GPSLayer: A GPS Custom Layer for ArcReader

GPSLayer is a custom layer component which will read points from a NMEA-0183 compliant (4800 baud) GPS collector and display them on the map. When added to a map document in ArcMap, the layer may be published to a PMF for use in ArcReader.
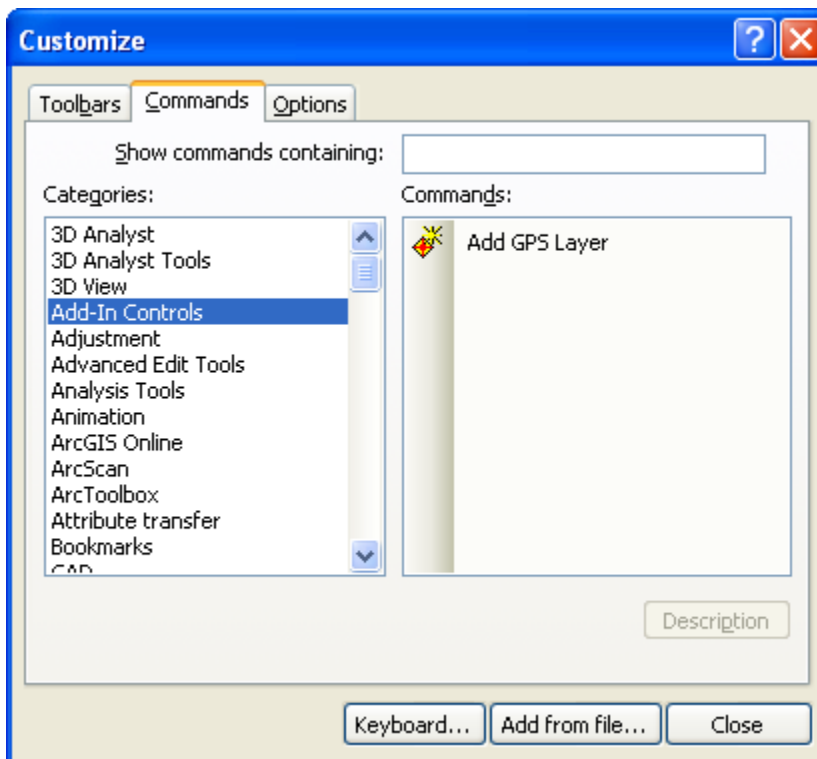
Installing GPSLayer

To install GPSLayer, unzip this ZIP file to C:\apps\GPSLayer (if you choose a different destination, you will need to edit GPSLayer.reg appropriately). Double-click GPSLayer.reg to register the DLL.

Installation must take place on the ArcMap Publisher machine as well as all ArcReader machines which will use the custom layer.
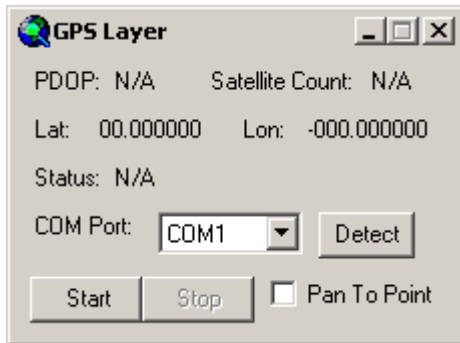
Adding GPSLayer to a Map Document

To install the ArcMap add-in, double-click AddGPSLayer.esriAddIn and follow directions. In ArcMap, use the "Add GPS Layer" button to add a GPS layer to a map. To add the button to a toolbar, right-click the toolbar and select "Customize…":

Select the "Add GPS Layer" Button and drag it to the desired location. When the button is clicked, a layer labeled "GPS" will appear at the top of the table of contents. Keep the layer invisible when publishing to PMF, and select the "Include all layers" option. Also, before publishing to PMF, make sure the datum of the map matches the datum of the GPS receiver, or apply an appropriate transformation (see "Using a WAAS-corrected Signal" below).
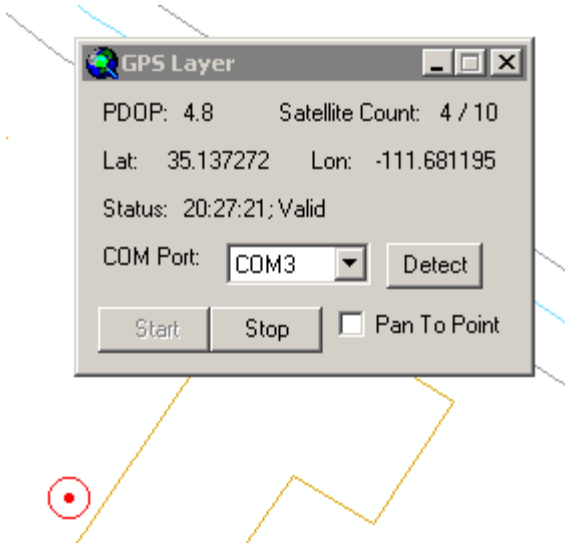
Using GPSLayer in ArcReader

Turning on the "GPS" layer will cause the GPS Layer dialog to appear:

Use the "COM Port" drop list to indicate the COM port the GPS unit is using. If the "Detect" button is pressed, the dialog will attempt to find the correct port. The "Pan to Point" option will automatically pan the map to re-center the GPS point should it wander beyond the bounds of the current view.
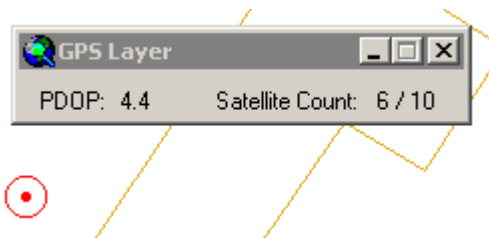
NOTE: When the GPS layer is first turned on, refresh the display to pass a handle to the layer. For some reason this is not necessarily done automatically in ArcReader.

When the "Start" button is pressed, the dialog will display the current coordinate as well as draw it on the map:
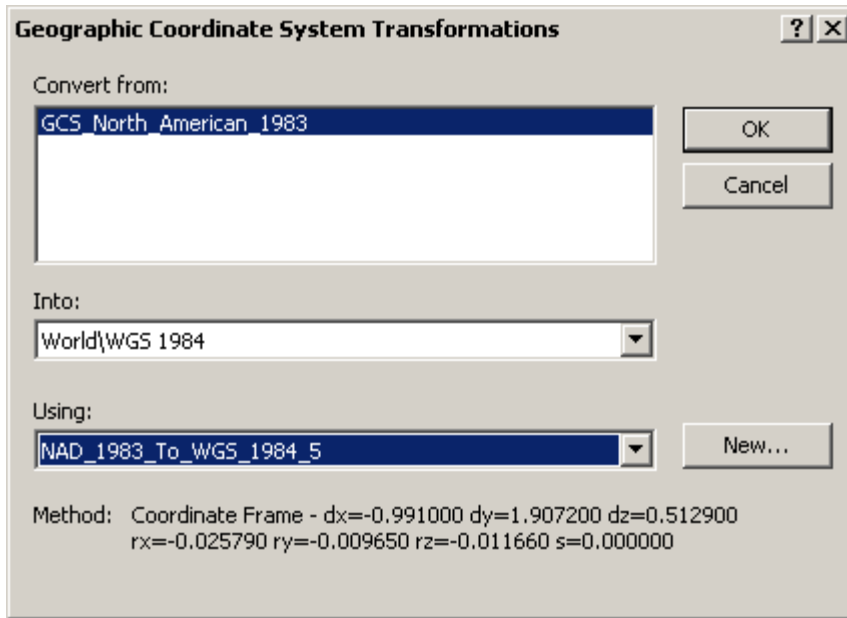
The GPS point is automatically refreshed when the coordinate is updated. Pressing the "Stop" button will halt the point collection. If the dialog is closed, point collection will also stop; to make the dialog appear again, turn the layer off and then on.

While visible and not minimized, the dialog will remain the topmost window on the desktop. For convenience, it may be resized to show only PDOP and satellite count:

Using a WAAS-corrected Signal

In general, the accuracy of the projected point will be adequate for the application if the datum of the map is set to NAD1983 or WGS1984. It should be noted that GPS receivers with built-in WAAS correction use a definition of WGS1984 datum based on ITRF00. This can amount to about a meter shift in North America when overlaid on NAD1983. To correct for this, set the datum transformation of the map to NAD_1983_to_WGS_1984_5, as in this example:

Geographic Coordinate System Transformations

Convert from:

GCS_North_American_1983

Into:

World\WGS 1984

Using:

NAD_1983_To_WGS_1984_5

Method: Coordinate Frame - dx=-0.991000 dy=1.907200 dz=0.512900
rx=-0.025790 ry=-0.009650 rz=-0.011660 s=0.000000

[For more information on the WAAS shift and the transformation to NAD 1983, see
http://trl.trimble.com/docushare/dsweb/Get/Document-170369/SprtNote_PFO-GPSA_NAD83Datum.pdf and
http://support.esri.com/index.cfm?fa=knowledgebase.techarticles.articleShow&d=24159
]

FAQ

Why I can't see my GPS collector?

GPSLayer uses standard ArcObjects to manage the GPS feed. If you cannot see the GPS collector in ArcMap using the out-of-the-box GPS toolbar, then you are most likely missing a piece of middleware that should be provided by your unit's manufacturer.

Why does the GPS point get larger or smaller as I zoom in or out?

If the map has a reference scale set, that will affect the sizing of the GPS point. To disable this, in ArcMap set the reference scale to "None" before publishing to PMF.
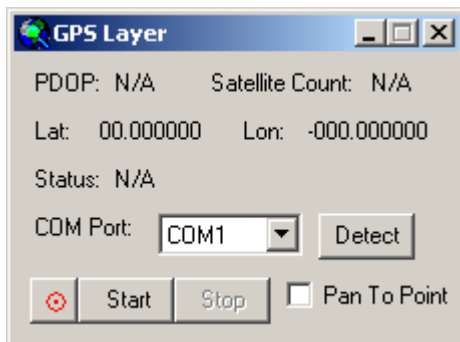
Can I change the GPS point symbol?
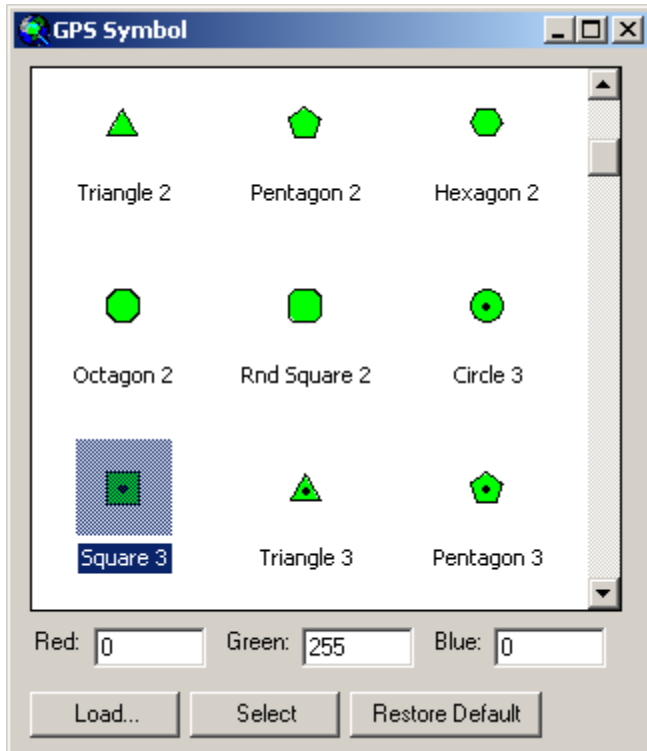
Yes! Read on:

Changing the GPS Point Symbol

As of version 3, the point symbol displayed can be set from an ESRI ServerStyle file. If a user changes the symbol in ArcReader, it is saved in user settings and will be used the next time the application is started; the user can also restore the default symbol. If the symbol is set in ArcMap, it will be saved to the PMF when published.

There is a new symbol button on the GPS layer dialog:

Clicking the symbol button will launch the symbol dialog:

Click the "Load…" button to navigate to and load a ServerStyle file. Selecting a symbol in the symbol picker will populate its foreground color in the red, green, and blue text items. Alter the values as desired and click the "Select" button to use the symbol. Click the "Restore Default" button to restore the default symbol.

-end-