



iMet-4 Radiosonde

403 MHz GPS Synoptic Technical Data Sheet

Temperature and Humidity

The iMet-4 measures air temperature with a small glass bead thermistor. Its small size minimizes effects caused by long and short-wave radiation and ensures fast response times. A super-hydrophobic coating minimizes wet-bulb effects

The humidity sensor is a thin-film capacitive polymer that responds directly to relative humidity. An integrated temperature sensor minimizes errors caused by solar heating.

Pressure and Height

As recommended by GRUAN³, the iMet-4 is equipped with a pressure sensor to calculate height at lower levels in the atmosphere. Once the radiosonde reaches the optimal height, pressure is derived using GPS altitude combined with temperature and humidity data.

The pressure sensor facilitates the use of the sonde in field campaigns where a calibrated barometer is not available to establish an accurate ground observation for GPS-derived pressure. For synoptic use, the sensor is bias adjusted at ground level.

Winds

Data from the radiosonde's GPS receiver is used to calculate wind speed and direction.

Data Transmission

The iMet-4 radiosonde can transmit to an effective range of over 250 km*.

A 6 kHz peak-to-peak FM transmission maximizes efficiency and makes more channels available for operational use. Seven frequency selections are pre-programmed - with custom programming available.

Calibration

The iMet-4's temperature and humidity sensors are calibrated using NIST traceable references to yield the highest data quality.

Benefits

- Superior PTU performance
- Lightweight, compact design
- No assembly or recalibration required
- GRUAN³ qualified (pending)
- Status LED indicates transmit frequency selection and 3-D GPS solution
- Simple one-button user interface

* Subject to ground station, balloon size and atmospheric conditions

¹ All uncertainties expressed at a 95% confidence level

² Primary atmospheric pressure derived by GPS altitude

³ GECOS Reference Upper-Air Network

Specifications subject to change without notice

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MEASUREMENTS			
Measurement cycle	1 Hz	GEOPOTENTIAL HEIGHT	Pressure derived
		Measurement range	SFC to 40 km
		Resolution	0.1 m
TEMPERATURE SENSORS	Glass Bead	Combined Uncertainty/Reproducibility ¹	
Manufacturer	Shibaura	1080 - 400 hPa	15 m / 10 m
Measurement range	+60°C to -90°C	400 - 10 hPa	200 m / 150 m
Resolution	0.01°C		
Response time: still air/ 5 ms ⁻¹ (1000 hPa)	2 / < 1 sec		
Repeatability in Calibration	0.2 C	GEOPOTENTIAL HEIGHT	GPS derived
Combined Uncertainty/Reproducibility ¹		Measurement range	SFC to 40 km
> 100 hPa	0.5 C / 0.3 C	Resolution	0.1 m
< 100 hPa	1.0 C / 0.75 C	Combined Uncertainty/Reproducibility ¹	
Night flight	0.3 C / 0.3 C	1080 - 400 hPa	30 m / 15 m
Solar correction	≤ 1.2 C	400 - 3 hPa	60 m / 20 m
HUMIDITY SENSOR	Capacitive Polymer	WIND SPEED AND DIRECTION	
Manufacturer	IST	Resolution	0.1 m/s / 1 degree
Measurement range	0-100 % RH	Speed	
Resolution	0.1%	Combined Uncertainty/Reproducibility ¹	0.5 / 0.25 m/s
Response time		Direction	
@ 25C	0.6 seconds	Combined Uncertainty/Reproducibility ¹	1 degree
@ 5C	5.2 seconds		
@ -10C	11 seconds		
@ -40C	61 seconds		
Repeatability in Calibration	5 %		
Uncertainty/Reproducibility ¹		TELEMETRY	
> 0 C	5% / 3%	Transmission type	Synthesized
-40 to 0 C	5% / 5%	Maximum Range	> 250 km
		Frequency stability	± 3 kHz
		Deviation, peak to peak	6 kHz
PRESSURE ²	Sensor	Output Power	~ 30 – 200 mW
Manufacturer	Measurement Specialties	Modulation	AFSK
Measurement range	1200 hPa - 10 hPa	Data Rate	1200 Baud
Resolution	0.01 hPa	Transmission Frequencies	7 Pre-programmed Channels
Response time	0.5 milliseconds	Custom Frequencies	Available
Uncertainty/Reproducibility ¹			
Whole range	2.0 / 1.5 hPa	GPS RECEIVER	
1200 - 400 hPa	1.0 / 0.75 hPa	Manufacturer / Type	U-Blox CAM-M8
400 hPa - 10 hPa	2.0 / 1.5 hPa	Cold Start Time	< 60 seconds (typical)
PRESSURE	GPS derived	OPERATIONAL DATA	
Measurement range	SFC to 3 hPa	Battery	Lithium
Resolution	0.1 hPa	Operating time	> 135 minutes
Uncertainty/Reproducibility ¹		Weight	120 grams
1080 - 400 hPa	2.0 / 1.5 hPa	Dimensions	Body (LWH): 139x67x31
400 hPa - 3 hPa	0.5 / 0.25 hPa		With boom (LWH): 235x67x31
		Calibration Stability	2 years

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