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GeoViewer v9.0 // 11 March 2022
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GeoViewer overview

GeoViewer is an application for viewing raster, vector, WMS, and LiDAR imagery. GeoViewer supports a broad range of file formats, including the industry standard MrSID format and the ISO standard JPEG 2000 format.

**IMPORTANT**
Extensis has discontinued development for this incarnation of GeoViewer. Because of this, we are making the GeoViewer Pro upgrade available to all users at no charge. GeoViewer Pro has no additional system requirements but offers additional features.
For upgrade instructions, see *Upgrading to GeoViewer Pro* on page 8.

Here are some of the tasks that you can perform in GeoViewer:
- Display multispectral imagery and select the image bands that you want to display.
- View image metadata, including projection information.
- Display an OpenStreetMap layer as a base map.
- Browse and display imagery from a WMS server that you specify.
- Change the map’s projection to view images in their native projection, in WGS 84, or in Web Mercator.
- Display LiDAR point clouds in 3-D.
- Create bookmarks for frequently accessed locations.
- Measure distances.
- Export images or portions of images.
- Use dynamic range controls to improve the way that images are displayed.
- **GeoViewer Pro:** Print images or portions of images that you specify.
- **GeoViewer Pro:** Create image tiles when you export images.
- **GeoViewer Pro:** Change the map’s projection to additional supported projections.
- **GeoViewer Pro:** Display the area of shapes that you draw on the map.

About this document

The *GeoViewer User Manual* is written for geographic information system (GIS) professionals that want to view geospatial imagery, including raster imagery, WMS imagery, vector imagery, LiDAR imagery, and more. This guide assumes that you have basic knowledge of GIS, including knowledge of projection systems. This guide describes how to install and use GeoViewer.
New features

GeoViewer 9.0 includes the following new features and enhancements:

- **Printing (available with the GeoViewer Pro upgrade*)**
  Print one or more images that you add to the map. When you print images, you can print the visible area, print custom areas, or print the full extents of all layers on the map. You can print at native resolution or automatically fit images on the number of pages that you specify (for example, specify to fit images in an area two pages wide and two pages high).

- **Bookmarks**
  Create bookmarks to save areas of interest that you access frequently. You can edit, delete, and export bookmark areas. With GeoViewer Pro, you can also print bookmark areas.

- **Changing the Map’s Projection**
  Reproject images to another projection that you specify. By default, you can display images in their native projection, in WGS 84, and in Web Mercator. With GeoViewer Pro, you can reproject images to additional supported projections.

- **OpenStreetMap Support**
  Display an OpenStreetMap layer as a base map. The OpenStreetMap layer is excluded from export jobs and print jobs.

- **Dynamic Range Stretching**
  GeoViewer automatically uses dynamic range stretching to improve the appearance of a 16-bit raster. You can change dynamic range stretching for a specific layer or for all layers.

- **Area Measurement (available with the GeoViewer Pro upgrade*)**
  Display the area of shapes that you draw on the map.

- **Location Search**
  Search for geographic coordinates.

- **JPIP Improvements**
  When you access JPIP imagery, GeoViewer reads projection information from the JPIP server to display imagery in the correct location. Additionally, if you access the JPIP component of an Express Server, you can browse a list of the imagery available on the server.

- **Tiled Image Export (available with the GeoViewer Pro upgrade*)**
  When you export imagery from GeoViewer, you can select tiling options. You may want to create image tiles when you export very large images.

- **Expanded File Format Support**
  You can now view 16-bit images and images in the CADRG and PNG file formats.

- **Auxiliary File Support**
  GeoViewer now reads projection information from auxiliary files in the aux.xml format automatically. The projection information from aux.xml files takes precedence over image metadata and over world files as well.

* See Upgrading to GeoViewer Pro on page 8.
System requirements

Before you install GeoViewer, verify that your system meets the minimum system requirements.

Operating system requirements
You can run GeoViewer on 64-bit versions of Microsoft Windows. GeoViewer supports:
- Windows Server 2012
- Windows 10
- Windows 8
- Windows 7

NOTE: GeoViewer may work on newer versions of Windows. Since Extensis has discontinued this incarnation, we have not tested nor can we support using GeoViewer on newer systems.

Hardware requirements
For optimal performance, verify that your system meets the following recommended hardware configuration:
- 2.5 GHz quad core processor
- 4 GB RAM
- 200 MB of disk space for installation and additional space for images
- SATA drive or better

It is possible to run GeoViewer on systems with the following minimum hardware configuration:
- 1.5 GHz processor
- 1 GB RAM
- 200 MB of disk space

Software requirements
GeoViewer requires the following software to run:
- Microsoft .NET Framework 4.5
- Microsoft DirectX 9
- Visual Studio C++ 2013 Redistributable

If this software is not already present on your system, the GeoViewer installer downloads and installs the software for you.

NOTE: Microsoft DirectX is used to display LiDAR imagery in 3-D.

Installing GeoViewer

To install GeoViewer:
1. Download the GeoViewer installer from GeoViewer 9 Support.
2. Navigate to your Downloads folder and double-click setup.exe. This starts the installation wizard.
   TIP: To install GeoViewer for all users, right-click setup.exe and choose Run as administrator from the shortcut menu.
3. In the installation wizard:
   - Accept the License Agreement.
   - Select whether you want to install GeoViewer for the current user or all users.
   NOTE: In order to install for all users, you must run the installer as an administrator.
   - Select the directory where you want to install GeoViewer.
   - Install the Microsoft .NET Framework, DirectX 9.0, and the Visual Studio C++ Redistributable if these are not already installed.

GeoViewer 9 Support: https://www.extensis.com/support/geoviewer-9/
Upgrading to GeoViewer Pro

GeoViewer Pro is now a free upgrade.

To upgrade to GeoViewer Pro:

1. Start GeoViewer.
   If you installed GeoViewer for all users, then right-click the GeoViewer icon and choose Run as administrator from the shortcut menu.
2. Choose Options > Purchase Pro license.
   If the menu instead reads View license then you have already upgraded GeoViewer.
3. Enter the following into the License code field (you can copy and paste the text between and including the * and the #):

   *DScT0EjjaffBw7425q1,7WFLXpxYzVRixdVhy0iRowYtVMbH12RwofP3RbTzjdny0:cUm1asW9zhhLqVzG6K1AhUeTMLQ5K2f1#

4. Click OK.
   You should see a message that licensing succeeded, and the View License dialog should show License status: Licensed. If this process wasn’t successful, then please read the article Activating the Pro features in GeoViewer for free.

Updating GeoViewer help

While the functions of GeoViewer have not changed, GeoViewer help has been updated to include contact information for Extensis.

We have made the updated version of GeoViewer help available to download and replace the original version, or you can choose to link to an online version of GeoViewer help instead.

**Downloading GeoViewer help**

If you want to update the local version of Help (installed with your copy of GeoViewer):

1. Locate the existing help system docs folder.
   By default, it is in C:\Program Files\LizardTech\GeoViewer\ (all users installation) or C:\Users\<user>\AppData\Roaming\LizardTech\GeoViewer\ (single user installation); if you installed GeoViewer to a non-standard location, you can find the help system by launching GeoViewer and choosing Help > Help topics, then reading the location in the browser’s URL bar.
2. Rename the existing docs folder (something like docs_old).
   This is just in case you want or need to revert to the older help system, and also saves the PDFs that were installed with GeoViewer.
3. Download a copy of this help system.
4. Decompress the .zip file (this should yield a folder named docs).
5. Move the new docs folder into the GeoViewer folder (where docs_old is located).
6. Quit and restart GeoViewer, then choose Help > Help topics to see the new help system.
**Linking to GeoViewer online help**

If you would rather link to an online version of this help system:

1. **Locate the existing help system docs folder.**
   By default, it is in `C:\Program Files\LizardTech\GeoViewer\` (all users installation) or `C:\Users\<user>\AppData\Roaming\LizardTech\GeoViewer\` (single user installation); if you installed GeoViewer to a non-standard location, you can find the help system by launching GeoViewer and choosing **Help > Help topics**, then reading the location in the browser’s URL bar.

2. **Rename the existing docs folder (something like docs_old).**
   This is just in case you want or need to revert to the older help system, and also saves the PDFs that were installed with GeoViewer.

3. [Download this file.](https://bin.extensis.com/geoviewer/online_docs.zip)

4. **Decompress the .zip file (this should yield a folder named online_docs).**

5. Move the `online_docs` folder into the `GeoViewer` folder (where `docs_old` is located).

6. Rename the `online_docs` folder to `docs`.

7. Quit and relaunch GeoViewer, then choose **Help > Help topics** to see the new online version of help.

---

GeoViewer help (online link): https://bin.extensis.com/geoviewer/online_docs.zip
GeoViewer main window

To start GeoViewer, double-click the desktop icon or click Start and choose Programs > LizardTech > GeoViewer > GeoViewer.

The Menu bar

The Menu bar gives you quick access to most tasks and settings.

<table>
<thead>
<tr>
<th>MENU</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>File</td>
<td>Add raster and vector layers to the map, add layers from a server, add an OpenStreetMap base layer, and load or save projects.</td>
</tr>
<tr>
<td>Layer</td>
<td>Perform tasks on highlighted layers in the Project pane. For example, you can remove layers, hide layers, view layer metadata, and change the appearance of layers with Layer Controls. To highlight a layer, click the name of the layer in the Project pane.</td>
</tr>
<tr>
<td>Navigation</td>
<td>Navigate the map by panning, zooming, and more. If you have a LiDAR point cloud visible in the Map pane, you can load the points again on the map with the Refresh Points menu item.</td>
</tr>
<tr>
<td>Tools</td>
<td>Access tools for measuring distances and areas, exporting and printing images, and changing the projection of the map.</td>
</tr>
<tr>
<td>Options</td>
<td>You can set preferences for changing the map projection when a new layer is added, and you can set display preferences, including vector display options, dynamic range options, and line color options. You can enter a GeoViewer Pro license code, or if you have already entered a license, you can view the license code.</td>
</tr>
<tr>
<td>Help</td>
<td>Display the GeoViewer help, view information about the GeoViewer product, and access Extensis support for the product.</td>
</tr>
</tbody>
</table>
The Overview pane

The Overview pane is a navigation aid that displays the current view of the Map pane with reference to the rest of the map.

The Overview pane displays a fixed overview of all the layers added to the map. It also displays a navigation rectangle that matches the current view on the Map pane. You can click and drag the navigation rectangle to change the view on the Map pane.

**TIP:** You can change the color and width of the navigation rectangle in the **UI Preferences**.

The Navigation bar

Use the Navigation bar to navigate the Map pane.

<table>
<thead>
<tr>
<th>ICON</th>
<th>NAME</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>🏡</td>
<td>Home</td>
<td>Restores the original view.</td>
</tr>
<tr>
<td>🌧️</td>
<td>Pan</td>
<td>Click and drag the map to change the location of the current view.</td>
</tr>
<tr>
<td>+</td>
<td>Zoom in</td>
<td>Click to zoom in on the current view or click and drag to zoom in on an area of interest.</td>
</tr>
<tr>
<td>-</td>
<td>Zoom out</td>
<td>Click to zoom out.</td>
</tr>
<tr>
<td>🌠</td>
<td>Smooth zoom</td>
<td>Click and drag to zoom in and out. You can also scroll with the mouse to zoom in and out.</td>
</tr>
<tr>
<td>🌒</td>
<td>Orbit focal point</td>
<td>3-D mode only. Moves your viewpoint in an orbit around your focal point.</td>
</tr>
<tr>
<td>🍀</td>
<td>Refresh points</td>
<td>3-D mode only. Freshly displays a configurable number of points that fall within the current view.</td>
</tr>
<tr>
<td>📈</td>
<td>Measure</td>
<td>Measure the distances between points. With GeoViewer Pro, you can also measure areas.</td>
</tr>
<tr>
<td>🔍</td>
<td>Select area</td>
<td>Draw an area of interest. You can save the area as a bookmark, export the area, or print the area.</td>
</tr>
<tr>
<td>🍍</td>
<td>Tips and tricks</td>
<td>Display one of the GeoViewer tips.</td>
</tr>
</tbody>
</table>

The Navigation bar includes a **Zoom** slider that you can use to change the zoom level quickly.

**TIP:** If you resize the GeoViewer window, some of the tools may disappear from the toolbar. Click the drop-down arrow on the right to access the hidden buttons.
The Project pane

The Project pane displays a list of the layers added to the map. Use the Project pane to hide layers, to change layer order, and more. To save the layers displayed in the Project pane, choose File > Save project.

By default, the layers that you add to the Project pane are organized in a group. You can right-click in the Project pane to add groups and add layers. Each layer and group in the Project pane includes a check box that you can deselect to hide the layer or group.

You can also click on the name of a layer to highlight the layer on the map. Use the Layer menu to display layer options for highlighted layers, or right-click on the name of a layer and choose an option from the shortcut menu:

- Remove selected
- Remove all
- Hide/show selected
- View layer metadata
- Layer controls
- Zoom to layer

To highlight multiple layers, hold down the CTRL key and click on the name of each layer. For example, you may want to highlight multiple layers to zoom to an area on the map that fits both layers.

TIP: You can also hold CTRL and click on a layer in the Map pane to highlight the layer in the Project pane.

The Map pane

The Map pane displays an interactive map that you can use to view layers. Use the Navigation bar to change the view of the Map pane. For example, you can pan, zoom, and restore the original view.

The Map pane includes a search box that you can use to search for locations. You can search for locations using geographic coordinates like latitude and longitude or MGRS coordinates.

The Map pane also includes tabs at the bottom that you can use to switch between 2-D and 3-D mode. The 3-D mode is only available when you have added a LiDAR point cloud to the map.

NOTE: To use 3-D mode, you must have DirectX 9.0 installed. DirectX is included in the GeoViewer installer and is installed by default.

The Status bar

The Status bar displays the projection of the map, the current position of the mouse pointer, and whether GeoViewer is working to render the map.

| WGS 84 / Pseudo-Mercator: 5942979.00000, -13681980.00000 | Lat/Long: 47.000000, -122.900000 | Idle |

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Viewing layers

To view an image, add the image, or layer, to GeoViewer. A layer is any raster, vector, or LiDAR image that you display in GeoViewer.

A list of the layers that you add to GeoViewer appears in the Project pane. Use the Project pane to remove layers, hide layers, view layer metadata, and more. The layers that you add to GeoViewer also appear in the Map pane. Use the Navigation bar to navigate the Map pane. For more information, see The Navigation bar on page 11.

NOTE: Changes that you make to layers in the Project pane affect the way that layers are displayed in the Map pane and vice versa. For example, if you remove a layer from the Project pane, the layer disappears from the Map pane.

If you add a LiDAR layer to GeoViewer, you can also change the view mode to display the layer in 3-D.

Adding layers

Use the File menu to add layers to GeoViewer. You can add layers that are stored on your computer or network, called local layers, or you can add layers from an Express Server, WMS server, or JPIP server. You can also add an OpenStreetMap layer as a base map.

When you add a layer to a blank map in GeoViewer, you are prompted to select a projection system for the map. By default, you can select the native projection of the layer, WGS 84, or Web Mercator. If you upgrade to GeoViewer Pro, you can select from additional supported projection systems. See Upgrading to GeoViewer Pro on page 8.

When you add a layer to a map that already contains layers, you may be prompted to reproject the layer to the map’s projection. For more information on projection systems, and to change the projection system of the map, see Projection systems on page 31.

To view a list of supported file formats that you can view in GeoViewer, see Supported file formats on page 15.

Adding local layers

Layers that are stored on your computer or network are called local layers.

To add a local layer to GeoViewer:

1. Choose File > Add local layer.
   You can also right-click in the Project pane and choose Add layer > Local layer from the shortcut menu.
2. Navigate to the location of the layer.
   If you do not see the name of the layer that you want to add, click the file format drop-down in the lower right corner and select All files.
3. Select one or more layers, and click Open.
   To select multiple layers, hold down the CTRL key and click the layers that you want to add.

TIP: You can also drag layers from Windows Explorer to the Project pane. You can use any supported image type as a layer. See Supported file formats on page 15.
Adding Express Server layers

Connect to an Express Server to browse the layers on the server, then add the layers to GeoViewer.

To add an Express Server layer to GeoViewer:

1. Choose **File > Add Express Server layer**.
   You can also right-click in the **Project** pane and choose **Add layer > Express Server layer** from the shortcut menu.
2. Enter the URL of the Express Server and click **Connect**.
   The catalogs hosted on the Express Server appear in the **Catalogs** list.
3. Select a catalog to view the layers in the catalog.
4. Select a layer, and click **OK**.

**NOTE:** The **iserv-catalog-index** layer that you see in Express Server catalogs is a fast, indexed group of all the layers in the catalog. To select individual layers in a catalog, connect to the Express Server from the **Add WMS layer** interface.

Adding WMS layers

Connect to a WMS server to browse the layers on the server, then add the layers to GeoViewer.

To add a WMS layer to GeoViewer:

1. Choose **File > Add WMS layer**.
   You can also right-click in the **Project** pane and select **Add layer > WMS layer** from the shortcut menu.
2. Enter the URL of the WMS server and click **Connect**.
   The layers hosted on the WMS server appear in the **Server layers** list.
3. Click **>>** to add all of the sub-layers to the list of selected layers.
4. Click **Up** or **Down** to move the selected layers within the list.

**NOTE:** When you add multiple layers at a time, the layers are displayed as a single layer in the **Project** pane and **Map** pane. To change the layer order after you add layers, remove the layers then add them again.

5. To remove a layer, click **X**.
6. Click **OK**.

Adding JPIP layers

To add a JPIP layer, enter the direct URL of the layer.

For example, you might enter the following JPIP URL:

```
http://demo.example.com:9013/JPIP/DC_Cropped.jp2
```

If the JPIP layer is hosted on an Express Server, you can enter the URL of the Express Server to browse JPIP layers. For more information, see **Adding Express Server layers** above.
## Supported file formats

GeoViewer can display a broad range of file formats for raster, vector, and LiDAR layers.

The following table lists the file formats supported by GeoViewer:

<table>
<thead>
<tr>
<th>FILE FORMAT</th>
<th>FILE EXTENSION</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>CADRG</td>
<td>.toc</td>
<td>.toc is the most common</td>
</tr>
<tr>
<td>ECW</td>
<td>.ecw</td>
<td>Earth Resource Mapping’s Enhanced Compression Wavelet format.</td>
</tr>
<tr>
<td>ERDAS IMAGINE</td>
<td>.img</td>
<td></td>
</tr>
<tr>
<td>ERDAS LAN</td>
<td>.lan</td>
<td>In 4-band LAN images, bands 2, 3, and 4 are interpreted as Red, Green, and Blue, respectively.</td>
</tr>
<tr>
<td>ESRI Shape files</td>
<td>.shp</td>
<td></td>
</tr>
<tr>
<td>JPEG</td>
<td>.jpg, .jpeg</td>
<td>Requires a world file for georeferencing.</td>
</tr>
<tr>
<td>JPEG 2000</td>
<td>.jp2</td>
<td></td>
</tr>
<tr>
<td>LAS</td>
<td>.las</td>
<td>This is a binary, uncompressed LiDAR point cloud format. GeoViewer supports LAS versions 1.0–1.3, with experimental support for LAS 1.4.</td>
</tr>
<tr>
<td>LASZip (LAZ)</td>
<td>.laz</td>
<td>This is a ZIP-compressed LAS file. GeoExpress supports LAZ files that are ZIPped versions of any supported LAS file.</td>
</tr>
<tr>
<td>MrSID</td>
<td>.sid</td>
<td>MrSID Generation 2 raster, Gen 3 raster, and Gen 4 raster and LiDAR</td>
</tr>
<tr>
<td>NITF 2.0, 2.1.</td>
<td>.ntf</td>
<td>Only supports uncompressed, JPEG compressed, and JP2 compressed data.</td>
</tr>
<tr>
<td>PNG</td>
<td>.png</td>
<td>Requires a world file for georeferencing.</td>
</tr>
<tr>
<td>Raw (uncompressed) BBB files (BIL, BIP, and BSQ)</td>
<td>.bbb, .bil, .bip, .bsq</td>
<td></td>
</tr>
<tr>
<td>Sun Raster</td>
<td>.ras</td>
<td></td>
</tr>
<tr>
<td>TIFF</td>
<td>.tiff</td>
<td></td>
</tr>
<tr>
<td>USGS DOQ</td>
<td>.doq, .nes, .ses, .sws, .nws</td>
<td>Both the old and new USGS DOQ formats are supported.</td>
</tr>
<tr>
<td>Windows BMP</td>
<td>.bmp</td>
<td>Requires a world file for georeferencing.</td>
</tr>
</tbody>
</table>

### NOTES
- All of the supported file formats can use world files for georeferencing, with the exception of file formats for LiDAR layers. However, GeoViewer does not read world files by default. To allow GeoViewer to read world files, choose Options > Georeferencing Preferences.
- If an aux.xml file exists for an image, the aux.xml file is used for georeferencing automatically. The projection information from aux.xml files takes precedence over image metadata and over world files as well.
Hiding and showing layers

When you clear the check box next to the name of a layer in the Project pane, the layer is hidden from the Map pane. For example, you may want to hide layers when you compare overlapping images. To show a layer again, select the check box next to the layer name in the Project pane.

To hide multiple layers at a time, hold down the CTRL key and click the names of the layers that you want to hide. Then, right-click one of the highlighted layers and chose Hide/show selected from the shortcut menu.

The following figure shows blank space on the Map pane where layers have been hidden:

![Blank Map pane with hidden layers]

Removing layers

Remove a layer to clear it from both the Project pane and the Map pane. To remove a layer, right-click the layer and choose Remove selected from the shortcut menu.

To remove multiple layers at a time, hold down the CTRL key and click the names of the layers that you want to remove. Then, right-click one of the highlighted layers and choose Remove selected.

To remove all layers, right-click in the Project pane and choose Remove all.

**NOTE:** Removing all layers from the Project pane does not clear the projection system of the map. To clear all layers and also clear the projection system of the map, choose File > New project.

Changing the layer order

For overlapping layers, the order in which you add layers to the map affects which layers display on top. To change the order of layers, click a layer in the Project pane and drag it up or down.

For example, to display a layer above all other layers in the Map pane, click the layer in the Project pane and drag it to the top of the layers list.
Viewing layer metadata

View layer metadata to view projection information for a layer, file information, and more.

To view metadata for a layer, right-click a layer in the Project pane and choose View layer metadata from the shortcut menu, or right-click a layer in the Map pane and choose Layer > View layer metadata.

To view the metadata for multiple layers at a time, hold down the CTRL key and click the names of the layers for which you want to view metadata. Then, right-click one of the highlighted layers and choose View layer metadata. The layer metadata is grouped by layer in the Layer Metadata dialog.

Organization of the Layer Metadata dialog

The Layer Metadata dialog is divided into two sides. The left side lists the layers that you selected and the metadata properties that you can view. The right side displays details for the item selected on the left.

Depending on the file format and the source of the layer you may view one or more of the following metadata properties for a layer:

- **Image properties**: width, height, number of bands, color space, sample type, bits per sample, format and compression ratios.
- **Vector properties**: number of shape layers, layer name, layer feature count and format.
- **LiDAR properties**: format; number of points; min, max, scale and offset; and supported fields.
- **Geographic properties**: left, top, right and bottom coordinates; x and y resolution; CRS name; and well-known text string (WKT).
- **File properties**: full layer path, size, creation time, modification time, attributes, and owner.
- **Express Server properties**: root URL; server, layer name and catalog; spatially indexed (true or false).
- **WMS properties**: root URL; GetCapabilities URL; server; layer name and title; CRS (may appear as SRS); format; and bounding box.
- **JPIP properties**: root URL; server, layer name and port.
- **Metadata tags**: basic metadata information, including file size, file name, encoding information, image tags, GeoTIFF tags, and more.
- **LAS properties**: ProjectID and generating software.

Viewing layers in 3-D mode

When you add a LiDAR point cloud to the map, you can view the layer in 3-D mode. To switch to 3-D mode, click the 3-D tab at the bottom of the Map pane.

Once the map is in 3-D mode, you can access additional navigation buttons in the Navigation bar. Use Orbit focal point to rotate the point cloud. Use Refresh points to redraw the points visible in the Map pane. To render your points quickly, GeoViewer draws a representative sample of your points rather than drawing every single point. If you pan or zoom in, you may want to refresh points to draw more points in the area that you are viewing. To increase or decrease the default number of points that GeoViewer draws, see User interface preferences on page 35.

**NOTE**: To use 3-D mode, you must have DirectX 9.0 installed. DirectX is included in the GeoViewer installer and is installed by default.
Changing layer appearance

Change the appearance of raster layers in GeoViewer with the Layer Controls dialog. To access the Layer Controls dialog, right-click a layer in the Project pane and choose Layer controls from the shortcut menu.

Use the Layer Controls dialog to complete the following tasks:

- For local raster layers, you can select the bands that you want to view.
- For all raster layers, especially for 16-bit layers, you can select dynamic range options.
- For all raster layers that do not have an alpha band, you can specify a No Data value.

To change the appearance of multiple layers at a time, hold down the CTRL key and click the names of multiple layers. Then, right-click one of the highlighted layers and choose Layer controls.

If the layers are in a group, you can change the appearance of all the layers by right-clicking on the group.

TIP: To change the appearance of vector and LiDAR layers, and to change the background of the Map pane, see User interface preferences on page 35.

Selecting bands

Use the Band Select section of the Layer Controls dialog to specify the bands that you want to view. You can view an image in grayscale, or you can select three bands as the red, green, and blue bands.

By default, for multispectral images that have more than three bands, the first three bands are mapped to red, green, and blue. Use the drop-down menus to change the band order. Layers that have fewer than three bands are displayed in grayscale.

NOTE:

Band selection is not available in the following cases:

- Multiple layers have been selected and some of the layers have a different number of bands.
- The layer is a CMYK image.
- The layer is not stored on your computer or network.
Setting dynamic range

In the Layer Controls dialog, you can set dynamic range values for images that benefit from dynamic range stretching.

Layers that do not use their full dynamic range have a tendency to display as black because all of the pixel values are clustered on one end of the possible range of values. To improve the appearance of a layer that does not use its full dynamic range, GeoViewer approximates the dynamic range of the layer from the layer’s pixel values. Then, GeoViewer distributes the image’s pixel values into an 8-bit color space for viewing.

You can select the method that GeoViewer uses to approximate the dynamic range values:

- **Off**: GeoViewer does not calculate the dynamic range or apply dynamic range stretching.
- **Min Max**: GeoViewer uses the minimum and maximum values from the image metadata and applies dynamic range stretching. If the metadata does not contain minimum and maximum values, then the values are approximated from a statistical sample.
- **Std Dev**: GeoViewer calculates a set number of standard deviations from a statistical sample of the image and applies dynamic range stretching. By default, the number of standard deviations used is 3; you can change this in the Dynamic range section of the UI Preferences dialog.
- **Manual**: GeoViewer uses the minimum and maximum values that you enter to apply dynamic range stretching. You can use the slider under the dynamic range histogram to manually adjust the minimum and maximum values.

**NOTE**: By default, dynamic range stretching is only applied to 16-bit images. To set the default method for calculating dynamic range, set Dynamic range preferences. For more information, see User interface preferences on page 35.

Setting the No Data value

The No Data value is the pixel value that you want to use for transparency. For example, if you have an image of a county, the parts of the image that are outside the county may display as black. To display the black portions of the image as transparent, you can set the No Data value to zero.

**NOTE**: For images with an alpha band, you do not need to set a No Data value because the transparent regions of the image are stored in the alpha band.

The following list describes the No Data values that you can select:

- **Set to minimum value**: For most images, the minimum value is 0, which corresponds to black.
- **Set to maximum value**: For 8-bit images, the maximum value is 255. For 16-bit images, the maximum value is 65535. The maximum value corresponds to white.
- **Use native layer transparency**: Read the image metadata for transparency information.
- **Manual**: Enter a No Data value for each band.
**Fuzzy No Data**

For compressed images without an alpha band, you can use GeoViewer’s Fuzzy No Data feature to improve the appearance of transparent image regions.

A compressed image may contain slightly altered pixel values to further reduce the size of the image. As a result, when you set the no data value, you may notice that some portions of the image that should be transparent still appear. To correct this problem, the fuzzy no data feature expands the no data value to a small range of values which includes most of the slightly altered pixels.

Fuzzy No Data is on by default. To turn off Fuzzy No Data, choose Options > UI preferences, then click the Viewer tab and deselect Fuzzy no-data.
Bookmarks

A bookmark is an area of interest that you want to save for later. For example, you may want to create bookmarks for areas that you access frequently.

Any time that you select an area of interest, the Bookmarks dialog appears and a temporary bookmark is created. You can export and print bookmarks, including temporary bookmarks, from the Bookmarks dialog. For more information on export and printing, see Tools on page 23.

To access the Bookmarks dialog without selecting an area of interest, choose Navigation > Bookmarks. The Bookmarks dialog includes a toolbar at the top, a list of saved bookmarks on the left, and details for the selected bookmark on the right. When you click a saved bookmark, the Map pane pans to the location of the bookmark.

Creating bookmarks

You can create bookmarks from the Bookmarks dialog or any time that you select an area of interest.

To create a bookmark:

1. Pan the map to the location of the area of interest.
2. Choose Navigation > Bookmarks.
3. Click Create Bookmark.
   A sample area of interest is drawn for you on the Map pane.
4. Use the points on the area of interest rectangle to drag or resize the bookmark.
   TIP: You can also enter coordinates for the bookmark extents in the Bookmarks dialog.
5. Enter a name and description for the bookmark.
6. Click Save.
   If you have added a name for the bookmark and selected an area within the bounds of the loaded layers, the bookmark is added to the list of bookmarks in the left pane of the Bookmarks dialog.

   TIP: Click Select area on the Navigation bar to manually draw an area of interest.
Deleting bookmarks

Delete one or more bookmarks at a time from the Bookmarks dialog.

To delete a bookmark:
2. Select an existing bookmark from the left pane of the Bookmarks dialog.
   To delete multiple bookmarks, hold down the CTRL key and click on the names of multiple bookmarks.
3. Click Delete Bookmark.

Editing bookmarks

When you edit a bookmark, you can change the name, description, or area of interest of the bookmark.

To edit a bookmark:
2. Select an existing bookmark from the left pane of the Bookmarks dialog.
3. Click Edit Bookmark.
4. Edit the name and description of the bookmark in the text fields.
5. Use the points on the area of interest rectangle to drag or resize the bookmark.
   You can manually change the bookmark extents in the text fields.
6. Click Save.
Tools

Click the Tools menu to access Measure, Print, and Export tools. You can only use GeoViewer tools when the Map pane is in 2-D mode.

The Tools menu also includes the Change map projection tool. For more information about changing the projection, see Changing the projection system on page 31.

The Measure tool

Use the Measure tool to measure the distance of line segments that you draw on the map. If you upgrade to GeoViewer Pro, you can also measure areas. See Upgrading to GeoViewer Pro on page 8.

Choose Tools > Measure to open the Measurement dialog, or click Measure on the Navigation bar.

The Measurement dialog includes a toolbar at the top that you can use to switch between measuring distances and areas, to remove points, and to copy the measured distance or area to a clipboard. The Measurement dialog also includes a drop-down for selecting the measurement units, a list of line segments lengths, and a drop-down for selecting the source units.

By default, the measurement units match the map units, also known as the source units. The source units are read from the map’s projection, so if the map projection has not been set, then the source units drop-down is unavailable. If the map does not have a projection system, then you can specify the source units from the drop-down.
Measuring distances and areas

Access the Measurement dialog to measure distances and areas. You can switch between distance measurement and area measurement without redrawing line segments.

To measure distances and areas:

1. Choose Tools > Measure.
   You can also click Measure on the Navigation bar or right-click in the Map pane and choose Measure from the shortcut menu.

2. Click in the Map pane to create points.
   GeoViewer draws line segments between the points that you create. To display the length of the line segments, click the arrow next to Segments.

3. Double-click to create the final point and stop measuring.

4. To move a point, drag the point to another position.

5. To delete a point, hold down the CTRL key and click the point.

6. Click Copy in the Measurement dialog to copy the length of the line segments and the measured length or area.
The Export tool

Use the Export tool to create an image from the layers that you have added to GeoViewer. You can export any layers that you add to GeoViewer except for the OpenStreetMap layer. For LiDAR data, you can only export the rasterized version of the point cloud that you see in 2-D mode.

When you export an image in GeoViewer, you must select the area that you want to export. Choose Tools > Export to view the areas that you can select.

Use the Export dialog to specify the Output File, Output Size, and Output Tiles. You can only create image tiles if you upgrade to GeoViewer Pro. See Upgrading to GeoViewer Pro on page 8.

NOTE: The Export tool always creates 8-bit, unsigned, RGB images. If you attempt to export multispectral imagery, the Export tool only exports the three bands that are currently selected. For more information on selecting bands, see Selecting bands on page 18.

Exporting the map

To export the full extents of all the layers that are currently visible on the map:

2. Click Browse.
3. Navigate to the directory where you want to save the exported image.
4. Enter a name for the image and click Save.
5. Select the format that you want to use for the export image.
   If you select PNG or JPEG, you can change the default compression and quality settings.
6. Click the Output Size tab and select one of the image dimensions from the drop-down.
7. If you have upgraded to GeoViewer Pro, then you can click the Output Tiles tab to export the map to several image tiles.
   See Upgrading to GeoViewer Pro on page 8.
8. Review the export summary to ensure that the approximate size and number of tiles are correct.
9. Click Export.
Exporting the current view

Export only the area that is displayed in the Map pane.

To export the map:

2. Click Browse.
3. Navigate to the directory where you want to save the exported image.
4. Enter a name for the image and click Save.
5. Select the format that you want to use for the export image.
   If you select PNG or JPEG, you can change the default compression and quality settings.
6. Click the Output Size tab and select one of the image dimensions from the drop-down.
7. If you have upgraded to GeoViewer Pro, then you can click the Output Tiles tab to export the map to several image tiles.
   See Upgrading to GeoViewer Pro on page 8.
8. Review the export summary to ensure that the approximate size and number of tiles are correct.
9. Click Export.

Exporting the selected area

To export an area that you draw in the Map pane:

1. Choose Tools > Export > Selected area, or click Select area on the Navigation bar.
2. Click and drag to draw an area of interest in the Map pane.
   The area is displayed as a temporary bookmark in the Bookmarks dialog so that you can make adjustments.
3. Click the points of the area of interest rectangle to drag or resize the area that you want to export. You can also manually enter the extents that you want to export in the text fields.
4. Click Export Bookmark.
5. Click Browse.
6. Navigate to the directory where you want to save the exported image.
7. Enter a name for the image and click Save.
8. Select the format that you want to use for the export image.
   If you select PNG or JPEG, you can change the default compression and quality settings.
9. Click the Output Size tab and select one of the image dimensions from the drop-down.
10. If you have upgraded to GeoViewer Pro, then you can click the Output Tiles tab to export the map to several image tiles.
    See Upgrading to GeoViewer Pro on page 8.
11. Review the export summary to ensure that the approximate size and number of tiles are correct.
12. Click Export.
Exporting a bookmarked region

To export a bookmarked region:

2. Select an existing bookmark in the left pane.
3. Click Export Bookmark.
4. Click Browse.
5. Navigate to the directory where you want to save the exported image.
6. Enter a name for the image and click Save.
7. Select the format that you want to use for the export image.
   If you select PNG or JPEG, you can change the default compression and quality settings.
8. Click the Output Size tab and select one of the image dimensions from the drop-down.
9. If you have upgraded to GeoViewer Pro, then you can click the Output Tiles tab to export the
    map to several image tiles.
   See Upgrading to GeoViewer Pro on page 8.
10. Review the export summary to ensure that the approximate size and number of tiles are correct.
11. Click Export.
The Print tool

**TIP:** Printing is available for GeoViewer Pro users only. See *Upgrading to GeoViewer Pro* on page 8.

Use the **Print** tool to print the layers that you have added to GeoViewer. You can print any layers that you add to GeoViewer except for the OpenStreetMap layer. For LiDAR data, you can only print the rasterized version of the point cloud that you see in 2-D mode.

When you print an image in GeoViewer, you must select the area that you want to print. Choose **Tools > Print** to view the areas that you can select.

**NOTE:** If you attempt to print multispectral imagery, the **Print** tool only prints the three bands that are currently selected. For more information on selecting bands, see *Selecting bands* on page 18.

![Print Map dialog](image)

**Printer Options**
- Printer
- Copies

**Page Options**
- Orientation
- Size

**Resolution**
- Native Resolution
- Fit to Page
- Fit to number of pages

The map will print on 18 pages.

**Use the Print dialog to specify Printer Options, Page Options, and Resolution.**

**NOTE:** The quality of the print job depends on the printer that you use. GeoViewer always maps pixels to DPI to create the highest quality print possible. For example, if you print on a page that is eight inches wide and printer has a DPI of 600, then GeoViewer prints an image that is 4800 (8×600) pixels wide.
Printing the map

Print the full extents of all the layers that are currently visible on the map.

To print the map:

1. Choose **Tools > Print > Map**.
2. Select a printer from the list of available printers. You can click **Advanced** to view printer-specific properties like two-sided printing.
3. Enter the number of copies that you want to print.
4. Select the page orientation and size.
5. Select the print resolution.

**IMPORTANT:** If you select **Native Resolution**, the print job may use a large number of pages. Review the number of pages needed for the print job at the bottom of the dialog.

6. Click **Print**.

Printing the current view

To print only the area that is displayed in the **Map** pane:

1. Choose **Tools > Print > Current view**.
2. Select a printer from the list of available printers. You can click **Advanced** to view printer-specific properties like two-sided printing.
3. Enter the number of copies that you want to print.
4. Select the page orientation and size.
5. Select the print resolution.

**IMPORTANT:** If you select **Native Resolution**, the print job may use a large number of pages. Review the number of pages needed for the print job at the bottom of the dialog.

6. Click **Print**.

Printing the selected area

To print an area that you draw in the **Map** pane:

1. Choose **Tools > Print > Selected area**, or click **Select area** on the **Navigation** bar.
2. Click and drag to draw an area of interest in the **Map** pane. The area is displayed as a temporary bookmark in the **Bookmarks** dialog so that you can make adjustments.
3. Click the points of the area of interest rectangle to drag or resize the area that you want to print. You can also manually enter the extents that you want to print in the text fields.
4. Click **Print Bookmark**.
5. Select a printer from the list of available printers. You can click **Advanced** to view printer-specific properties like two-sided printing.
6. Enter the number of copies that you want to print.
7. Select the page orientation and size.
8. Select the print resolution.

**IMPORTANT:** If you select **Native Resolution**, the print job may use a large number of pages. Review the number of pages needed for the print job at the bottom of the dialog.

9. Click **Print**.
Printing a bookmarked region

To print a bookmarked region:

1. Choose Tools > Print > Bookmark region.
2. Select an existing bookmark in the left pane.
3. Click Print Bookmark.
4. Select a printer from the list of available printers.
   You can click Advanced to view printer-specific properties like two-sided printing.
5. Enter the number of copies that you want to print.
6. Select the page orientation and size.
7. Select the print resolution.

   **IMPORTANT:** If you select Native Resolution, the print job may use a large number of pages.
   Review the number of pages needed for the print job at the bottom of the dialog.
8. Click Print.
Projection systems

Projection systems define the location of layers in GeoViewer as well as how to compensate for the curvature of the earth. To display multiple layers at a time, GeoViewer must display all the layers in the same projection. The process of displaying a layer in another projection system is called reprojection.

When you add a layer to a blank map, you are prompted to select a projection system for the map. You can also change the projection system of the map after you have added layers. By default, you can display a layer in the native projection of the layer, in Web Mercator, and in WGS 84. If you upgrade to GeoViewer Pro, you can use additional supported projection systems. See Upgrading to GeoViewer Pro on page 8.

Selecting the projection system

When you add a layer to a blank map, GeoViewer prompts you to select the projection system that you want to use for the map. Any layers that you add after the initial layer are displayed in the projection system of the map.

The OpenStreetMap layer however, is an exception. The OpenStreetMap layer can only be displayed in the Web Mercator projection system. If you add the OpenStreetMap layer to an existing map, GeoViewer prompts you to change the projection of the map to Web Mercator.

By default, you can set the projection system of the map to the native projection of the initial layer, to WGS 84, or to Web Mercator. If you upgrade to GeoViewer Pro, you can also select additional supported projections. See Upgrading to GeoViewer Pro on page 8.

Changing the projection system

If you have already added layers to GeoViewer, you can reproject the layers by choosing Tools > Change map projection. NOTE: You cannot reproject LiDAR layers.

By default, you can change the projection system of the map to Web Mercator and WGS 84. If you upgrade to GeoViewer Pro, you can change the projection system to additional supported projection systems. See Upgrading to GeoViewer Pro on page 8.

NOTE: If one or more of the layers that you have added to the map is not compatible with the projection system that you select, GeoViewer prompts you to remove the layers or cancel the reprojection.
Issues with projection systems

You may encounter issues with incompatible projection systems and with layers that do not have a projection system.

Many projection systems, especially region-specific projection systems are not compatible. For example, you may not be able to change the map projection from WGS 84 to UTM Zone 10N. Any time that there is a problem with incompatible projections, GeoViewer prompts you to either change the projection of the map or remove the layers with incompatible projections. To change the prompt settings, see Georeferencing preferences on page 34.

If you add a layer to GeoViewer that does not have a projection system, the layer is added with arbitrary pixel coordinates. If you add more layers, the layers may be added on top of each other. To position an image using a world file, see Georeferencing preferences on page 34.

NOTE: If an aux.xml file exists for an image, the aux.xml file is used for georeferencing automatically. The projection information from aux.xml files takes precedence over image metadata and over world files as well.
Projects

A project saves information about the layers that you have open in GeoViewer. Every time that you run GeoViewer, a temporary project is created for you. You may want to save a project if you have many layers open, if you access the same layers frequently, or if you configured the layers to change their appearance. For each layer, GeoViewer stores the image bands that you selected, the dynamic range method that you selected, and the No Data value that you selected.

GeoViewer projects are saved with a .gvp file extension.

Creating a new project

A temporary project is created for you every time that you open GeoViewer. If you choose File > New project, GeoViewer clears all layers from the Project pane and also clears the projection system of the map.

TIP: If you remove all the layers from the Project pane, but do not create a new project, the map retains its projection system. You can view the projection system of the map in the Status bar.

Opening a project

To open a saved project file, Choose File > Open project. Only one GeoViewer project can be open at a time.

Saving a project

To save a project, choose File > Save project. To create a copy of an open project, you can choose File > Save project as.

If you make changes to a project, GeoViewer prompts you to save the project before closing. To turn off the prompt, select the Don’t ask me again option the next time that you see the prompt. To turn the prompt on again, choose Options > UI preferences and click Restore Defaults.
Preferences

Change the default georeferencing and user interface preferences from the Options menu.
To restore the default preferences, choose Options > UI preferences and click Restore Defaults. This also restores the default preferences for georeferencing.

Georeferencing preferences

Set georeferencing preferences to select the default projection system for the map, to configure warnings about reprojection, and to turn on support for reading world files. To set georeferencing preferences, choose Options > Georeferencing preferences.

Default projection preferences

By default, when you add a new layer to a blank map, GeoViewer prompts you to select a projection system. You can configure GeoViewer to automatically use WGS 84, Web Mercator, or the native projection of the layer. Additionally, if you upgrade to GeoViewer Pro you can choose from other projection systems. See Upgrading to GeoViewer Pro on page 8.

For more information on projection systems, see Projection systems on page 31.

Reprojection warning preferences

If you add a layer to GeoViewer that does not match the projection system of the map, GeoViewer warns you that the layer must be reprojected. To reproject layers automatically, clear the check box labeled Warn me before reprojecting it.

If you add a layer that does not have a projection to an existing map, GeoViewer warns you that the layer cannot be positioned correctly. If the existing map does not have a projection and the layer does have a projection, GeoViewer displays the same warning. To turn off this warning, clear the check box labeled Warn me when a CRS is missing. For more information about issues with reprojection, see Issues with projection systems on page 32.

World file preferences

By default, GeoViewer does not use information from world files to position layers on the map. To turn on world file support, select the check box labeled Read world files. If you turn on world files, information from world files takes precedence over information in a layer’s metadata.
User interface preferences

Set user interface preferences to configure the status bar, to select colors for vector layers and other outlines, to change how point clouds are displayed, and more. To set user interface preferences, choose Options > UI preferences.

Status bar preferences
Select display preferences for the Status bar. To hide the Status bar, clear the Show status bar check box. Additionally, you can hide the coordinate reference system of the map and decide how to display the position of the mouse on the map.

Viewer preferences
Select the background color of the Map pane and turn Fuzzy no-data on or off. For more information see Fuzzy No Data on page 20.

Overview preferences
Change the color of the navigation rectangle in the Overview pane. For more information, see The Overview pane on page 11.

Measurement tool preferences
Change the color of the line segments and points that you create with the Measure tool.

Grid tool preferences
Change the color of grid lines during tiled image export.

Layer boundaries preferences
Display an outline around layers, change the color and width of the outline, and display the name of individual layers when you rest your mouse pointer on the layers.

Default vector style preferences
Change the color and width of vector layer lines.

Help settings
Display tips and tricks when GeoViewer starts. If you turn off tips and tricks, you can still access them from the Help menu or Navigation bar.
3-D settings
Change the display settings for LiDAR data that you can view in 3-D mode. You can change the following settings:

- Exaggerate the Z axis to make differences in elevation more noticeable.
- Change the number of points to display at a time. Increase the number of points to display more detail and avoid refreshing points frequently. Decrease the number of points to improve the rendering time.
- Change the color gradient to help you visualize changes in elevation.
- Enter a custom range for Z values.
- Display or hide the X, Y, and Z axes.
- Display or hide a bounding box that marks the extents of the point cloud.

Dynamic range preferences
Change the method that GeoViewer uses to calculate dynamic range values for stretching the dynamic range of 16-bit images. For more information, see Setting dynamic range on page 19.
Contacting Extensis

**Extensis**
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Portland, OR 97201
Web: [https://www.extensis.com/](https://www.extensis.com/)

**Extensis Europe**
Suites 17 & 18, Newton House
Kings Park Road, Moulton Park
Northampton NN3 6LG, United Kingdom

**Customer Support**

**Sales**
Web: [https://www.extensis.com/contact-us-form/](https://www.extensis.com/contact-us-form/) (all regions)
We also work with resellers around the world; find one near you.

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**Extensis:** [https://www.extensis.com/](https://www.extensis.com/)
**Sales:** [https://www.extensis.com/contact-us-form/](https://www.extensis.com/contact-us-form/)
**Find A Reseller:** [https://www.extensis.com/find-a-reseller/](https://www.extensis.com/find-a-reseller/)
Support

Use these resources to get answers to questions you have about GeoViewer and other Extensis products.

**GeoViewer**

**GeoViewer 9 Support**
This page links to installers and uninstallers, PDF downloads, and other common support resources.

**GeoViewer Desktop System Requirements**
Full system requirements and other information about the current version of GeoViewer.

**GeoViewer Desktop Release Notes**
Historical release notes for all updates to the current major release of GeoViewer.

**GeoViewer Pro Knowledge Base**
Articles describing situational issues and solutions to user-reported problems with GeoViewer.

**General resources**

**Extensis Knowledge Base**
Search for articles about any current Extensis product, and retired versions as well.

**Support Services**
Details about types of support and hours of availability, including our Support Policy.

**Our Support Policy in a nutshell**
Extensis provides full support for the current version of all shipping products. In addition, Extensis provides limited support for older products up to one year after the product version is no longer offered for sale.

**Extensis's Videos on Vimeo**
Hundreds of training sessions, events, and webinars. These are mostly in English, but there are some gems in French and German as well.

**Extensis Videos on YouTube**
Training, event, and educational videos.
Support Form
Use this form to submit a support case.

Provide as much of the following information as you can:
- Your email address;
- As the Subject, a brief description of the problem you are having;
- A more detailed description of the problem: when it occurs, whether you can reproduce it, whether it has caused you to lose data, and any other details to help our staff track down the issue.
- Your company name or account number;
- The type of support you need (generally you’ll choose Fix an Issue/Technical Support);
- The product you’re using;
- The version of the product (generally this is in the product’s About box);
- Your operating system;
- Any creative application that might also be affected.

You can also attach a screen shot or other file related to your issue.

Chat
Click at the bottom right of any page of the Extensis website. (Chat is only available between 8:00AM and 3:00PM Pacific time, Monday through Friday.)

Learn and Support
Links to white papers, testimonials, blog posts, and other resources.

Legal resources

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The legalese description of your rights while using GeoViewer and any associated services.

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Details about information we collect and how we use it, including information specific to Europe and California.

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