CopterSonde 3

WxUAS Boundary Layer Vertical Profiler
Technical Data Sheet

Purpose-built, Rotary-wing UAS for Boundary Layer Profiles

The CopterSonde 3* reimagines boundary layer observations by combining the efficiency of UAS-based operations with proven radiosonde-quality sensors. This breakthrough technology offers exciting new opportunities for atmospheric research *and* operational meteorology.

Three Air Temperature and Humidity sensors are mounted in a custom-built hull with a front-facing intake duct to protect the sensors and supply undisturbed air for sampling. A programmable, integrated fan ensures proper aspiration at 10 m/s for consistent data quality. All system elements are designed to isolate the PTU sensors from electronic and physical interference.

A Comprehensive Observation Platform

The CopterSonde 3 is a complete, turn-key design that measures all atmospheric variables observed by traditional radiosondes (Air Temperature, Humidity, Barometric Pressure and Wind Speed/Direction). A modular sensor bay allows for future development of pollution and gas sensors.

Autonomous and semi-autonomous flight modes allow the aircraft to be used as a radiosonde analog - producing conventional met data products ready for input to forecast models. Available data plots include Skew-T Log-P, hodograph and time vs. height temperature / humidity evolution and contour data visualizations.

Wind Vane Flight Mode

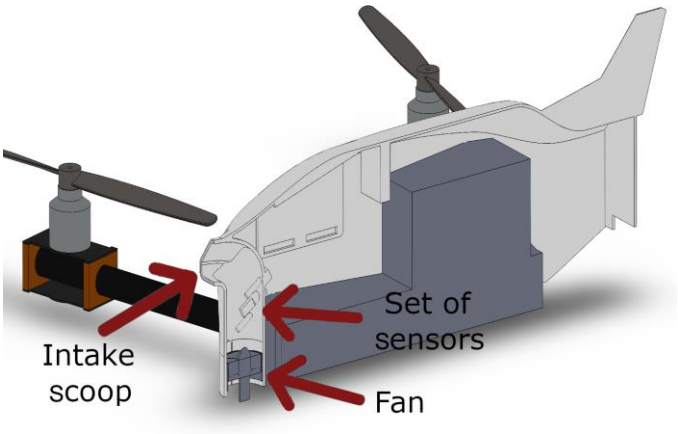
CopterSonde 3 uses proprietary algorithms working in tandem with the aircraft's autopilot and inertial measurement units (IMUs) to adaptively turns the drone into the wind. Wind speed is calculated from the energy required to keep the aircraft horizontally stationary while profiling vertically, eliminating the need for an auxiliary anemometer.

Wireless Data Streaming in Real-Time

Weather data and messages are sent to the ground station in real-time using the Micro Air Vehicle Link (MAVLink) protocol. Sensors and messages can be monitored without the need for cloud-based post processing. Users have immediate access to summary data, with more extensive information stored on removable media.

A World-Class Team

The Coptersonde project brings together the University of Oklahoma - one of the world's leading centers of atmospheric research and engineering, with InterMet System's 25 years' experience building operational radiosondes. The result is a high-quality, sensor-oriented design *at an affordable price.*



InterMet
International Met Systems
4767 Broadmoor SE, Ste 7
Grand Rapids, MI 49512
Voice : 616-971-1005
info@intermetsystems.com

** Patent Pending*
Specifications Subject to Change without Notice
Document 244001-10

Platform Technical Specifications

Drone Dimensions	
Weight (ex. battery)	1.5 kg
Average All-up Weight	2 kg
Diagonal	51 cm
Height	15 cm

Communications	
Telemetry Frequency (Data)	915 MHz
Flight Controller Frequency	2.4 GHz
Transmission Distance	up to 5 km
ADSB Equipped	Yes
Remote ID Compliance	Yes
System Computer	Toughbook Model 55

Field Cases (dimensions, approx. loaded weight)	
Primary (Drone)	Pelican 1630: 79x61x46 cm, 18 kg
Accessories and Tools	Pelican 1600: 61x48x23 cm, 10 kg
Batteries and Charger	GPCDJIP4BTRY: 38x30x18 cm, 7 kg

Propulsion Systems	
Motors	Brushless, 780 KV
T-Style Propeller Material	Polymer
Attachment Style	10 mm SS Screws

Power	
Battery Type	4S Smart HV-LiPo
Capacity	5870 mAh
Typical Flight Endurance	15 min
High Wind Failsafe Return	Included

Standard system includes eight batteries with charger

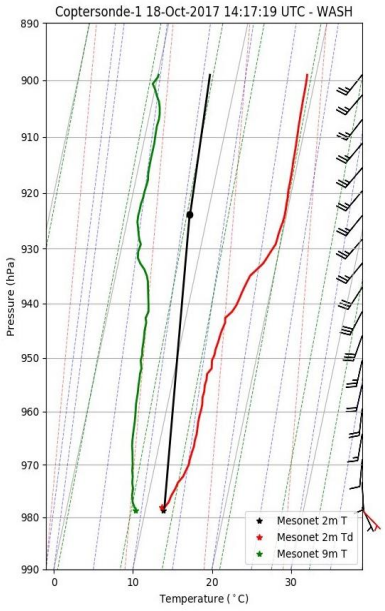
Meteorological Specifications

Thermodynamic	
Primary Variables	Pressure, Temperature, Humidity
Derived Variables	T_d, T_v, θ, θ_e, θ_ω, r, r_s, q, q_s, e, e_s, LCL, Γ
Accuracy	T: ± 0.3 °C RH: ± 5 % p: ± 1.5 mbar
Default Logging Rate	10 Hz

Kinematic	
Primary Variables	Tilt Angles
Derived Variables	Horizontal wind speed and direction
Accuracy	Wind Speed: ± 0.6 m/s Wind Direction: ± 4°
Default Logging Rate	10 Hz

Operating Conditions

Mean Wind Speed	22 m / s (43 knots)
Sustained Max Wind Gust	26 m / s (50 knots)
Maximum Flight Ceiling MSL	3 km (~10,000 ft)
Maximum Flight Altitude	1.5 km AGL
Recommended Operating Temp.	-20 to 40 °C
Typical Ascent Rates	1 – 5 m / s
Typical Descent Rates	1 – 6 m / s



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