

ImageConnect

Version 3.1

USER DOCUMENTATION



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Introduction

What is it?

Developed for anyone who uses standard desktop mapping applications, ImageConnect instantly imports georeferenced aerial imagery into your mapping application using GlobeXplorer's online aerial image database. ImageConnect takes away the time, cost and hassle of locating an image provider, waiting for delivery, and managing large image files. Powered by GlobeXplorer, ImageConnect is the largest distributor of aerial and satellite content in the world. To contact GlobeXplorer customer support, call 1-800-417-7808 or send an email to imageconnect@globexplorer.com.

System Requirements:

Windows 98, Microsoft XP or newer.
Stable Internet connection.
Administrator rights to computer.
Mapping application: AutoDesk Map 2005 or newer

How does it work?

ImageConnect works by sending coordinates from the map view in your mapping software to a GlobeXplorer DLL. The DLL then formulates a URL that is sent over the Internet to the GlobeXplorer Image server. The image server then evaluates the coordinates in the request, confirms that the Client ID is valid, projects the image into the requested projection, and then sends the image back to the user. The DLL then creates a world file based upon the image header information.

The "ImageConnect" button will download an image to fit your screen resolution. The actual Ground Resolution or Meters Per Pixel of the image will depend on the scale that you are at when you request the image. See Appendix 1 for a table of common resolutions and their corresponding scales.

Installing ImageConnect

Installing ImageConnect is simple. Just double click the Setup program and follow the on-screen instructions. Once you have installed ImageConnect, start up your mapping application to start using it.

Step 1: Loading the Extension

To install ImageConnect; first be sure that no versions of your mapping program are running. Run the setup file that was sent to you by our customer service team or downloaded from our website. The file may be in a compressed zip format. You will need to extract the Setup program from the zip file before running setup. From there, double click the executable to start the installation and follow the installation instructions in the setup interface.

Once you have installed ImageConnect, start your mapping program. You should get a message indicating that an ImageConnect license could not be found or is incorrect. Click “OK” and input your license code and Client ID into the ImageConnect License dialog box that comes up.

Step 2: Entering your License Information

GlobeXplorer provides ImageConnect in 3 distinct license arrangements:

- 1) **Trial License** – Trial Licenses are available to experience ImageConnect. The 14 day trial allows you to view watermarked imagery and get image information but does not give you access to the full functionality available from our ImageConnect product. To try ImageConnect all you need is a trial license code which you can get at: <http://www.globexplorer.com/products/imageconnect-suite.shtml> Just fill out the Free Trial form and click the “Download Now” button. You should receive an email with your Trial License code shortly.
- 2) **Metered License** – Metered Licenses charge by the amount of imagery that you use. You will get full access to all of the ImageConnect functions and unwatermarked imagery. The imagery will be saved on your hard drive so that you can use them any time. To access your account, you will need your License code, Client ID number and to fill in a User name of your choice. This username helps you keep track of your usage through our Customer Reporting System (CRS).
- 3) **Seat License** – Seat Licenses charge a flat fee to access our image archive. You will get full access to all of ImageConnect functions and unwatermarked imagery. The imagery will be saved to your hard drive. To access your account, you will need your seat License code and your Client ID number and your choice of user name.

Step 3: The Properties Button

Clicking on the Properties button brings up the ImageConnect properties dialog box. This interface can also be accessed by choosing “ImageConnect Properties” from the ImageConnect menu pulldown.

Saved Image Path: ImageConnect saves your downloaded images here. Deleting this directory will cause ImageConnect to stop functioning correctly. You can change this to any directory where you would like to store your images.

Job Code File: ImageConnect saves your Job Codes file here. The Job Codes text file should list job numbers for images loaded using a specific job code in the file and can be tracked in our Customer Reporting System. It is best to only enter new job codes using the ImageConnect interface to avoid entering erroneous codes into the file.

To import a Job Code file from a previous version of ImageConnect:

1. Open the existing job code file with a text editor such as Notepad or Wordpad.
2. Add this header text to the very top of the file:

[ImageConnect]

Version=2.5

3. Save the file as a text file (.txt).

4. Open ImageConnect Properties and click Browse (at the end of the Job Codes file selection box) and select the text file.. A warning message will appear:

"File x has an old ImageConnect job file format. Do you wish to convert it? All existing job codes will be preserved." Click Yes to convert the job code file to be applied to the newest version of ImageConnect.

Note: This file may be shared with other users. If this text file is not created or modified in ImageConnect with version 2.5 to version 3.1, the entries in the text file will likely be truncated and possibly all the content lost if the user selects it as a job code file.

User Name: User Name is tracked in our Customer Reporting System (CRS) with each image that is loaded. This could be a department name or that of an individual user

Data Layer: A selectable list of the image data.

Image Layer Status: There are two settings:

Overwrite: Each new image downloaded will Overwrite or delete the previously downloaded image. This configuration is optimal for quick use. **Note:** you lose the information previously downloaded each time you click to load a new image.

Keep: Each time you request a new image, the plug-in will add a new image layer to your mapping program. This configuration will create an image history in your Saved Image Path.

Set Proxy Server: Click on this button to enter your Proxy Server information.

Dynamic Download: When checked, images are automatically retrieved for every pan or zoom change, change of projection or update of map elements. We suggest that you turn off Dynamic Download before changing Projections or making changes to the elements in your map.

Custom Projection: If you encounter a projection that doesn't appear to be supported, please contact GlobeXplorer Customer Support at (800) 417-7808 for a custom code. Once you receive this code, please enter it in ImageConnect Properties.

Using ImageConnect – Requesting Imagery

The Download a Premium Aerial/Satellite Button

Clicking on the “Download a Premium Satellite/Aerial” button brings in an image large enough to fill your screen and appropriate for the scale you are at when you request the image.

The image will show using the name ‘GlobeXplorer’. If you have your “Image Layer Status” set to “Keep”, an incremental integer or the date with a decimal number at the end will be added to each image you download (for example, ‘GlobeXplorer_1’ or ‘GlobeXplorer_20060830.12131533’) depending on the mapping program you are using. The metadata will also be downloaded with the image in the location designated as “Saved Image Path” in ImageConnect Properties.

In AutoDesk Map 3D 2007, when you request an image, it will appear as a raster layer when typing “image” in the modelspace or command line. Images will always load on the bottom of the image list. You will need to detach the previous image from this list to see the newest image. If you would like to see the image below the vector data in your view, in ImageConnect properties, in CAD Options, check the send to back option and give it a name, such as “Image” and click Ok.

NOTE: If “Dynamic Download” in the “Properties” dialog box is turned off, zooming in does not draw a new image from the server. The image is re-drawn from the same image that was stored in the “Image path” on your computer. However, the image may appear blurry or pixilated. To solve this problem you will need to request a new image or select “Dynamic Download” in the property dialog box to download a new image each time you zoom or pan.

The ImageConnect Data Library Button

Click on the Info button to display a list of imagery available at the scale and area in your current view. The checked dataset shown in the list is the default image that would be sent if you clicked on the “Download a Premium Satellite/Aerial” button. To select one of the other datasets available uncheck the pre-selected choice or click on the “Clear Selections” button and check the dataset that you want to retrieve.

Note: GlobeXplorer mosaics imagery together at seams and selecting any one dataset may not fill the view completely. Any area not covered will be black.

The data in this list has the following information:

Data Source: This is the name of the original provider of the dataset

Date: Is the Date that the image was taken. The date is shown in the format YYYY-MM-DD. In cases where the imagery was taken over a range of days or weeks due to weather the oldest date for that dataset is shown.

Resolution: Shows the maximum Ground Sampling Distance of the original dataset in Meters Per Pixel (MPP). For example 1.0m means that each pixel shown represents 1 meter on the ground in the real world. The actual resolution downloaded though is determined by the scale that you are at when you request the image and may not match the MPP listed in the resolution field. Refer to Appendix I for a table of common scales and the resolution they will give

Spatial Accuracy: This represents the positional accuracy of the image and is defined using the National Mapping Accuracy Standards (NMAS). Refer to Appendix II for a table of common accuracies. If no accuracy is stated 1:0 will be displayed.

Type: Refers to the spectrum of the imagery such as Color, Panchromatic (Greyscale/Black & White), CIR (Color Infrared)

Sorting: You can sort by any field by simply clicking on the field name. For example if you want the oldest image in the list to be on the top of the list click on the “Date” field once, to sort it with the most recent date at the top click on the “Date” field again. To sort the list click on the field that you want to sort it by.

Retrieving Images: To retrieve an image through the Info dialog box,

- First uncheck the pre-selected choice or use the “Clear Selections” button to clear any selected datasets.
- Then select the dataset that you want to retrieve by clicking on the box next to the Data Source’s name. **Note:** If you have your Image Layer Status set to Overwrite but do not want to Overwrite your previously downloaded image in this case, uncheck the “Overwrite” box.
- Click on the “Draw Selected Images” button to request the image

Custom Size Images

The Custom Size Image button allows you to download images up to a maximum of 5000 X 5000 pixels at a specified scale. These larger images can be used to create high resolution prints or to retrieve one large image to cover an area instead of downloading multiple regular sized images. Because these images can be much larger in size than a regular download it can take considerable amounts of time to generate and download images. Extremely large images may take up to 15 minutes to generate and begin downloading, though typically, images should return in just a few minutes.

In all Custom Image Size modes, you will be allowed to see a thumbnail preview of your image. This is NOT a full-sized representation of the image. It will allow you to see the color tone and extent of the data in your Area of Interest (AOI). The Preview is free and will be displayed in its own window with no geo-referencing information. The purpose of the preview is to allow you to see what the final image will look like before purchasing it. Be sure to check that the Preview meets your needs before downloading a full image. Common issues that you will want to check for is that you will receive a complete image, with no black areas or otherwise moving off the edge of a dataset, and that the color tone and balance is acceptable for your use.

The Custom Size Image Button – Data View

There are two methods of retrieving Custom Image Sizes. These are “Fill this View” and “Exact Size and Scale”.

Method 1 – Fill this View

This is the default setting for the Custom Image Size button. When “Fill this View” mode is selected, mapping window will be the boundaries of the requested image. By setting either the scale of the data or the number of pixels for the Image Width or Height, the other options will be automatically determined to completely fill your view. This is good for drawing images that cover larger areas at exact scales. Remember there is a maximum image size that can be drawn from GlobeXplorer at any one time. You will receive a warning if you exceed that limit.

To retrieve an image in the “Fill this View” mode:

- Enter either the Scale that you want your final image or the Image Width or Height that you want in pixels.
- Use the “Check Data Library” button as the data choices that you can download will change depending on the scale you are at when you request an image. The most recent data available at the scale that you want will be pre-checked.
- Ensure that the pre-checked imagery is what you want, if not choose another dataset by using the “Clear Selections” button or click on the check boxes to unselect them. Then check the boxes next to the dataset that you want.
- When all of your parameters are set, use the “Get Image Preview” button to retrieve a preview of the image. Once satisfied with the preview close the Preview window.
- Click the “Get Premium Image” button to retrieve a Custom Size Image.

NOTE: In some cases multiple datasets with the same Data Source, Resolution, Spatial Accuracy, and Type may be seen. In this case to get a complete image you will need to select both of these records. This is due to the way GlobeXplorer’s system checks for and pre-selects imagery. Use the Preview to make sure that you have all the imagery needed to make a complete image, sort the records in the dialog box to help find identical datasets.

Method 2 – Exact Size and Scale

The other option is to draw a custom image at an exact scale and/or pixel size. To select this mode simply uncheck the “Fill this View” box. In this mode the image requested will draw such that the center of your image is at the same location as the center of your view. You will be able to set your own Scale, Image Width, and Image Height in pixels. Remember that there remains a maximum image size that can be drawn from GlobeXplorer. You will get a warning if you exceed the limit.

To use the Exact Size and Scale mode:

- Uncheck the “Fill this View” box
- Enter the Scale, Image Width and Image Height that you want

- Use the “Check Data Library” button as the data choices that you can download will change depending on the scale you are at when you request an image. The most recent data available at the scale that you want will be pre-checked.
- Check that the pre-checked imagery is what you want, if not choose another dataset by using the “Clear Selections” button or click on the check boxes to unselect them. Then check the boxes next to the dataset that you want
- When all your parameters are set get a preview of the image by using the “Get Image Preview” button. Once satisfied with the preview close the Preview window.
- Click the “Get Premium Image” button to retrieve a Custom Size Image.

The Custom Size Image Button - Layout (Plot Download)

Requesting imagery in your layout works similarly to requesting a custom-sized image. In this case however the Scale is set in your layout and the Image Width and Height is automatically determined. By using the window dimensions along with the DPI that you set, ImageConnect will figure out the Image Width and Height needed. The default DPI that is used is 150 DPI. This can be changed by using the “Change DPI” button but there is still a 5000X5000 pixel limit on the maximum image size that can be drawn.

Unlike the Custom Image Size dialog box, in the Plot Download dialog box there is an area that allows you to enter a specific Filename to be used when saving your Plot image. As with the Custom Size Image interface you can retrieve a Preview and change datasets in the same way.

To download a Custom Size Image – Plot Download:

- Switch to the Layout.
- Set the page size and printer settings. This can be accessed from the “File” menu select “Print” or “Plot”.
- Set the Scale for your final print.
- Adjust your Map or Model Area on the page so that you have the correct width and height that you want for your final print.
- Click the Custom Size Image Button or Select “Download a Custom size Image” from the ImageConnect pulldown.
- If you want to change the DPI use the “Change DPI...” button. The default DPI setting is 150 dpi for normal printing.
- Select the image(s) that you want for you final image. If necessary, click the “Clear Selections” button and then check the box next to the “Data Source” you want.
- Preview the final image by clicking on the “Show Print Preview” button, once satisfied with the Preview move on to the next step.
- Enter the filename that you want used for the final plot image into the “Plot Name” box.
- Use the “Retrieve Plot Image” button to download the full plot image.

Using ImageConnect – Metadata

GlobeXplorer provides metadata with each image draw describing the requested data.

Text File

In your Saved Image Path, there is a text file that corresponds to each Image file. This is the raw metadata that is pulled from the GlobeXplorer server at the time of the image request.

XML

GlobeXplorer also provides an FGDC Metadata record in XML format. GlobeXplorer provides as much of this data as possible, including image date(s), image providers, spatial accuracy, and acquisition date. In addition to this basic image data, there is the GlobeXplorer contact information for quick and easy contact.

ImageConnect Troubleshooting Guide

FAQ:

Question: I have installed ImageConnect and entered my Client ID and License Code but all the Download image and Info buttons are grayed out.

Possible Cause: There is no vector or raster data in the view. In most mapping applications ImageConnect requires a vector or raster data layer to already be in the view to provide a set of coordinates to our server.

Question: I only have access to the Custom Download button.

Possible Cause: You are probably in the Layout. The Custom Download button is the only button available in the Layout. Switch to the Data View, Mapper or Modelspace to see the other buttons.

Question: Every time I download a new image the previous image that I downloaded disappears from my view.

Possible Cause: The “Overwrite” option is turned on in the “ImageConnect Properties” dialog box. Go to the “ImageConnect” menu and select “ImageConnect Properties”, click on the “Keep” option in the lower left section of the dialog box under “Image layer Status” and click the “OK” button.

Question: ImageConnect was installed by our System Administrator but when I open the “License Information” dialog box from the ImageConnect menu, enter my information and click the “OK” button, the mapping environment freezes up and I have to terminate it from the Task Manager.

Possible Cause: You do not have permission to write to the registry. The license information, properties and other settings are all held in the registry. If the user does not have permission to write to the registry it will lock up the mapping program.

Question: Our system administrator installed ImageConnect on to my machine and everything worked fine. However, now that I have logged in to my account, all of the ImageConnect buttons are grayed out.

Possible Cause: ImageConnect requires Administrative privileges for the user in order to run and each user must install ImageConnect themselves as information is written to the User profile section of the Registry. The person running ImageConnect needs to be given permissions to write to the registry and hard drives and needs to re-install ImageConnect while logged in as the user.

Question: When I try to download an image, the “Retrieving data from the GX server” message comes up. Once it finishes I still don’t have an image in my view.

Possible Causes:

- 1) The Saved Image Path (for example: C:\Documents and Settings\user\Local Settings\Application Data\GlobeXplorer\ImageConnectForArcMap\gximages) in ImageConnect properties has been deleted during clean up of the temp directory. This path is the local directory pointed to your pictures folder. This is the default directory that ImageConnect uses to save all of the downloaded images and supporting files to. The user may have changed this default directory. Check the “ImageConnect Properties” dialog box, accessible through the “ImageConnect” menu, to see where the images are being stored. Check that this directory does exist through “Windows Explorer”.

- 2) The user does not have permissions to write to the directory where the GX images are being stored. Some companies lock off certain directories from their users

Question: I'm getting an "Invalid Client ID/AppID" error message.

Possible Causes:

- 1) Open the "License Information" dialog box, which can be accessed through the "ImageConnect" menu pulldown. Check to make sure that the Client ID is correct and that there are no spaces or symbols in the entry box for the Client ID. Double check that the license code is correct because it is case sensitive.
- 2) Each mapping program, such as ArcView, ArcGIS, MapInfo, or AutoCAD, must be setup in our Database prior to use. If you originally ordered ImageConnect for AutoCAD but then decided you wanted to use ArcGIS also, GlobeXplorer will need to be notified. We can then add these applications to the servers to allow you access through another GIS.

Question: Images are not showing up in the mapping window but are in the temp directory.

Possible Cause: You may have turned off JPEG image support..

Question: I'm trying to load an image that is larger than 6000 pixels in either the width or the height in a custom image and it won't load.

Possible Cause: The maximum size of the image allowed to load is 5000x5000 pixels with a requirement that either the width and height not exceed 6000 pixels (ie. A request with 6001x4000 pixels will not return an image).

Question: When I try to use ImageConnect for the first time, I get an error. I have administrative rights on my computer to write to the registry and have entered in the correct license code and client id.

Possible Causes: Your ImageConnect install may have not installed correctly. Please uninstall and reinstall ImageConnect. You may also be using an unsupported version of mapping software. Please check above to see our system requirements.

Question: When I check the data library to load an image, I see duplicate dates for images. When I load one of them, I get a partially black image.

Possible Causes: These duplicates occur due to beginnings and endings of images in specific locations. You can avoid black images by checking all the images with duplicate dates in the list and ImageConnect will load in a mosaic of the images.

Question: I'm having difficulty loading images with the correct resolution.

Possible Cause: Please zoom to the appropriate zoom level according to the resolution you are trying to load and load the image. Please refer to Appendix I for the scale to resolution table for reference.

Question: I can only load low resolution imagery when I am really zoomed out.

Possible Cause: To avoid hefty loading wait times and see high resolution imagery optimally, ImageConnect requires a user to be zoomed in relatively closely to street level to load high resolution images (1 meter and better). To see a larger coverage area of high resolution imagery, zoom in, choose "Keep" in ImageConnect Properties, load the image, pan over and load an adjacent image.

Projections:

GlobeXplorer now supports many of your own custom projections along with the “Predefined” projections available by default. If you define your own custom projection, ImageConnect will read the parameters that you have set for your coordinate system and send them to our servers when the request is made. Our servers then re-project the imagery to your coordinate system before sending the images to you. Because of the multitude of projections available globally there may be some projections that are not supported. If you run into a projection that is not supported please contact GlobeXplorer Customer Support, imageconnect@globexplorer.com.

Proxy Servers:

Communication problems with the ImageConnect servers are most often caused by proxy server problems. A proxy server separates an internal network from the outside world to ensure security and administrative control. Read the section titled “Information on Proxy Server” to determine if your organization uses a proxy server or ask your IT manager. The proxy server’s parameters in the “Properties” dialog box should either be completely blank for no proxy server or have the server in terms of IP or NAME and COLON PORT such as **10.1.10.1:4321** or **proxy.company.com:2371**. In addition you may be required to enter your username and password.

Account Information:

Your account is established through a number of pre-set factors that include: **Client ID** (your master account), **License Code** (Seat or Metered), **AppID** (indicating the type of mapping program you use ImageConnect in), **Term of Contract** (the length of your contract), and **Layerstack** (The data you’ve subscribed to). These settings should all be established automatically. If however, you are not able to receive imagery and everything appears to be set up correctly, please contact Customer Support to make sure that the Extension and the Service are in agreement about your access status.

Information on Proxy Servers:

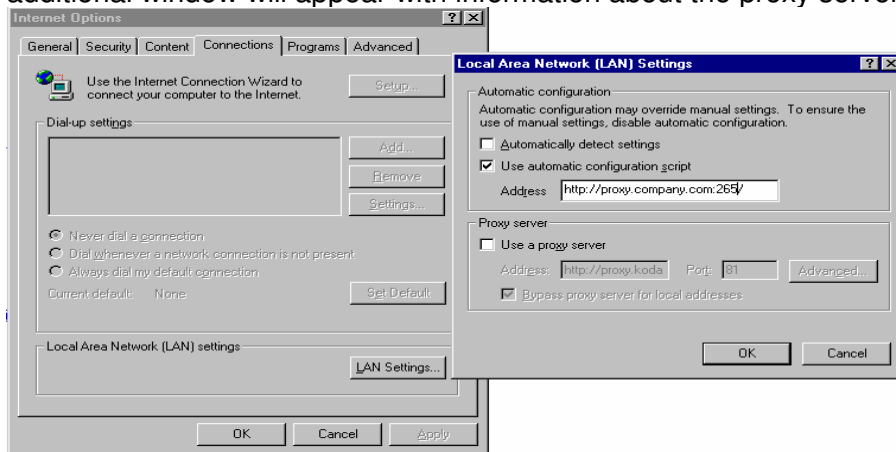
In an enterprise that uses the Internet, a proxy server is an intermediary between a workstation user and the Internet so that the enterprise can ensure security and administrative control. A proxy server is associated with a gateway server that separates the enterprise network from the outside network and a firewall server that protects the enterprise network from outside intrusion.

If you are not sure if your enterprise is using a proxy server or to find out the server name, port, username and password, here is what you should do:

Using Internet Explorer

Go to “Tools” in the menu bar and select “Internet Options.” In the upper tabs, select “Connections” and then “LAN Settings...” at the bottom right corner of the window. An

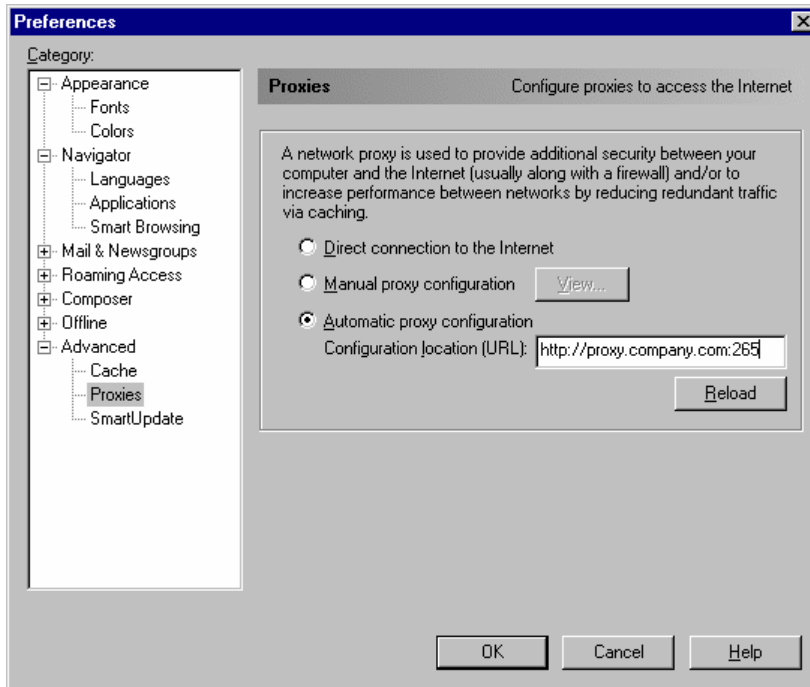
additional window will appear with information about the proxy server.



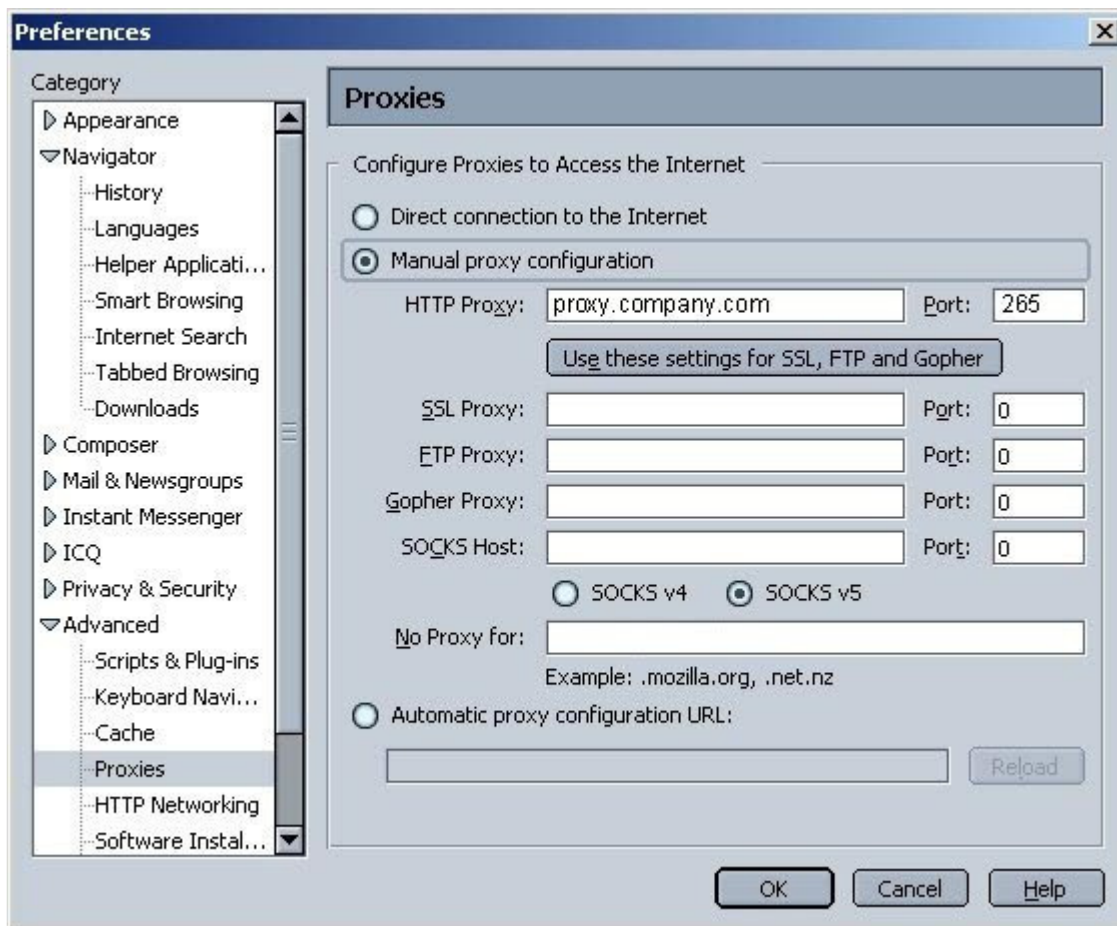
If you are not using a proxy server, the address field should be blank and you do not have to enter any information in the “Set Proxy Server...” dialog box. If you are using a proxy server, its name and port are reported in the address field. In this example, the name of the proxy server is “proxy.company.com”. The port of the proxy server is “265”. If this still isn’t working for you, try eliminating the ‘http://’ part of the proxy name.

Using Netscape

Go to “Edit” in the menu bar and select “Preferences”. A new dialog box will appear on your screen. In the left menu, select “Advanced” and then “Proxies”



If you do not use a proxy server, a check mark will be placed in front of “Direct connection to the Internet”. In this case, you do not have to enter any information in the “Set Proxy Server...” dialog box. If you use an “Automatic proxy configuration”, the proxy server name and port are reported as “proxy.company.com” and “265” respectively. If you use a “Manual proxy configuration” that option will be checked and the settings will be shown in there.



With a manual proxy configuration, the server name is reported in the field titled “HTTP” and the port number is located to the right of the server name. In this example, the name of the proxy server is “proxy.company.com”. The port of the proxy server is “265”

Proxy Server Username and Password

If you use a proxy server, it is likely that you also use a username and password to access the Internet. This username and password is requested by Internet Explorer or Netscape every time you access the Internet. You will need to enter the same user name and password into the “Set Proxy Server...” interface in the “ImageConnect Properties” to give you access to the Internet. You may need to delete “<http://>” from the proxy server username to connect to our server.

If you do not use a username and password, leave the corresponding fields blank.

ImageConnect – Appendix I

These values are approximate and may change depending on what Latitude you are at when you request the image.

Scales and Corresponding Resolution or Ground Sampling Distance (GSD)

Scale	Resolution - Meters	Resolution - Feet
1:575	0.1521	0.50
1:1152	0.3048	1.00
1:2304	0.6095	2.00
1:3780	1	3.28
1:7560	2	6.56
1:18900	5	16.40
1:37800	10	32.81
1:56700	15	49.21
1:94500	25	82.02
1:113400	30	98.43
1:189000	50	164.04
1:378000	100	328.08
1:1890000	500	1,640.42
1:3780000	1,000	3,280.84

The table above shows common resolutions used. You can determine Meters Per Pixel for any Scale by simply dividing the Scale by 3,780, the value of 1 Meter Per Pixel. You can also find the Scale necessary to retrieve imagery at a certain Meters Per Pixel by multiplying the Meters Per Pixel that you want times 3,780.

For Example:

To find the Meters Per Pixel for 1:1200 scale:

Divide the Scale by the conversion factor of 3,780

$$1200 / 3780 = 0.31746 \text{ Meters Per Pixel}$$

Multiply Meters times 3.28084 to get Feet Per Pixel

$$0.31746 \times 3.28084 = 1.0415 \text{ Feet}$$

To find the Scale needed to retrieve imagery at a 4 Foot Per Pixel:

Divide by the conversion factor of 3.28084 to get Meters Per Pixel

$$4 / 3.28084 = 1.219 \text{ Meters}$$

Multiply meters times the conversion factor of 3,780

$$1.219 \times 3,780 = 4608$$

So use a Scale of 1:4,608 to get 4 Foot Per Pixel imagery

Remember there is a limit on the Per Pixel resolution you can get. You will not be able to get a Per Pixel resolution that is better than what the Per Pixel resolution of the original dataset is. For example you will not be able to get 1 Meter Per Pixel imagery from a 15 Meter dataset.

ImageConnect – Appendix II

The National Map Accuracy Standard (NMAS) define the requirements for meeting horizontal accuracy as 90% of all measurable points must be within 1/30th of an inch for maps at a scale of 1:20,000 or larger, and 1/50th of an inch for maps at scales smaller than 1:20,000. The table below shows the standard for some common map scales.

Table of Common Scales and Corresponding Accuracy (NMAS)

Scale	Engineering Scale	National Map Accuracy Standard
1:1,200	1"=100'	+/- 3.33 feet
1:2,400	1"=200'	+/- 6.67 feet
1:4,800	1"=400'	+/- 13.33 feet
1:9,600	1"=800'	+/- 26.67 feet
1:10,000		+/- 27.78 feet
1:12,000	1"=1000'	+/- 33.33 feet
1:24,000	1"=2000'	+/- 40.00 feet
1:63,360	1"=one mile	+/- 105.60 feet
1:100,000		+/- 166.67 feet