CADtoEarth™ for Autodesk® Revit®
User Guide

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Welcome to CADtoEarth

This document contains guidelines aimed to describe the formal steps of how to use CADtoEarth™ for Autodesk® Revit® with CADtoEarth web application. It provides help materials that assist you in using all application and technology demonstration functions.

What is CADtoEarth

CADtoEarth is a family of innovative technology demonstrations of linking popular CAD modeling software packages with Cesium®, a geospatial 3D mapping platform.

The solution offers various functions, including an ability to:

- Upload a model directly from a modeling session into Cesium.
- Import a section of the Earth surface directly from Cesium into a modeling session.
- Position a 3D structure on the imported surface within a modeling session and subsequently upload it back to Cesium.
- Perform the same operations on 2D objects in a modeling environment and Cesium.

CADtoEarth for Autodesk Revit

Introduction

CADtoEarth for Autodesk Revit is a technology demonstration of establishing a bidirectional connection between Autodesk Revit and Cesium. Using the Forge platform, CADtoEarth is integrated with Autodesk360 cloud service allowing users to better collaborate on projects.

With CADtoEarth for Autodesk Revit, you can:

- Import a surface section from Cesium into the Revit modeling session.
- Get information about the building layer from Cesium.
- Place the selected 3D structure on the imported surface in Revit modeling session, and then upload it back to Cesium.
- Upload a 3D structure directly from the Revit modeling session into Cesium.
- Convert a 3D structure to 3D PDF.
- Log in using Facebook, LinkedIn, Google or Autodesk credentials.
Requirements

CADtoEarth for Autodesk Revit requires the following software to be installed:
- Windows 7, 8.1, or 10
- Autodesk® Revit® 2019

Getting Started

To get started with CADtoEarth for Autodesk Revit, launch Autodesk® Revit® 2019, select a Revit model, and click the CADtoEarth AddIn tab on the Revit ribbon.

User Interface

The CADtoEarth AddIn tab contains a toolbar with the following buttons: Log In/Out, CADtoEarth Site, Export Model, Get Surface, About (see Fig. 1).

![Figure 1.](image)

Log In/Out

CADtoEarth implements a client-server system, where CADtoEarth AddIn is a client that sends a request to the server that returns a response. To communicate, you need to log in to CADtoEarth AddIn with your account credentials.

To log in
1) Click Log In (see Fig. 2).
2) Enter your username and password.
3) Select the Remember me checkbox if you want to automatically log in to the CADtoEarth AddIn every time you open Autodesk Revit.
4) Click OK.

Note: If you don’t have an account, go to the Don’t have an account? link to sign up.
To authorize with Facebook

1) Click the Facebook button.
2) In the Facebook Log in dialog (see Fig. 3), enter the email or phone number and password for your Facebook account.
3) Click Log In.
To authorize with LinkedIn
1) Click the LinkedIn button.
2) In the LinkedIn Log in dialog (see Fig. 4), enter the email or phone number and password for your LinkedIn account.
3) Click Sign In.

Figure 4.

To authorize with Google
1) Click the Google button.
2) In the Sign in with Google dialog (see Fig. 5), click Next.
To authorize with Autodesk

1) Click the **Autodesk** button.
2) In the **Autodesk Log in** dialog (see Fig. 6), click **Allow**.

*Figure 5.*
Once you logged in, the other CADtoEarth AddIn buttons will be enabled and you will have the full access to the CADtoEarth features (see Fig. 7).

**Figure 6.**

**Figure 7.**

**CADtoEarth Site**

Click the **CADtoEarth Site** button to display the CADtoEarth web application in a new tab of the web browser (see Fig. 8).
Export Model

The Export Model button is used to export the currently opened model in Revit to Cesium and upload the resulting file to the CADtoEarth cloud service.

To export a model

1) Click Export Model (see Fig. 9).
2) Fill in the Longitude and Latitude fields with certain values to bind the origin of the model to some geographical location.

Note: By default, the Longitude and Latitude fields are set to 0. Leave them as is to choose the model location on the Earth after export.
3) Select the **Upload the model on the server after export** checkbox if you want to automatically upload the generated file directly to the CADtoEarth cloud service. Leave the **Upload the model on the server after export** checkbox deselected if you want to save the resulting .gltf file on your computer without uploading it to the CADtoEarth cloud service.

4) Enter a model name in the **Model name** field.

5) Click **OK**.

### Get Surface

One of the unique features of CADtoEarth is the ability to import certain parts of the Earth surface into CAD application.

Click the **Get Surface** button and follow the instructions given in the Drawing mode section.

Once everything is done, a part of the Earth surface captured using the CADtoEarth task pane tools will be imported into the current Revit modeling session (see Fig. 10).
If some curves were sketched in Cesium prior to surface capturing, those curves will be brought in along with the surface, which may be useful, for example, to bring the outlines of buildings along with the surfaces they are located on.

About
The **About** button opens a dialog with information about the current version of CADtoEarth for Autodesk Revit and the link to the website of the technology developer (see Fig. 11).
CADtoEarth web application

Introduction

The CADtoEarth web application allows you to:
- Capture a certain part of the Earth surface from Cesium.
- Provide a personal storage for every CADtoEarth account, where the 3D models will be placed.
- Provide a set of tools that will help you manage your 3D models. You can move, rotate and scale your 3D structures to fit the surrounding area.
- Share your 3D models with other CADtoEarth users.
- Choose the models to be placed at startup. It can be useful when you work with a set of 3D models.
- Generate PDF with 3D model(s).

Integrated with Autodesk Forge and Google Drive, it provides more opportunities for managing your own data.

Requirements

To run the CADtoEarth web application, you will be required to have Internet connection and a web browser.
Right now, CADtoEarth supports the following web browsers:
- Mozilla Firefox 67.0 or newer
- Google Chrome 73.0 or newer

Getting Started

To start working with the CADtoEarth web application, sign up for a CADtoEarth account to link up your CAD environment to Cesium.

The account is completely free. To register, follow the steps below.

1) In the browser address bar, type [https://cadtoearth-advanced.amcbridge.com](https://cadtoearth-advanced.amcbridge.com)
2) In the Registration dialog, click Sign Up (see Fig. 12).
3) Enter your email, password, first name, and last name into the form.
4) Select the I agree Data Privacy Policy checkbox.
5) Click Sign Up to complete the registration.

**Note:** Enter your email to be able to recover your account if you forget the account credentials. We require no personal information to simplify the account creation experience.

6) Once signing up is finished, enter your credentials, and click Sign In (see Fig. 13).
Note: You can also register to the CADtoEarth web application using your Facebook, LinkedIn, Autodesk, and Google accounts.

Cesium task pane

The application provides access to Cesium, a cross-platform virtual globe for visualizing dynamic data in space.

Click the expand icon on the left to see the Cesium task pane. It consists of the Storage, Model control, Drawing mode, Upload model tabs and the Create 3D PDF button (see Fig. 14).
After exporting, the models will be uploaded directly to the CADtoEarth server. You can view the uploaded models either in the Private storage (Private folder) or in the External one (Autodesk, Google Drive).

By default, the storage is determined by the platform you choose to sign in to the site. However, you can easily change it.

**Private storage**

If you sign in with your personal account credentials, via LinkedIn or Facebook, all data will be automatically saved to your private folder. In the Private storage you will find the list of models that were exported or uploaded by you. The total storage size provided for each user is limited to 100Mb. The uploaded data is stored for 1 month since the moment of uploading. If it is not relocated to any available external storage, it will be removed.

**External storage**

If you sign in with your Autodesk or Google account credentials, all data will automatically be saved to the External storage which is represented by Autodesk Forge and Google Drive. Moreover, you can move your projects from the Private storage into the External one.
To do this, right-click a particular model on the list -> **Move to external storage** -> Autodesk/Google Drive (See Fig. 15).

*Figure 15.*

**Model control**

When a particular model is selected, double-click it, and Model control will be enabled (see Fig. 16).

*Figure 16.*
Model control allows you to interact with the model using the following buttons (see Table 1).

**Table 1: The Model control buttons**

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Icon" /></td>
<td>Enables you to move the model to different sides along the selected surface. <strong>Tip:</strong> Click any arrow to move the model to a certain distance. Click and hold any arrow to drag the model along the surface.</td>
</tr>
<tr>
<td><img src="image2" alt="Icon" /></td>
<td>Enables you to change the model scale.</td>
</tr>
<tr>
<td><img src="image3" alt="Icon" /></td>
<td>Enables you to change the model angle.</td>
</tr>
<tr>
<td><img src="image4" alt="Icon" /></td>
<td>Enables you to change the model attitude.</td>
</tr>
<tr>
<td><img src="image5" alt="Icon" /></td>
<td>Enables you to save the model after modifications.</td>
</tr>
<tr>
<td><img src="image6" alt="Icon" /></td>
<td>Enables you to reset parameters of the model.</td>
</tr>
</tbody>
</table>

**Drawing mode**

The Drawing mode is a specific mode that allows you to select a certain surface for its further export to the Revit modelling session (see Fig. 17). The Drawing mode is available when the altitude is not higher than 740 meters.
Once the Drawing mode is turned on, the drawing tools will be enabled (see Table 2).

Table 2: The drawing tools

<table>
<thead>
<tr>
<th>Icon</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>Add</td>
<td>Enables you to add another polyline.</td>
</tr>
<tr>
<td></td>
<td>Edit</td>
<td>Enables you to edit.</td>
</tr>
<tr>
<td></td>
<td>Undo</td>
<td>Enables to undo the previous change.</td>
</tr>
<tr>
<td></td>
<td>Close polyline</td>
<td>Enables you to close polyline.</td>
</tr>
<tr>
<td></td>
<td>Clear</td>
<td>Enables to clear all polylines from the Earth.</td>
</tr>
</tbody>
</table>

To draw a surface, follow the steps below (see Fig. 18).

1) Enable the Drawing mode.
2) Select the starting point of the surface and draw three curves in a form of a square. The fourth curve will be drawn automatically when you click Close polyline.
3) Select the Building layer information checkbox to see the buildings located on the selected
surface.

**Note:** If there are more than 100 buildings on the selected surface, the information on building layer won’t be displayed.

4) Click **Save surface**.

![Figure 18](image)

**Upload model**

Using this tab, you can upload a particular .gltf or .glb file containing a model from your computer (see Fig. 19).
To upload a model, follow the step below:

- Specify **Latitude** and **Longitude** of the desired location or leave these fields empty to select the location later.
- Enter a file name.
- Select the storage for a model from the drop-down list.
- Click **Choose file** to select a model.
- Click **Upload**.

Once the model is uploaded, it will be reflected in the project tree.

To place it on the Earth

1) Right-click the model in the project tree.
2) Select **Place model**.

**Create 3D PDF**

You can easily convert the resulting 3D view into 3D PDF using the **Create 3D PDF** button. Once you captured the surface, click **Create 3D PDF**, and the surface with placed 3D buildings will be converted into 3D PDF.

**Note:** Only 3D models generated by the family of CADtoEarth technology demonstrations could be converted into 3D PDF.
About AMC Bridge

AMC Bridge is a vendor of choice for software development services in the areas of computer aided design, engineering, manufacturing and construction. Since 1999 we have been delivering solutions for CAD, CAE, CAM, PDM, BIM and PLM applications. For over 15 years we have participated in the development of commercial software products and custom solutions for the engineering markets based on the variety of platforms from desktop and web to mobile and clouds.

AMC Bridge helps to improve engineering process overhead by the development of 3D and 2D modeling software products, data, document and community management technologies, CAD data interoperability, and many other aspects of software development for the engineering markets.

Feel free to use wide experience of AMC Bridge team to find out all features and intricacies of software development process. Contact us any time and we will do our best to turn your ideas into reality.

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