



**InterMet**  
International Met Systems

## Application Note 252007



### iMet-1-RSD/iMet-Iridium Procedure

Version 01

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## 1 Introduction

This procedure describes the necessary steps to connect the iMet-1-RSD to an iMet-Iridium modem.

### 1.1 iMet-1-RSD

The iMet-1-RSD is a specialized version of the iMet-1 radiosonde. Typically a radiosonde transmits meteorological data each second using a 300mW transmitter using a carrier frequency in the range of 402-406 MHz. For the iMet-1-RSD the transmitter is removed, and the radiosonde is configured to output data using a serial port. This data is connected to an external device using a cable.

### 1.2 iMet-Iridium Modem

Iridium Communications is a company that currently operates a system of 66 active satellites used worldwide for voice and data communication.

InterMet has developed a modem that utilizes the short-burst data (SBD) capabilities of Iridium to send meteorological data.

The modem buffers incoming meteorological data into a flash memory chip. Once enough data has been buffered (approximately 130 bytes) the modem connects to the satellites and transmits the data.

## 2 Hardware Setup Procedure

This procedure shows how to configure the hardware of the iMet-1-RSD and the iMet-Iridium modem. Once this procedure is complete, the iMet-1-RSD data packets will be sent from the Iridium modem to the Iridium Gateway.

### CAUTION

If the data packets are not retrieved from the Iridium Gateway using the iMet-Iridium VAR Server within 24 hours, the data will be lost permanently. This server is maintained by InterMet Systems. If there are any problems connecting to the server or an error has occurred, InterMet Systems should be contacted immediately using the information in section 3.1.

The procedures in section 2.1 through 2.3 should be followed in order with no deviations.

### 2.1 iMet-1-RSD Setup

Use Figure 1 to complete the setup of the iMet-1-RSD radiosonde.

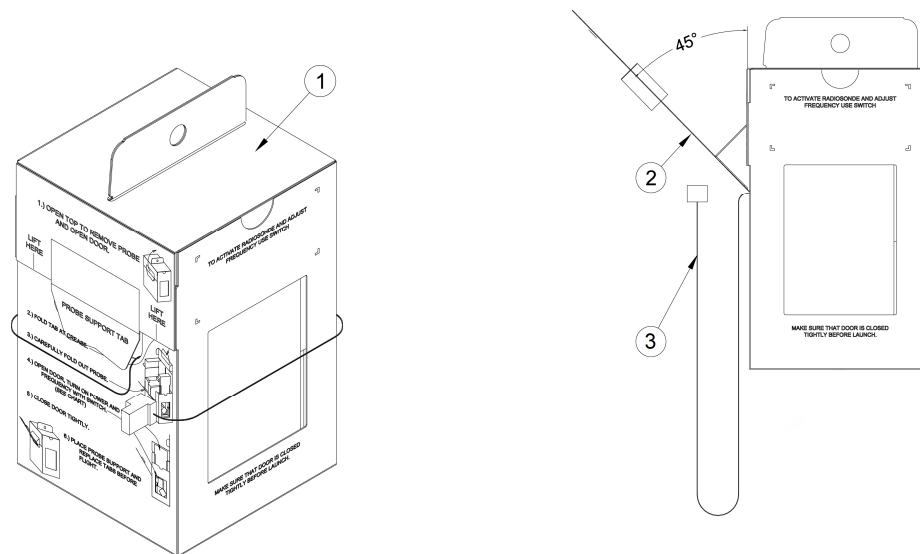


Figure 1 iMet-1 RSD Setup

1. Remove sonde from shipping bag
2. Open top flap (1) and deploy the temperature/humidity probe (2).
3. Bend temperature/humidity probe (2) to approximately a 45° angle.
4. Close the top flap and extend the data cable (3).

### 2.2 iMet-Iridium Setup

5. Open the top flap of the modem and slide up the door to gain access to the connectors as shown in Figure 2.



Figure 2 Connector Access

6. Carefully remove the battery from the foam housing.
7. Connect the iMet-1-RSD data cable to the 4-pin connector on the iMet-Iridium as shown in Figure 3.

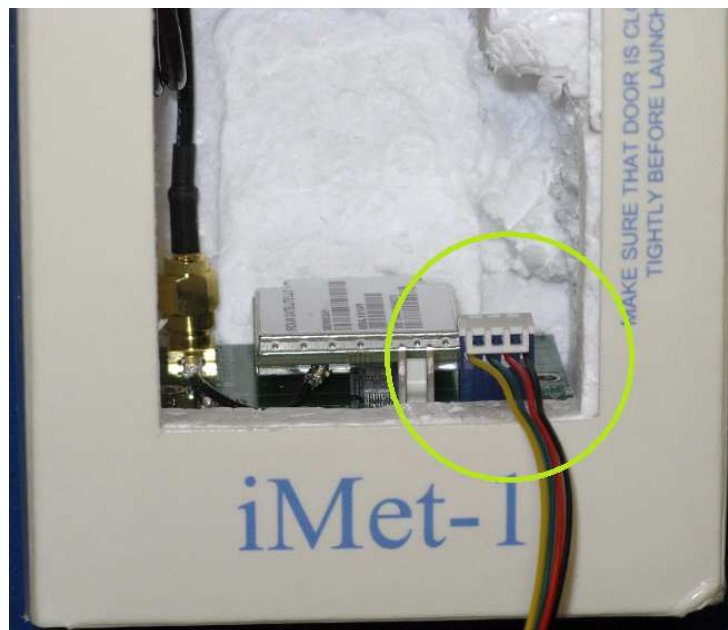


Figure 3 Data Cable Connection



Figure 4 Battery Connection

8. Plug in the battery as shown in Figure 4.
9. Once the battery connector is plugged in, the red LED should turn on for approximately 16 seconds. During the time, the flash memory is being erased. Wait for the red LED to turn off.
10. Immediately after the red LED turns off, the blue LED should turn on as shown in Figure 4.

#### NOTE

The equipment must be taken outside in clear view of the GPS satellites and the Iridium satellites for the remaining steps.

11. Wait for the iMet-1-RSD to acquire a GPS fix. The iMet-Iridium modem indicates a GPS solution by the blue LED blinking in one second intervals.
12. After at least 12 packets have arrived (12 seconds of radiosonde data), the amber LED should turn on. This indicates the modem is connecting to the Iridium satellites and attempting to send a packet.
13. After approximately 15 seconds the green LED should blink, indicating the modem has successfully sent a message and received confirmation from the Iridium Gateway. Verify the green LED has blinked.

#### NOTE

The red LED will blink instead of the green LED if the transmission is unsuccessful. An unsuccessful transmission can occur for many reasons, but the most common is a bad RF link between the modem and the

Iridium satellites. The data packet will NOT be lost after an unsuccessful transmission since it is saved to flash memory. The modem will keep trying to transmit until the modem has caught up with the memory. Is in normal for the modem to fall behind the memory in a buffered state up to 5-10 minutes per hour.

14. Carefully slide the door back down. The data cable will be pinched by the foam, and this is acceptable.

### 2.3 Preparation for Flight

15. Tape the iMet-1-RSD and the iMet-Iridium together using clear shipping tape in the area indicated in Figure 5. The tape should make at least one full revolution around the two units.



Figure 5 Tape Application

16. Tie a piece of 16" string (recommended cotton twine or nylon) to the attachment point of the iMet-1-RSD and the iMet-Iridium as shown in Figure 6.

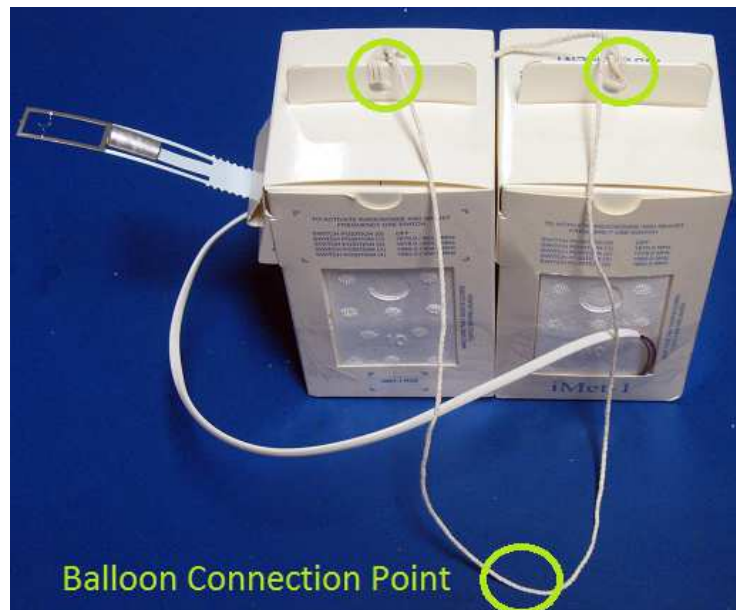


Figure 6 Balloon Attachment Point

17. Use the location marked “Balloon Connection Point” from Figure 6 to attach the devices to the balloon payload.



### 3 Software Setup Procedure

This procedure describes the necessary steps to retrieve the iMet-1-RSD data from InterMet’s iMet-Iridium VAR Server using the freely distributed iMet-Iridium VAR Client program.

#### NOTE

All the steps outlined in this procedure require a stable internet connection.

#### 3.1 Download the iMet-Iridium VAR Client

1. Navigate to [www.intermet.com](http://www.intermet.com) . Log In as a member (Registration is necessary the first time).
2. Use “Customer Resources” menu option to navigate to the iMet-Iridium VAR Client download location.
3. Download the file “600106.0001.zip” to a known location. Ignore any warnings associated with the download. Anti-virus software may not like this file since it contains an executable file.
4. Extract the entire zip file into a known directory.
5. Run the “iMet-Iridium Client.exe” file as shown in Figure 7.

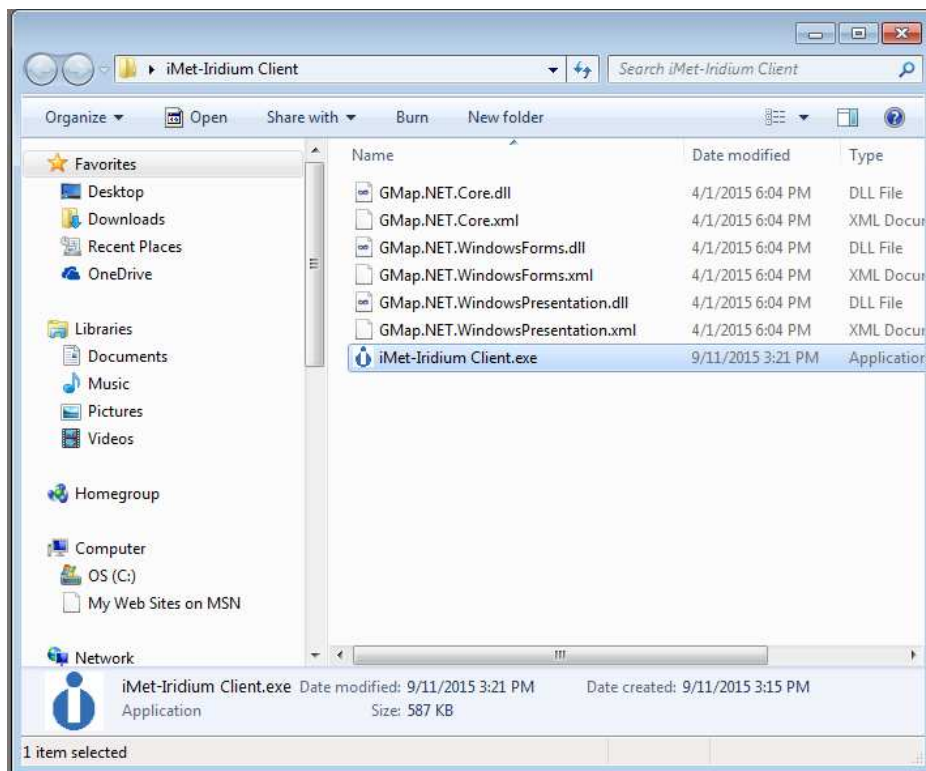


Figure 7 iMet-Iridium VAR Executable File

### 3.2 Configure the Client

6. Enter a valid user name and password in the “Server Connect” window and click the “Connect” button to connect to the server as shown in Figure 8.

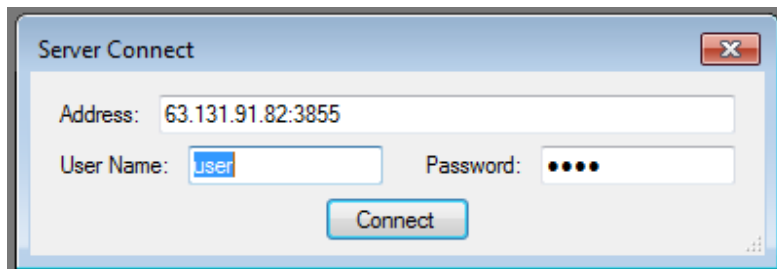


Figure 8 Server Connection

#### NOTE

User names and passwords are issued by InterMet and could take up to one day to process. If a new user name and password is required, contact InterMet Systems using the information in section 11.

7. Select the IMEI number(s) to monitor by using the pulldown menu and clicking the “Subscribe” button as shown in Figure 9. Multiple IMEI numbers can be subscribed to.

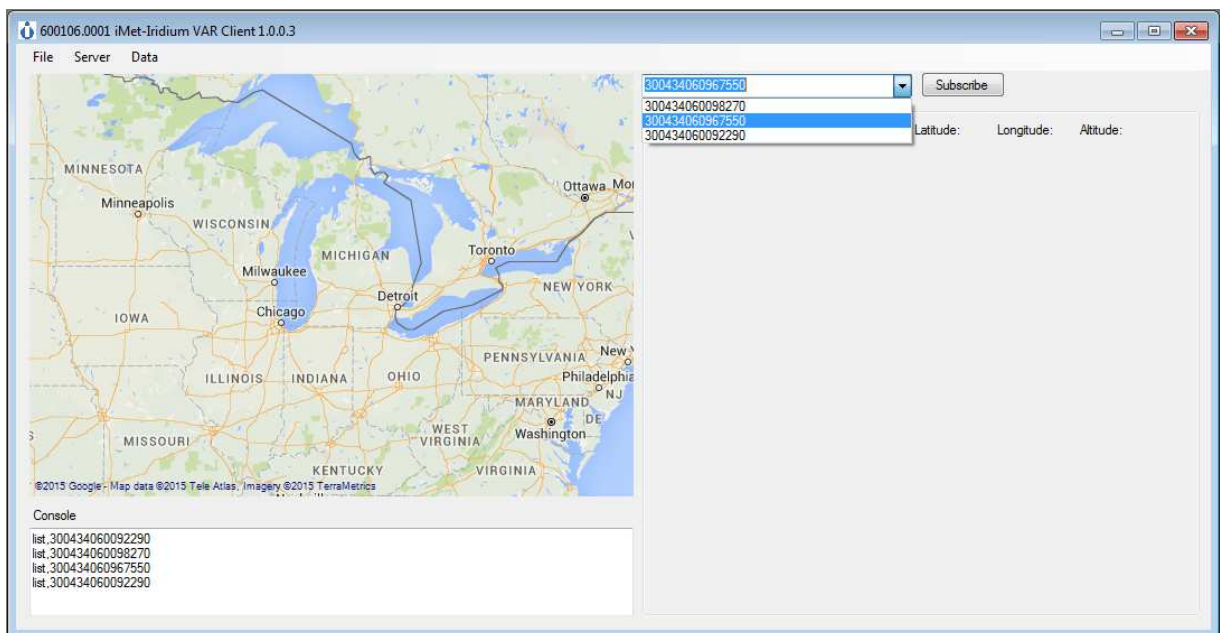


Figure 9 IMEI Subscription

8. Observe the radiosonde data appearing under the subscribed IMEI as shown in Figure 10.

| Radiosonde Data |  |           |           |                                  |            |           |
|-----------------|--|-----------|-----------|----------------------------------|------------|-----------|
| Time            | Pressure:                                  | Air Temp: | Humidity: | Latitude:                        | Longitude: | Altitude: |
| 300434060967550 | <input type="button" value="Get Backlog"/> | 36.2      | 15.2      | <input type="button" value="X"/> |            |           |
| 16:13:18.27     | 980.00                                     | 20.00     | 50.00     | 42.918580                        | -85.546110 | 238.9     |

Figure 10 Radiosonde Data

9. Observe the location of each IMEI in the GoogleMaps display as shown in Figure 11. If the PC mouse has a wheel attached, the wheel can be used to zoom in or out.



Figure 11 GoogleMaps Location

### 3.3 Exporting the Data to .CSV File

10. At any time during or after a balloon flight, select “Data→Export” along with the desired IMEI number as shown in Figure 12.

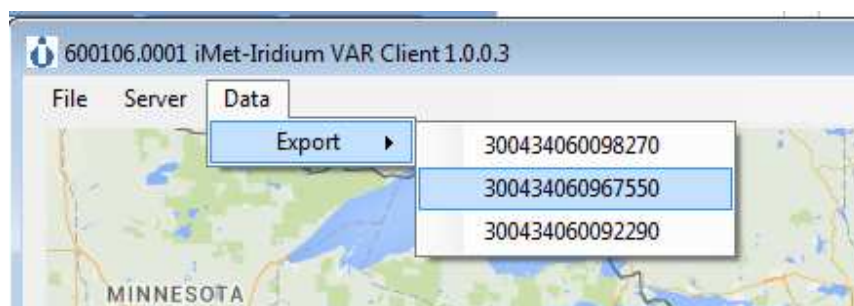


Figure 12 Data Export

11. Select a filename and directory to save the comma-delimited file.
12. Process this data using a software suite for handling .csv files (Excel, MatLab, ect.).

## 4 Contact Information

|         |   |   |
|---------|---|---|
| email   | : | <a href="mailto:support@intermetystems.com">support@intermetystems.com</a>        |
| phone   | : | (616) 285-7810  |
| fax     | : | (616) 957-1280  |
| address | : | InterMet Systems<br>3854 Broadmoor Ave. SE<br>Suite 107<br>Grand Rapids, MI 49512 |