RAPID Alert System

User Guide

Know when intruders enter a restricted zone, immediately, anywhere in the world. Receive real-time alerts by email or text message

Document Version 1.5

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Overview

The RAPID Alert system is an intrusion detection and notification system intended to work off the grid. This battery and solar powered system is incredibly power efficient. Intelligent sensors alert only when there is a very high probability of human intrusion. The system is designed for protecting remote areas such as wildlife conservation zones, remote cultural resources and off-the-grid properties.

Depending on the sensors and options chosen, RAPID systems will last for several months or indefinitely, unattended. It waits hidden and silent to warn you of intruders.

With a combination of high confidence level sensors and real-time notification, we believe the RAPID system is a game changer. No longer will poachers and intruders have the advantage of being a needle in a haystack. You will know where they are, and they won't know you’re coming.
The RAPID system blends several cutting edge technologies to bring you a single, easy to use solution. Systems are compact, light weight and designed for quick field installation.

**Detection**

Unlike other intrusion detection sensors, such as Passive Infrared (PIR) and Seismic Sensors, RAPID sensors are designed to detect human intrusion by targeting human characteristics:

- **Vehicle Sensor** – detects moving metal over a roadway
- **Temperature Spike Sensor** – detects a sudden increase in temperature, indicative of someone lighting a fire in a cabin or fire pit
- **Active Infrared Break Beam** – detects people walking along a trail. The sensor is intelligent enough to know the time it takes a person to cross a path versus falling leaves, rain, or something simply blocking the sensor.
- **Gate and Door Switch** – a hidden switch which can let you know if a gate or door has been opened.

The RAPID system allows you to connect more than one sensor to give you a higher level of confidence and to also give you additional information, such as speed and direction of travel for selected sensors. A total of 4 sensor ports leaves flexibility for future sensors.

And we’re not stopping there. Wildlife Intel is developing a sound sensor to detect vehicle sounds, chainsaws and gunshots.

To help collect evidence, the RAPID system will also support a digital video camera and video recorder which starts recording when sensors are triggered.

**Notification**

RAPID system is based on Iridium Low Earth Orbit Satellite Short Data Burst communication. Iridium is the only satellite network which has coverage everywhere in the world. In addition, Iridium has two-way communication so that the system can be configured remotely, via a configuration and monitoring website.

The system sends two kinds of messages:

- Periodic check-in messages to let you know:
  - System status
  - Battery levels
  - Traffic information, such as the number of triggers received in the past week
  - Hour-by-hour traffic log
- Alert messages to let you know immediately:
The system which has been triggered
- The location, date and time
- Sensors which have been triggered
- (where applicable) speed and direction of travel

You have complete control over which messages you receive, who receives the messages, and how often.

The messages are sent to the Wildlife Intel communications server and you can get these messages either by logging into a secure web server, or by having these messages sent directly to your email or text message device. People anywhere in the world may receive the near real-time alerts to their handheld satellite devices, such as the Delorme InReach®: [http://www.inreachdelorme.com/product-info/inreachse.php](http://www.inreachdelorme.com/product-info/inreachse.php)

**Monitoring and Management**

Large organizations may choose to deploy several of these systems across their enterprise. Headquarters may monitor and remotely configure all installations from one place.
Hardware Description

As indicated in the overview diagram, a system may consist of a base station, an online account, many sensors, a satellite antenna, external power, and a video camera. However, the system may also be quite simple as shown below.

A Typical System

![Antenna](image1)
![Alert Base Station](image2)
![Vehicle Sensor](image3)
Base Station

The RAPID Base Station is the central hub for communications, configuration, power management and data logging.

![Alert Base Station (inside)](image)

![Iridium Antenna](image)

The RAPID Alert Base Station is made up of several components:

- GPS Receiver
- Iridium Short Data Burst Modem
- Iridium Antenna Connector
- Internal Batteries (8xAA)
- 1 simple sensor port (2 pin connector)
- 3 intelligent sensor ports (8 pin connector)
- 1 external power port

The unit is weatherproof, including an NEMA 6 rated enclosure and Conxall field weatherproof connectors. You may access the inside by removing 4 philips screws.
Wildlife Intel Secure Web Application

To use the RAPID Alert System, you need to create an on-line account in which to register base stations. From the on-line service, you may configure and monitor your systems. Access to the system is secured by SSL encryption and user name and password authentication.

Creating an On-Line Account
To register the Base Station, follow this procedure:

1. Go to http://www.wildlifeintel.com
2. Click on the Login tab, which will bring you to a secure sign-in page
3. If you have not already created an account, click “Create a New Account”.
   a. Enter all applicable information show below
   b. Items marked with an asterix are mandatory
   c. The IMEI Number can be found
      underneath the GPS receiver,
      on the Satellite Modem
      (the 15 digit number shown here
      is not valid)

(You will need to unscrew the four
screws on the lid of the base station)
d. Click on “Request Account”

e. The account will be enabled usually within an hour at which point you will be notified by email
If you do not receive a confirmation email, please contact accts@wildlifeintel.com.

When you receive a confirmation email, you may return to the secure login page and enter your username email and password.
Add a New Base Station

1. Click on “Add a Base Station” and enter requested information
   a. IMEI is the number found inside the Base Station on the Satellite Modem (described above)
   b. Give the device a name, such as EC001
   c. Give the device a description, such as “North entrance to Fred’s lake”
   d. Select a configuration for the device. This can be changed at any time.
   e. Indicate whether the device has a video camera module
   f. Enter any comments about the device
   g. Select a project for the device (described later) or leave it as default
   h. For now, ignore the Advanced Options. These are ways which you may fine tune the way your base station operates.
   i. Click Save which will take you back to the list of all your devices
   j. Click “Send Configuration” icon next to the desired device. This will queue a configuration to be retrieved by the Base Station
### Advanced Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comments</td>
<td>Include any comments about the device.</td>
</tr>
<tr>
<td>Check-in Schedule</td>
<td>Every second day, at 12:10pm.</td>
</tr>
<tr>
<td>Meters Apart</td>
<td>For systems with speed and direction capability, indicate the distance between apart Port 1 and Port 3 sensors.</td>
</tr>
<tr>
<td>Suspend Alerts</td>
<td>Indicate when the system will suspend alerts to save power and data costs. This could be, for example, when permitted visitors are expected.</td>
</tr>
<tr>
<td>Alert Frequency</td>
<td>Set the minimum time between alerts. This function is only available in firmware build 4.1.4d and later.</td>
</tr>
<tr>
<td>Send Alerts</td>
<td>Uncheck this box to disable alerts from being sent. This mode can be used to reduce data transmission costs in the case of frequent triggers.</td>
</tr>
<tr>
<td>Hourly Counts</td>
<td>Check this box to send hour-by-hour trigger counts. This function is only available in firmware build 4.1.4d and later.</td>
</tr>
</tbody>
</table>

### Managing Notifications

You may specify which email address and SMS message devices receive notifications by clicking on the Distribution Lists link. For each email address or text message device (phone) number, or Delorme InReach device, you may choose whether to notify of Check-ins, Alerts, both or none.
This procedure requires access to the internet.

**Dashboard**

Once a Base Station has been installed and triggered, they can be viewed in a map dashboard which displays each device as an icon – a different one for each sensor type. Hovering over an icon, the user may see a basic status on the device. Clicking on an icon, the user may see extended information on the device, including battery levels.

If a Base Station has been recently triggered (within 24 hours), the icon will bounce. Clicking on this icon will show information relevant to the triggered event, including which sensor was triggered, date, time, location and speed and direction of travel, if applicable.
Projects

Organizations with RAPID Alert Base Stations at several locations may choose to group these devices into Projects. In that way, the dashboard may focus on certain geographical areas.

From the Distribution Lists menu item, choose “Add a New Project”. Give the project a name and a description then click “Create Project”. After this point, the project will be available as a choice when categorizing base stations.
Receiving by Email and SMS

Email addresses which are configured to receive Check-ins and Alerts will receive an email from noreply@wildlifeintel.com. The email message will contain all of the information available from the website dashboard, plus a hyperlink to see where the event is on Google Maps.

Delorme InReach and SMS devices will receive a shorter version of the same information.
Base Station Hardware

Setting up the Base Station

1. Add 8 AA (lithium batteries)
2. Set the base station to...
   a. OFF
   b. In the “CONFIG” position
   c. Voltage switch to “12 volts”
3. Attach the antenna cable to the Base Station and the Iridium (round, green) antenna.
4. Point the green antenna upward where there is lots of sky view
5. Slide the ON/OFF switch to the ON position

When you slide the ON/OFF switch to ON, you should see the following sequence of events:

A) A red Status LED will stay on for a minute or two to get a GPS satellite fix.
B) Once there is a GPS fix, a red Status LED will flash about once per second indicating that the system is in CONFIG mode. In this mode, sensors can be tested without sending a satellite signal

Location, date and time of the Base Station is set automatically by the on-board GPS receiver.

Tips:

- The key to fast, reliable satellite signals is lots of sky view for the Iridium antenna
- It is better to hide the base station in vegetation or mulch rather than rock or dirt. This will allow the GPS sensor inside to get a fix in the case there is a system reset.
Attaching Sensors

After sensors are placed and hidden, installation of the sensors is just a matter of plugging in sensors using Conxall® Field Installable Connectors to the Base Station. These are simple twist-on connectors. Ports are designed in such a way that an incompatible device may not be connected to an incompatible port.

Configuration happens over satellite. Until the device is configured, it will default to listening to all ports and all sensor types. To save power it is recommended that the device be configured for the attached sensors.
Sensors

Trap/Gate/Door Sensor

A Trap/Gate/Door switch sensor comes in two parts – a magnet portion and a reed switch portion which connects to the sensor cable. The sensor will trigger when the two components are pulled apart. Aside from intrusion detection, this sensor is ideal for live animal trapping.

Switch Sensor Cable

Switch Options

Installing the Trap/Gate/Door Sensor

1. Set the Base Station to...
   a. OFF
   b. In the “CONFIG” position
   c. Voltage switch to “12 volts” or “6 volts”
2. Install the magnet portion of the 2-part switch in the moving part of the gate or doorway.
3. Install the reed switch portion of the 2-part switch in the stationary part of the gate or doorway
4. Run the cabling to the Base Station
5. Plug the switch sensor into the Base Station – either port 1 for an 8 pin sensor or “Trap” port for a 2 pin sensor
6. Separating the two halves of the switch, you should see a quick green flash on the Base Station Status LEDs.
7. When ready, switch the system to “ARM”, attach cover and hide components.

Example Installation of Switch Sensor
Vehicle Sensor
The Vehicle Alert system uses a buried probe style vehicle sensor to detect traffic along a roadway. Once installed, the vehicle detector is virtually undetectable.

The system is very power efficient and can last for months on on-board batteries

Installing the Vehicle Sensor
1. Set the Base Station to…
   a. OFF
   b. In the “CONFIG” position
   c. Voltage switch to “12 volts”
2. In the middle of a trail or roadway, bury the vehicle sensor wand about 6” deep.
3. The best spots are:
   a. Where water will not collect
   b. Where vehicles will travel at a moderate/slow speed (e.g. under 20 miles/hour)
4. Surround the wand with fine dirt or sand – avoid large sharp rocks right next to the wand since these could crack the wand when a vehicle drives over top.
5. Bury trailing cable deep enough so that it does not become exposed (a few inches).
6. Any excess cable should be bundled and immobilized so it doesn’t toss around in strong winds. This could set off false alarms.
7. Plug the vehicle sensor into the Base Station (Port 1 for the first sensor, Port 3 for a second sensor)
8. Turn base station ON … BUT DO NOT TEST THE VEHICLE SENSOR YET…
9. Wait 3 minutes for the calibration process to finish. The least moving around during this time, the better, for a sensitive calibration.
10. Test by moving a fairly large object (e.g. shovel head) over the wand installation site. You should see a quick green flash on the Base Station Status LEDs.
Example Installation of a Vehicle Sensor

![Example Installation of a Vehicle Sensor](image)

Notes:

- As ground settles, you may see a couple false alarms over the first few days
- Lightening storms are known to occasionally trigger false alarms
Temperature Spike Sensor
The temperature spike sensor is an intelligent sensor which detects a sudden rise in ambient heat. Suitable locations include the rafters of remote cabins or buried beneath fire pits.

Installing the Temperature Spike Sensor
1. Set the Base Station to…
   a. OFF
   b. In the "CONFIG" position
   c. Voltage switch to "12 volts" or "6 volts"
2. Expose the metallic portion of the temperature spike sensor where ambient heat can be read – avoid locations where there may be direct sunlight at any point during the day and locations which receive drafts from the outside
3. The best spots are:
   a. The rafters of a cabin or house
   b. 6 inches beneath a fire pit
4. The sensor reads temperature every 10 minutes so testing will take over 20 minutes.
   a. Switch the Base Station to “ARM”
   b. Put the metallic probe in a cold area (e.g. fridge) for at least 10 minutes
   c. Turn ON the Base Station
   d. Move the metallic probe to a warm area (e.g. room) for at least 10 minutes
   e. Once the second reading is reached, the sensor should trigger an alert – you should see a blue LED light for a few minutes
Example Installation of a Temperature Spike Sensor
Active IR Break Beam Sensor

The Active IR Break Beam Sensor has two components to be set on either side of a trail. The first component is the IR Emitter. It is a simple device which connects only to a battery pack. When the IR Emitter is not in use, detach the battery pack to save power. It should last at least 6 months before replacement. The second component is the IR Receiver which connects to the Base Station.

Model A IR Emitter

Note that the IR Emitter also comes in a smaller version that has a simple on/off switch:

model B IR Emitter

Installing the Break Beam Sensor

1. Set the Base Station to...
   a. OFF
   b. In the “CONFIG” position
   c. Voltage switch to “12 volts” or “6 volts”
2. Find a spot where both the emitter probe and the receiver probe can be installed at about torso or shoulder height at both sides of a trail or roadway.
3. Install the break beam emitter probe on one site of the trail or roadway.
4. Install the break beam receiver probe on the other side of the trail or roadway.
   a. Maximum 30 feet apart, 20 feet is better.
   b. Aim the emitter and receiver at each other as if aiming the barrel of a gun.
   c. Be sure that neither emitter or receiver will be knocked out of alignment by e.g. wind.
5. (Model B IR Emitter) Turn ON the IR emitter by pressing the bulge at the end of the flashlight-like battery pack. Immediately afterward, an LED will light at the other end of the battery pack which indicates that there is power. This LED will fade out to save power. But it is still ON. Once turned on, keep it on. The batteries will last a very long time.
6. (Model A IR Emitter) Turn ON the IR Emitter by pressing the push switch. Down position is on. Once turned on, keep it on. The batteries will last a very long time.
7. Plug in the break beam receiver into the Base Station (Port 1 for the first sensor, Port 3 for the second sensor).
8. Turn the Base Station ON.
9. This starts a 1-2 minute calibration period in which a green LED, visible through a window on the side of the break beam receiver probe, will flash quickly. This indicates that the break beam receiver is properly communicating with the emitter.
10. Once the calibration period is complete, you can test by walking between the emitter and receiver.
11. You should see a quick flash on the green Status LED on the Base Station.

Notes:
- There is intelligence built into the break beam sensor to reduce false alarms.
- If there are short interruptions of the beam – too quick to be a person walking by – then the break beam sensor will assume the signal is dirty and not to be trusted. The signal will be disabled for up to ½ hour.
- Waving a hand quickly in front of the receiver will make the sensor assume a dirty signal.
- To avoid waiting for a ½ hour, you can power off the Base Station then power it on again. You will still need to wait for the calibration process (1-2 minutes) which repeats each time power is applied to the break beam sensor.
Example Installation of Break Beam Sensor
**Tips and Tricks**

- To get the most sensitivity from the vehicle sensor, keep very movement to a minimum for the 3 minutes of calibration.
- To get the most out of your batteries, consider:
  - Do not leave the alert system in Config mode for extended periods. This mode uses 20x more power – turn off or arm the system.
  - Switch check-ins to “weekly” once you know the system is operating correctly.
  - Use the specific sensor setting such as “Break Beam Sensor on Port 1” instead of listening to all ports. Stand by power use will be cut to 50% in most cases.
  - If you are using lithium batteries and not using vehicle sensors, switch the power mode to “6 volt”.

**Troubleshooting**