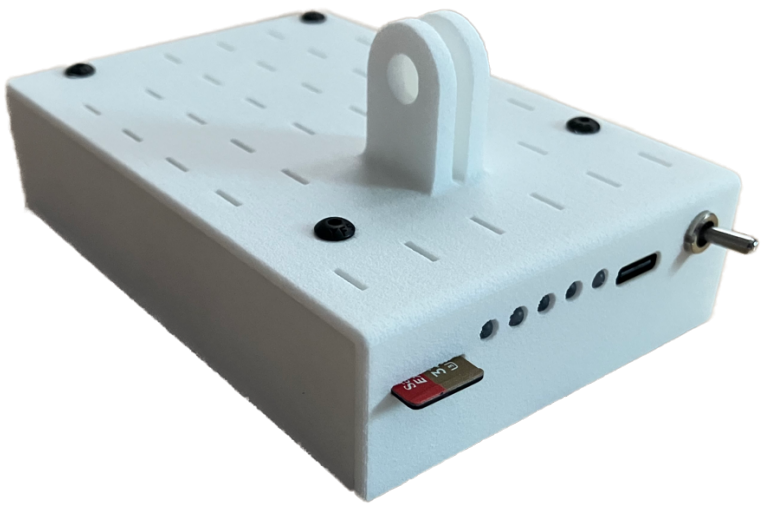
OnFlight Hub External Air Data Interface v0

Firmware v1.0, v2.0, and v3.0

Document Revision 1.1



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Document Revisions

1.0: initial baseline
1.1: corrected error in the byte offset

1 Technical Documentation

The following documentation and support software are included with OnFlight and available from our website:

- **User Manual:** describes the OnFlight Hub, specifications, and operations.
- **CSV Data Log Description:** describes the fields available in the CSV formatted data logs.
- **Binary Data Log Description:** describes the binary data log format that OnFlight Hub uses to write data. This is useful for application developers who would like to natively read and use these data logs.
- **UDP Broadcast Description:** describes the real-time UDP broadcast packet format that is sent by OnFlight Hub.
- **External Air Data Interface (this document):** describes the interface to send OnFlight Hub data from an external air data system.
- **External AGL Altimeter Interface:** describes the interface to send OnFlight Hub data from an external Above Ground Level (AGL) altimeter.
- **Data Converter:** application for Windows or MacOS, which converts the data from OnFlight to CSV format.

2 Support

If you have technical problems or cannot find the information you need in the provided documents, please contact our technical support team by email at: support@bolderflight.com. Our team is committed to providing the support necessary to ensure that you are successful using our products.

3 Introduction

OnFlight Hub can wirelessly receive data from an external air data sensor, which is time synchronized and saved in the OnFlight Hub data log and re-broadcast over the GDL-90 and UDP interfaces. This is useful for incorporating static and differential pressures, indicated and true airspeeds, pressure and density altitudes, and angle of attack. The message from the external air data sensor should be sent at a rate of up to 50 Hz, and no less than 1 Hz, over UDP port 2001. The message structure is described below. Data is formatted as little endian.

Byte Offset	Type	Name	Scale	Unit	Description
0	U1	version	-	-	Interface version number, 0.
1	I1	die_temp_c	1	C	Module die temperature.
2	U2	status	-	-	Status, see Section 4 for bit field description.
4	U2	static_pres_pa	2	Pa	Static pressure.
6	U2	diff_pres_pa	1	Pa	Differential pressure.
8	I2	oat_c	1 / 100	C	Outside Air Temperature (OAT).
10	U2	ias_kts	1 / 100	kts	Indicated Air Speed (IAS).
12	U2	tas_kts	1 / 100	kts	True Air Speed (TAS).
14	U2	pres_alt_ft	-	ft	Pressure altitude, biased by +10,000 ft (pres_alt = pres_alt_ft - 10000).
16	U2	density_alt_ft	-	kts	Density altitude, biased by +10,000 ft (density_alt = density_alt_ft - 10000).
18	I2	aoa	-	-	Angle of attack, either in degrees or a pressure ratio depending on the status bit set, described in Section 4.

4 Status Bit Field

Status bits are used to efficiently encode data, below is the description and bit masking of these bytes. The description describes the case if a bit occupies that position.

Mask	Description
0x0001	Warning that the power remaining is becoming low and should be charged.
0x0002	Warning that the power remaining is critically low and the module will power down soon.
0x0004	Module temperature is within limits.
0x0008	OAT data is available from the module.
0x0010	AOA data is available from the module.
0x0020	New static pressure data is available.
0x0040	Static pressure sensor is healthy and communicating at the expected rate.
0x0080	New differential pressure data is available.
0x0100	Differential pressure sensor is healthy and communicating at the expected rate.
0x0200	New OAT data is available.
0x0400	OAT sensor is healthy and communicating at the expected rate.
0x0800	New AOA data is available.
0x1000	AOA sensor is healthy and communicating at the expected rate.
0x2000	AOA data is transmitted in degrees. If not set, it is assumed the data is transmitted as a pressure ratio.