WorkLink Create Manual

Browser based Version

Updated: February 2022

For use on Premise, Cloud and as a Standalone deployment.

contact: support@scopeAR.com

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OVERVIEW

Scope AR

SCOPE AR is focused exclusively on bringing the benefits of augmented reality to industry. By bridging the gap between the most advanced computer vision technologies and the best wearable and mobile hardware devices, we provide industries with useful AR solutions that save them time and money by increasing comprehension and maximizing efficiency. In addition, through WorkLink, we are committed to creating the best tool possible to make the creation of these solutions a possibility for anyone. Our goal is the simplification of this process to the point where users can create WorkLink instructional content as easily as PowerPoint™ users can create presentations.

The New WorkLink Create

The new WorkLink Create is the successor to the Unity-based WorkLink Create (WorkLink Authoring Platform). The user can create similar Work Instructions with the new Create as the user could with older Unity-based Create, The content can be consumed on the WorkLink apps available on app stores or directly from the Scope AR CMS.

We developed this software to deliver three fundamental values:

- Get authors productive quickly and intuitively
- Gain powerful control over the knowledge lifecycle
- Author painlessly directly from source CAD files.

WorkLink Implementation
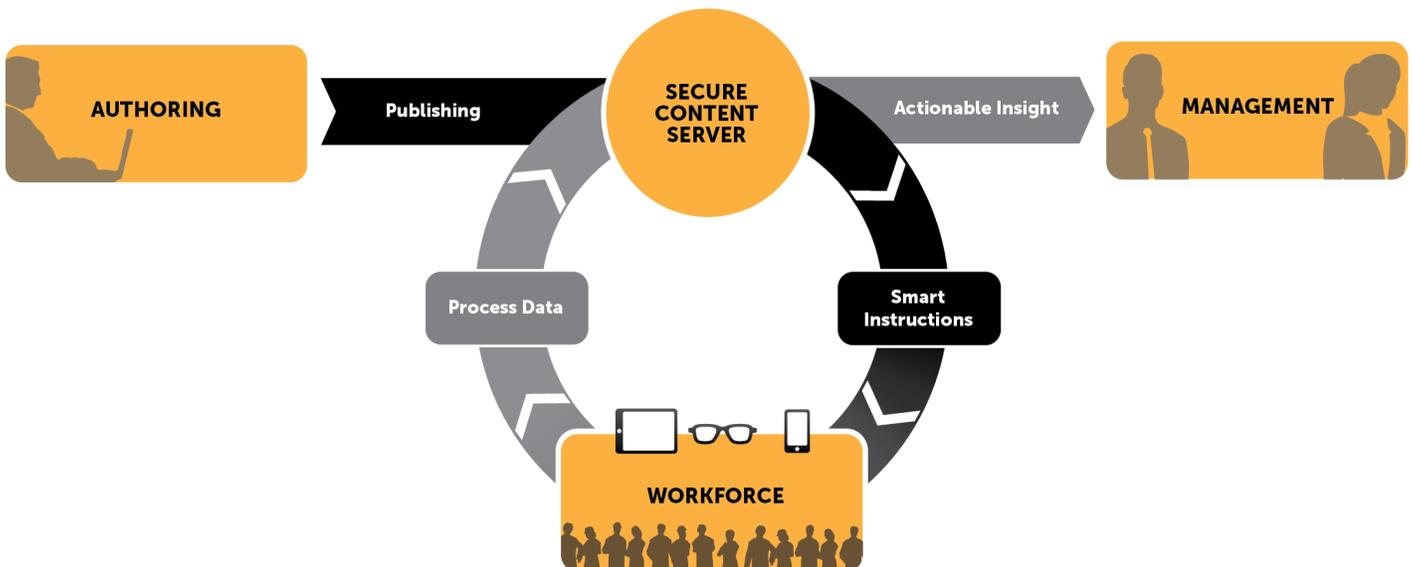
The implementation of WorkLink follows the model illustrated above.

Authoring: Existing instructions and information, usually paper instructions, photos, videos and CAD models, are used to create Smart Instructions using the New WorkLink Create Platform.

Publishing: Once ready for use (or testing), the Smart Instructions can be immediately published to the Secure Content Server, which can be accessible via the internet or restricted to intranet (behind a firewall)

Workforce Access: These Smart Instructions are now available to any authorized personnel running any compatible device (essentially any smart device with a camera)

Process Data: As the workforce executes the instructions, extensive information is generated, both active (data entry, photos) and passive (date/time, location, time per step) and passed back to the server.

Insight: This information is formatted and made available to process management, to assist in everything from inventory control to process improvement.

Technology

The new WorkLink Create Platform is the successor to the Unity-based WorkLink Create. Just as its predecessor, this improved version was developed to dramatically simplify and accelerate the development and distribution of augmented reality instructional content. In order to execute AR content, two components are required.

- **System Configuration/Setup**
    - 8GB of RAM (16GB recommended)
    - Graphics card with at least 1GB of VRAM (discrete hardware acceleration recommended)
    - A Chromium-based browser:
        - Google Chrome (recommended)
        - Microsoft Edge version 80+ (latest version)

Tips for optimum performance

Browser hardware acceleration activated. Visit this site for instructions on how to enable hardware acceleration in Chrome. macOS machines (especially MacBooks) prefer to use the integrated GPU to save battery, and often won't switch to the discrete GPU automatically. To manually make the switch on MacOS platforms, please install and use the gfxCardStatus app, available at https://gfx.io/

- **Content Delivery Device**

This is the device that the end-user will be holding (or wearing) when they access the instructional content. WorkLink supports recent iOS devices (iPhones and iPads) as well as most recent Android devices, including smart glasses such as the Microsoft HoloLens. The platform can be adapted to support new devices if/when necessary, although new releases of iOS and Android devices generally do not require any specific support. Published content is accessed on devices via the WorkLink application. Users can access their published modules by logging in and downloading their instructions over the internet or private network, or by transferring the content via direct connection from the authoring computer to the device (for those operating in 'locked down' network environments).

Browser Compatibility

The new WorkLink Create is compatible with Google Chrome, Microsoft Edge, Firefox and Safari browsers.

USER INVITATION AND LICENSING

Invitation

Scope AR Admin can invite users to the new WorkLink Create platform by assigning them the required License on the Scope AR Customer Portal.

For companies who have integrated their SSO to Scope AR, the company's Scope AR Admin can choose to add users rather than inviting them.

Visit articles: What does SSO mean? and What is the difference between "adding" and "inviting" a user? for more information.

Accepting Invitation

Invited users must accept an invitation to access the WorkLink Create Platform.

Required License for WorkLink Create

The WorkLink Author license is required to use WorkLink Create.

- ● WorkLink Author License allows the user to create and publish projects on WorkLink Create. The licensed user can also view projects on the WorkLink App.

- ● WorkLink Viewer License allows the user to view projects on the WorkLink App but the licensed user cannot create or publish projects on WorkLink Create.

ACCEPT YOUR INVITATION

Hi Scope AR Support,

Scope AR Support has invited you to use WorkLink.

To get started you must first accept your invitation.

If you would like to learn more, please contact Scope AR at support@scopear.com.

Accept Invitation

Visit article: Licensing and License Management for more information.

THE WORKLINK CREATE ENVIRONMENT

The WorkLink Create Interface

The new WorkLink Create introduces a refined User interface. Authors no longer need the Unity Software to create and publish work instructions on the new WorkLink Create Platform. See the WorkLink Create Window Menu for more information.
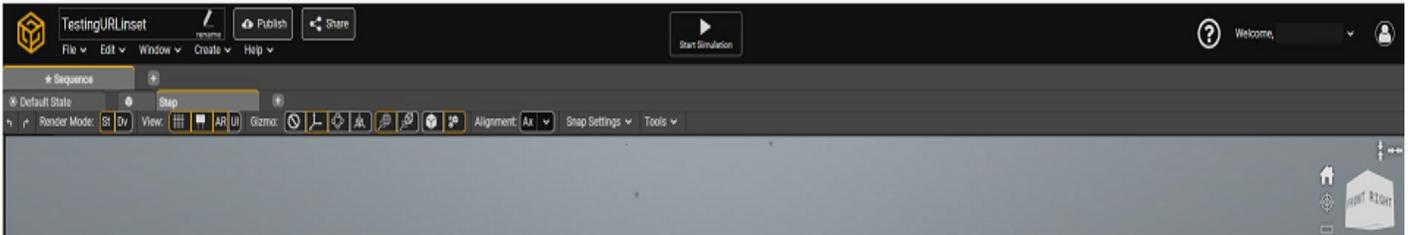
Creating and/or Opening a New Project

Related Article: How to create and open a Project/Scenario.

Creating a New Project:
- From the welcome screen, navigate to "New Project" on the top right hand corner of the screen to create a new project. Users can still create a new project from within any project using the "File" drop down menu.

Opening a Project:
- From the Welcome screen, users can create a new project, open existing projects, upload a project, access YouTube videos, Help Center, Contact Support and view updates on bugs/fixes and releases. To open an existing project, double click the project and choose to open a newer Auto-save version or a manually saved version. You can also right click and select "**Version History**" to choose a specific version of the project to open.
  Learn more: Welcome Screen - Overview.
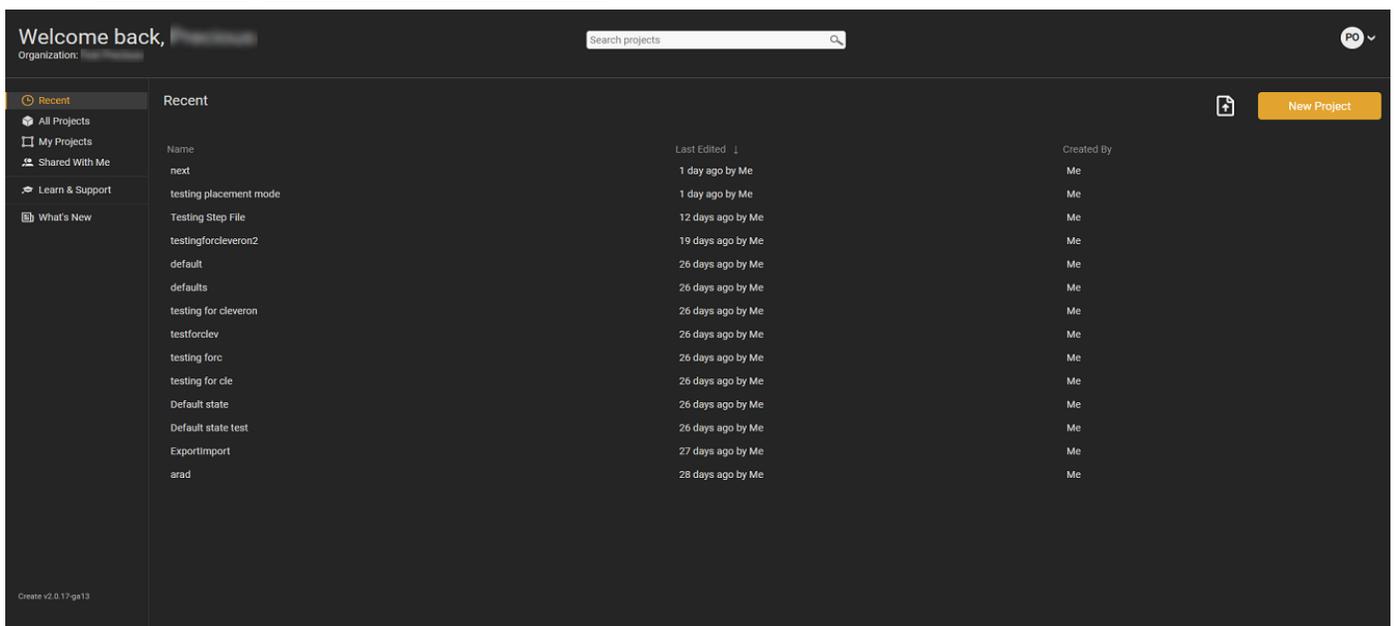
<u>Available Tabs</u>
- Recent - Shows a list of recent projects (Name of project, last edited date and the author)
- My Projects - Shows a list of all your projects and the last edited date.
- Shared with me - Shows a list of projects shared with you by other authors.
- Learn & Support - Shows shortcuts to YouTube Videos, Help Center and Scope AR Support.
- What's New - Shows details of Product releases and Known issues and fixes.
- New Project - To create a new project - Click on "New Project" (Top right hand side of the window)
- Upload Project - Click on the Upload icon (Top right hand side of the window)

<u>Others</u> -
- Application version is below (Left hand side of the window)
- Your username and Organization name is is above (Left hand side of the window)
- To sign out, click on the drop down icon beside your initial (Top right hand side of the window)

Saving and Loading a Project

Users can save and load the projects to a scene by selecting "Save" and "Open" from the "File" drop down menu.

"Save" saves the current state of the Project while "Open" loads a different project onto the scene.

By default, projects are auto-saved every 10 minutes. A user can enable or disable this setting by clicking the 🔲 button on the bottom right side of the scene..
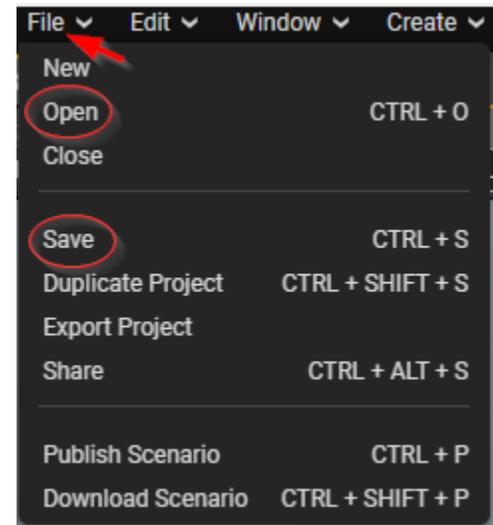
Publishing

Content is viewed on devices via the WorkLink application.

There are two methods of publishing, Online and Offline.

Online Publishing allows content delivery through connection to the **Scope AR Content Management System** (CMS). Once this is accomplished, modules can be added and updated via the internet.
- To publish a project online, click on the "File" drop-down under the project name and select the "Publish Project" option or click on the "**Publish**" button

Offline Publishing allows content installation via cable connection between the new WorkLink Create Platform and the delivery device.
- To publish a project offline, click on the "File" drop down under the project name and select "Download Scenario". This option will download the .scope file, which can be sideloaded on the device.
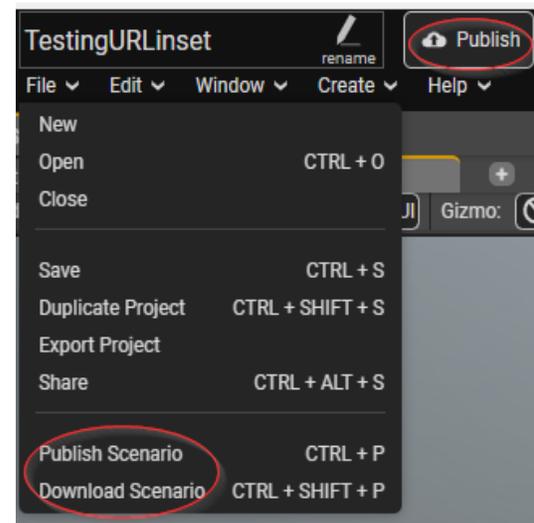
Both methods require that the WorkLink app be installed on the delivery device being used. The WorkLink application is available for free on the Apple App Store, Google Play store and the Microsoft Store.

Visit articles: Online Publishing and Offline Publishing for more information.

THE WORKLINK CREATE WINDOW MENU

The image below provides a reference for the various windows and areas you will need to know as you proceed to work with the software. Please refer to it as needed.
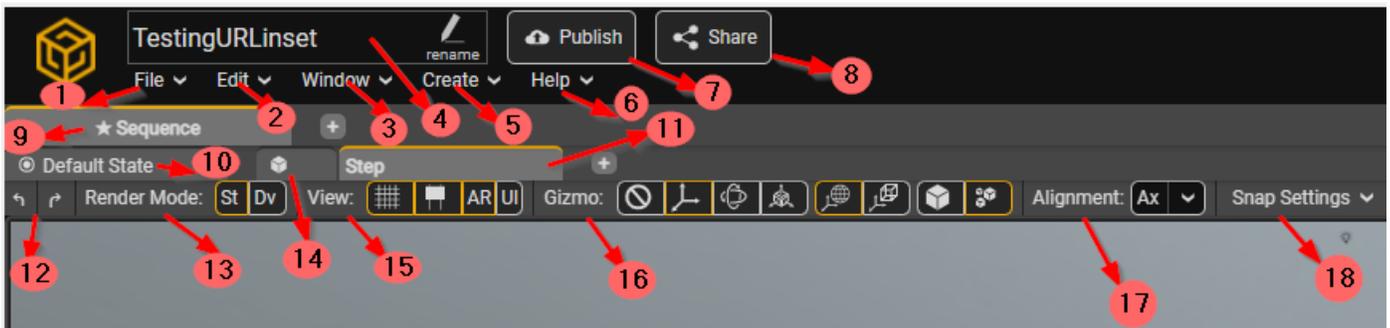
1. File Menu	8. Share	15. View Settings
2. Edit	9. Sequence	16. Gizmo
3. Window Menu	10. Default State	17. Alignment
4. The Project name	11. Step	18. Snap Settings
5. Create	12. Back/Forward button	
6. Help Menu	13. Render Mode	
7. Publish	14. Content Placement Step	
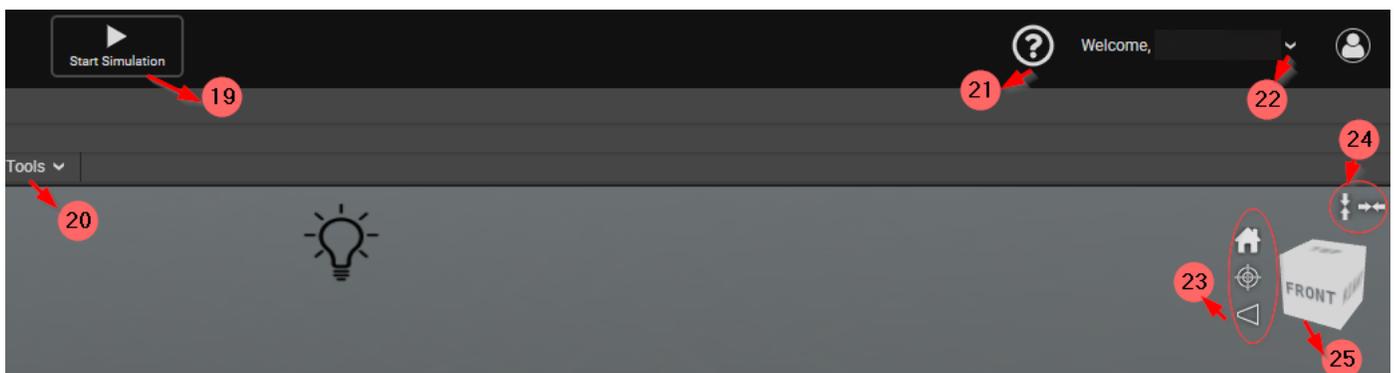
19. Tools	23. Scene camera/focus selection/perspective projection	25. Marquee selection
20. Start/Stop Simulation		
21. Start Tour button		
22. Sign Out	24. Split Scene View	

WorkLink Create Menu Options

The File Menu

The File menu allows you to create, save, load, export, publish and close projects.

- **New**: Clicking on this sub-menu overrides already open projects to create a completely new one. You can also create a new project from the Welcome screen.

- **Open**: Click to open a previously saved project from a list of existing projects.

- **Close**: This option allows you to close the project in order to return to your project list.

- **Save**: This option allows the manual saving of a project. Different versions of a project are saved when an author saves while working on a project. All projects are auto-saved every 10 mins, you can disable this option.

- **Duplicate Project**: This allows you to create a duplicate version of your project. Feel free to rename the duplicate copy.

- **Export Project**: Click to download all assets of your project.
  Export type can be shallow, lightweight or full export. Learn more: Exporting and Importing your project.

- **Share**: This allows you to share your project with other authors in your group or company.

- **Publish Scenario**: Click to publish your project online to the WorkLink App. (If applicable, select recipient group(s) before confirming.)

- **Download Scenario**: Click to download current project as a publishable offline file (.scope file). This is for offline publishing.
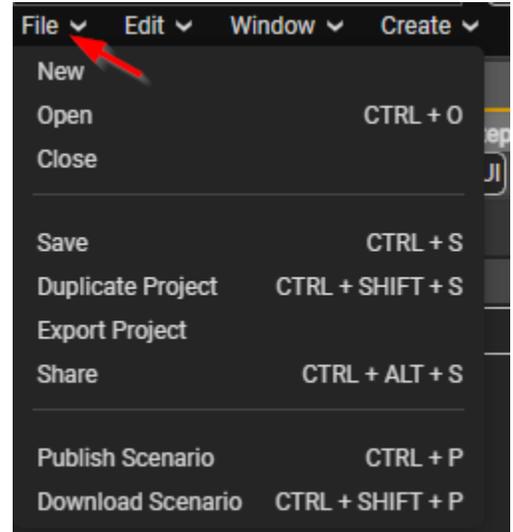
Edit

The Edit button can be used to make quick modifications to your project.
- **Delete Unused Materials**: Click option to delete unused materials from your project.
- **Preferences**: Click option to adjust or customize General settings and Timeline, Object Properties and Keyboard Shortcuts.
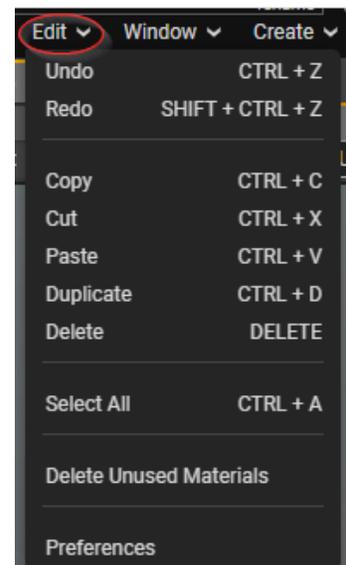
The Window Menu

The Window menu provides easy access to the sub menus available in the WorkLink Create Interface. Once selected, a sub menu window can be dragged and docked anywhere on the Scene.

- **Asset Library** - This allows an author to upload, rename and delete assets/files from your project.You are able to sort the Asset Library list alphabetically using the sort icon on the top left corner of the Asset Library window. **Note**: When you delete a model from your project, the materials remain in the Asset Library. You can remove these materials from the Asset Library by clicking on "Generated Scenario Assets">>Right Click "Materials">> "Delete Unassigned Materials".

- **Object Groups** View - This is used to categorize objects in the Step Hierarchy into groups in order to animate them as well as to define their visibility within the Object Properties.

- **Revisions Editor** - This is used for CAD file/model conversions and revisions. Also known as Object optimization. You can see how deep a hierarchy is and how many objects are displayed under Asset Revision. Go to "Revisions Editor">>Select Mode>>Confirm>>Base Revision>>Advanced >>Expand Object to view the total number of descendants of the node and its hierarchy level. Also see Advanced Revision Editor.

  Meaning of related symbols :
  - ■   ▚ - The hierarchy Level of this node
  - ■   ▲ - The total amount of triangles in this node and all of its descendants
  - ■   ♯ - The total number of descendants of this node

- **Step Hierarchy** - This is a tree-like structure that helps the software decide how to link up objects and some of their parameters through a parent and child relationship. It shows how many descendants each object has. **Note**: You can reset to the default the hierarchy of a step that has been modified.

  Meaning of related symbols :
  ▲ - The total number of triangles in this node and all of its descendants.
  ♯ - The total number of descendants of this node.

- **Checklist Editor** - The Checklist editor allows an author to feature a checklist item (text, checkbox, number, photo, multiple option, Yes/No or barcode) in a project. The priority can be set to passive, force view or must respond. This data is available on the CMS.

- **Sequence Editor** - This shows you the full map of your projects, as well as the contents of any given sequence in your project.

- **Timeline Editor** - This allows the editing of 3D content for each step, this includes creating timeline animations. You can edit, copy and delete multiple timebars, objects and channels at once.

- **UI Editor** - This allows an author to design the project templates and provide relevant contents for each step of the project.

- **Object Properties** - This lists all the components and properties of an object and allows you to edit their values. **Note**: You can copy the object properties elements of an object and paste for another by simply right clicking the specific properties bar to copy/paste.

Window ⌄	
Asset Library	ALT + L
Object Groups	ALT + G
Revisions Editor	CTRL + ALT + R
Step Hierarchy	ALT + H
Checklist Editor	ALT + C
Sequence Editor	ALT + S
Timeline Editor	ALT + T
UI Editor	ALT + U
Object Properties	ALT + P
AR Trackers	ALT + A
Action History	CTRL + ALT + H
Close All	ALT + 1
Collapse All	CTRL + SPACE
Reset Layout	ALT + 0

- **AR Trackers** - The AR Trackers view is used to create new or locate AR trackers on the scene. Learn more about Image Tracking.
- **Action History** - This tracks all your actions on the scene making it easy to go back to previous actions.
- **Close All/ Collapse All** - "Close All" will close all opened sub- menus while "Collapse All" will minimize the sub menu windows.
- **Reset Layout** - Reset Layout allows the automatic pop out of closed windows for Object Properties, Step Hierarchy, Timeline editor and Asset Library on the scene.

The Project name

The project name is the title of your project/work instruction. A user can provide a name while creating a new project or allow the system to auto-generate a project name.Click on the "pencil" icon beside the project name to rename it. You can also rename a project from the "Welcome Screen" by right clicking the project>Rename. Learn more about naming and renaming a project.
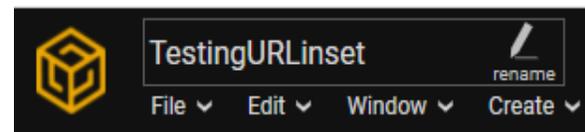
Create

Create allows you to create objects/primitives. Click on "Create" to add the following to the scene: AR Tracker, Empty Object, directional light, audio source, camera, 3D Text, Video Panel and 3D objects. To enable Interactive Mode for your project, the camera added to your project must be enabled using the button "Use for Interactive Mode" in Object Properties. Use "Start Simulation" to see how the object will be displayed on the app.
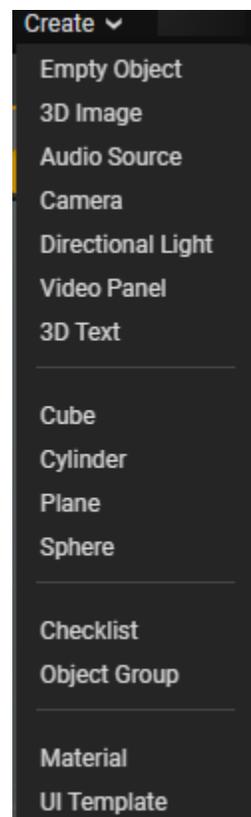
Help Menu

Use the "Help" menu to stay up to date with release notes on new features, improvements and fixes. Click on "Contact Us" to create a Support ticket.

Publish

The publish button allows you to publish your finished project online real time. Upon successful publishing, you can log into the WorkLink App on any supported device to view your project. You need the WorkLink Author or Viewer license to access a published project on the WorkLink App.
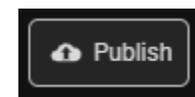
Share

By default, you can access only projects you own (i.e. created by you) in WorkLink Create. The Share button allows you to share your projects with other authors in your organization. You can also share a project from the "Welcome Screen" by right clicking on the project>Share.
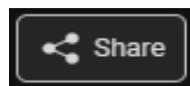
Sequence/ Sequence Counter

This is the first sequence in the project. Further configuration can be done in the sequence editor window. Author can continue the previous sequence by clicking "+" on the Sequence Counter. This is located at the top left corner of the Scene.

Default State

For your 3D content, this will generally mean that any model(s) added to the scene in Default State will be visible with their complete assemblies in every step of your project. It is a good idea to make any global changes to your scene in Default State before defining other steps. Learn more: The Default State.

Step/ Step Counter

This shows all Steps in the selected sequence. It can be accessed through the sequence editor window. Author can continue the previous step by right clicking the previous "step" and selecting "Continue Step" or clicking "+" on the Sequence Counter. This is located at the top left corner of the scene.

Back/Forward Button

This can be used to quickly revert changes in your work by going a step backward or forward.

Render Mode

This shows a preview of the objects as they will be rendered in the WorkLink App. You can select Standalone mode or device mode. Learn more about Render Mode.

Content Placement Step

This is also known as Author-defined Alignment allows an author to define what step(s) of the project alignment will be initiated. An author is allowed to add a step or multiple steps before content placement by simply dragging the content placement step button before or after the desired step.

View Settings

View settings allow you to toggle the visibility of the unit grid, visibility of sprites in the scene view and the visibility of AR trackers in the scene view.

Gizmo

This is used to change the Scene windows icon sizes.

- Hide Gizmo (Shortcut is Q) -

- Translate - To change the selected object's position (Shortcut is W) -

- Rotate - To change the selected object's orientation (Shortcut is E) -

- Scale - To change the selected object's size (Shortcut is R) -

- Orient the gizmo to match the basic grid orientation -

- Orient the gizmo to match the selected object -

- Place the gizmo's pivot at the pivot of the selected object -

- Place the gizmo's pivot at the average center of the selected object's bounding boxes -

Alignment

■ **Object Axis X** - Allows the user to rotate the content in the X-axis relative to the set alignment point.

■ **Object Axis Y** - Allows the user to rotate the content in the Y-axis relative to the set alignment point.

■ **Object Axis Z** - Allows the user to rotate the content in the Z-axis relative to the set alignment point.
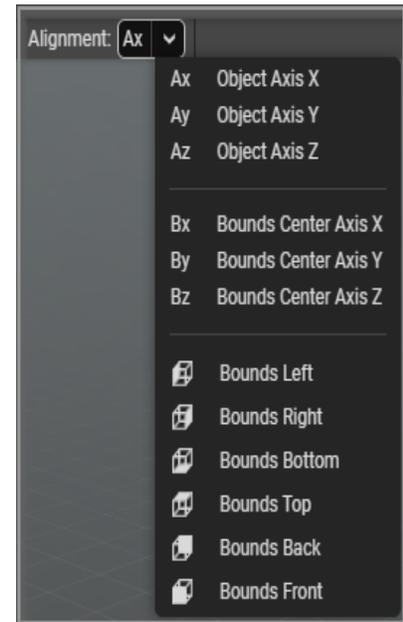
Snap Settings

Snap settings control the translation, rotation and scale levels of the object. To apply Snap settings to an object, select the transform gizmo, hold CTRL command and move the object.
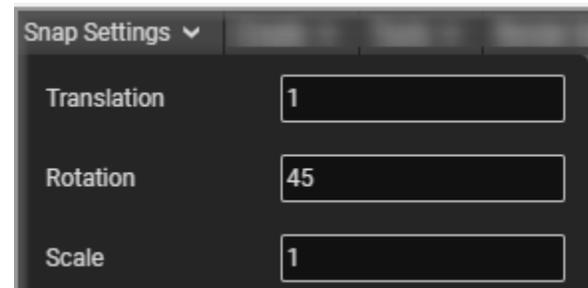
Tools

This allows you to measure the distance of the object on the scene in meters, yards, feet, inches,centimeters or millimeters.

Start/Stop Simulation

This button allows the live preview of your project steps and animations. The purpose is to overview your project before publishing. Your screen is completely frozen during simulation, therefore, no change can be made until you stop simulation.

Start Tour button

Click button to initiate a tour of the WorkLink Create Environment,

Sign out

This option allows you to sign out of the application.

Scene camera/focus selection/perspective projection

 - Reset the scene camera to its default position.

 - Move the scene camera so that the selected objects are in view.

 - This is for perspective projection. It sets the projection mode to orthographic.

Split Scene View

This allows you to split and expand the scene view into two separate views vertically or horizontally.

Marquee selection

This shows the top, bottom, front, back, left and right views of a scene Object. Click and drag Marquee for available views.

Content Placement Step

Content Placement Step, also known as Author-defined Alignment allows an author to define what step(s) of the project alignment will be initiated.

An author is allowed to add a step or multiple steps before content placement by simply dragging the content placement step button before or after the desired step.

Content Placement Step provides an opportunity to create step(s) before alignment for information purposes.

Content Placement Step is a part of the initial sequence.

To use this feature for other sequences, simply right click on the new sequence and select "set as initial sequence" to copy over the content placement step to the new sequence.

See: User Experience on the App.
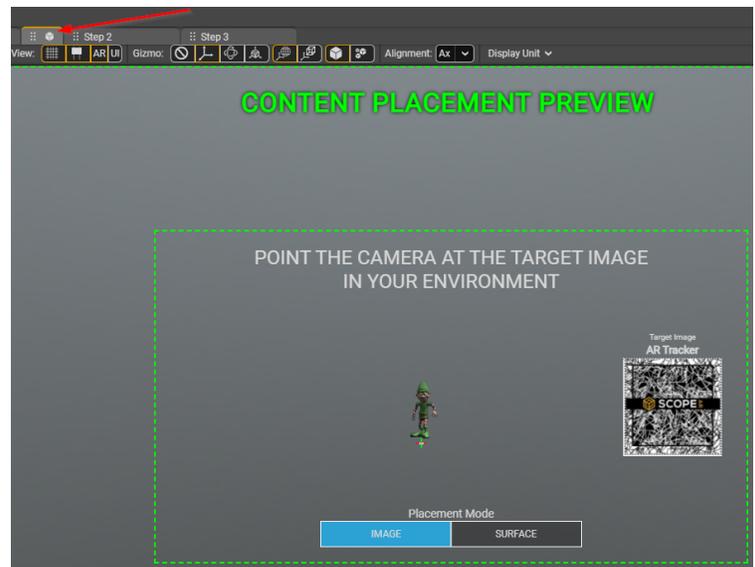
ADVANCED FEATURES

Timeline Editor

The Timeline Editor allows editing of 3D content for each step. This includes animating and positioning 3D objects as well as defining which objects should be visible or invisible.

Animations for the scene are created, manipulated, and viewed in the timeline. Animations for individual items are represented in the timeline by animation timebars.
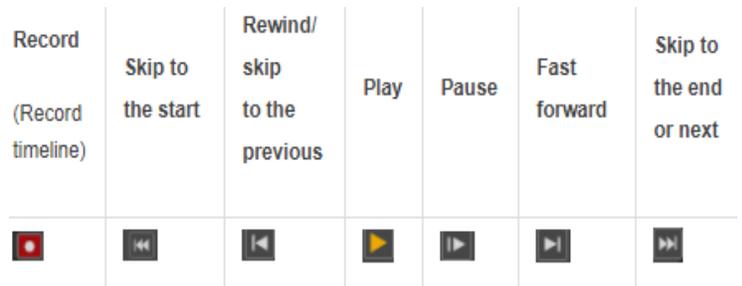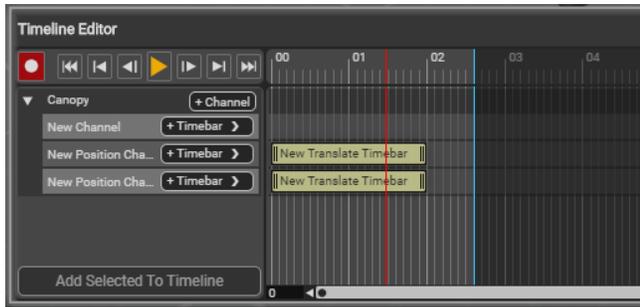
It is possible to edit more than one timebar/object/channel at a time. To drag and move timebars/channels, hold down the "Control" key on your keyboard and use the left button on your mouse. Learn how: Edit, copy, delete multiple time bars/channels.

To copy, delete, duplicate and replace objects, right click the channel to select the function to use.
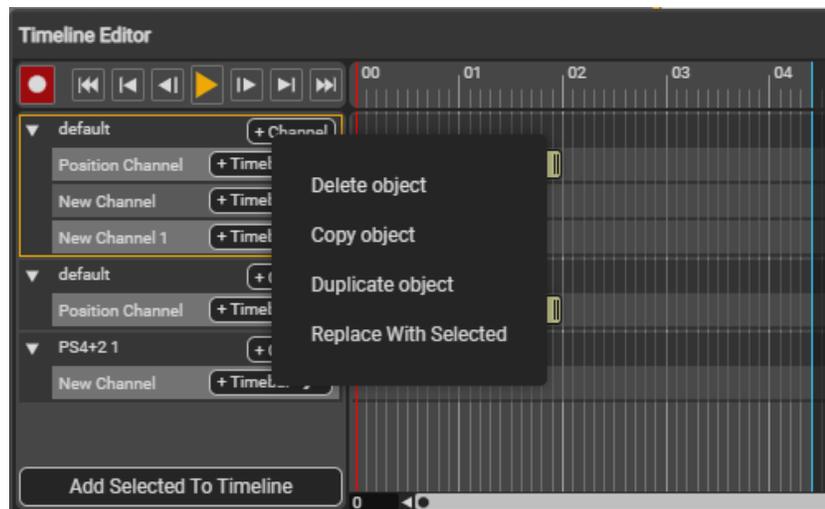
Simulating timeline animation

Simulation means the live preview of your project steps and animations before publishing.

To simulate the current step as it will run on a device, use the "Play" button in the Preview tools section or "Start Simulation" button located at the top of the Scene.

Click "Stop Simulation" to stop Simulation. For easier, but less precise, live previewing, simply drag the playhead back and forth across the timeline and view the results in the Scene.

Your screen is completely frozen during simulation, therefore, no change can be made until you stop simulation.

Visit articles: Timeline, Create Timeline Animations, Simulate Timeline Animations for more information.

Replace Project Asset (Asset Swap)

Asset Swap allows the replacing of an existing model with another in the scene.

- Open Asset Library

- Right click on the asset/model you want to replace and click on "Replace Project Asset"

- This action will launch the "Replace Project Asset" window.

- Select the new asset/model and compare objects in the old and new asset.

- Enable "Keep Old Materials" if you wish to.

- Hit "Confirm" to replace the old model with a new model.

- The new model will be displayed in the scene.
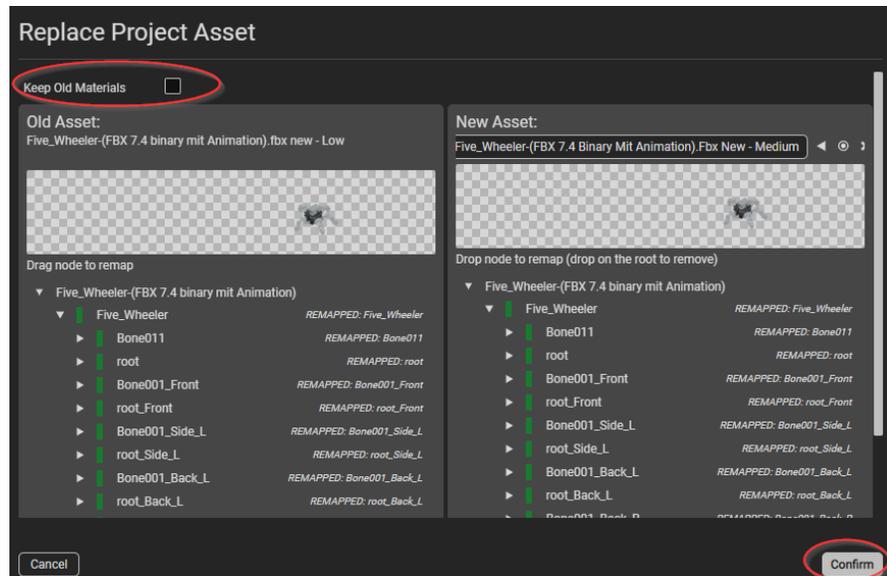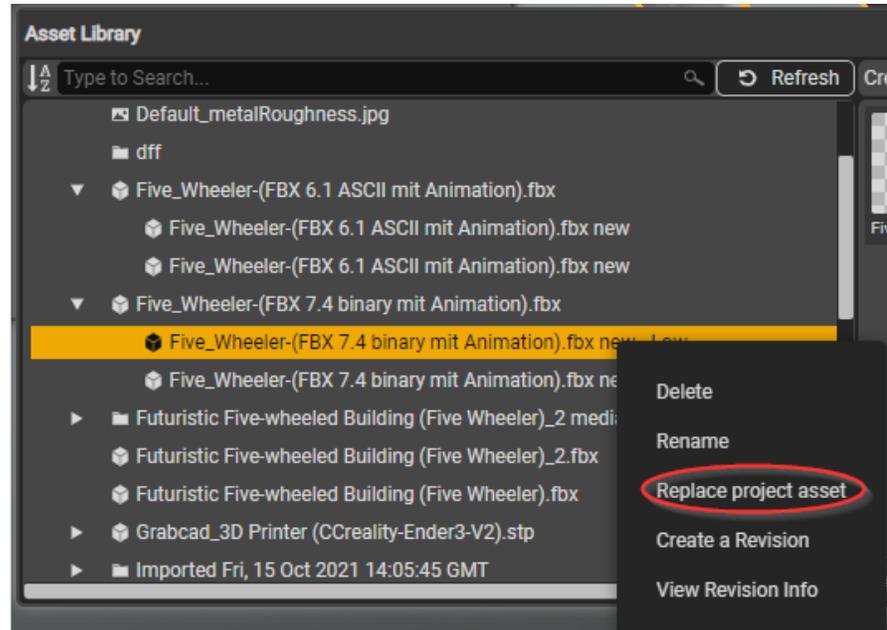
Callouts

Callouts are descriptive text boxes that can be added to 3D objects. You can set up Callout to create annotations and anchor them to specific parts of an object under Object Properties. To enable and configure Callout, go to Object Properties>>Callout>> Enabled.

You will be able to configure the following when Callout is enabled:

1. **Visible**: You can disable this option to make the callout invisible.

2. **Scale**: To increase/decrease the size of the Callout.

3. **Title**: To give your Callout a name.

4. **Title Color**: To choose a desired color for the Callout title/name.

5. **Title Background**: To choose a desired color for the Callout title background.

6. **Title Background Alpha**: To adjust background color shade as desired.

7. **Content**: To add additional content to your Callout, if applicable.

8. **Text Color**: To choose a desired color for the Callout text.

9. **Background Color**: To choose an overall background color for the Callout.

10. **Background Alpha**: To adjust overall background color shade as desired.

11. **Offset**: To adjust the callout's position.

For more information, visit the article: [New WorkLink Create: Callout](#).
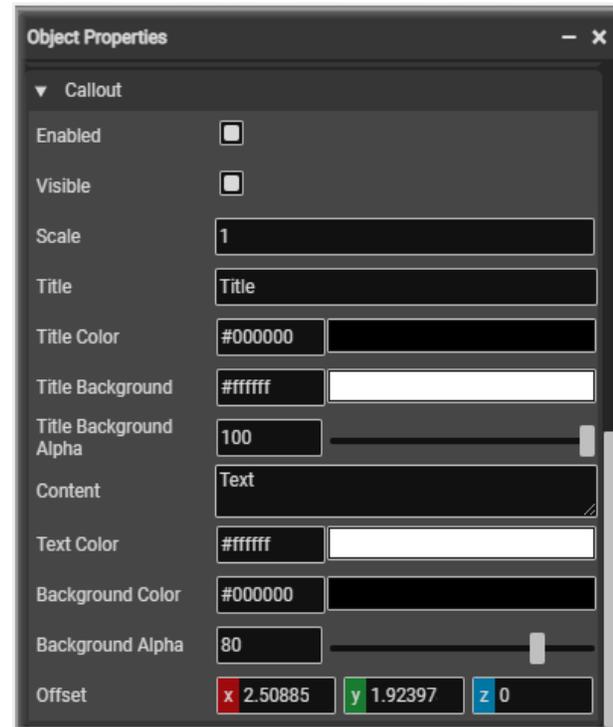
Object triggers (Non empty)

Object triggers allow you to add interactivity to scene objects. It can be set up to allow an object to act as a button that takes the user to another step anywhere in your scene or an ON/OFF switch that controls the visibility of a specified object. It can also be used for visibility of a callout.

To enable and configure Object triggers, go to:

- Object Properties
- Scroll down to Triggers
- Click on "Add Trigger"
- Select "Type" and Target Step

The type of triggers you can apply are Visibility toggle, Move to Step and Callout toggle.

- **Visibility toggle** - Available modes are Solid, Ghosted and Hidden.

  - Solid: Causes objects to be solid, regardless of their default setting.

  - Ghosted: Causes objects to be semi transparent, regardless of their default setting.

  - Hidden: Causes objects to be hidden, regardless of their default setting.

- **Move to Step** - Allows you to select a step to apply the trigger.

- **Callout toggle** - Allows you to apply triggers to a callout.
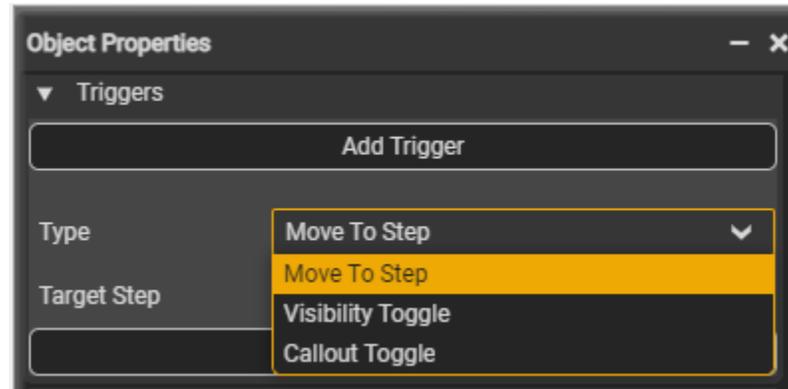
Project Link

The Project Link feature allows you to launch a different scenario or project from within an active session on the WorkLink App.
To enable project link in the New WorkLink Create:

- Select the object in the scene that will serve as the redirection trigger.

- Click on Object Properties>> Triggers>>Add Trigger
- Under Type, Select Project Link>> choose mode (Online or Offline)
- For Online mode, select the project you wish to link from the dropdown list. Make sure you save the project before publishing.
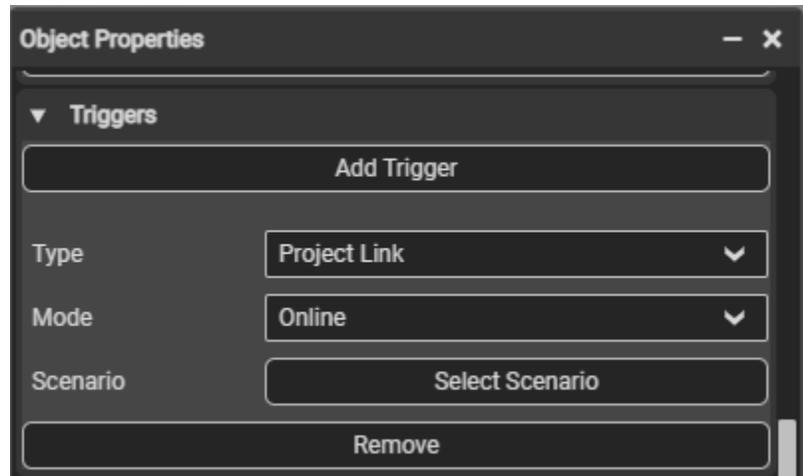
<u>Note</u>

1. Offline mode allows you to specify a project that was published offline and manually published to your device. You must ensure the project name matches what was published offline and includes the ".scope" file

extension.

2. Linked projects must have been published (Offline or Online) from WorkLink Create.

3. Linked projects must be published to the same environment. For use in offline mode, both projects must exist on the same device.

Image Tracking

Image Tracker allows you to align your AR Content in your environment using a specific or custom image or marker.

This video demonstrates how to configure Image Tracker in the New WorkLink Create. Remember to upload your custom image to the Asset Library before setting up the Image Tracker for your project.

Object Tracking (Beta)

The Object tracking feature allows users to align and track objects more effectively in the new WorkLink Create. This feature is in **beta** and is applicable to HoloLens devices only (at the moment).

Feel free to reach out to us at support@scopear.com if you have any questions or concerns using this beta version. Related Article: Configuration and Best Practices for Object Tracking.
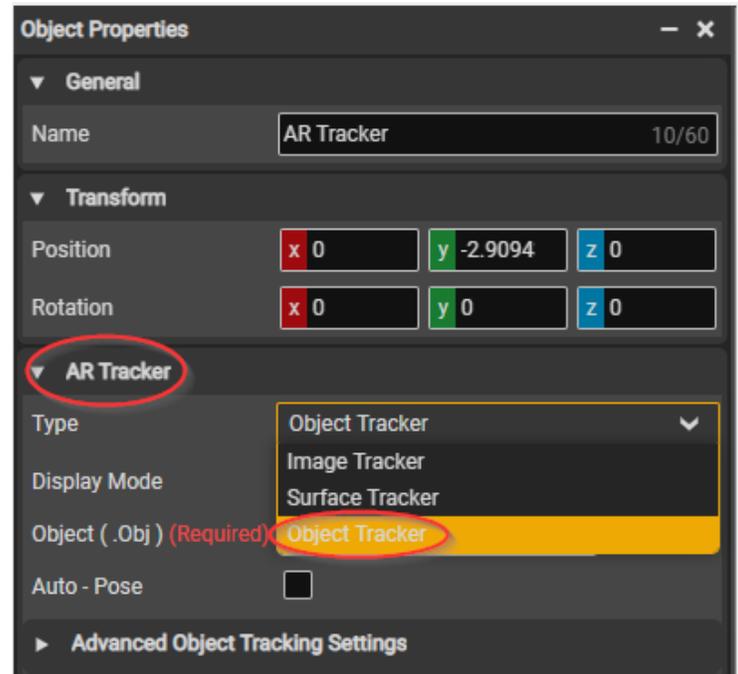
Configuration and Setup in the new WorkLink Create:

1. Click on Window Menu > Asset Library > Upload Files to upload the .obj file to be used for object tracking.

2. Click on Window menu > AR Trackers> Create AR Tracker to create an AR tracker.

3. Click on Window Menu > Object Properties, then click on the AR tracker in the scene for further configuration.

4. Click on the drop down arrow beside "Type" under "AR Tracker and choose "Object Tracker".

5. Click "Select Model" to choose the .obj file that will be used for tracking from the Asset Library. This is the .obj file that was uploaded in step 1 above. The model will be uploaded to the scene.
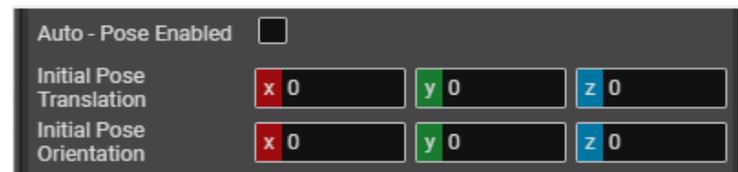
Note:

- By default, the auto - pose (Called AutoInit in vision lib) is enabled. Auto - pose/ AutoInit is the automatic configuration in VisionLib that theoretically allows the author to look at the model from any direction and begin tracking.

- If the author disables the Auto - Pose, he then will see the Initial Pose configuration:
- The InitPose with the author defined orientation and position defines the intended direction that the author will start tracking the model from.
- In essence, these are camera values. To initiate tracking you would need to look at the object from the same position and angle. This method is known to have faster alignment vs Auto - Pose.
- For a specific configuration, an author can tweak the Advanced Object Tracking Settings. First, disable Auto -Pose and click on the drop down arrow for "Advanced Object Tracking Settings" to input required values.

Advanced Object Tracking Settings

1. **Laplace threshold**: Threshold in mm for generating the line-model. This value specifies the minimum depth distance between two neighboring pixels necessary to be recognized as an edge.

2. **Normal threshold**: Threshold for generating the line-model. This value specifies the minimum normal difference between two neighboring pixels necessary to be recognized as an edge. Usually we set this threshold very high, because from our experience normal-based lines can't be recognized very reliably. It might make sense to use lower values for certain models, though.

3. **Inlier Ratio Init**: This is a quality threshold for validating the tracking result during the initialization phase. The value highly depends on your scenario. If the line-model matches the real object perfectly and there is no occlusion a high value is recommended. However, usually the line-model doesn't perfectly match the real object which is why a lower value might work better. Then again if the value is too low the algorithm might start tracking the wrong object. In our experience it is better if the minInlierRatioInit value is higher than the value for minInlierRatioTracking, because it's difficult for the algorithm to recover from a bad initialization.
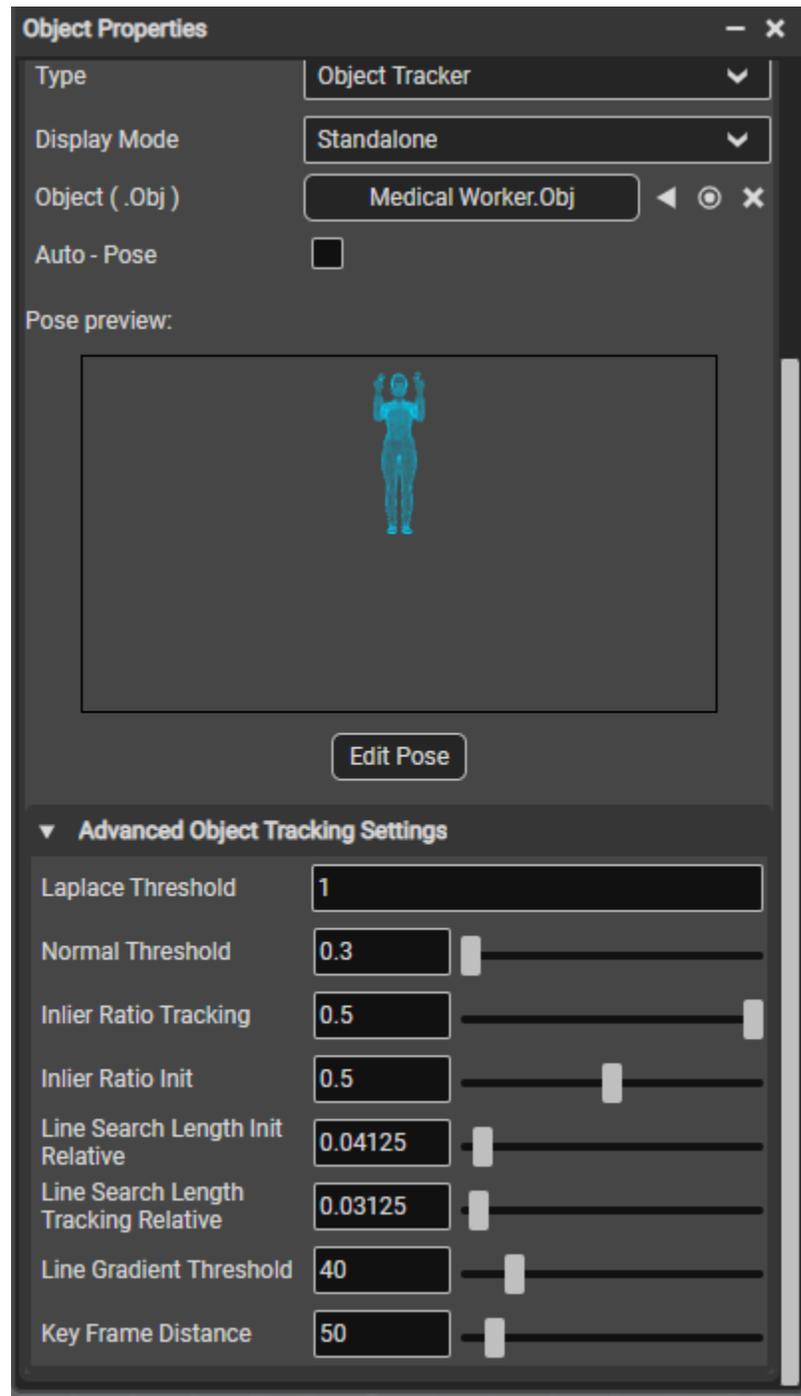
4. **Inlier ratio tracking:** This is a quality threshold for validating the tracking result after the initialization phase. The value highly depends on your scenario. If the line-model matches the real object perfectly and there is no occlusion a high value is recommended. However, usually the line-model doesn't perfectly match the real object which is why a lower value might work better. Then again if the value is too low the algorithm might start tracking the wrong object. In our experience it is better if the minInlierRatioTracking value is lower than the value for minInlierRatioInit, because we don't want the tracking to fail after the initialization due to effects like motion-blur.

5. **Line search length init relative**: The model-based tracker projects the 3D line-model into the camera image and searches for edge pixels orthogonal to the projected lines. The lineSearchLengthInitRelative specifies the length of the orthogonal search lines in percent relative to the minimum resolution during the initialization and tracking phase. Please use lineSearchLengthTrackingRelative and lineSearchLengthInitRelative in favor of the non relative parameters since these parameters work independently.

6. **Line search length tracking relative**: Same as lineSearchLengthInitRelative, but used during the tracking phase.

7. **Line gradient threshold**: Threshold for edge candidates in the image. High values will only consider pixels with high contrast as candidates. Low values will also consider other pixels. This is a trade-off. If there are too many candidates the algorithm might choose the wrong pixels. If there are not enough candidates the line-model might not stick to the object in the image.

8. **Key frame distance**: The minimum distance between keyframes in mm. The line-model will only be generated for certain keyframes. Therefore a higher value improves the performance at the cost of a lower precision. Lower values cost more performance but increase the precision.

Recommended settings for Advanced Object Tracking Settings:

1. The only setting you might need to adjust is the "Laplace Threshold" (as it is influenced by model size).

2. You can roughly interpret this value as the maximum (width or height or depth) value of the 3D object bounding box (on condition the object is not positioned smaller within the "Pose preview" window as in the screenshot above).

3. Integer values are fine (doesn't need to be 100% exact), round up when in doubt. (eg. max object size is 3.2 meters, use value 4. Any object smaller than 1 meter, use value 1.)

4. After this is done, you can publish the scenario and try it out on your device.

Ideal scenario/best practices:

These are important tips for good object tracking (these are recommendations/ ideal scenarios, not limitations, the more of these points are checked, the smoother the experience):

1. The .obj file uploaded under "select model" needs to be an exact 3D model of the object that is being attempted to track in the real world. The accuracy of the 3D model vs the real life object is very important. The .obj needs to be exported in the metric system, meter size (1 unit = 1 meter), as obj's do not contain a system of measurement and Create imports it as "meter" size. (Support for more formats is on our roadmap.)

2. Ensure that the .obj is correctly imported. Meaning correct scale (meter size), correct rotation (right way up) and correct translation, before import. You can double check the size by importing the .obj into a step and measuring it with the Tools - Distance Tool.

3. Create some sequences and steps that match the position of your .obj model used for tracking.

4. As this technology is comparing lines generated by edges (normals) in the .obj file with lines caused by contrast on the real world object, the object being tracked in the real world should be uniform in color on places where no edges are present. (eg. a camo print or development mule decals on an object would be the worst case scenario.)

5. The lighting conditions in the real world should be optimized for optimal contrast recognition of shapes, so that edges can easily be detected. For this reason, over- or underexposed objects will be more difficult to detect (eg. a completely black object might be more difficult to detect edge contrast.)

6. Using Auto - Pose disabled (Init - Pose enabled), you can define the angle the end user needs to position himself to initiate the tracking. This is ideally a position in which the object has recognisable features/contours.

7. A good contrast of the real world object with its background is helpful. This helps to generate good contrast for edge detection (e.g. a mid gray object on a white background.)

User Experience on the WorkLink App

1. Log into the WorkLink App.
2. Launch your project.
3. Look at the model from an angle which has a distinct silhouette with good consistent lighting. Preferably with the model filling a large portion of the camera's Field Of View.
4. Stay still and look at the object for approximately 10 seconds.
5. Pinch fingers or say "Set Position" to place once tracking is successful.
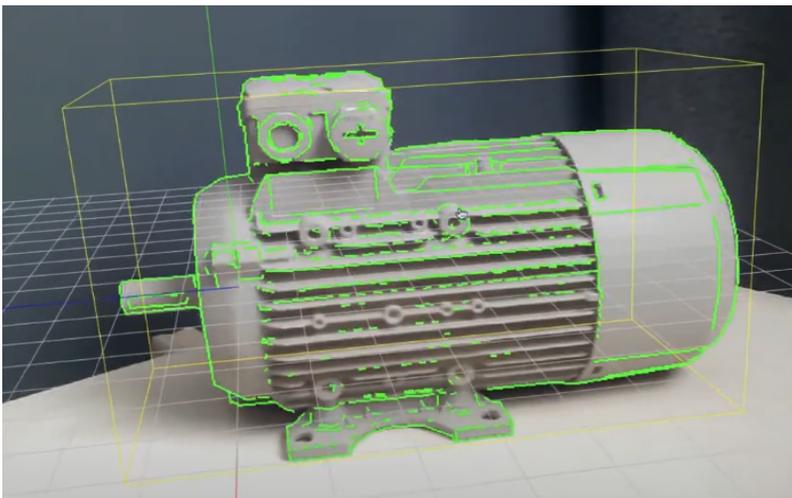
Example of how a line model based on edges in the .obj (normal threshold) is generated, and compares it with lines generated by contrast in the real world image picked up by the camera.

More information on Object Tracking can be found here:
- Object Tracking Explained
- Configuration and Best Practices for Object Tracking

TIPS AND SHORTCUTS

You can use the following tips and shortcuts when creating your work instructions:

- Camera Controls/ Scene Navigation

  - Hold Right Mouse Button and drag to look around.
  - Hold the Right Mouse Button and use W (forward),A (left),S (backwards),D (right),Q (up),E (down) to move the camera around, hold SHIFT to double speed.
  - Hold ALT and:
  - drag with Left Mouse Button to orbit around the screen center.
  - drag with the Right Mouse Button to dolly the camera.
  - drag the Middle Mouse Button to the pan.
  - Hold the Middle Mouse Button and drag to pan.
  - Scroll the WHEEL to dolly the camera.

- Gizmo

  - Use W,E,R change gizmo modes to translate/rotate/scale.
  - W - Translate
  - E - Rotate
  - R - Scale
  - Q - Hide Gizmo
  - X - Change spaces (Local/Global)

- Snap to grid

  - Ctrl + Shift + gizmo drag.
  - It rounds up the position and increments in steps of 1
  - Action History:
  - Undo : CTRL + Z
  - Redo : SHIFT + CTRL + Z
  - Click an action to quickly "jump" to it

- Timeline

  - Adding fragments ("boxes" like in the current WorkLink 1.0) to channels can be done by recording or by right-clicking in the channel and choosing a fragment.
  - Positioning fragments (drag the fragment itself left-right in the channel lane.)
  - Resizing fragments (drag the edges of the fragment to make it shorter/longer.)
  - Zooming the timeline horizontally with shift + mouse wheel.
  - Zooming the timeline vertically with alt + mouse wheel.
  - Timeline playback/pausing (click the PLAY / PAUSE word.)
  - Time scrubbing (click and drag on the time strip - where the time markers are - to set the current time point.)
  - Drag loop marker (blue marker) to define the looping point.

- UI components

  - Hide and show all UI components: CTRL + SPACE.

- Scene objects

  - Z - Switch between group center and object pivot.

- Tooltips

  - This is presented on the bottom left corner of the scene when hovering on an icon/button.

- Autosave

  - Activity progress autosaves every 10 minutes. Last saved time can be found in the bottom right corner of the scene.

- WorkLink Create version

  - This can be found on the bottom right corner of the scene.

Learn more about: <u>Navigation Tips and Shortcuts</u>.

WORKLINK VOICE COMMANDS

There is a range of voice commands available to make users' experience seamless on the HoloLens 2. These commands are specific to the Login screen, Scenario/Contact list & AR view screen as well as within a Scenario. You can view a list of available commands after logging into the WorkLink App and within a scenario. Simply.say "Show help" to launch the command window specific to the active screen. See a comprehensive list of commands below:

Login Screen

1. **User Name** - Selects the username field on the login screen.
2. **Password** - Selects the password field on the login screen.
3. **Log in** - Logs user in after password authentication.
4. **Advanced Settings** - Launches Advanced Settings window.
5. **Demo projects** - Shows a list of available demo projects.
6. **Forgot Password** - Initiates a password reset.

Scenario/Contact List/AR View and within a Scenario

1. **Align Project -** Opens the "Alignment Panel" prompting you to place content..
2. **AR View -** Opens the AR view. Outside of a call, you can access the [diagnostic window](#) by air-tapping the settings gear on the right side of the AR View.
3. **Back -** Takes you back one step in the current section.
4. **Close Help** - Closes the Help Window.
5. **Call [User Name] -** Attempts to call the named user, say "OK" to proceed, "Cancel" to cancel. E.g. Call Support Test (Support Test is the username).
6. **Clear Search -** Clears the search box.
7. **Contact List -** Shows the Contact List.
8. **Contacts -** Same as above, shows the Contact List.
9. **Exit Scenario** - Attempts to end the Scenario.
10. **Lock -** Locks the WorkLink window, stops it from following your gaze.
11. **Lock Interface -** Same as above**.** Locks the WorkLink window, stops it from following your gaze.
12. **Next** - Proceeds to the next step.
13. **Nudge** - Toggles the nudge mode. Allows adjustments to the alignment of your 3D content using the following commands:

| Undo Nudge	Undo All Nudge	Redo Nudge	Rotate X	Rotate Y	Rotate Z	Move
Moves object back to its previous position.	Moves object back to its original position.	Moves object to its nudged position.	Enable nudge rotation on the x axis.	Enable nudge rotation on the y axis.	Enable nudge rotation on the z axis.	Translates the x, y, and z axis.

14. **Place Content -** Places your model/content in your environment.
15. **Scenarios -** Shows the scenario list.
16. **Scroll [Up/Down] -** Scrolls up and down the contact, scenario list and Settings..
17. **Search -** Shows the search box. Allows you to search for a contact/scenario.
18. **Set Position -** Fixes your content to its current alignment with a recognized target.
19. **Settings -** Shows settings page.
20. **Show [App/Application/WorkLink] Help -** Same as "Show Help". Shows available voice commands.
21. **Show [Interface/WorkLink] -** Brings the main WorkLink Interface into view.
22. **Show Help -** Shows available voice commands.
23. **Switch Visibility Mode -** Switches visibility mode from Standalone to Device mode, vice versa.
24. **Unlock -** Unlock the WorkLink window, windows start following your gaze.
25. **Unlock Interface -** Same as above. Unlock the WorkLink window, windows start following your gaze.
26. **View [Username] -** Shows the current status of the user (Offline/Online status) and allows you to call.

QUICK HOW-TO GUIDES

How to improve performance of heavy models with the CAD pipeline.

The CAD pipeline allows you to create a revision of your file/model based on an existing one. To do this:

1. Upload your CAD file to the Asset Library.
2. Select "Revisions Editor" under the Window Menu.
3. Select the model file for the new revision by clicking "Select Model">>Confirm.
4. Choose between Simple and Advanced Mode. The Simple mode is a simpler way to set your target to low, medium or high while Advanced mode allows you to control the operation.
5. Click "Confirm" once done.
6. The Revisions Editor window will show the status of the request (Processing, Processing CAD, Rendering, Failed/ Done, etc.)
7. Close the Revisions Editor window when processing is done and open the Asset Library.
8. You will see the revised version listed under the main file and you can drag it to the scene like any other 3D asset.
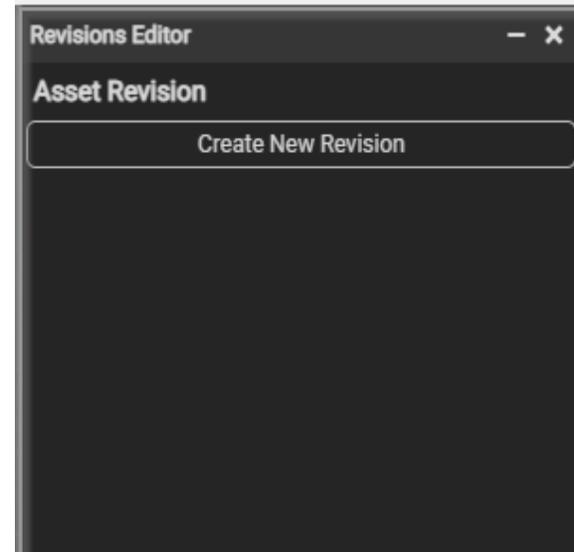
Uploading models in zip files
You can upload a Zip file that contains multiple assemblies, parts and textures by uploading the Zip file to the Asset Library.

Select a different root file from within the zip and generate a revision on that following same steps above i.e. Revision Editor> >Create New Revision>Select Model>>Select File and process revision.

For more information, visit articles: Advanced Revision Editor and Improve performance of heavy models with the CAD Pipeline.

How to add Picture and Video Insets to your project

You can add picture inset to your project from the UI Editor following the steps below:

1. Transfer/copy the picture file to the Asset Library.
2. Go to UI Editor>>Template>Content.
3. Under "Insets", choose "image" for Inset type
4. Click "Select image" to choose your image>>confirm.
5. Adjust the height and position using Inset Height and Inset Anchor.
6. Use the "Start Simulation" button at the top of the scene to preview your work.

You can add video inset to your project from the UI Editor following the steps below:

1. Transfer/copy your file to the Asset Library.
2. Go to UI Editor>>Template>>Content.
3. Under "Insets", choose "Video" for Inset type
4. Click "Select image" to choose a background image for your video>>confirm.
5. Click "Select Video" to choose your video>>confirm.
6. Adjust the height and position using Inset Height and Inset Anchor.
7. Use the "Start Simulation" button at the top of the scene to preview your work.
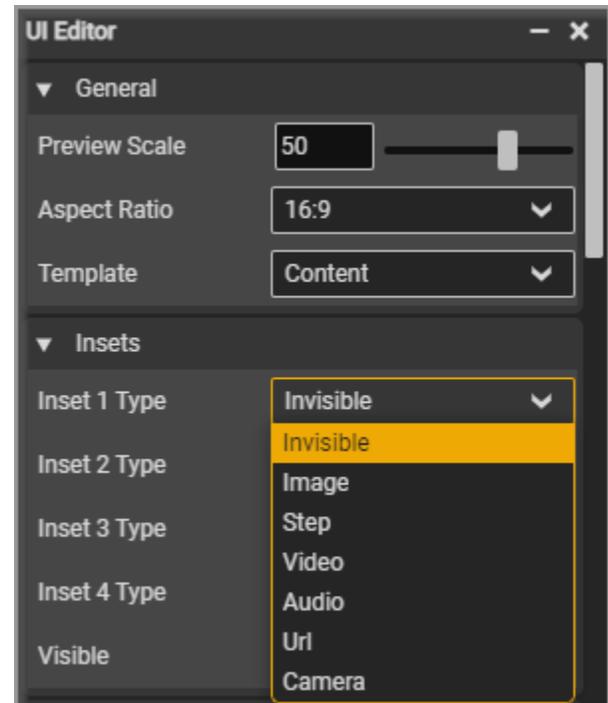
For more information, check out video: How to add Video Insets to your project.

How to upload/rename/delete asset files and create a model through the Asset Browser

You can upload, rename and delete asset files through the Asset Library. The Asset Library is listed under the Window Menu.

Upload

- To upload files, go to the Asset Library and click on "Upload Files." The files will be uploaded to the personal assets folder.
- You can also drag files from your computer to drop in the Asset Library.
- To create sub-folders in the personal assets folder, click "Create."

Rename/Delete

- You can rename or delete a file from the asset library by clicking the "Edit" button.
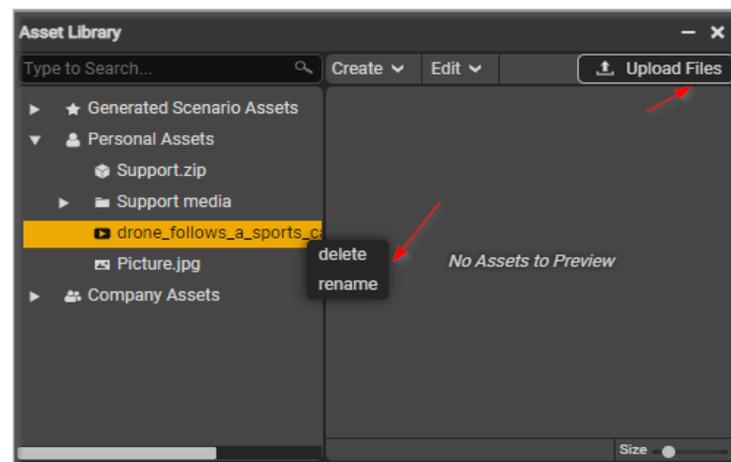
- To delete, you can also click the asset/material you wish to delete and tap the "Delete" button on your keyboard.

For more information, visit article: How to upload/rename/delete asset files.

How to import a model to the Scene

To import a model to the scene, simply choose the model from the Personal Assets or Company Assets folder, then drag and drop the model into the scene.

- Once you have imported the model, Gizmo mode allows you to change its position, rotation and scale as desired.
- Use W,E,R change gizmo modes to translate/rotate/scale. You can assign/unassign the Key Bindings under the Window menu.

For more information, visit article: Importing a model to the Scene.

How to create Callouts

You need to first enable callout to use it.

- Select the Object or part of the object you wish to apply Callout on.
- Go to Object Properties
- Scroll down to Callout and click on the "Enabled" button to enable/disable callout. For more information, visit article: Callouts.
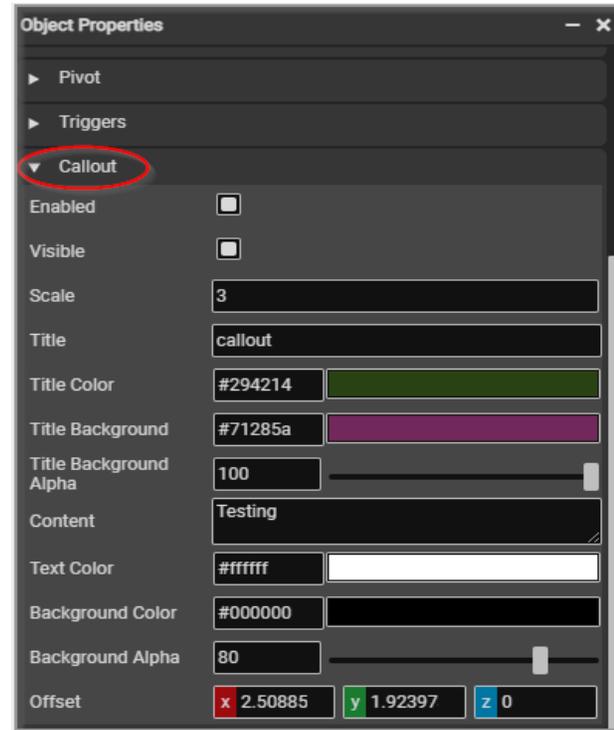
How to select parts of an object

The step hierarchy window displays the content within your scene and allows you to select, organize, add and remove parts of an object from your scene.

For more information, check out the video: How to select parts of an object.

How to apply Visibility Mode - Standalone and Device Visibility Mode

Visibility Mode allows you to choose whether you are aligning 3D content onto the real equipment or without real equipment. The Visibility mode for an object or a group can be set to Standalone or Device visibility mode in Object Properties. To apply visibility mode:

- Select the Object/ part of the object.
- Go to Object Properties
- Click on the drop down arrow in front of the Device Visibility Mode Option

For more information, visit article: Visibility Mode - Standalone and Device Visibility Mode.

How to create/modify project steps/sequences using the Sequence Editor

The Sequence editor is used to create or modify steps and sequences in your project. Select the Sequence editor menu and right click the sequence or step for available options:

Right Clicking Sequence

- **Continue Last Step**: This will create a new step in which the timeline continues the final frame of its previous step.
- **Add New Step**: This will add a new step to the sequence.
- **Reverse Sequence**: You can also reverse a step through the context menu.
- **Set as Initial Sequence**: This will re-reposition a sequence in your project.
- **Rename Sequence:** You can rename any sequence by right clicking it.
- **Copy Sequence**: You can copy a sequence and paste it by right clicking an empty space>paste sequence.
- **Duplicate Sequence**: Duplicate a sequence in your project.
- **Remove Ongoing Connection:** Right click on the first sequence and select "Remove Outgoing Connection" to delete a connection.
- **Delete Sequence**: You can delete a sequence by right clicking it and hitting "delete sequence" as long as it is not the only sequence.
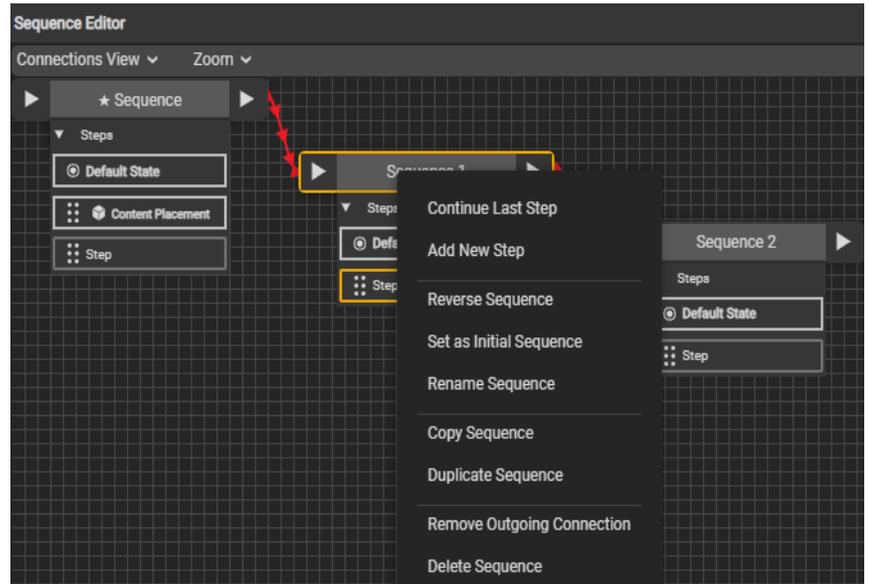
Right Clicking Step

- **Continue Step**: This will create a new step in which the timeline continues the final frame of its previous step.
- **Continue Step Reversed**: This will copy the step and reverse it.
- **Reverse Step**: You can also reverse a step through the context menu.
- **Rename Step**: You can rename any step by right clicking it.
- **UI Template**: You can swap UI template, apply changes to main template, reset all changes or go to main template from this option.
- **Copy Step**: You can copy a step from one sequence and paste the step in another sequence.
- **Duplicate Step**: Duplicate a step within the same sequence.
- **Delete Step**: You can delete a step by right clicking it and hitting "delete step" as long as it is not the only step.

Add/Connect Sequences

- To add a new sequence, right click on the background and click "Add Sequence"
- You can connect sequences by dragging the mouse pointer.
- To delete this connection, right click on the first sequence and choose "Remove Outgoing Connection".
- You can rename a step/sequence by double clicking it.

For more information, visit article: How to create/modify project steps using the Sequence Editor.

How to customize Project templates

The User Interface (UI) editor allows the author to design the project templates and provide relevant contents for each step of the project. To customize a project template:

Go to the UI Editor and provide values for the following templates:

- **Blank**: Blank canvas, intended for custom step type.
- **Intro Splash**: Intended for use as the main project title page.
- **Title**: Intended for use as a title page for new sections.
- **Content**: Intended for use as a standard instructional step.
- **Branch**: A menu page to allow the user to branch to different sequences.
- **EULA**: Intended for an End User License Agreement.
- **Title Menu (6)**: A menu page with project title, project subtitle and 6 options with links
- **Title Menu (12)**: A menu page with project title, project subtitle and 12 options with links
- **Full Page Text**: Intended for an extended length of the text to explain a process
- **Finish Procedure**: This is the last page. This can come in the form of a question with a "Yes or No" response option displayed at the end of the session.
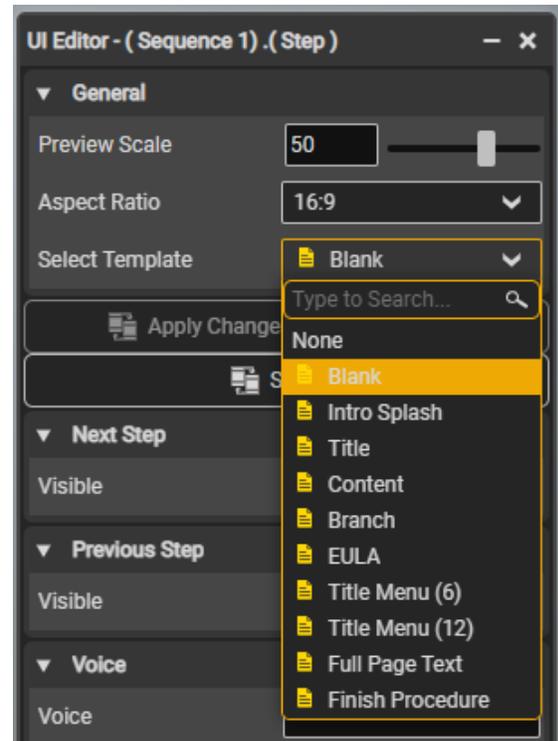
How to track activities with the Action History tab

The Action history tracks all your actions on the scene making it easy to go back to previous actions.

Shortcuts:

- Undo: CTRL+Z
- Redo: CTRL+SHIFT+Z

For more information, check out the article: Tracking your activities with Action History.

How to create Timeline animations

Follow the steps below to create timeline animations:

- Select the object you want to animate and hit the record button.
- The movement of the object will be recorded and a track will be created in the timeline until you hit "Stop Recording." A new time bar will be created inside the timeline. (You can record multiple transform changes for the same object).
- Hit the play button to play the animation.

How to simulate timeline animations

The "Start Simulation" button allows the live preview of your project steps and animations. The purpose is to overview your project before publishing.

- To start and stop simulation:

- Click on "Start Simulation" to start the live preview of your timeline animation/project.
- Click on "Stop Simulation" to stop the live preview of your timeline animations/project.

For more information, visit the article: How to simulate timeline animations/projects.

How to create and open a Project

To create a Project:

- Log into the New WorkLink Create
- Click on "Create New Project" on the Welcome screen.

You can also create a new project from within an open/existing project by:

- Clicking on the File Menu and selecting "Create New Project"

To Open an existing Project:

- From the Welcome screen, search for the project using the Search box or Scroll bar.
- Click on the Project and click on "Open Project"
- To restore a manually or auto saved version of a project, select the project from the list and click on "choose save", then select the version from "Manual Saves" or "Auto Saves">> "confirm."

For more information, visit the article: How to create and open a Project.

How to invite and accept an invitation

Your WorkLink Admin must invite you to use the new WorkLink Create.

As an Admin inviting a User:

- Log into the CMS to send a user invitation.

As a User, accepting an Invitation:

- You will receive an email upon invitation.
- Click "Accept Invitation" on the body of the email.
- Enter your username and confirm your password>>Accept invitation.

For more information, visit articles: How can I add/invite a new user and How to invite and accept invitation.

How to rename a project

To rename your project:

- Click inside the text box or click on the rename pencil icon.
- Type in your preferred project name.
- Press the "enter" button on your keyboard or click anywhere outside the text box to save changes.

How to sideload a project on supported devices

Android

- Connect the Android device to your computer via USB.

- Copy the published "**.scope file**" to \Android\data\com.scopear.RemoteAR\files\ on the device.
- Your content will now be available for use in the WorkLink App as an offline project.

iOS

- Connect the iOS device to your computer.
- Launch iTunes and select your device; choose the "Apps" icon, then "File Sharing". (Note: iOS on Windows has iTunes, while MacOS has no iTunes);
- Copy your project file (.scope file) to the WorkLink Documents.
- Your content will now be available for use on the WorkLink App as an offline project.

WSA-Surface

- Open the File Explorer window and navigate to C:\Users\<Username>\Pictures\Camera Roll\
- Copy the project you downloaded into the Camera Roll folder
- Your content will now be available for use in the WorkLink App and feature as an Offline Project.

Note: You can also achieve this by copying and pasting the file into the location (Camera Roll folder).

Didn't show up?
- Try saving your content in
  C:\Users\yourname\AppData\Local\Packages\ScopeAR.ScopeARWorkLink_qw0sdg9ragx7y\LocalState

HoloLens 1 and 2

- Log in to the HoloLens through the Windows Device Portal
- Navigate to the following location: System> File Explorer
- Navigate to the Camera Roll folder
- Browse your directory for the file you wish to upload, double click the file and select Upload
- Your content will now be available for use in the WorkLink App and feature as an Offline Project.

Note: You can also achieve this by copying and pasting the file directly into the location (Camera roll folder).

How to create a simple project in 10 quick steps

1. Log into the New WorkLink Create platform
2. Click on "**Create New Project"** on the Welcome Screen.
3. Give y**our Project a name** and confirm**.**
4. Open **Asset Librar**y and upload your files/assets to the Asset Library (If you have not already).
5. Drag your model to the scene from the **Asset Library**.
6. Use the **Scale Gizmo** to increase the model's size. Alternatively, open **Object Properties** and update the scale values for x,y,z. as desired.
7. Apply your desired template with the **UI Editor**.
8. Click **Start Simulation** to preview your project.
9. Click **Stop Simulation** to stop preview.
10. Click **Save & Publish Project** under File Menu or use the **Publish** button to publish the Project online. For more information, check out the video below:
    - [How to create Work Instructions using an Iphone 12](#).
    - [How to use WorkLink Create to build AR work instructions | PB650 ventilator example.](#)