



# 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.

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

#### Pressure and Height

As recommended by GRUAN<sup>3</sup>, 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.

#### Radiosonde 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
- GRUAN<sup>3</sup> 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

<sup>1</sup> All uncertainties expressed at a 95% confidence level

<sup>2</sup> Primary atmospheric pressure derived by GPS altitude

<sup>3</sup> GECOS Reference Upper-Air Network

Specifications subject to change without notice, Rev 11 190801

MEASUREMENTS			GEOPOTENTIAL HEIGHT	
Measurement cycle	1 Hz		Pressure derived	
			SFC to 40 km	
			Resolution	0.1 m
TEMPERATURE SENSORS			Combined Uncertainty/Reproducibility <sup>1</sup>	
Manufacturer	Glass Bead	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 <sup>-1</sup> (1000 hPa)	2 / < 1 sec			
Repeatability in Calibration	0.2 C		GEOPOTENTIAL HEIGHT	GPS derived
Combined Uncertainty/Reproducibility <sup>1</sup>			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 <sup>1</sup>	
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			WIND SPEED AND DIRECTION	
Manufacturer	Capacitive Polymer	IST	Resolution	0.1 m/s / 1 degree
Measurement range	0-100 % RH		Speed	
Resolution	0.1%		Combined Uncertainty/Reproducibility <sup>1</sup>	0.5 / 0.25 m/s
Response time			Direction	
@ 25C	0.6 seconds		Combined Uncertainty/Reproducibility <sup>1</sup>	1 degree
@ 5C	5.2 seconds			
@ -10C	11 seconds			
@ -40C	61 seconds			
Repeatability in Calibration	5 %		<b>TELEMETRY</b>	
Uncertainty/Reproducibility <sup>1</sup>			Transmission type	Synthesized
> 0 C	5% / 3%		Maximum Range	> 250 km
-40 to 0 C	5% / 5%		Frequency stability	± 3 kHz
			Deviation, peak to peak	6 kHz
PRESSURE <sup>2</sup>	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		Standard Frequencies	402, 402.5, 403, 403.5 404, 404.5, 405
Response time	0.5 milliseconds		Custom Frequencies	Available
Uncertainty/Reproducibility <sup>1</sup>				
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		<b>OPERATIONAL DATA</b>	
Measurement range	SFC to 3 hPa		Battery	Lithium
Resolution	0.1 hPa		Operating time	> 135 minutes
Uncertainty/Reproducibility <sup>1</sup>			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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