Iridium 9575 Extreme and Delorme inReach as GPS Trackers

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GPS Trackers

- **Safety**
  - An additional informational tool in emergencies
  - A Personal Locator Beacon (PLB) is the NSF ARSLS standard tool for safety. PLB required by Government of Greenland
  - Ideally, does not require operator activation

- **Logistics**
  - Tracking of assets (e.g., vehicles, boats)
  - Informative of deviation from research itinerary
  - Near real-time display of location for outreach
Ski-Doo Installation

- GPS Trackers originally designed for snow machines. Also used on tractors.

Summit Station, Greenland

- Weatherproof enclosure
- 12 VDC vehicle power
- No operator input

Greenland Inland Traverse
Greenland Inland Traverse

Elapsed Time
6 days 16:29:26

Distance Travelled
91 km

Distance to Summit
1083 km

Current Location
76° 35' 36" N
65° 32' 20" W

Current Elevation
1264 m

Bearing and Speed
69° 0 km/h

Leaving the Transition

Photo by Robin Stokes
**Iridium 9575 Extreme Satphone**

- Ruggedized
- IP67 water spray protection
- SMS & SBD position reports
  - SOS function
  - Adjunct to ever-present satphone

![Iridium 9575 Extreme Satphone Image]

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From: 881631459731@msg.iridium.com
Subject: SMS from 881631459731@msg.iridium.com

To: roy.stehle@sri.com

I am here: Lat+64.526053 Lon-147.851766 Alt +452 It GPS Sats seen: C4

[map link] http://map.iridium.com/m?lat=54.825683&lon=-147.861766 Sent from my Iridium handset
Customer-controlled 9575 SMS

Simple E-mail and/or Text messages

Subject: SMS from 881622450139@msg.iridium.com
From: 881622450139@msg.iridium.com
Date: Wed, 09 Jan 2013 21:59:53 +0000
To: roy.stehle@sri.com

I am here Lat+37.454449 Lon-122.176500 Alt +6 m GPS Sats seen: 04
http://map.iridium.com/m?lat=37.454449&lon=-122.176500 Sent from my Iridium handset

Subject: SMS from 881622450139@msg.iridium.com
From: 881622450139@msg.iridium.com
Date: Wed, 09 Jan 2013 22:01:23 +0000
To: roy.stehle@sri.com

EMERGENCY Lat+37.454449 (stdv 0039) Lon-122.176500 (stdv 0039) Alt +6 m GPS sats 04
2013-01-09 22:00UTC Batt 82% User lang en Sent via Iridium

Subject: SMS from 881622450139@msg.iridium.com
From: 881622450139@msg.iridium.com
Date: Wed, 09 Jan 2013 22:03:17 +0000
To: roy.stehle@sri.com

Emergency cancel, stand down 2013-01-09 22:03UTC Sent via Iridium
**SMS Messages**

- **Expensive**
  - $0.35 per message
  - 30 minute message interval, 10 hour day, 30 days/month
  - 600 messages = $210/month

- **Awkward to process**
SBD Messages

- Provided by Iridium Service Providers
  - 34 Byte location message
  - $7/month plus airtime charges
    SBD 17 Plan: $21.00/month incl. 17 kB; $1.40/kB over 600 messages = $32.76/month total plus voice plan
  - ISP’s Website shows present location
  - SOS Services incur additional monthly charges

- Full Location Based Service via Custom Portal
  - Non-Disclosure Agreement to learn record formats
  - Certification by Iridium
  - Full access to records from 9575 for plotting, alerting, etc.
SBD Message Re-routing Hybrid

- Iridium Service Provider routes to your server
  - 34 Byte location message
  - $5/month plus airtime charges
  - SBD 17 Plan: $21.00/month incl. 17 kB; $1.40/kB over 600 messages = $30.76/month
  - Your responsibility for SOS services
  - Your plotting services
9575 Comments

- Single package for voice, data, tracking
  - Single set of batteries; carry spare for extra tracking power
- Rechargeable Li-Ion batteries
- Accessories to charge satphone and use antenna
  - GPS antenna built into satphone; external antenna Iridium only
  - Connector seal can fall out w/ battery
- Battery bail hard to grasp
- Trace-compliant model runs DOD SIMs
- Potentially less sensitive than 9505A
**Delorme inReach**

- Uses Iridium SBD messaging
- Mates with smartphones or GPS for messaging and display
- SOS functionality by GEOS
- Floats
## SBD Messages

- **Service plans provide unlimited tracking**

<table>
<thead>
<tr>
<th></th>
<th>Safety Plan</th>
<th>Recreation Plan</th>
<th>Expedition Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Annual (12 Months)</strong></td>
<td>$9.95 Monthly</td>
<td>$24.95 Monthly</td>
<td>$49.95 Monthly</td>
</tr>
<tr>
<td><strong>Seasonal (4-month minimum)</strong></td>
<td>N/A</td>
<td>$39.95 Monthly</td>
<td>$64.95 Monthly</td>
</tr>
<tr>
<td><strong>SOS</strong></td>
<td>Unlimited</td>
<td>Unlimited</td>
<td>Unlimited</td>
</tr>
<tr>
<td><strong>Predefined Messages from inReach</strong></td>
<td>10 per month shared with Messages</td>
<td>Unlimited</td>
<td>Unlimited</td>
</tr>
<tr>
<td><strong>Messages</strong></td>
<td>10 per month shared with Predefined Messages</td>
<td>40 per month</td>
<td>120 per month</td>
</tr>
<tr>
<td><strong>Tracking</strong></td>
<td>$0.25</td>
<td>Unlimited</td>
<td>Unlimited</td>
</tr>
<tr>
<td><strong>Overage</strong></td>
<td>$1.50 per message</td>
<td>$0.50 per message</td>
<td>$0.25 per message</td>
</tr>
</tbody>
</table>
## GPS Tracker Comparison

<table>
<thead>
<tr>
<th>Feature</th>
<th>9575 Extreme</th>
<th>inReach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions (in)</td>
<td>5.51 x 2.36 x 1.06</td>
<td>3.4 x 2.85 x 1.73</td>
</tr>
<tr>
<td>Volume (cu in)</td>
<td>13.8</td>
<td>16.8</td>
</tr>
<tr>
<td>Weight (grams)</td>
<td>247</td>
<td>227</td>
</tr>
<tr>
<td>Operating Temperature (C)</td>
<td>-10 to +55</td>
<td>-20 to +70</td>
</tr>
<tr>
<td>Durability</td>
<td>IP65</td>
<td>IP68</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Floats</td>
</tr>
<tr>
<td>Battery Lifetime (hrs)</td>
<td>30 standby</td>
<td>125 lithium</td>
</tr>
<tr>
<td></td>
<td></td>
<td>~60 alkaline</td>
</tr>
<tr>
<td>Battery</td>
<td>Rechargeable Li-Ion</td>
<td>Primary or Rechargeable</td>
</tr>
<tr>
<td>Tracking Interval</td>
<td>5 min to 1 week</td>
<td>10 in to 4 hrs</td>
</tr>
</tbody>
</table>