iGPSGIS II

Help

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Overview

iGPSGIS II is a professional GPS/GIS data collection and mapping app. You can use it to record position data from the built-in GPS of the iPhone or from a compatible external GPS receiver. You can select the coordinate system and distance and angle units in which to display the data. You can add other Points, Lines and Areas by importing them from Shapefiles or by drawing them on the screen. You can tag the Feaures with descriptions and change the symbols used for representing these Features. You can add a background map to your job file. You can export Feature data in Shapefiles format. All the functions are described in this Help document.

When you start the app for the first time, it will ask you if you wish to open this Help document. You may read the document now, or you can access it later by tapping on **Help** under the Main Menu.

The app needs to have a file to work on. Therefore, when you start the app for the very first time, it will prompt you to create a Job file. As an example, tap the little "down arrow" for the **File Name** field and select the "**cmttut**" sample job. Tap on the **OK** button to confirm.

The Feature List provides a convenient way to tag Features with pre-defined relevant information during GPS data collection, but it is not necessary to have a Feature List to do a data

collection job.

The app will display the main screen that shows any spatial data (**Features**) and/or background map present in the currently active job. This is called **Map View**. When you tap on a Feature, it will be highlighted in the default orange color. The Feature ID and the location coordinates will pop up in Map View.

Tap on the **Zoom Fit** icon on the Toolbar to display all map elements:

Tap the **pull-down arrow** beside this icon to reveal additional **Map Tools**.

Tap the **Main Menu** tool to see a menu of functions:

The **GPS** icon pertains to data collection:

Sheet View presents data in a spreadsheet:

You may also select a Feature by selecting the corresponding Feature record in the Sheet View.

Topic View lets you select an active Topic:

With a Feature selected, you will be able to view its coordinates as well as any Attribute and Values by using the **Feature Properties**tool:

Whenever ✓ is displayed, you can tap on it to **confirm** and accept the data entered into a screen.

Whenever ✗ is displayed, you can tap on it to **cancel** an operation and abandon the changes made to a screen.

You can use iGPSGIS II to perform various data collection and mapping tasks.

The data collected using iGPSGIS II can be loaded into the CMT desktop PC software (such as PC-GIS, PC-GPS or PC-MAPPER) for analysis, map enhancement, master map file update and printout. The PC software can also be used for preparing the background maps.

On-screen keyboard

An on-screen keyboard will automatically pop up when the focus is on a data entry screen. After entering data, tap the **Return** button on the pop-up keyboard. If a **Next** button is displayed in the data entry dialog, then tap that button to go to the next step. To hide the keyboard, tap the **Hide Keyboard Key** on the pop-up keyboard.

When entering numeric data, you will notice that there is a **Special Key** showing several symbols on it. This key will facilitate data entry in several ways.

To enter a distance value with a fractional part, tap this key to put in the decimal point.

To enter angles in **DMS** (Degrees-Minutes-Seconds), if your data value

will not fill in all the places, then tap the special key after entering the desired value. For example, to enter the longitude of 91º09'26.082"W, you could type in 0910926.082W. Or, you could type 91, tap the special key, type 9, tap the special key, then enter 26.082W.

Similarly, to enter angles in **Decimal Degrees**, instead of filling in the leading zeros, you could tap the special key after entering the desired number of digits in the integer part of the value. For example, if you wish to enter the slope angle of, say 10, for a Traverse or Side-shot Point, remember to tap the special key after entering the 10. Otherwise, you will have entered a slope angle of 100. Alternatively, you could enter "010" to fill all the integer places.

[Back to TOC](#)

Set up Coordinate System & Units

To change the coordinate system for displaying Feature data, first tap **Menu**, select **Setup** then select **Coordinate System**. Select the desired system and **distance unit** then confirm.

Caution: Make sure the **coordinate system** and **distance unit** are correct before tapping on **OK** to confirm. For UTM, make sure the UTM Zone is correct. For SPC, make sure the State, Region and Zone are correct. For a user-defined coordinate system or a local NEZ plane, be sure to select the name of the proper system to use.

This app can work with a user-defined coordinate system that you have defined using the optional PC-GIS software. After defining the the user-defined coordinate system, use iTunes to copy the user_cor.sys file (in lower-case letters) from the PC to the Documents folder for your iGPSGIS

II. In iGPSGIS II, select Setup - Coordinate System then select **User Defined** to access the new coordinate system.

This app will let you calibrate a local NEZ coordinate system. To do so, first select Setup - Coordinate System. Tap on **NEZ** then tap on OK.

Tap on **Edit** then enter a name for the coordinate system into the Plane Name field..
Mark the **Control Point** option. Select **Reference Point** and enter the corresponding GPS and NEZ coordinates. Then select **Control Point** and enter the corresponding GPS and NEZ coordinates. You may use the **Pick** button to select an existing GPS point as the Reference Point or the Control Point, and its coordinates will be automatically entered. The resultant calibration angle and scale will be displayed.

If you know the angle and scale for calibrating the local coordinate system against the LLA system, then unmark the **Control Point** option and enter these parameters directly.

The **Y-axis** ("N") of an NEZ plane will be displayed on the screen as pointing "up". This is generally different from the direction of the North Arrow in Map View. The NEZ **X-axis** ("E") will point to the "right".

Select **Setup** under the Main Menu then select **Elevation and Angle** to set up the angle unit and angle system.

Available choices for displaying angles are **Azimuth** and **Bearing**. If Azimuth is chosen, also specify the **Angle System**: North or South. Angles will be displayed in Degrees, Minutes and Seconds (DMS).

This Setup screen will also let you select the elevation system used for

displaying, importing or exporting elevation values. Select **Orthometric(MSL)** when working with Mean-Sea-Level elevations. Select **Ellipsoidal(HAE)** when working with elevations based on the ellipsoid.

Set up Feature List

To facilitate data collection, you can set up one or more Feature Lists to define the data collection parameters and the Attribute/Value database.

Although you do not need a Feature List to start collecting GPS/GIS data using this app, using a properly set up Feature List will greatly facilitate the data collection task. You may skip over this section on the first reading of this document, if you wish, but we recommend that you come back later and study it well.

Features, Attributes and Values

A **Feature** is a GIS term used to describe an object at a location. There are three types of Features:

Point Features
Line Features
Area Features

Features can be assigned **Attributes** and **Values**.

An Attribute is a specific descriptor.

The Value quantifies or qualifies the attribute.

Example: A fir tree may be recorded as follows:

Feature: Tree
Attribute: Species

Value: Fir
Coordinates: 44 33 46 N
               123 15 45 W

To work with a Feature List, first tap
on **GPS**, then select **Feature List**.

To create a new Feature List, select
New.
Name your Feature List in by filling
the "FileName:" box. Enter **up to
eight characters or digits** as a name
for the Feature List.

Press the **green check mark** to
confirm the entry and create your
Feature List file.

To modify an existing Feature List,
tap on **Open**, then select the desired
.fbr Feature List file.

Feature List Editing

The commands below are shared by
the **Feature**, **Attribute** and **Value**
pages.

Open: Open a Feature List by
selecting an existing one from the list.

Save: Save changes to the active
Feature List.

Save As: Save the currently active
Feature List as a new Feature List by
typing in a new file name.

Add: Add a new blank record at the
end of the list.

Insert: Add a new blank record above
the currently highlighted record.

Delete: Delete the selected record.

You may change an existing Feature
Topic Name by double-clicking on it
then typing over it.

Marking the **Feature Lock**
checkbox will force you to select a

Feature from the Feature list for tagging GPS data during data collection.

This will be helpful for keeping the Feature Names consistent in the data file.

You may define the **data collection parameters** for each Feature Topic.

Type: Point, Line or Area.

Mode: Select the mode of data logging.

Static Time: Logs a stationary Feature for the specified **Time Session** in seconds. This is the default for Point Features.

Lines and Area Features may also be collected in Static mode. In this case, you would let the GPS receiver stay at each node of the Line or Area Feature for the duration of the Time Session. The software will join these nodes or vertices with straight lines.

Dynamic Time: Logs a Line or Area Feature at the specified **Time Interval** in seconds.

Dynamic Distance: Logs a Line or Area Feature based on the specified **Distance Interval** in the active distance unit. The result will be a Feature with equally spaced nodes.

After defining the data collection parameters and Attributes/Values for the Feature Topic that you have added, if you need to define another Feature Topic with a similar Attribute and Value setup, then you can save time by using the **Duplicate** function. Please change the duplicate Feature Name to the new name before confirming the screen.

To add an Attribute to a Feature Topic or to modify one of the existing

Attributes, first highlight the Feature Topic record in the Feature List screen. Then tap the **Attribute tab** at the bottom.

A listing of existing Attributes (if any) for the selected Feature Topic will be shown.

When you tap the **Add** button, a new Attribute will be added at the end of the list. You may double-tap on the Attribute name then change it to a new name.

Tap the **Lock** checkbox if you wish to lock the Values associated with this Attribute. When this option is chosen, the user will not be able to alter or add to the set of Values defined for this Attribute. They may only select from the defined Values to tag the Feature.

For the **Type** field, select **List** if the Values to be defined are a group of discrete numbers or names.

Select **Range** if the Value entry will be a number within between a lower limit and a upper limit. If you select **Range**, then the **Lock** checkbox will be automatically marked. This means that the Values entered will always be checked against the defined Range for data validity.

To see the Values (if any) that have been defined for an Attribute, first highlight that Attribute then tap the **Value tab** at the bottom of the screen.

If the Attribute is of **List** type, you will see a list of the existing Values, or you will be able to tap the **Add** button to add new Values to the list.

You will also be able to mark one of the Values as the **Default** Value. If most of the data you collect will have the same description, it will save time if you specify this as the default description for that Attribute in the

Feature List.

If the Attribute is of **Range** type, enter the **Max**. (upper bound) and **Min**. (lower bound) Values. You will also be able to enter a **Default** Value to be displayed during data collection.

Tap the **green check mark** to **confirm** the changes and return to the Map View, or press the **red cross mark** to **cancel** the operation and abandon the changes.

Open or Close a Job

Use **Menu/Job/Current Job** to open a new or existing Job file on your Mobile Device. The job files have the **.pmp** file name extension.

Open a Job file by clicking on the drop-down arrow and selecting the desired file name.

To create a new job, click the **New** button then enter the name for the new job.

You may select a **Feature List** to be associated with the job. Doing so will facilitate the specification of the data collection parameters as well as the entry of the Feature the Attributes during data collection.

Once the proper files have been selected and any optional information has been entered, click on the green check mark to return to the Map View. If you have selected an existing job, your job data will be displayed.

Saving the Job File

Use **Menu/Job/Save** to save your data. If you wish to save the data under a different job name then use **Menu/Job/Save As** and enter the new

job file name.

You may use **Menu/Job/Close Job** to close the currently active Job.

Load Background Map

You may load various types of background map into a Job file.

Map

Tap on the GPS icon then select "GPS On" to turn on the GPS function. The GPS location marker will be displayed. (Make sure the **Location Service** is turned on for the iGPSGIS II application software.)

Tap the **Main Menu** icon then select **Map**.

Select the type of Map you wish to see, and the map will be displayed on the screen.

Basemap

You may use **Menu/Basemap/Load BaseMap** to select a BaseMap to load into iGPS GIS II. Click on the desired **.pbm** file then click the green check mark at the top .

You can use PC-GIS to prepare the .pbm Basemap file.

Job Map

You may select **Menu/Background Map/Load Map** to select another .pmp job file to be loaded as the background for the job.

Registered Image

You may select **Menu/Background Map/Load Registered Image** to select a geo-referenced image in the **.pim** format to be loaded as the

background for the job.

The Raster images (*.tif, *.jpeg, *.sid, *.ecw) to be used in iGPSGIS II must be converted into the proper format (*.pim) before they can be loaded into the app. You can use PC-GIS, PC-GPS or PC-MAPPER to do so. These are mapping software programs designed for use on a PC or on a Mac operating in PC mode.

Before loading a .pim file, make sure the correct coordinate system and distance unit have been selected under **Menu/Setup/Coordinate System**.

Click on the file you wish to load into Map View then click the green check mark .

Shapefiles

To import a Shapefile that has been transferred to your Mobile Device, choose **Menu/Job/Import Shapefile**, click on the checkboxes for the desired Shape files to mark them for import then click on the green check mark.

The imported shapes will be displayed in the default symbol and color for the Point, Line and Area Features. You may change the default symbol and color assignment by selecting **Menu/Setup** then selecting **Color/Pattern.**

You can export Feature data to Shapefiles by using **Menu/Job/Export Shape file**.

Select one or more Topic layers to export. Each Feature Topic will be exported as a separate Shapefile.

Each Shapefile consists of several files (e.g. the .shp, the shx, the .dbf, and the .prj files).

The exported data files will reside in the Documents folder for the

application. To access your exported Shapefiles outside the iGPSGIS II application, first connect to the iTunes® program. Then click on the **Apps** tab and scroll down to the Documents Folder for iGPSGIS II in the File Sharing section.

If you need to use the Shapefile data with another GIS application, please copy the .shp, the .shx, the .dbf, and the .prj file by the same job name to your desktop computer.

Create Grid

The Grid you create for a selected Area Feature is placed in the **Non-Spatial Data** Topic layer.

To place a grid over an Area Feature, first click in that Area Feature then tap the pull-down arrow by the Zoom Fit icon and select **Create Grid**.

The **Start Point** page lets you specify the reference location for the grid. You may enter the coordinates for that point or tap the **By Pick** button to select the location from Map View.

If the reference point is a known point but you want to shift the grid a distance from it then tap the **Offset** checkbox to display the relevant data entry fields. The software will compute the new grid reference point.

You may specify an azimuth or bearing as the **Orientation** of the grid. If you would like the grid to go parallel to a line segment of the selected Area Feature, tap the **By Segment** button then tap on the desired line segment. If you would like to have the grid go parallel to a line joining two existing points or nodes in the active job, then tap the **By 2 Nodes** button and select the two nodes.

The **Mode** page will display the default grid parameters. You may change them, if you wish.

Select the **Grid Nodes** option if you wish to just see the grid nodes. If you wish to see the grid lines then select **Lines**.

On the **Boundary** page, you may specify the boundary line style and line width.

You may dictate whether Point Features should be created from the grid nodes, or Line Features should be created from the grid lines.

If you selected the **Grid Nodes** mode on the **Mode** page, you have the option to mark the **Create Points from Grid** checkbox to have Point Features created at the grid nodes.

Accept the default Grid Points Topic, or select another point topic in which to store the new Point Features.

If you selected the **Lines** mode on the **Mode** page, you have the option of marking the **Create Lines from Grid** checkbox to have Line Features created at the grid lines. Accept the default Grid Lines Topic, or select another line topic in which to store the new Line Features.

Tap the **Preview** tab to view the grid. When you confirm the **Grid Property** screen by tapping the green check mark, you will see the grid points or the grid lines displayed in the map.

Each time you confirm the **Grid Property** screen, a new grid will be created. To avoid confusion, it's best to just keep one grid for an Area Feature.

To delete the extra grids that you don't need anymore, first tap the **Topic View** icon and select Non-spatial Data. Then tap the **Sheet View** icon, select

the unwanted grid then tap the recycle bin icon.

Collect GPS Data

iGPSGIS II will let you create a Job and select a Feature List to use, collect location data for Point, Line, and Area Features, and tag them with descriptions. Feature data may also be collected in the **Offset** or **Traverse** mode.

You may view the data collected for each Feature in textual or graphic format.

Job Setup

After tapping the **Menu** button, select **Job** then select **Current Job**.

You can select an existing Job to open it.

If this is a new job you are starting, tap the "**NEW**" button and accept the default Job name or enter the desired Job name.

You may select an existing Feature List to be associated with the Job.

Press **OK** to confirm the screen.

You may select an existing **Feature List** to use with the job.

Turn the GPS ON

Click on **GPS** then select **GPS On**. To save power, turn the GPS off when you are not actively collecting GPS data.

Position Information

To view your current position and GPS accuracies, select **GPS/Position Info**.

Navigation Setup

Under **Setup/Navigation Settings**, you can also specify how to keep the screen focused on your location by selecting an option for the **Navigation Zoom Mode**.

In the **Auto Scroll** mode, the job map will scroll to keep your position displayed on the screen while you are moving along. The map scale will not change.

In the **Auto Zoom** mode, when you hit the border of the screen, the app will automatically zoom out to let you see more of the job map.

The **Move Map** mode does not apply to the built-in Apple Map, which is fixed in the "up" direction. The Move Map mode will work with the ***.tif** geo-referenced map images and the ***.pim** map images prepared by using the PC-GIS software program. Such a background map will re-orient itself to align with your direction of motion in the Move Map mode.

When you are moving at a high speed (such as in an aircraft), and you don't want the map to be constantly reorienting itself while you are collecting data, you could mark the check box for **Margin** and specify a boundary within which the map will stay still. When you cross the boudary, then the map will re-orient to align itself with your direction of motion.

Select a Feature Topic

Tap the **GPS** icon then select **Collect**.

Tap the **New** button to call up the **Store Feature** screen.

Select the desired **Feature Topic** from a list of the predefined Feature Topics. Or enter a new Feature Topic name and select the Topic Type. To record

one or more points, select a Point-type
Feature Topic. To record a line, select
a Line-type Feature Topic. To record
an area, select an Area-type Feature
Topic.

The fields for **ID** (for the individual
Feature to be logged, such as
Tree001), Feature **Type**, **Log Mode**
and **Time Session** or **Time Interval**
are automatically filled. You may
override these default settings, if you
wish.

When done specifying a Feature Topic
for which to collect data, tap on the
green check mark.

If you need to define a new Attribute
for the Feature Topic, tap the
Attribute tab at the bottom of the
screen.

Feature Attribution

If a Feature List is active for the Job,
the Attributes associated with the
Feature will be automatically
displayed.

For an Attribute of the **List** type, click
on the pull-down button to select the
desired value.

For an Attribute of the **Range** type,
enter a Value within the allowed range.
If the Attribute is not locked, then you
may enter any Value.

If the Feature Topic is not from a
Feature List, you may manually enter
the Values for the Attributes created in
the Topic Editor to characterize it.

If you wish to assign a specific symbol
or color for the Feature, then click on
the **Pattern** button and make the
desired choices.

Data Logging

To log GPS data, press the **Store**

button from the **Collect** screen.

Data will be recorded per the Feature type and the data logging parameters specified for the Feature.

To halt data logging temporarily, tap the **Pause** button. When ready to continue, tap the **Continue** button.

Viewing Position Plot

While GPS data is being logged, you may tap the **Map View icon** in the **Collect** screen to go to Map View and watch the Features being created.

Tap the **Back** button to return to the Collect screen.

Storing Static Points

Each Static Point is a stand-alone Feature.

1. Stay at the feature location and **do not move around** while you are logging data for a Point Feature.

2. Select or enter the description for the Feature.

3. Press the **Store** button to log GPS data.

4. When the time is up, and the data collection session ends, the Point Feature is recorded and the Feature ID advances by 1.

If necessary, you may press the **Stop** button to stop the data logging process at any time. The point will be recorded with fewer coordinate fixes to average.

5. Walk or drive to the location of the next point you wish to record then select the description, and press the **Store** button to log a second Point for the same Feature Topic.

6. Repeat Step 5 for any additional

static points you wish to log.

To start collecting data for a **different Point Topic**, first tap the **New** button then select or create the desired Feature Topic. Then go to Step 1 above.

If you incorrectly logged a Point Feature and wish to correct it, first select the Point Feature in question from Map View or from Sheet View. Tap the **Feature Properties** icon then tap the **Update** button.

Specify the desired time session then tap the **Start** button to record the correct position.

Storing Static Line or Area

For a Static Line or Area Feature, you would occupy each vertex (node) for the duration of the Time Session to record its location. And nothing will be recorded while you walk or drive from one vertex to the next. The software will automatically connect the nodes for the Static Line or Area.

1. Go to the beginning node of the Static Line or Static Area Feature. Stay there and **do not move around** while logging data for this node.

2. In the **Collect** screen, select or enter the desired description then press **Store** to record the Feature.

The steps are identical to the Static Point data logging procedure described above, except that pressing the **Stop** button will just stop the data logging process for the current node, and will not end the data logging for the Static Line/Area Feature.

3. When the first node has been collected, move to the next node of the Static Line/Area Feature, then press **Store** again to log data for that point.

4. Repeat Step 3 until you have finished logging data for all nodes of the Static Line/Area Feature.

Tap **New** if you wish to collect data for another Topic.

Storing Dynamic Line or Area

For a Line or Area feature logged in Dynamic mode, data will be collected while you are moving along the Line feature or the perimeter of the Area Feature. There are two options for the dynamic mode.
Dynamic Time: Log a position based on the specified time interval.

Dynamic Distance: Log a position based on the specified distance interval.

1. Go to the beginning node of the Line or Area Feature for which you wish to collect data. Assign Feature information to the new Feature (Feature name and description).

2. Press **Store** from the **Collect** screen. Start moving (i.e. walking, driving) along the Line Feature or the perimeter of the Area Feature.

3. Press the **Stop** button when you have reached the ending point of the line feature or the beginning point of the area feature. You may also use this button to abort the data logging process at any other time.

Tap **New** if you wish to collect data for another Feature Topic

To end the GPS data collection, tap the **Exit** button. Tap the Zoom-fit icon at the top to see all the Features displayed on the same screen.

Nested Points

iGPSGIS II allows you to interrupt a Line or Area Feature (without ending

it) to record a nearby Point Feature. This kind of Point Feature is called a **Nested Point**. The process of logging a Nested Point is similar to that for logging a regular Point Feature. You may log one or more nested points for a Line or Area Feature.

Following is the procedure for recording a Line or Area Feature with Nested Points:

1. Begin logging a Dynamic Line or Area Feature.

2. From the **Collect** screen, press the **Nested** button. A list of Point Topics in your Feature List will be shown.

3. Highlight the appropriate Point Topic or create a new one. When done, press the green check mark.

4. Optionally select or enter descriptions for the selected Nested Point Feature.

5. Press **Store** to record the Feature information and log data for the Nested Point Feature. Do not move around while you are logging data.

If necessary, you may press **Stop** to stop the data logging process for the Nested Point Feature.

6. When data has been logged for the Nested Point Feature, you may choose to log another Nested Point or to continue logging the original Line or Area.

If you need to log another nested point, press the **Nested Point** button.

To continue with logging the Line or Area, depress the **Continue** button and start moving again along that Feature.

7. Press the **Stop** button when you have reached the ending point of the Line feature or the beginning point of

the area feature. You may also use this button to abort the data logging process at any other time.

Offset Mode

For a Feature that is not directly accessible, you can log data for one that is accessible and record the offset information along with the Feature data.

To access the **Offset** function and enter an offset for a Feature, press the **No Offset** button from the **Collect** screen. ("No Offset" indicates that there is currently no offset associated with the Feature.)

iGPSGIS II provides for two types of offset computations.

Left/Right Offset

You can offset a **Line** or **Area** Feature to the left or to the right.

Slope Distance:
Enter the horizontal distance from where you are collecting GPS data to the target. This distance should be parallel to the ground, perpendicular to the direction of motion.

Direction:
Select "Left" or "Right" to indicate whether the target is to the left or right, respectively, of where you are collecting GPS data.

Point Offset

You can offset a **Point** Feature to another point location.

Slope Distance:
Enter the slope distance from where you are collecting GPS data to the corresponding point on the target.

Azimuth:

Enter the azimuth of the target.

Slope:
Enter the slope angle to the target.

After specifying the offset information, tap on the green check mark to return to the **Collect** screen and log the GPS data as described above.

Append Coordinates

If you wish to add GPS data to an existing Line or Area Feature, press the **Existing Line/Area** button from the **Store Feature** screen.

Then click on the pull-down menu under "Name" and choose the Feature Topic that contains the Line or Area Feature to which you want to append coordinates.

Next, click on the pull-down menu for the "ID" field then select the ID for the specific Line or Area Feature that you want to append coordinates to.

After you press the green check mark, proceed to collect data as described above for Line/Area data collection.

Traverse Mode

The **Traverse** function lets you continue mapping **several** Point Features when GPS signal is not available.

The application will record the following information that you enter for each traverse leg:

SLOPE DIST: The slope distance from the reference position to the location of the new traverse point.

AZIMUTH: The direction from the reference position to the new traverse point (0 to 359 degrees).

SLOPE: The slope from the reference

position to the new traverse point (-90 to 90 degrees).

You may record traverse points in two different modes, as described below.

Side mode: Use this method to perform a radial traverse by taking multiple "side shots" from the same reference point. The following diagram refers to a known GPS reference point.

Traverse mode: Use this method to traverse to a new point that will then be used as the reference point for the next traverse point. This method can be used for storing lines or area boundaries.

iGPSGIS II will permit you to take multiple side shots from each point on a traverse.

The general steps for using the Traverse function are as follows:

> 1. Click on the **Traverse** button from the **Collect** screen.
>
> 2. In the **Traverse New Feature** screen, select an existing Point Feature as the **Reference Point Feature**.
>
> 3. In the **Name** box, enter or select the name of the Point Topic into which the new Point Feature will be stored. The ID will automatically be entered for you. Click **OK**.
>
> 4. Choose the method for defining the new point by tapping on **Side (mode)** or **Traverse (mode)** button below the ID field.
>
> 5. Optionally enter the descriptions for the newly

defined Traverse Point Feature. Optionally assign a symbol for the new Point Feature to be stored.

6. Click the **Store** button to display the traverse data entry fields.

7. Enter the Slope Distance, Azimuth, and Slope for the point to be created with respect to the reference point. The reference point is shown with a **circle** around its symbol. The target point will be displayed with the temporary symbol .

Click the **OK** button to record the new point.

8. If you are working in the **Traverse mode**, the newly stored Traverse Point will automatically become the next Reference Feature.

If you are working in the **Side mode**, the Reference Feature will stay the same.

To continue working in the same traverse or side-shot mode, repeat the above steps 5 through 7.

To switch to the other mode, first tap on **Side (mode)** or **Traverse (mode)** button below the ID field then repeat the above steps 5 through 7.

Please note: If you would like to store the new point to a different Feature Topic, tap the **New** button to call up the **Traverse New Feature** screen then enter or select the new

Topic name. Click **OK** then continue with the above steps 5 through 7.

When GPS signal can be received again, you may return to normal GPS data collection mode by clicking the **GPS** button in the data collection screen.

When done collecting data, tap **Exit** to return to Map View.

The GPS Track

If you wish to record your GPS track in the background while performing other tasks in this app, first turn on the GPS. Then tap on the **GPS** menu and select **Tracklog On**. A dialog will be displayed for you to set the desired **time interval**.

The recorded track will be stored in the **Tracklog Topic**.

To stop recording the track log, select **GPS/Tracklog Off** or turn off the GPS by using **GPS/GPS Off**. Whenever you turn off GPS or Tracklog, this action ends the track that was being logged.

You may record one or more tracks in this manner.

The Tracklog function is available only while GPS is turned on. Also, the logged track becomes a Feature that you can select or zoom (into or out of) only after the data logging has been completed by selecting **GPS/GPS Off** or **GPS/Tracklog Off**.

If you don't see the new Tracklog record in **Sheet View**, please turn the Sheet View off then on. Then the new Tracklog record will display.

View Data

Map View

All the map elements are displayed in Map View.

When you tap on a Feature, the Feature ID and the location coordinates will pop up in Map View.

The Feature will be highlighted in the **default orange** color.

You may tap Menu,select **Setup** then select **Color/Pattern** to change the default color settings.

The map scale will be displayed in the active distance unit.

Area/Length & other Feature Properties

With a Line or Area Feature selected, you may tap the **Feature Properties** tool icon then select **Length/Area** to get the area and perimeter information.

For a Line Feature, this tool will display the line length as well as the area that would be formed if the line were closed.

Please see the section titled "**Feature Properties**" for details about the additional Feature information that you can view.

Topic View

The Features in your map are organized into Feature Topics. To see a list of all the Feature Topics you have in the currently active job file, tap the **Topic View icon** at the upper-right corner of the screen.

When you tap on one of the Topics in the Topic View, that Topic becomes

the **currently active Feature Topic**.

When you to tap on one of the Features in Map View, the Topic, to which that Feature belongs, becomes the active Topic.

To zoom to a specific Topic, first select the Topic of interest as the active Topic, then tap the pull-down arrow beside the **Zoom Fit** icon and select **Zoom to Topic**.

The screen will now be zoomed to the Features in the active Topic.

If you intend to look for a Feature far from the GPS location, it helps to first turn off the GPS.

You can toggle the **display** of a Feature Topic ON and OFF by clicking on the mark box to the left of each Feature Topic name.

You can **change the order** of the Feature, first activate the Topic View then tap the Main Menu icon, select Topic then select **Move Topic**. A handle will appear by each Topic Name. Now grab a Topic by the handle and drag it to a different location in the Feature Topic List.

It is advisable to place Point and Line Topic layers above Area Topic Layers.

To change the **symbol**assignment for a Topic, simply double-tap the existing symbol displayed by the Topic name in Topic View then select the new symbol.

If you wish to have the Features displayed in Map View along with one or more of its identification labels or descriptions, first select **Menu/Topic/Auto Label**.

You may opt to show the Feature's **Topic Name**, **Sequence#** or **Feature ID**.

You may select one or more **Attributes** to be displayed.

Select **Delete Labels** if you wish to have the labels delete.

Select **Hide Labels** if you only want to hide the labels but not delete them.

Tap on the **Font** tab to change the font size, font type face, or the **Freeze label size in zoom** setting.

Sheet View

After selecting a Feature Topic, you may tap the **Sheet View** icon at the top of the screen to list all the Features in that Topic.

The Sheet View presents the Features and their Attributes in a spreadsheet format.

Sheet View also provides an alternative way for you to select the desired Feature for viewing or editing. Simply tap a record in Sheet View and watch the corresponding Feature get highlighted in Map View.

You may change the order of Features in a feature Topic by highlighting the Feature record and then using the "Front", "Back", "First" or "Last" icon at the bottom.

To delete a Feature, first highlight it then tap the **Recycling Bin** icon at the bottom of the screen.

Caution: Always make sure you really want to delete a Feature before confirming the action.

Feature Properties

With a Feature selected from the Sheet View, or highlighted in the Map View, you may tap the **Feature Properties**

icon to view the relevant information.

Three pages are provided for displaying the Feature properties.

Tap on the **Coordinates** button to see the coordinate information for the Feature.

Tap on the **Attribute** button to see the Attribute/Value information for the Feature.

For a **Point Feature**, you may use the **Update** button, if necessary, to redo the data collection at this point.

For a Line or Area Feature, tap on the **Length/Area** button at the bottom of the screen to see the line length or the perimeter and acreage of the area in the currently active units of measurement.

To change the coordinate system for displaying Feature data, first tap **Menu**, select **Setup** then select **Coordinate System**.

Select the desired system and distance unit then confirm.

iGPSGIS II can work with a user-defined coordinate system that you have defined using the optional PC-GIS software. After defining the the user-defined coordinate system, use iTunes to copy the user_cor.sys file (in lower-case letters) from the PC to the Documents folder for your iGPSGIS II. In iGPSGIS II, select Setup - Coordinate System then select User Defined to access the new coordinate system.

Assign Feature Symbol or Pattern

From the Coordinate Information screen, you may select a symbol or pattern and a display color by clicking

on the **Pattern** button.

After making the desired changes, click on the green check mark to accept the settings.

Area Transparency

You can adjust the transparency of an Area Feature within the **Area Pattern screen**.

To do so, simply enter a percentage value into the Transparency field, or tap the little arrows to scroll either way.

Feature Offset

You can view and modify the offset of a Feature by using the **Offset** button from within the Feature Properties screen.

This button will be labeled "**No Offset**" if there is no offset information associated with the Feature.

When you click this button, the **Edit Offset** dialog box will be displayed. The offset options are the same as for Data Collection in Offset Mode.

Digitizing Features

You may manually add new Features to the current Job file. GPS is not needed for the digitizing functions.

Adding Point Features

The fist step in digitizing a Point Feature on a background map is to create or activate a Point Topic.

To create a new Point Topic, tap the Main Menu, select **Topic** then select New Topic. Enter a Topic Name.

Make sure the Type field shows: **Point**.

Optionally add one or more **Attribute Names** (title of description) for this Topic.

Then tap the green check mark to confirm the screen and return to the Map View.

To activate an existing Point Topic to add points to it, tap the **Topic View** icon on the upper-right corner of the main screen then select the desired Point Topic. Tap the Topic View icon again to hide the list of Topics.

Now, tap the pull-down arrow beside the **Zoom Fit** icon. Select **Add Point Manually** ●. If the ● icon is already displayed, then simply tap on that icon.

Tap the points on the desired locations on the background map to drop the points onto the map.

The **Add** tool 👆 ADD at the top is a toggle switch that you can use to halt the point digitization and reactivate the regular **touch-screen** mode. For example, you may wish to zoom into a map to make it easier to place your node more accurately. When **Map** is turned on, you may not be able to zoom to a really small scale. If the background Map is not necessary, you could turn it off then reverse-pinch (pull) to zoom in further. To fit the drawing to the screen, simply tap the **Zoom-Fit** icon.

Tap on the 👆 ADD toggle again when you are ready to digitize additional points.

If there are existing Features on the map and you want a new point to snap to one of the existing Features, then

tap the **SnapToNode** tool . When the SnapToNode toggle is on, the point you add will be dropped on top of the nearest Point or node.

To place a dot precisely at the desired location, tap on the donut-shaped

Node tool . A donut with crosshairs at its center will be displayed on the map. Touch on the purple area of this tool and drag the crosshairs to the desired location.

Now tap once in the donut hole to drop the point. You could also keep holding down on the purple donut and use another finger to touch outside of the dounut area to drop the point.

If you wish to digitize a point for another Point Topic, simply tap the **Topic View** icon on the upper-right corner of the main screen and select that other Point Topic.

When done with the point digitization, tap the **Back** button to end the digitizing session and go back to Map View.

If you wish to log the actual GPS position for a digitized Point Feature, then select that Point Feature and tap the **Feature Properties** icon from Map View. Then tap the **Update** button.

Specify the desired time session then tap the **Start** button to record the GPS position.

Add Point by Coordinates

If you know the coordinates for the point you wish to add to the map, you may add the point by using this information. To do so, tap the pull-down arrow by the **Zoom Fit** icon then

select **Add Point by Coordinates** . Enter the known coordinates then confirm the screen. Make sure you specify the correct North or South

Latitude, and the correct East or West Longitude. Otherwise a point may be created very far away from your job site.

You may tap on the **Pattern** button to select a different symbol and color for the Point Feature to be created.

The Orthometric height is the elevation based on mean-sea-level. The ellipsoidal height is based on the ellipsoid.

Tap on **Cancel** if you decide not to create the new point.

Adding Line Features

To digitize a Line Feature in iGPSGIS II, first select an existing Line Topic or create a new Line Topic.

To create a new Line Topic, tap the Main Menu, select **Topic** then select **New Topic**. Enter a Topic Name.

Make sure the Type field shows: **Line**. Add one or more **Attribute Names** for this Topic.

Then tap the green check mark to confirm the screen and return to the Map View.

To activate an existing Line Topic in order to add a new Line Feature to this group, tap the **Topic View** icon then select the desired Line Topic. Tap the Topic View icon again to hide the list of Topics.

When a Line Topic is active, and you tap the pull-down arrow for the **Zoom Fit** icon, you will see that the **Add Line manually** tool 〜 is active. Tap this selection, and the Add Line manually tool icon will be displayed.

Now, **tap** to drop nodes along the line or **drag** to trace the curvilinear line.

The **Add** tool, the **SnapToNode** tool and the **Node** tool work in the same way as for digitizing Point Features.

After digitizing the last node for the Line Feature, tap the **Add Line manually** tool again.

<u>Adding Area Features</u>

To digitize an Area Feature, first select an existing Area Topic or create a new Area Topic.

To create a new Area Topic, tap the Main Menu, select **Topic** then select **New Topic**. Enter a Topic Name, such as "Fields".

Make sure the Type field shows: **Area**. Add one or more **Attribute Names** (title of description) for this Topic.

Then tap the green check mark to confirm the screen and return to the Map View.

To activate an existing Area Topic in order to add a new Area Feature to this group, tap the **Topic View** icon then select the desired Area Topic. Tap the Topic View icon again to hide the list of Topics.

When an Area Topic is active, and you tap the pull-down arrow for the **Tools** icon next to the Main Menu icon, you will see that the **Add Area manually**

tool is active. Tap this selection, and the Add Area manually tool icon will be displayed.

Now, tap the vertices of the desired polygon, or trace the curvilinear outline of an irregular area.

The **Add** tool, the **SnapToNode** tool and the **Node** tool work in the same way as for digitizing Point Features.

When you have digitized the last node for the Area Feature, tap the **Add Area**

manually tool again. The software will automatically close the gap between the first and the last digitized nodes.

Add Description for Digitized Features

To be able to enter descriptions to a Feature that you have digitized manually, you must first set up the Attribute Names for the Feature Topic, if you have not already done so when creating the Topic.

To set up Attribute Names for the active Feature Topic, tap the Main Menu, select **Topic** then select **Edit Topic**. Select an existing Topic Name.

Tap the **Add** button to add a new Attribute, such as "ID". Tap the green checkmark to return to Map View.

Now tap the **Feature Properties** icon for a selected Feature then tap the **Attribute** button.

For each listed Attribute you may double-tap the corresponding Value field and enter a value or change the displayed value.

If you wish to stay in the edit mode then tap the icon (**View mode**) to switch to the **Edit mode** represented by the icon.

Please note: If you digitized a Feature into a Feature Topic that was set up in a **Feature List**, then the Attribute fields assigned to the Feature Topic will be automatically displayed.

Back to TOC

Move Node

iGPSGIS II stores the recorded data in its "Documents" folder.

The **Move Node** tool on the Map Tools Menu will let you adjust the position of an existing Point Feature or a node on a Line or Area Feature.

The steps for moving a node of a Feature are as follows:

1. Tap on the Feature to select it then tap on the Digitizing Tool Menu and select **Move Node**. If the Move Node icon is already displayed, then simply tap on that icon to get to the Move Node screen.

If you've tapped on the wrong location, you may tap the **Reset tool** icon to reset the selection then select the correct location.

2. Drag the **Crosshairs** to the node you wish to move then tap once in the center of the donut to mark the node.

3. Drag the **Crosshairs** to the new position and tap once in the center of the donut to affix the node there.

When you wish to snap to an existing Point or node by tapping in its vicinity, remember to first tap on the **Snap to Node** icon to turn it on

If the Crosshairs have moved off the screen, you could tap on the icon to bring the Crosshairs back to the center of the screen.

You may turn off the instruction text by tapping the **View Hint** icon . This will free up more screen space for displaying the job data, especially when you are using your device in landscape mode.

Tap the **Back** button to exit this screen.

Measure Distance

If you would like to know the distance between two or more map locations, first tap on the **Main Menu**, select **Utilities** then select **Measure Distance** . Then tap on the map locations to have the distance calculated. The total distance as well as the length and direction of the last segment added will be displayed.

Whenever you need to place a node precisely, tap on the **Node tool** then use the crosshairs to zero-in on the desired location.

If your device has GPS capability, you could tap the **GPS** icon to turn on GPS then tap the **Pick GPS** icon to add a node for the line to be measured.

Tap on the **Snap to Node** icon to turn it on when you wish to snap to an existing Point or node by tapping in its vicinity.

To back-step, tap the **Undo** icon . To delete all the nodes made in this measurement session, tap the **Reset** button .

Please note that the Measure Distance tool will not retain the **temporary** shape you have delineated for computing the distance.

When you no longer need the displayed information, tap the **Back** button to close this screen and discard the temporary shape.

Measure Area

The **Measure Area** tool on the **Main Menu/Utilities** menu will compute the area enclosed within a boundary that you form by tapping on the map.

Whenever you need to place a node precisely, tap on the **Node tool** then use the crosshairs to zero-in on the desired location.

If your device has GPS capability, you could tap the **GPS** icon to turn on GPS then tap the **Pick GPS** icon to add a node for the area to be measured.

Tap on the **Snap to Node** icon to turn it on when you wish to snap to an existing Point or node by tapping in its vicinity.

To back-step, tap the **Undo** icon . To delete all the nodes made in this measurement session, tap the **Reset** button .

Please note that the Measure Distance tool will not retain the **temporary** shape you have delineated for computing the distance.

When you no longer need the displayed information, tap the **Back** button to close this screen and discard the temporary shape.

Back to TOC

Manage Data Files

iGPSGIS II stores the recorded data in its "Documents" folder on your device.

The Points, Lines and Areas with their Attribute/Values and symbol assignment are saved in the CMT **.pmp** file format.

As mentioned under "Load

Background Map", you may export the Feature data to Shapefiles by using **Menu/Shapefile/Export**. The Shapefile will be represented by the **.shp** extension.

The Feature List have the **.fbr** file name extension.

If you make use of the CMT Base maps, they have file name extension **.pbm**.

Raster images prepared using a separate CMT PC mapping software take on the file name extension **.pim**.

Accessing the Documents Folder

To see the Documents folder, first connect your Mobile Device to the iTunes® program and select your Mobile Device.

Then you should see an **Apps** tab across the top of the screen. Click on that tab then make sure the iGPSGIS II application is synched with your computer.

Scroll down to the File Sharing section. Select the iGPSGIS II appliction to see the files that are stored in its Documents folder, such as the .pmp files, the Shapefiles, the Basemap files and the raster map images.

You can drag files into or out of this Documents folder. You may use the **Add** button on the iTunes® screen to select and add files from your computer to the Documents section.

To delete a file, first highlight it then press the **Del** button on your computer.

Caution: Always make sure you really want to delete a file before proceeding to do so.

Please note: Before updating to a new version of iOS, first back up all you apps and data files. Also, should you decide to remove an application software for some reason, beware that all the associated data files will be deleted. If you wish to save the data files, please save a copy to your desktop computer before removing the app.

Send or Get Job Files via email

You may use iGPSGIS II to send or get job files via your email service.

When you select **Menu/Job/Email Files**, a dialog will be displayed to provide three File Type options:

Job: .pmp files

Feature List: .fbr files

ShapeFile: Shapefiles

The files listed in the displayed table depends on the file type selected. You may mark the checkbox before a file name to select it.

If the files to be sent are in iCloud® Storage then mark the **on Cloud** checkbox.

Enter the receiver's email address then click the **Send** button to attach the selected files to an email.

When you open an email using the Apple® Mail® application program, and click on an attached Job file (e.g. a .pmp file), the system will automatically forward the file to iGPSGIS II.

In case there are multiple applications on your device that can use the same type of files, the Mail® program will pop up a menu for you to select the application to which you intend to forward the file.

Store or Retrieve Files via iCloud® Service

The iGPSGIS II application supports iCloud® service for file storage. To make use of iCloud® Storage, make sure that Documents and Data is turned ON under the Cloud setting on your device.

In iGPSGIS II, under **Menu/Setup/iCloud**, there are three options:

Job: .pmp files and Shapefiles

Feature List: .fbr files

Basemap: Basemaps and registered images

When you enable iCloud for a file type, the app will move the selected type of files to your iCloud® storage location whenever you tap the **OK** button on the iCloud Setup screen. Afterwards the app will look for that type of files only from the iCloud storage until you unmark the iCloud check box for that file type.

For example, if you select iCloud® storage for the "**Job**" file type under **Menu/Setup/iCloud**, the folder for loading and saving the .pmp files and for importing the Shapefiles would be on the cloud. Therefore the app would attempt to look for the files in iCloud. Unmarking the iCloud storage setting will permit the app to look for the .pmp files and the Shapefiles in the local Document folder for this app.

Helpful Tip: As there are two possible places for storing your files, when you are puzzled why you are unable find a certain file, be sure to inspect the iCloud Setup under **Menu/Setup/iCloud**.

To view the names of the files stored on cloud, tap the **Settings** icon on the

Home page of your iOS device then select iCloud\Storage & Backup\Manage Storage\iGPSGIS II. Both iCMTGIS II and iGPSGIS II share the same cloud name "iGPSGIS II".

The files stored at the iCloud® storage location can be shared with another iPad® or iPhone® device. They can be shared between the iGPSGIS II and iCMTGIS II applications. For example, if you use iCMTGIS II to load a **.pim background image** to **iCloud**, you could make use of that background image in iGPSGIS II or another iCMTGIS II using the same iCloud account.

A word of caution regarding sharing the **.pmp job files** or the **.fbr feature list files** using iCloud. As defined by Apple, if two apps use the same file on iCloud, these apps must synchronize the file automatically. Therefore, you must take care when using the same file in two different apps if you will be making changes to the file. For example, suppose you open the same .pmp job (stored on iCloud) in both the iCMTGIS II and the iGPSGIS II apps. You add a Point Feature in iCMTGIS II, and you add a Line Feature in iGPSGIS II. When you save the job in iGPSGIS II, the job will be automatically loaded into iCMTGIS II from the cloud. As a result, iCMTGIS II will gain a new Line Feature but lose the newly created Point Feature that has not yet been saved.

Get/Send Files via FTP

You could use iGPSGIS II to transfer files over the Internet using **File Transfer Protocol (FTP)**. FTP file transfer requires a FTP server and a ftp client. iGPSGIS II will use an **FTP client** to let you send or get files to or from the PC running the FTP server.

To access the FTP function, select
Main Menu/Job then select **FTP**.

Enter the IP address of the ftp site you
want to connect to. If a user name and
password for accessing the ftp site is
required, then enter them into the
corresponding boxes. For an FTP site
that provides anonymous FTP access,
simply mark the Anonymous
checkbox, and the User Name will be
automatically filled in with
"anonymous".

You may select the FTP Path and have
it point to the desired folder on the PC.
The files on the iPad and the files on
the ftp site will be listed separately.

Select the files you wish to send from
one side to the other then tap the
corresponding large arrow button to
complete the transfer.

If the files for your device are in
iCloud® Storage then mark the **on
Cloud** checkbox.

Some versions of CMT PC mapping
software, such as PC-GIS X, provide
an **FTP Server** to let an FTP Client
get or send files from your computer.
For example, you may use Deed Calls
Pro to transfer files to and from your
PC via FTP.

The steps for making an FTP file
transfer using the CMT FTP Server are
as follows:

1. In PC-GIS X run **Utilities/FTP
Server**, and select the IP if you have
more than one network card. The FTP
Client will connect with the FTP
Server via this IP. If you don't want to
allow the client to login as
Anonymous, you should set User
Name and Password.

2. Specify the FTP Path, i.e. the
desired folder on the PC.

3. Click the "Start" button to start the FTP server.

4. In the iOS app enable the FTP function under Menu/Job then log in to the ftp site.

5. In the iOS app select the files to be sent, then tap the corresponding arrow button.

Back to TOC

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