

MyTracking J2ME Java Application

This application currently runs on most Motorola iDen phones. There is a separate version compatible with Nokia's java implementation like the N95. It is ONLY designed to work with phones that have built-in GPS receivers. It was designed to have a small footprint and use little of the phones resources in order to make it stable and compatible with even the most inexpensive handsets like the iDen 425. The main function of the application is to send the phone's current GPS position to a remote map server. Reports are sent via the phone's mobile internet connection (TDMA, GPRS, etc). Once the reports are stored on the map server, anyone with access to the user's account via a desktop or mobile web browser can see the current location and a breadcrumb trail (*see the Google Map example at the end of this document*). Here are the main features and functions of the software:

- Sends current GPS position by either time or distance.
- If mobile internet access is lost, reports are logged and re-sent when the phone re-connects
- Runs in the background allowing the phone and walkie-talkie to be used normally.
- Waypoints can be saved in order to return to a point of interest or locate a geocache.
- A map of the current position with the address can be displayed after each report.



Motorola iDen i425

Installation

The following are needed to complete the installation:

1. A standard mini-USB cable
2. The Motorola "Java Application Loader". This is a free download, but it is necessary to create an account first. Here is the link to the download page:

<http://developer.motorola.com/docstools/idenjal/openJAL/>

To avoid the hassle of creating a developer account at Motorola, we have a copy of the JAL here:

<http://jprestonsystems.2mydns.com/pdaportal.html>

There is a link to the "Java application loader" at the bottom of that page.

Once the JAL is installed and a link to the phone is made, the JAL will prompt for the location of the ".jad" file. After the application is loaded, you may be asked to set some permissions the first time the application is run. Always allow the application to access the GPS receiver.

The first time the program is run, you will see a config screen like this:



Here is where you will configure the various settings. The following is list of all the settings and what they mean:

Rpt Distance:

This determines how often reports are transmitted to the server via the mobile internet connection. 60 seconds (a value of "60" is entered) is the fastest report rate. Any value of 999 or less for this setting will

make the phone send by time. For example, “300” will send every 300 seconds (5 minutes). A value of 1000 or more will make the unit send by distance. For example, “1000” will make the phone send a report only after it moves 1000 meters (1 km) or more. The by-distance mode has some advantages. The phone only sends while moving and will use much less battery. In by-distance mode, one additional report is always sent when the phone stops moving for about 2 minutes. This is important because the map server will always have an accurate location of where the phone is “parked”.

It is possible to force a position report to be sent at any time. Simply press and hold any of the number keys EXCEPT THE “1” KEY for five seconds or more. The “1” key is always the PANIC button.

Username:

This must be the same username for the account on the map server. NOTE: be sure there are no spaces after the username. With many phones, it is easy to make this mistake and the server will respond with “Need an account”.

Password:

This must be the same as the password used to create the account on the map server.

Server URL:

Although the program was designed for use with the PrestonSystems map server, it may be possible to use it with any map application that accepts HTTP GET requests. The URL of the map server is entered here.

Speed Limit:

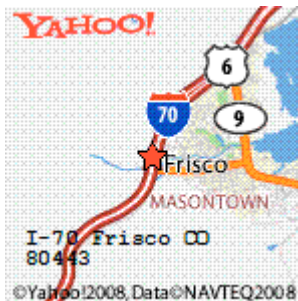
An email or SMS alert will be sent if this speed is exceeded. The destination for the alert is set up on the map server.

Config PIN:

To prevent access to this config screen, you can enter a 4-digit PIN. This may be used to keep employees who use the phone as a tracking tool from disabling the application. A value of “0000” turns off this feature and allows anyone to access the config screen.

Show Map:

If this box is checked, a small map will be displayed after each position report is sent. The map is centered on the current position and the current address is overlaid on the map. The zoom level of the map is controlled with the D-pad navigation button from the main screen. Toggle the button up/down to change the zoom level. Below is an example of the map:



NOTE: If maps are turned on AND WayPoints are turned on AND your current WayPoint is another server user, the map will be centered on this user and the address of his/her last known position will be displayed.

Mph:

If checked, speeds are displayed and sent to the server in miles per hour. Otherwise Kph is used.

After entering your settings, be sure to click the “Save” menu item. The “Back” menu item can be used to temporarily change settings without saving them. If the program is re-started, the settings will revert to the last ones saved.

NOTE: Unless you are a teenager, entering text into these fields can be tricky. Clicking the center “menu” key will usually reveal the text modes. Select “alpha”, or “numeric” if you just need to enter numbers.

Using the Application

Once the initial configuration is completed, each time the program is restarted, it will automatically begin in the main screen and it will automatically start sending reports after a GPS signal is acquired. Here is the main screen:



Unless “Show Map” is checked or Waypoints are enabled, this is the default view. When the phone is moving, the compass shows the direction of travel and the current speed is shown on the bottom. There are menu items for “config” (discussed above) and “Waypoint” (discussed later). The only other choice is the center menu button which has an “Exit” item.

NOTE: In some situations it is best to hide the tracking application from the user in order to prevent accidentally changing settings or simply to avoid the distraction of an additional application. To do this, start the application from the Java menu. This menu is called different things on different phones. The iDen i425 calls it “Games & Apps”. Once started, use the Red “hang up” button to back out to the main screen of the phone. The application will continue to send reports as it runs invisibly in the background. **IT MAY NOT BE LEGAL TO TRACK SOMEONE COVERTLY**. So make sure that if the tracking system is running invisibly, the user knows they are being tracked.

Clicking the Waypoint menu item brings up the *WayPoint List* screen:



It is a list of all the Waypoints currently saved. To activate a WayPoint, simply select one of the entries and click “Goto”. This will take you back to the main screen which will now look like this:



A small red arrow has been added to the display as well as a line of red text. In this example, our WayPoint is 1.2 KM from our current position, and it is Southeast of us. It is very easy to arrive at our WayPoint. Start moving and change direction until the blue arrow points in the same direction as the red arrow. You are now heading directly to the WayPoint. Of course, this assumes you are walking in an open field. If you insist on driving a car directly to a WayPoint, you will crash into things. (Note the signal-strength bars in the upper right; these indicate GPS signal quality).

How is a WayPoint created and added to the list? Each entry in the list was created by clicking the center menu button in the *Waypoint List* screen and getting this screen:



This is where you can turn **off** Waypoints, **delete**, **add**, or **edit** a WayPoint. When the *Add* item is selected, the current lat/lon is initially used. This is handy if you just want to quickly create a WayPoint of where you parked your car so you can find it later. However, if you want to create a WayPoint of a known place, just change the lat and lon boxes with your known coordinates. To use another server user as your WayPoint, prefix the WayPoint name with "@". For example, if your friend has an account on the map server called "john" and you want to use his last position as the WayPoint, add a WayPoint named "@john". The WayPoint arrow and distance will always point to John's last GPS position report. Additionally, if maps are turned on, the map will display John's location on the map along with his last know address and how long it's been since he sent a postion report. You can always get this map on demand by clicking and holding one of the number keys for 5 seconds or more (see **Rpt Distance above**).

Panic Button

Hold the "1" key for 5 seconds or longer. If the phone has a valid GPS signal, it will immediately send a report to the server with an "SOS" message. If the account was previously configured on the server to respond to an SOS, an email or text message will be sent to the designated destination.

Auto Start

To load the J2ME application when the phone is powered up:

Menu > settings > personalize. Scroll down and select "Power Up". Use the right or left D-pad until "track425" is displayed, then select it. Press the red hang-up key to return to the main screen.

Tracking Maps

Google map and a breadcrumb trail.

After the phone sends some GPS position reports to the map server, the current position and a “breadCrumb” trail can be accessed with a standard web browser. In the example above, each position report sent to the map server is represented by a directional arrow. Clicking any of the arrow markers will display details about the report including address, time, speed, heading, etc. Tracks from previous days can be viewed by clicking a date on the calendar control. The above example uses Google maps. Several other map choices are available including Virtual Earth, Google Earth, shapefiles, custom gif and jpg images, MapPoint desktop, US Census Tiger map service, and others. The map server will also have map pages designed to be used on smartphones and WAP phones allowing the phone to be tracked from almost anywhere. To view these maps, an account on a compatible map server must be created for the phone.

Be sure to check out the rest of the cool features of these online real-time maps. An example of Google’s “streetView” and an example of a **geo**fence are displayed below.

Google streetView

The screenshot displays the Google Maps interface. The main map shows a grid of streets with a yellow route highlighted. A red arrow indicates the current location on the map. The interface includes a search bar, map controls (Map, Satellite, Hybrid), and a sidebar with various tools and data.

FOUND USER: MT

Last Report:	20 hour
Altitude:	100
Speed:	2
Course:	12
<input type="checkbox"/> Refresh:	247
Latitude:	39.620693
Longitude:	-105.022280

[Download data](#) [Drive Report](#)

BreadCrumbs

July 2008						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
29	30	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	1	2
3	4	5	6	7	8	9

Virtual Earth

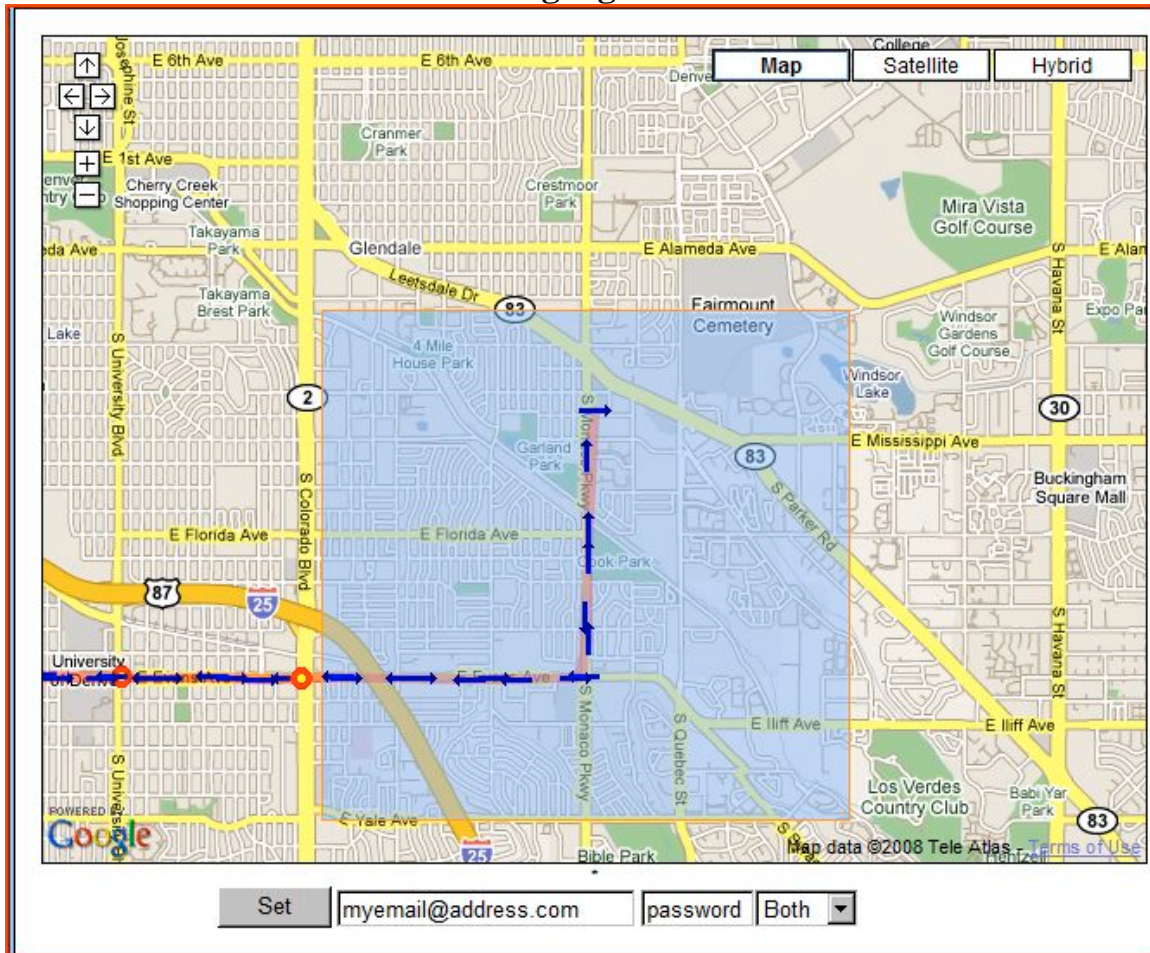
MyTracking

geoFence Poll

The street view window below the map shows a perspective view of a street, with a white arrow pointing forward. The street is labeled "E Mississippi Ave".

Zoom in a bit and make sure the “BreadCrumbs” checkbox is checked. If “streetView” is available for this area, the streets will have a blue shading. Clicking any of these blue streets will open the streetView window below the main map. To use this Google feature, make sure you have the latest [Adobe Shockwave](#) plugin installed.

Creating a geoFence



In the above example, we drew a rectangular fence on the map by clicking 2 opposite corners of the rectangle. You can clearly see the fence as the light-blue shaded area. After entering an email address or a cellphone number for an SMS text message, we then enter the password and choose the type of fence we want. The fence types are:

BOTH

This will trigger an alert if our target ENTERS or LEAVES this fence we created.

EXIT

This triggers only when the target LEAVES the fence.

ENTER

This triggers only when the target ENTERS the fence.

1SHOT

This is a special kind of fence. It will trigger an alert if the target ENTERS or LEAVES the fence, but is not saved. Once the fence is violated and an alert is sent, the fence is destroyed.

Contact Info

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Please visit our home page for info on the map server application:
<http://www.geocities.com/prestonsystems/mytracking>