

Real Time Dynamics Monitoring System

One-Line Diagram Kit User Guide



Real Time Dynamics Monitoring System (RTDMS)

One-Line Diagram Kit User Guide

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1 Introduction

Real Time Dynamics Monitoring System® (RTDMS®) One-Line Diagram Kit is a free-form drawing toolset that enables you to create one-line diagrams for both system and substation-level [visualization in the RTDMS client application](#). System-level views offer a representation of bulk power system transmission lines, substations, and their connectivity. System-level views also allow you to drill down to substation levels, where you can view busses, breakers, switches, transformers, and line configurations.

You can [create](#) new one-line diagrams or [import](#) them from existing visualization systems (the import feature is an add-on module that requires an additional license). One-line diagrams provide complement geospatial displays, providing the flexibility to use geospatial displays for wide-area situational awareness and one-line diagram displays for zeroing in on specific transmission and substation information.

System Requirements

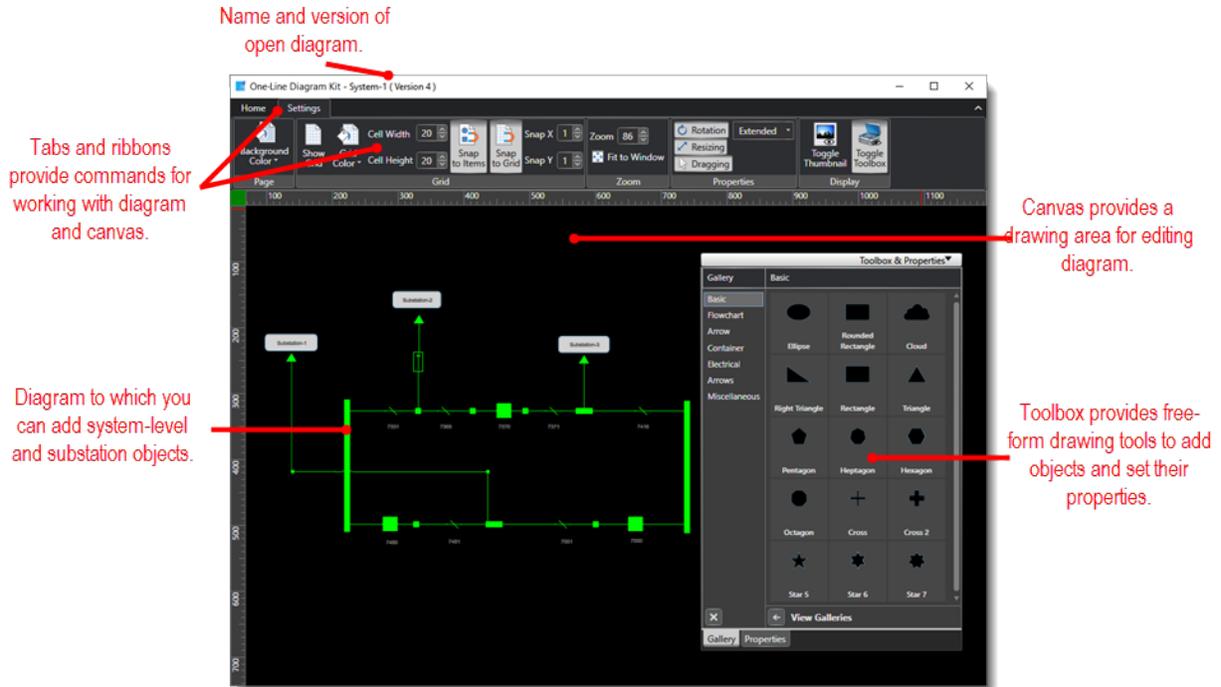
The following minimum system requirements are necessary to run One-Line Diagram Kit:

- **Operating System:** Microsoft Windows 7 or higher
- **Processor Type:** Intel Core 2 or higher
- **Processor Speed:** 1.0 GHz or faster
- **Memory (RAM):** 4 GB or more
- **I/O Ports:** 1 Network Interface Card (NIC) 1 GBPS
- **Video Card:** Support to DirectX9 or higher; capable of 1024x768 high color resolution

This user guide includes information and instructions for importing diagrams from existing visualization systems. This import feature is an add-on module that requires an additional license, which you can obtain by [contacting EPG](#).

Overview of the User Interface

One-Line Diagram Kit has a user interface that contains many features for drawing diagram objects and managing the canvas area on which you draw.



After you [create](#), [open](#), or [import](#) a diagram, the following primary features are available for working with the diagram:

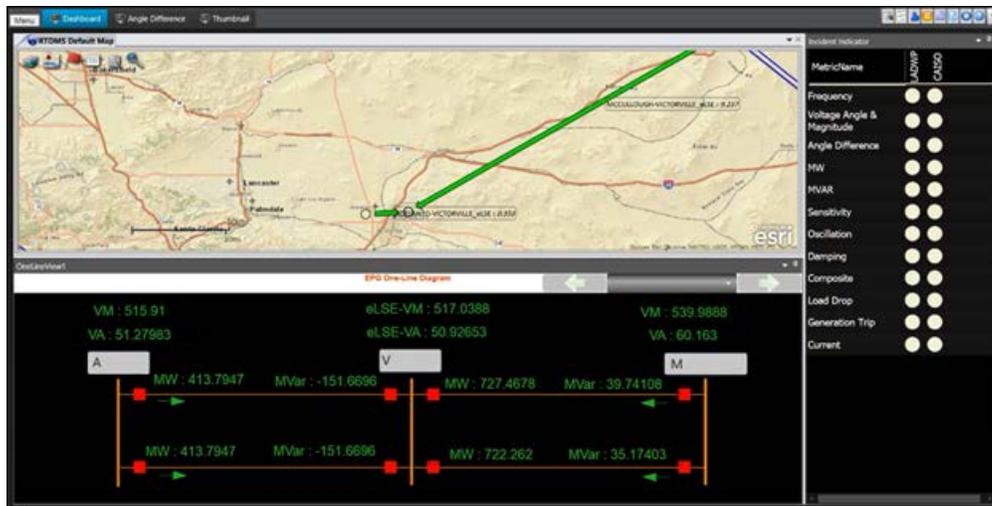
- [Tabs and corresponding ribbons](#) provide commands for [editing diagrams](#) and managing the underlying canvas.
- A [canvas](#) area on which you draw diagram objects.
- A toolbox that contains a variety of free-form [drawing tools](#) for adding [objects](#) to the diagram and set their underlying [properties](#).

Integration in RTDMS Client Application

Diagrams [created](#) in One-Line Diagram Kit can be [saved](#) to your ISG and then added as views for visualization in the RTDMS client application. These views can include system-level diagrams or substation-level diagrams.

Example of View with System-Level Diagram

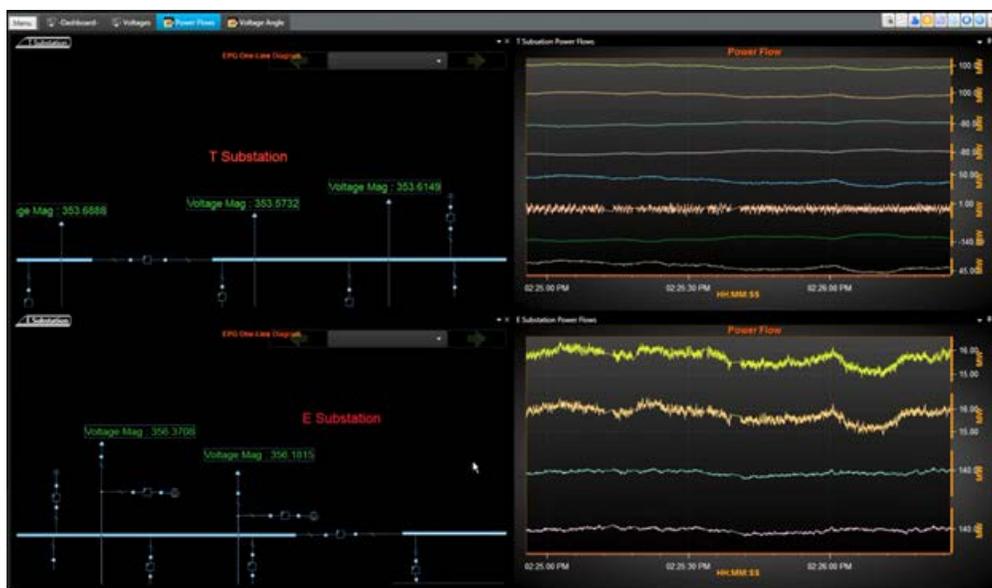
The following example shows a system-level diagram added to an RTDMS client application dashboard, with synchrophasor data and breaker status (if available via ICCP/PMU Digitals) mapped to the diagram:



This example diagram view contains a three-bus system diagram created in One-Line Diagram Kit using the [free-form drawing tools](#). The diagram includes substation names, buses, transmission lines, and circuit breakers. The voltage phasor measurements are mapped to the substations, and the calculated power flow signals are mapped on the corresponding transmission lines. Arrow icons along the transmission line represent the direction of power flows on the diagram view.

Example of View with Substation-Level Diagram

The following example shows an RTDMS client application display that contains a substation-level node-breaker diagram added to an RTDMS display, with synchrophasor data mapped to corresponding nodes:



In this example, the **T Substation** and **E Substation** are added separately to the display as individual views. The voltage magnitude PMU measurement on each line-side is mapped to the corresponding nodes of the transmission lines.

Who This Documentation is For

This user guide is for administrators who use One-Line Diagram Kit to create, edit, and manage one-line diagrams for visualization through the RTDMS client application.

Customer Support

For RTDMS customer support, please contact:

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Phone: (626) 685-2015

Located in Pasadena, California (Pacific Time Zone)

2 Getting Started

While you might adopt your own specific practices and processes for working with One-Line Diagram Kit, working with the application usually involves the following basic process:

1. [Start](#) the application in either [offline](#) or [online](#) mode.
2. [Create, open, or import](#) a diagram (the import feature is an add-on module that requires an additional license).
3. Use the [free-form drawing tools](#) to create and set properties for system and substation objects.
4. Work with [tabs and ribbon commands](#) to further refine the diagram and control the canvas.
5. [Verify](#) the diagram configurations by previewing the diagram.
6. [Save](#) the diagram, and make it available to the RTDMS client application.

Starting One-Line Diagram Kit

You can start One-Line Diagram Kit from the **Electric Power Group** program group on your Windows **Start** menu or the application shortcut created on your computer. When you start the application, you can either [work offline](#) or log in to the system to [work online](#).

Working Offline

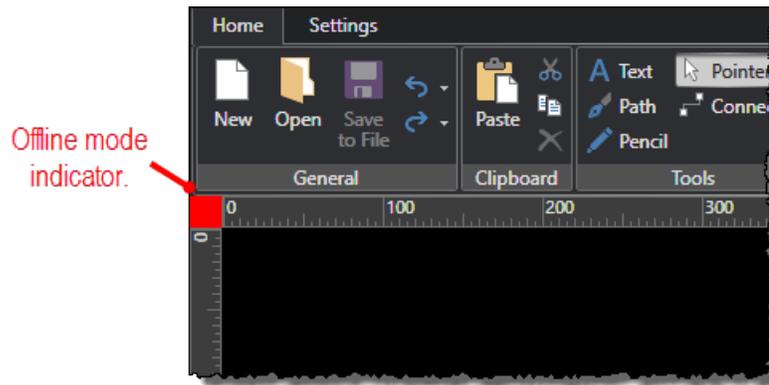
If you do not have network access or otherwise do not want to log in to the system, you can work with One-Line Diagram Kit in offline mode. When you work in offline mode, you cannot [open](#) and [save](#) diagrams on your ISG. You can only [open](#) and [save](#) diagrams to files. However, when you later log in and work in [online mode](#), you will be able to open any saved diagram files and then save those diagrams to your ISG.

➤ To work in offline mode:

- After [starting](#) the One-Line Diagram Kit application, click the offline icon.



When the main window opens, you can confirm you are working offline by the **red** offline mode indicator at the top-left corner of the canvas.

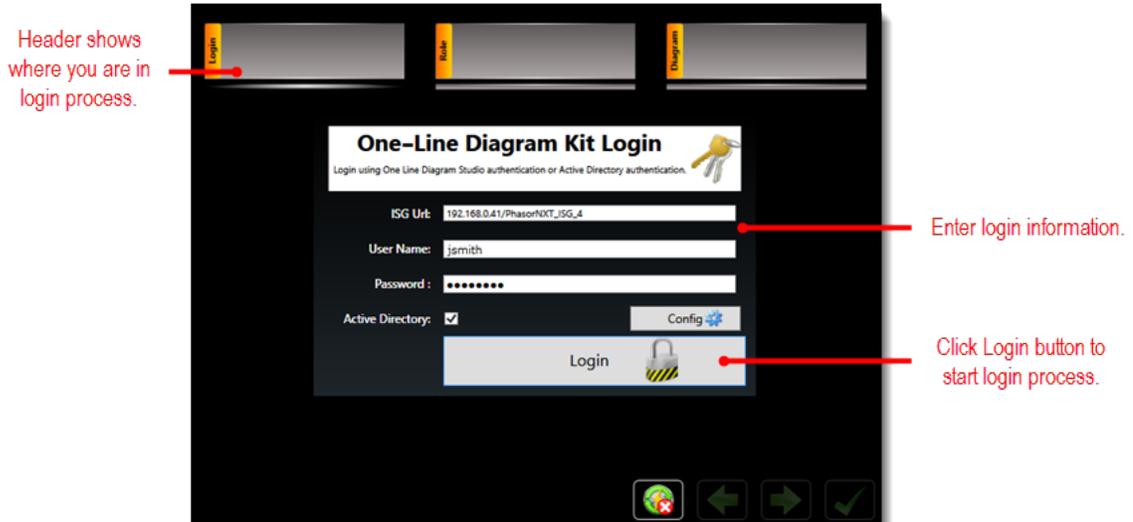


Working Online

You must work with One-Line Diagram Kit in online mode to [open](#) and [save](#) diagrams on your ISG.

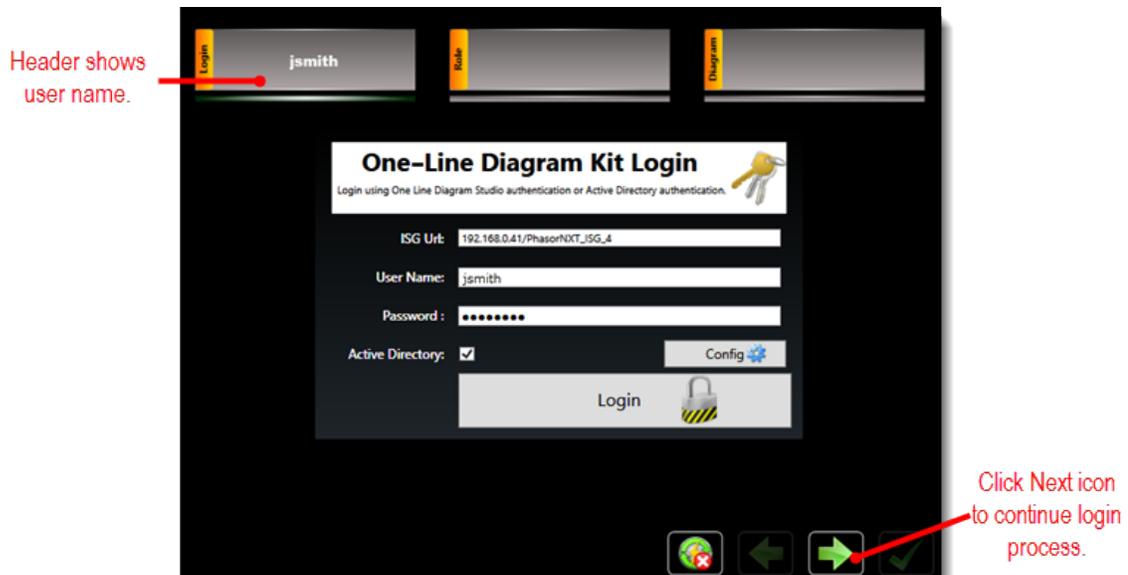
➤ To work in online mode:

1. After [starting](#) the One-Line Diagram Kit application, enter your ISG URL, user name, and password. If your organization uses Active Directory for authentication, select the **Active Directory** check box. Your administrator can help you with the appropriate URL and login information. After entering this information, click the **Login** button.



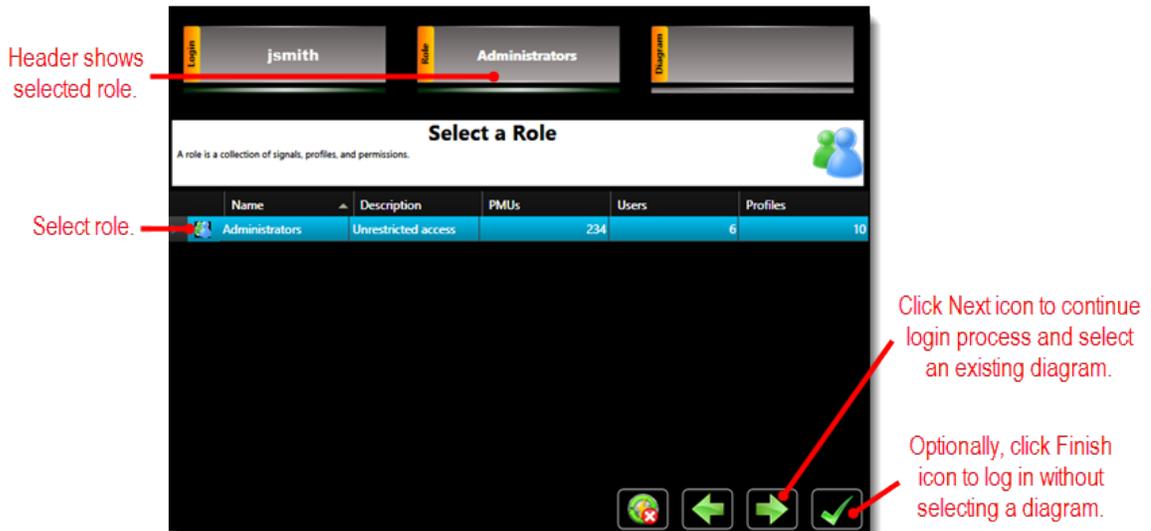
Note: After a successful login, the system remembers the most recent URL entered, so for future logins you only have to provide your credentials.

- When you enter a valid user name and password, the next icon (➡) becomes available. Click it to continue to the **Select a Role** screen.

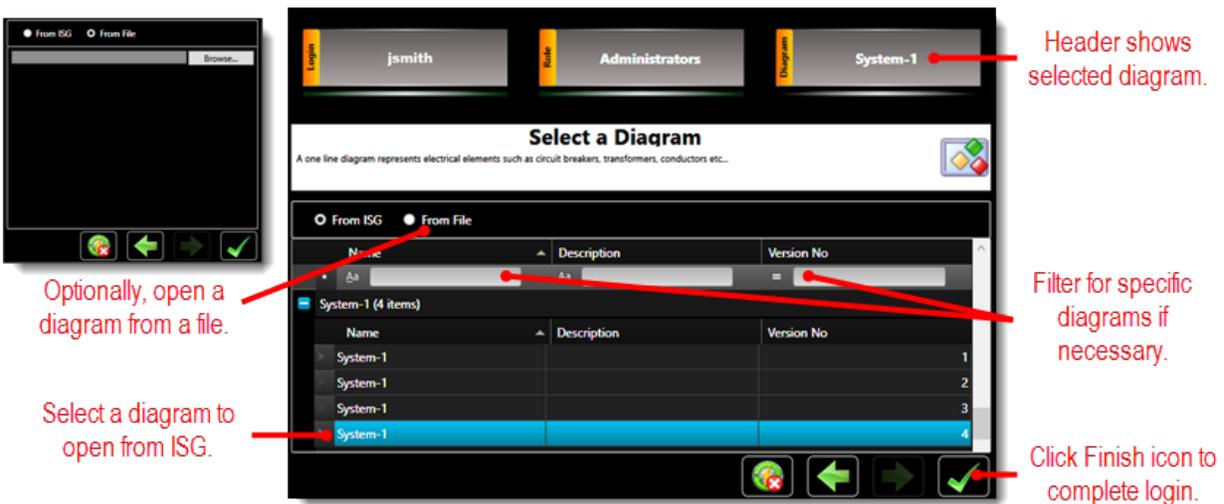


Note: At any time during the login sequence you can click the go back icon (⬅) if you need to return to a previous login screen.

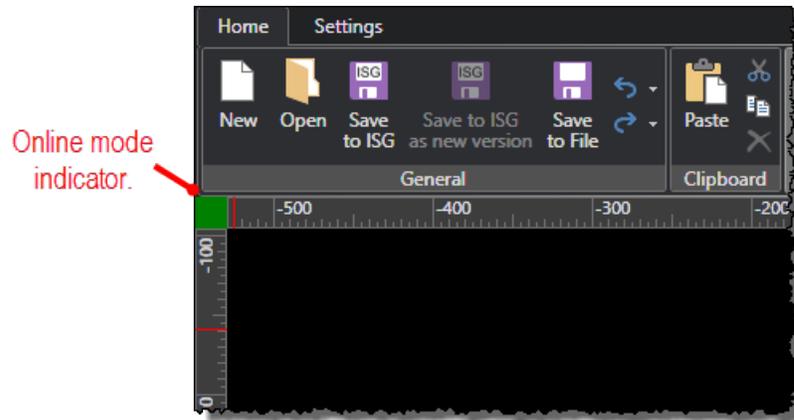
- The **Select a Role** screen includes the list of roles your administrator has made available. Click a role to select it. With the role selected, click the next icon (➡) to continue to the **Select a Diagram** screen if you want to open an existing diagram. Alternatively, you can click the finish icon (✅) instead of the next icon to bypass the **Select a Diagram** screen and skip the rest of the steps in this procedure. If you bypass the **Select a Diagram** screen, the system automatically opens a blank canvas, where you can [create](#) or [open](#) a diagram.



- The **Select a Diagram** screen includes the list of existing diagrams available on your ISG. Click a diagram to select it. If the diagram has [multiple versions](#), select the version you want to work with. If you have a large list of diagrams, you can use a [filter](#) to find a specific diagram to select. Alternatively, you can select the **From File** option to browse for and select a diagram from a local file instead of your ISG. After selecting a diagram from your ISG or local file, click the finish icon (✅) to open the system with the selected diagram.



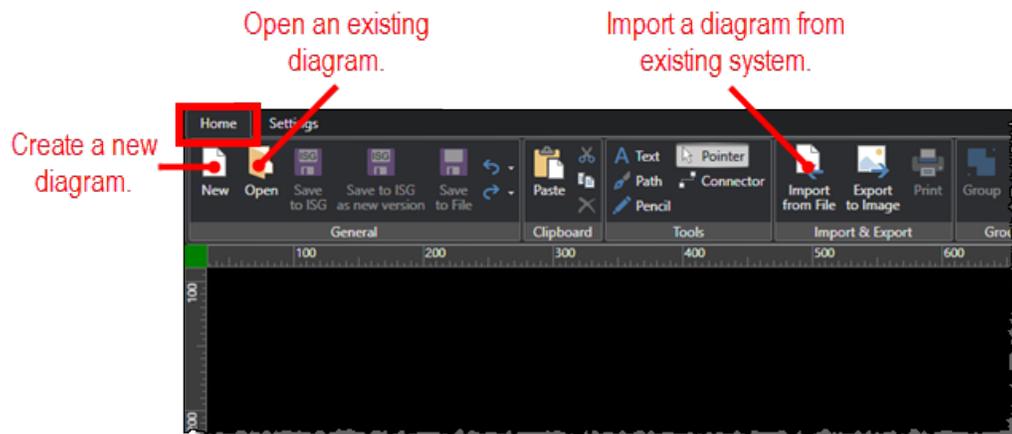
When the main window opens, the selected diagram appears on the canvas. If you did not select a diagram, the canvas will be empty, allowing you to create or open a diagram. You can confirm you are working online (as opposed to [working offline](#)) by the **green** online mode indicator at the top-left corner of the canvas.



Creating, Opening, and Importing Diagrams

You can select a diagram to work with when you [log in](#) to the One-Line Diagram Kit system. After you log in, you also have the following options for working with diagrams on the [Home ribbon](#):

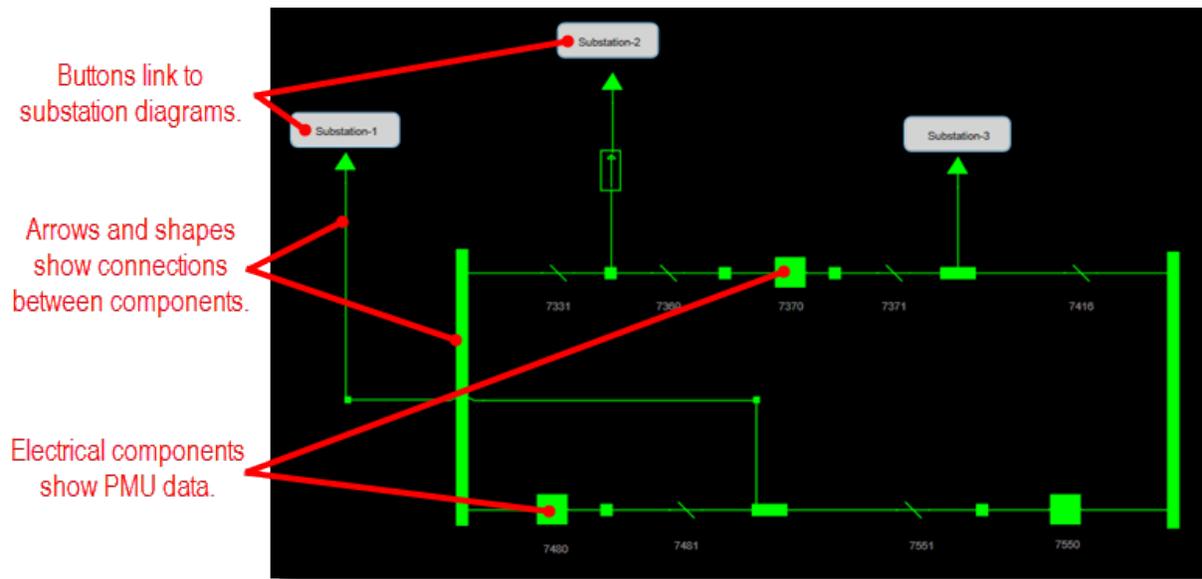
- Create a new diagram.
- Open an existing diagram, either [from a file](#) or [from your ISG](#). When you open from your ISG you can select any available version of the diagram. Refer to the [Understanding Diagram Versions](#) section for more information on diagram versions.
- [Import](#) a diagram from your existing visualization system (the import feature is an add-on module that requires an additional license).



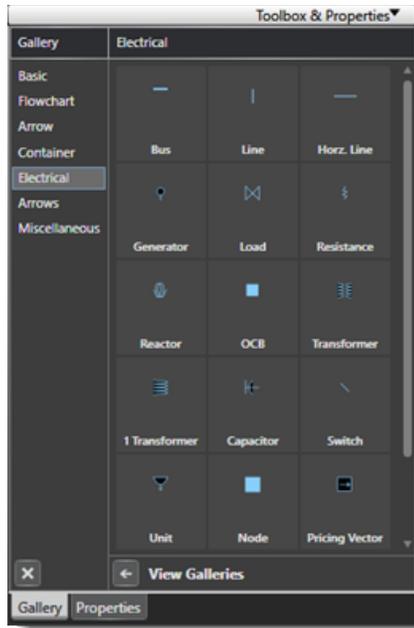
After you create, open, or import a diagram, you can use the [free-form drawing tools](#) to add and edit system and substation-level [objects](#) and [properties](#) for visualization in the RTDMS client application.

Using the Free-Form Drawing Tools

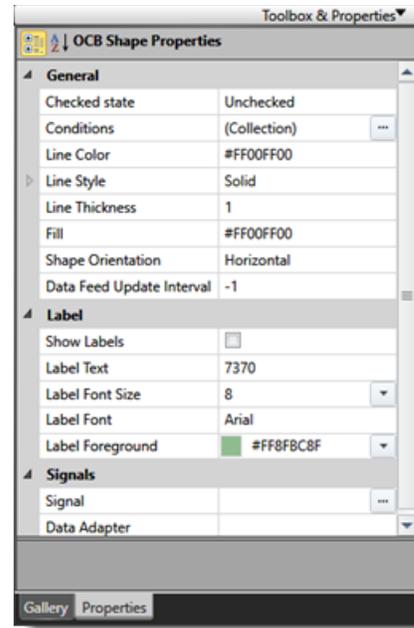
One-Line Diagram Kit offers [free-form drawing tools](#) for you to draw objects that can represent system and substation-level electrical components in your diagram. The following example shows a free-form drawing of a system-level diagram:



This diagram includes electrical components, arrows, shapes, and substation button links. You can draw these [objects](#) and set their [properties](#), [data sources](#), and [conditional behaviors](#) using the free-form toolbox.



Toolbox gallery includes objects you can draw on the diagram.



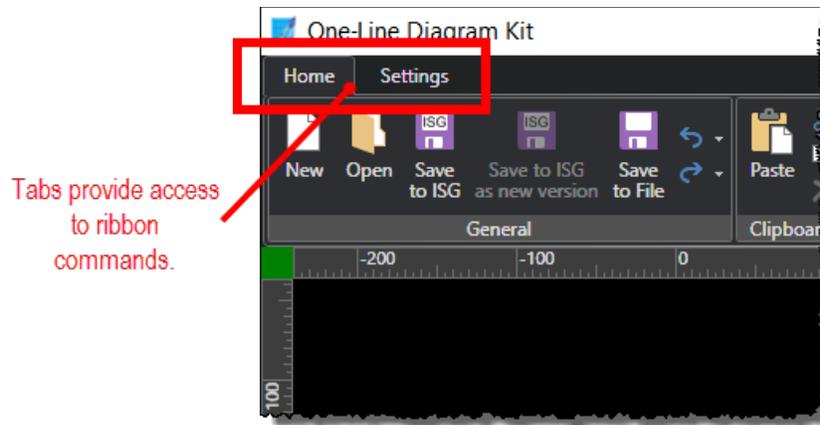
Toolbox provides access to property settings for objects.

Note: If the free-form toolbox is not visible on the screen, you can open it by selecting the [Toggle Toolbox](#) command on the [Settings](#) ribbon.

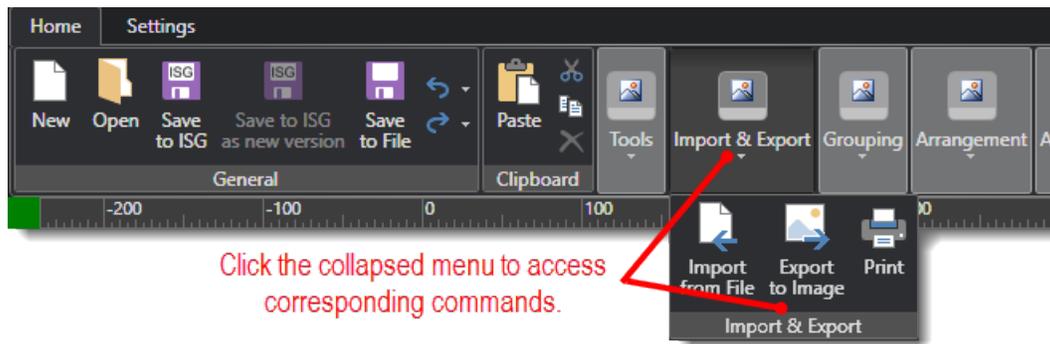
Working with Tabs and Ribbon Commands

One-Line Diagram Kit has two main tabs at the top of the screen that provide access to the following ribbons:

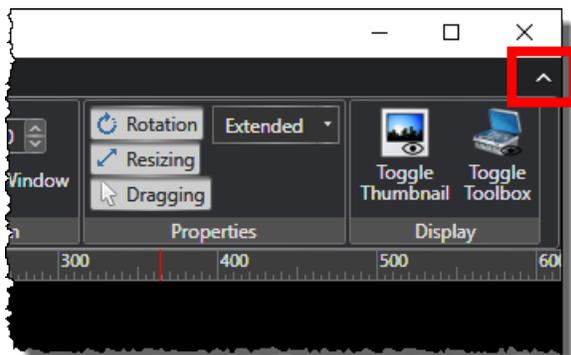
- The **Home** tab provides access to the [Home](#) ribbon, which includes commands for [managing a diagram](#) and the objects in a diagram.
- The **Settings** tab provides access to the [Settings](#) ribbon, which includes commands for [working with the canvas](#) and drawing tools.



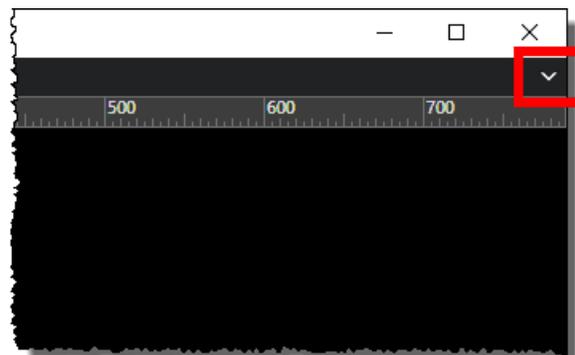
Related commands on each ribbon are categorized into command groups. If you reduce the size of your One-Line Diagram Kit application window, command groups in the ribbon will collapse to menus. You can access collapsed commands by clicking the corresponding menu.



If you need more space on the canvas to work with a diagram, you can minimize the ribbon area by clicking the ribbon's minimize/expand toggle button.



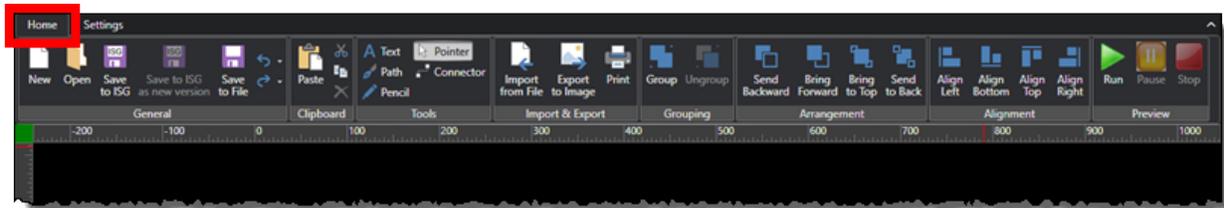
Click toggle to minimize ribbon.



Click toggle to expand minimized ribbon.

Working with the Home Ribbon

The **Home** ribbon provides commands that help you manage a diagram and the objects in that diagram. To access this ribbon, click the **Home** tab.

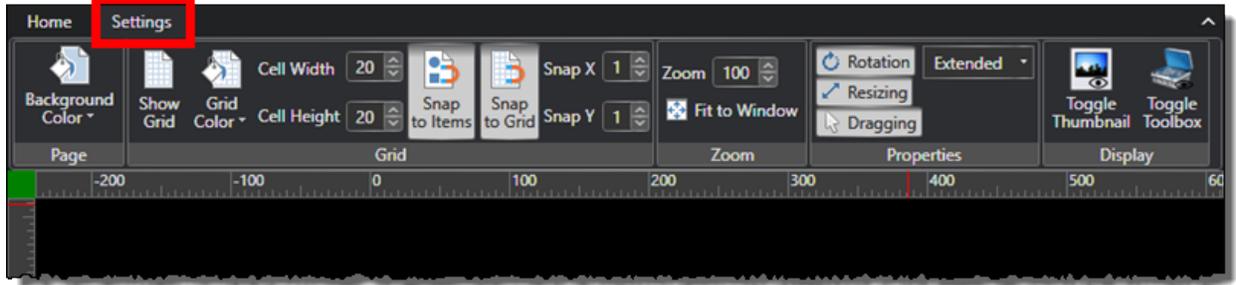


The **Home** ribbon includes the following command groups:

- **General** commands help you to [manage diagrams](#) by creating, opening, and saving them. This command group also includes commands to undo mistakes and redo edits when working with diagrams.
- **Clipboard** commands allow you to [cut](#), [copy](#), [paste](#), and [delete](#) selected objects in a diagram.
- **Tools** commands help you to [add text](#), [connectors](#), and [paths](#) to a diagram.
- **Import & Export** commands allow you to [import](#) diagrams from existing visualization systems (the import feature is an add-on module that requires an additional license), [export](#) diagrams to an image, and [print](#) a diagram.
- **Grouping** commands allow you to organize multiple objects into one selectable and editable [group](#) or to [ungroup](#) objects that have been placed in a group.
- **Arrangement** commands allow you to move selected objects [in front of or behind](#) other objects.
- **Alignment** commands help you to exactly [align](#) objects to one another.
- **Preview** commands allow you to [preview](#) diagrams to verify correct appearance and behavior when visualized in the RTDMS client application.

Working with the Settings Ribbon

The **Settings** ribbon provides commands that help you work with the canvas and drawing tools. To access this ribbon, click the **Settings** tab.



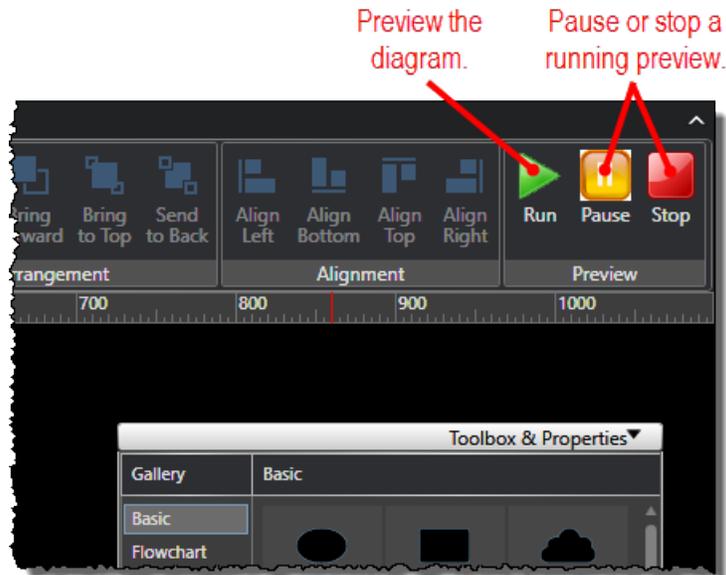
The **Settings** ribbon includes the following command groups:

- The **Page** command allows you to [change the background color](#) of the diagram that is open on the canvas.
- **Grid** commands allow you to [show or hide](#) a grid that you can use to help place objects on the diagram. Not only can you show or hide the grid, you can also change the grid's [color, line width, and cell size](#). You can also automatically [snap objects](#) to the grid or to other objects.
- **Zoom** commands allow you to [zoom in and out](#) of the diagram to examine and modify objects.
- **Properties** commands control [locking and unlocking](#) of adjustments to diagram objects to help prevent unwanted sizing and positioning.
- **Display** commands allow you to see a [thumbnail](#) perspective of the area of the diagram you are viewing and to pan to different parts of the diagram. You can also [show or hide](#) the free-form drawing toolbox if it visually obstructs the diagram.

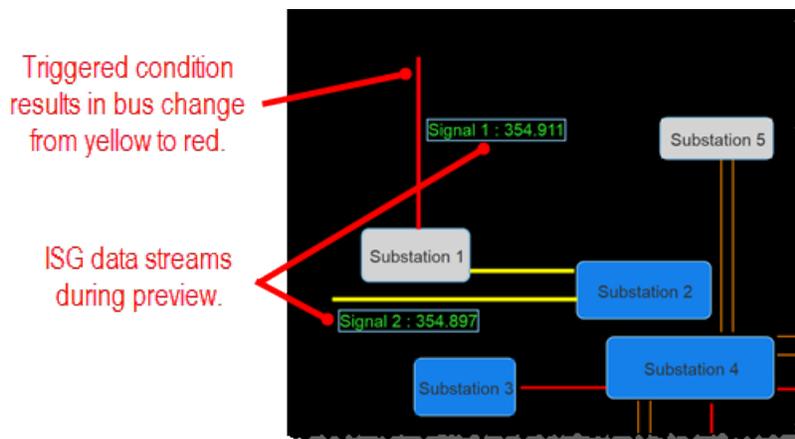
Verifying Configurations Using Preview

As you build and edit your diagrams, you can preview them to see how they will appear when visualized in the RTDMS client application. Previewing diagrams helps to ensure proper mapping of [signals to objects](#) and correct dynamic response to any [conditions](#) set up in the objects' [properties](#). The preview commands are available on the [Home ribbon](#).

Note: The preview feature is not available in [offline mode](#). It is available only in [online mode](#).



When you start the preview, the real-time data feed from your ISG starts, and signal values are shown with the mapped objects. If any conditional actions are specified for an object, the action is taken on the object if the condition is triggered. For example, a bus color could change from yellow to red if a condition is set to do so when the voltage exceeds a predefined threshold.

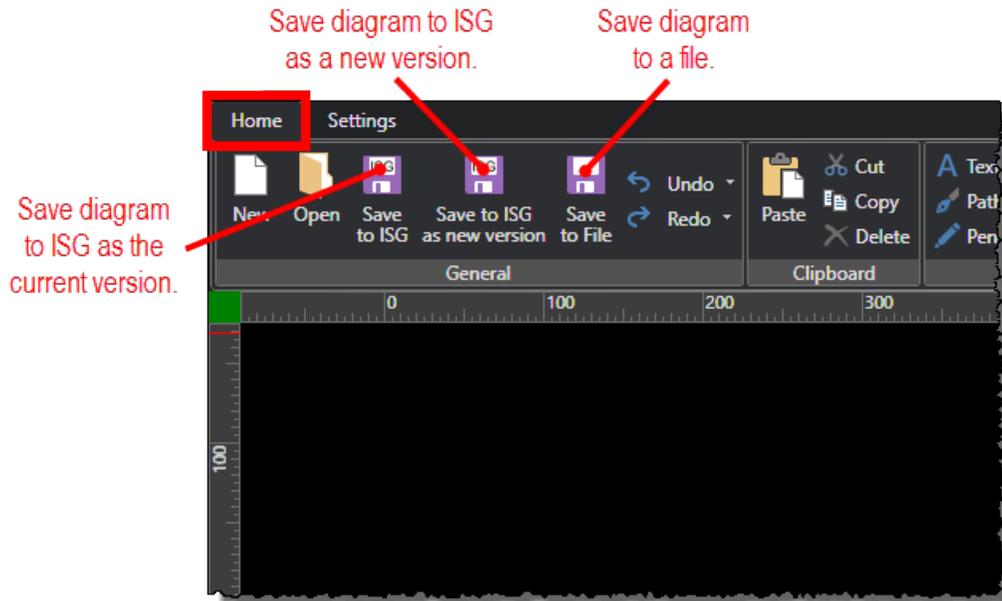


Saving Diagrams

You can save diagrams either to your ISG or to a file using the following commands on the [Home ribbon](#):

- When you save to your ISG, the diagram is available for visualization through the RTDMS client application. You can save the diagram as the [same version](#) or as a [new version](#). Refer to the [Understanding Diagram Versions](#) section for more information on diagram versions.

- When you [save to a file](#), the diagram is not available on your ISG for visualization through the RTDMS client application. You might want to save to a file if you are not ready to make the diagram available for visualization. You can save the diagram to your ISG later when you are ready to make it available for visualization. When working in [offline mode](#), you can only save diagrams to files.



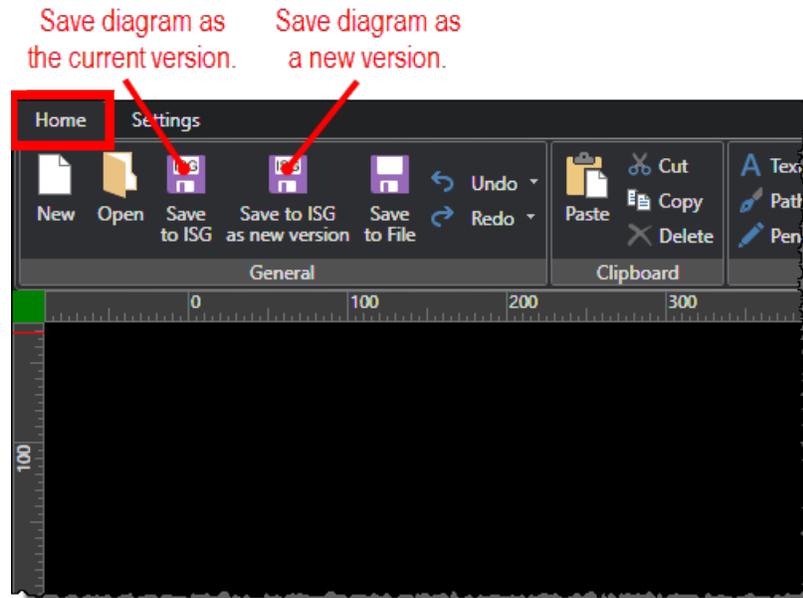
3 Managing Diagrams

One-Line Diagram Kit provides several options for [opening](#), [importing](#) (add-on module that requires an additional license), [saving](#), and [deleting](#) diagrams. You can also work with multiple diagram [versions](#) as you continue to make changes to those diagrams.

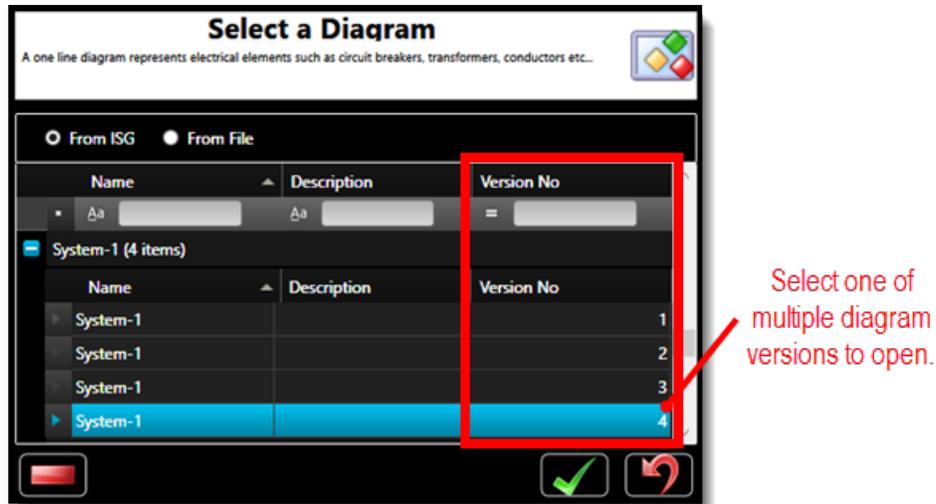
Understanding Diagram Versions

A diagram version is a specific copy of the diagram when it is [saved as a new version](#) to your ISG. For example, if you edit the original version (version 1) of a diagram and then save it as a new version (version 2), you will have two versions of the diagram, both of which you can work with as separate diagrams.

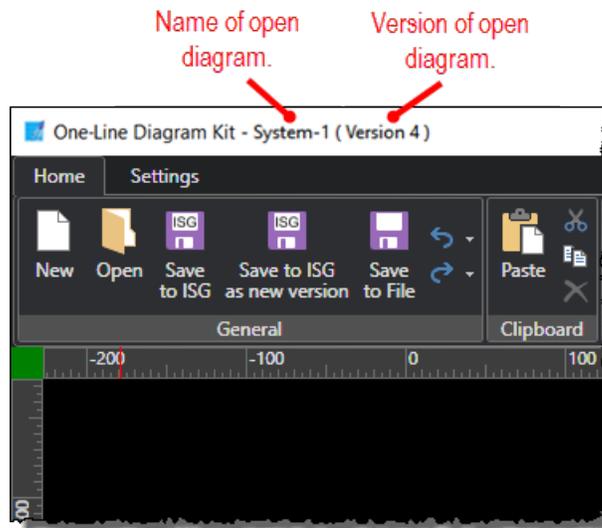
If you have never saved a diagram as a new version and have only [saved to the current version](#), then that diagram will have only one version.



When you [open a diagram with multiple versions from your ISG](#), you have the option to select any of the diagram versions.



You can confirm the version of an open diagram in the application title bar.

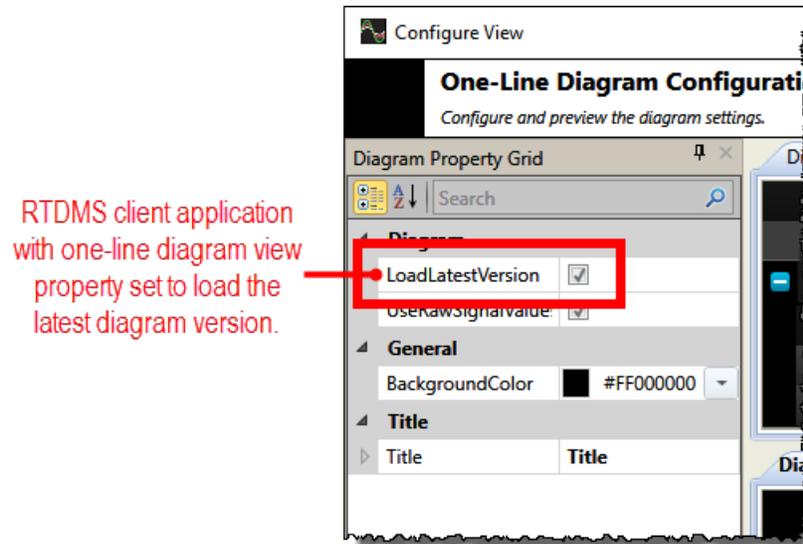


Versions When Opening and Saving Diagrams to Files

Diagram versions do not exist when [opening](#) or [saving](#) diagrams to files because you can save only one diagram to a file. However, you can achieve a result similar to diagram versions simply by using unique file names for saving updated versions of diagrams (for example, appending numbers at the end of the file name).

Diagram Versions in the RTDMS Client Application

A one-line diagram view in the RTDMS client application will automatically open the latest version of the underlying diagram on your ISG if that view's **LoadLatestVersion** property is selected.



If the view is already open in the RTDMS client application when the new diagram version is saved in One-Line Diagram Kit, then the view's diagram will refresh to the latest version the next time the user resets their profile in the RTDMS client application.

If the RTDMS client application view's **LoadLatestVersion** property is **not** selected, the version of the diagram last loaded in the view will continue to open.

Opening Diagrams

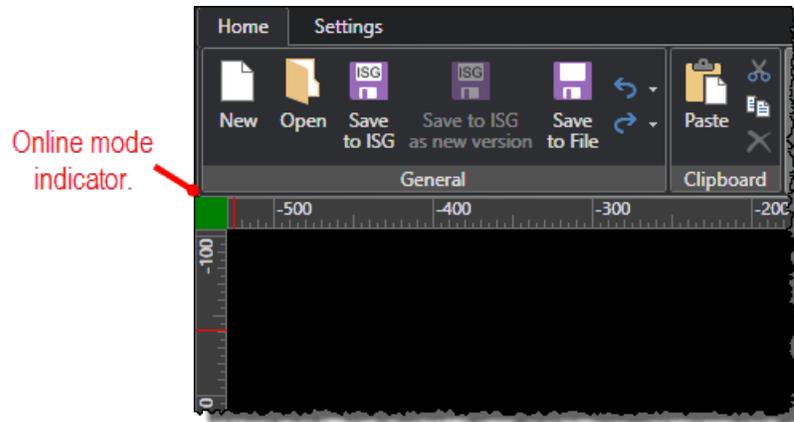
Opening an existing diagram in One-Line Diagram Kit depends on how the diagram was previously [saved](#). To open a diagram, you will open it either [from your ISG](#) or [from a file](#).

Opening Diagrams from Your ISG

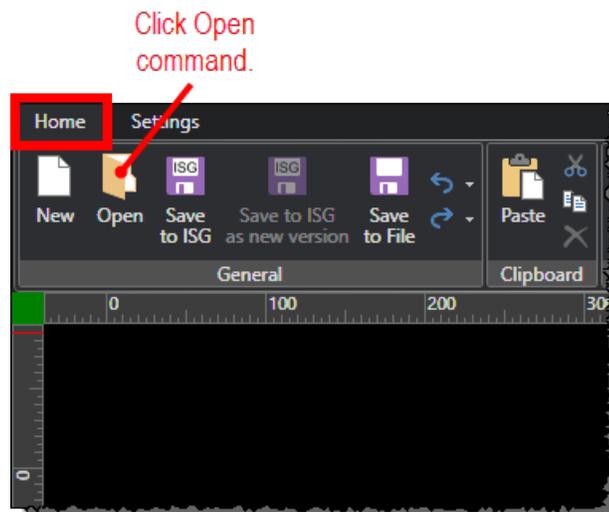
If you are [logged in](#) and working in [online mode](#), you can open diagrams from your ISG, including any diagram [versions](#) you may have.

➤ To open a diagram from your ISG:

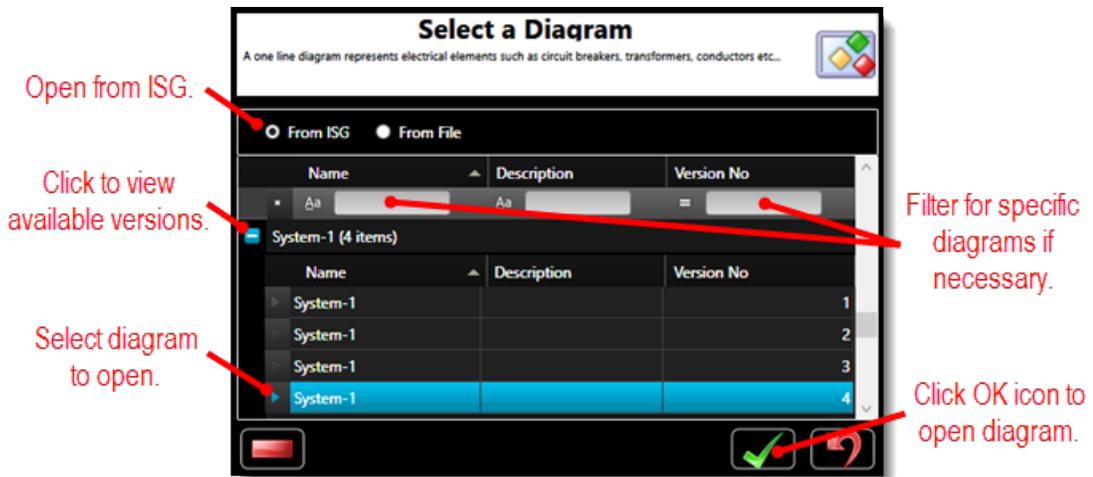
1. Make sure you are working in online mode.



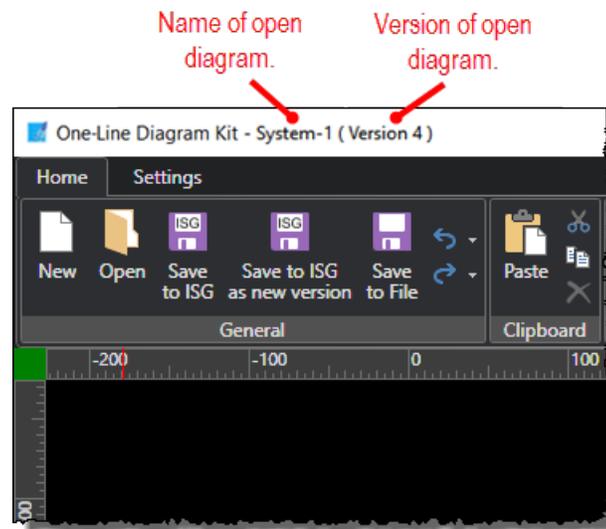
2. Under the [Home](#) tab, click the **Open** command.



3. When the **Select a Diagram** screen opens, select the **From ISG** option if it is not already selected, and then select the diagram you want to open. If the diagram has multiple versions, you can select any of them. If you have a large list of diagrams, you can use a [filter](#) to find a specific diagram.



4. Click the OK icon (✔). The diagram opens onto the **canvas**. You can confirm the diagram name and version in the application toolbar.

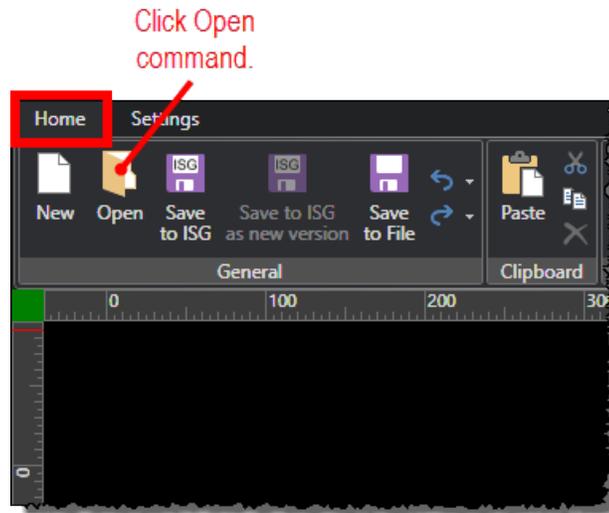


Opening Diagrams from Files

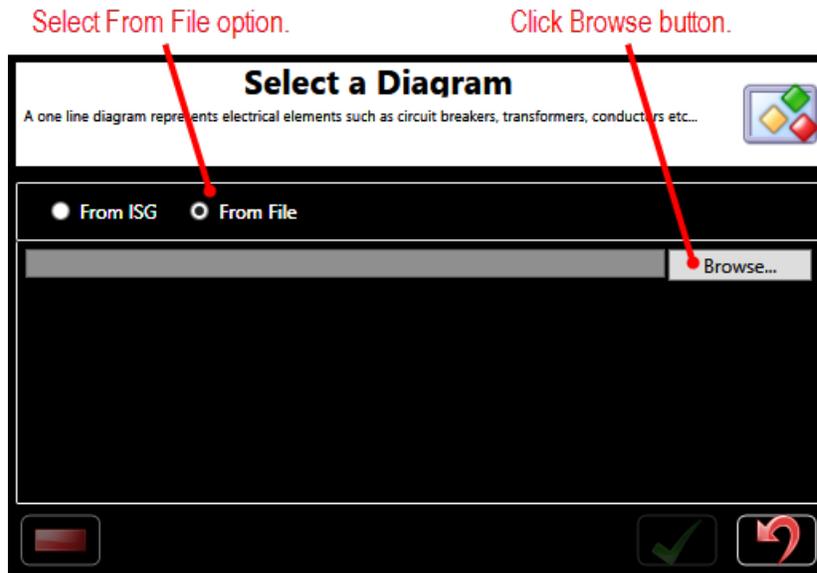
You can open diagrams from files that are in EPG One-Line Diagram file format (.epgold file extension). You can open diagrams from files in both **online** and **offline** mode.

➤ **To open a diagram from a file:**

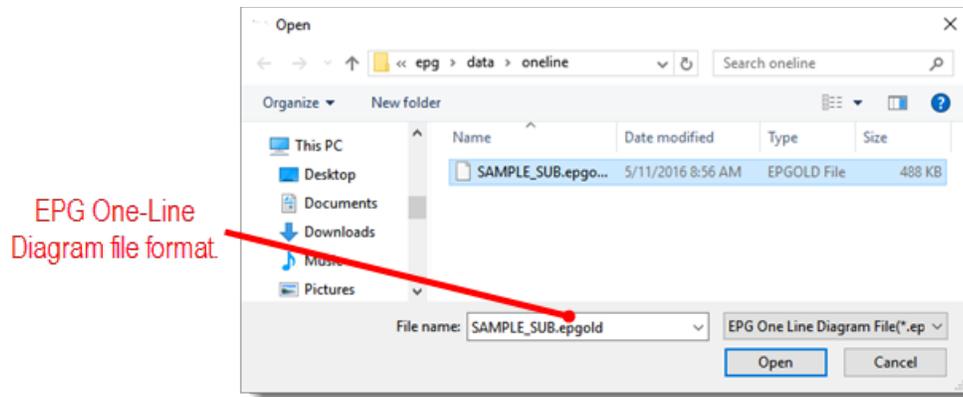
1. Under the **Home** tab, click the **Open** command.



2. When the **Select a Diagram** screen opens, select the **From File** option, and then click the **Browse** button.



3. When the pop-up window opens to select a file, browse to and select the **.epgold** file you want to open.



4. With the file path specified in the **Browse** field, click the OK icon (✔). The diagram opens onto the [canvas](#).



Importing Diagrams

Note: The import feature is an add-on module that requires an additional license. [Contact EPG](#) for more information.

One-Line Diagram Kit allows you to import diagrams from your existing system for visualization in the RTDMS client application. The import feature ensures consistency of diagrams between RTDMS and your existing visualization system while eliminating the need to draw and update diagrams manually.

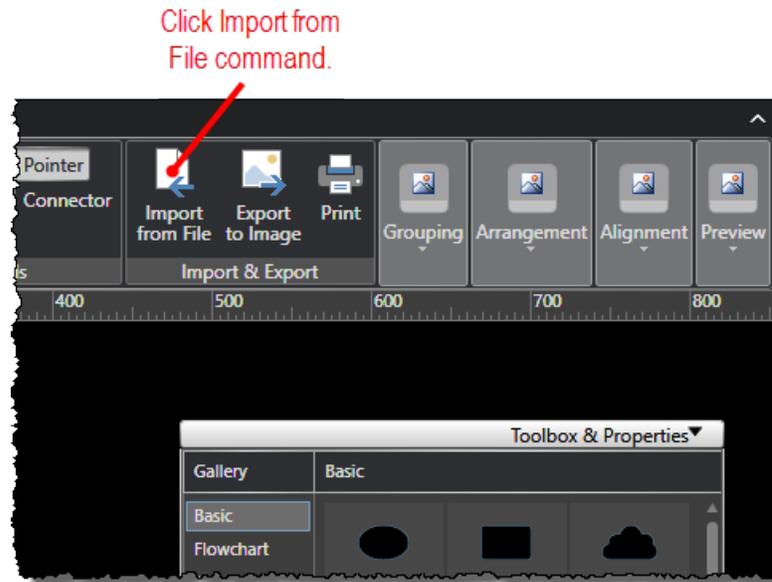
You can use the import feature to [import new diagram files](#) or [re-import updated diagram files](#) that have changed since being previously imported.

Importing New Diagrams

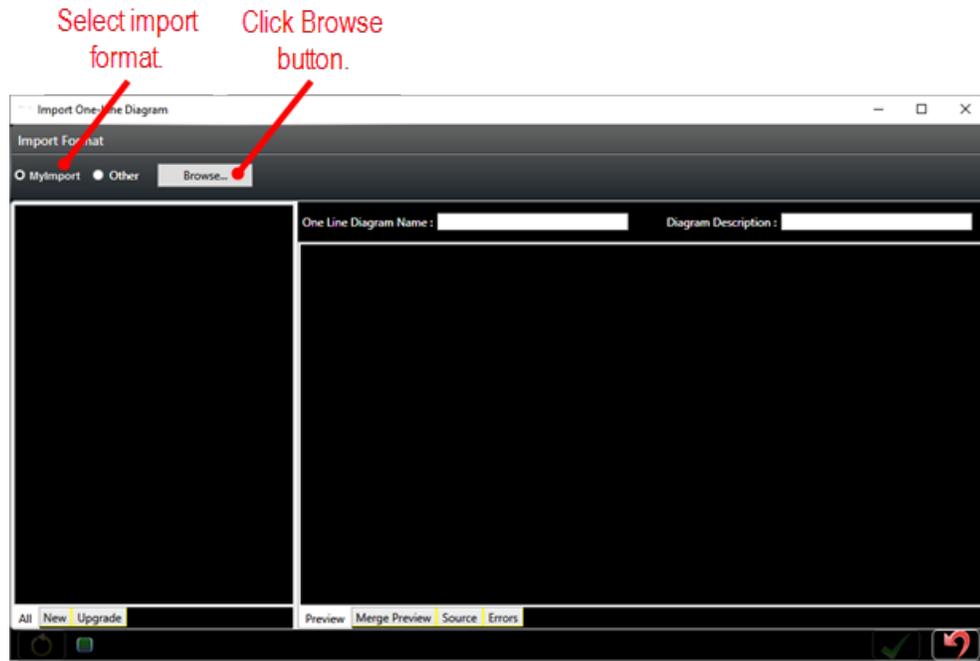
You can use the [import feature](#) to import diagrams from your existing visualization system (the import feature is an add-on module that requires an additional license).

➤ **To import a new diagram:**

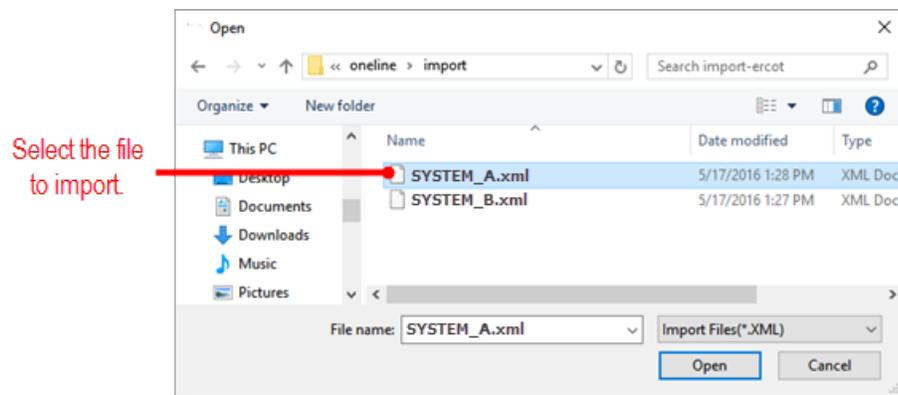
1. Under the [Home](#) tab, click the **Import from File** command.



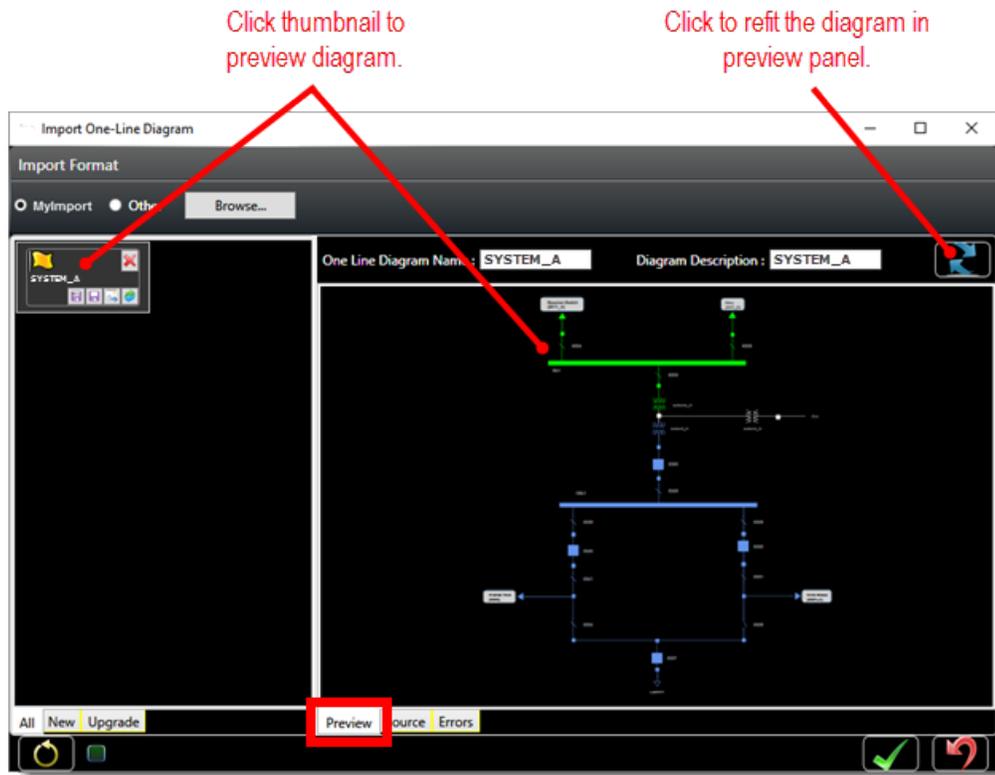
2. When the **Import One-Line Diagram** screen opens, select the file format option for the file you want to import, and then click the **Browse** button.



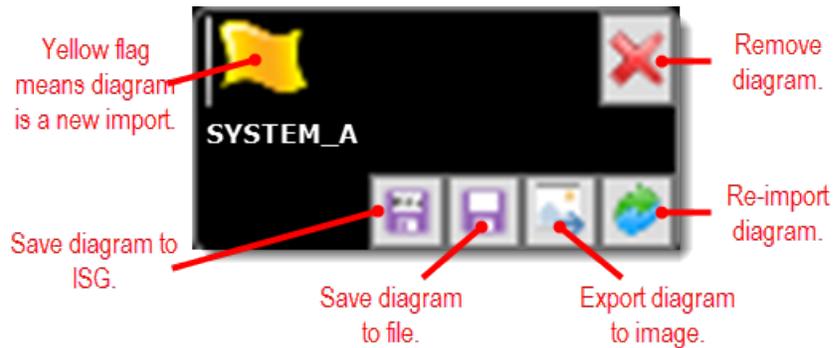
- When the pop-up window opens to select a file, browse to and select the diagram file you want to import.



- When the file is loaded to the **Import One-Line Diagram** screen, a thumbnail appears for each diagram. Click a thumbnail to preview the corresponding diagram on the **Preview** tab. While previewing a diagram, use your mouse scroll wheel to zoom in and out of the diagram. You can refit the diagram in the preview panel at any time by clicking the refit icon (📐).



5. Click any of the thumbnail commands depending on the task you want to perform on the corresponding diagram.



The thumbnail includes the following commands:

- **Save to ISG:** Save the corresponding diagram to your ISG. When you click this command, the diagram is automatically **saved to your ISG** with the same diagram name and description that was imported.

Note: You can click the save all icon () at the bottom of the **Import One-Line Diagram** screen if you have multiple diagrams and want to save them all to ISG at the same time.

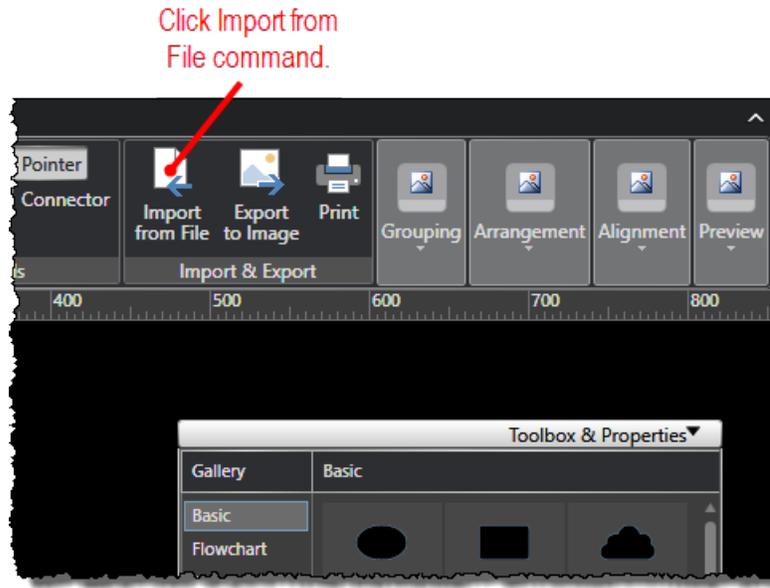
- **Save to file:** Save the corresponding diagram to a file. When you click this command, you perform the same task as [saving a standard diagram to file](#).
 - **Export to image:** Export the corresponding diagram to a PNG image file. When you click this command, you perform the same task as [exporting a standard diagram to an image](#).
 - **Re-import:** If necessary, re-import the corresponding diagram.
 - **Remove:** Remove the thumbnail and corresponding diagram from the screen.
 - **Yellow flag (informational only):** Confirms that the corresponding diagram has not been previously imported (a red flag means the diagram has been previously imported but can be [re-imported](#)).
6. At any point, you can click the clear icon () at the bottom of the **Import One-Line Diagram** screen if you need to clear all diagrams from the screen and start over.

Re-importing Updated Diagrams

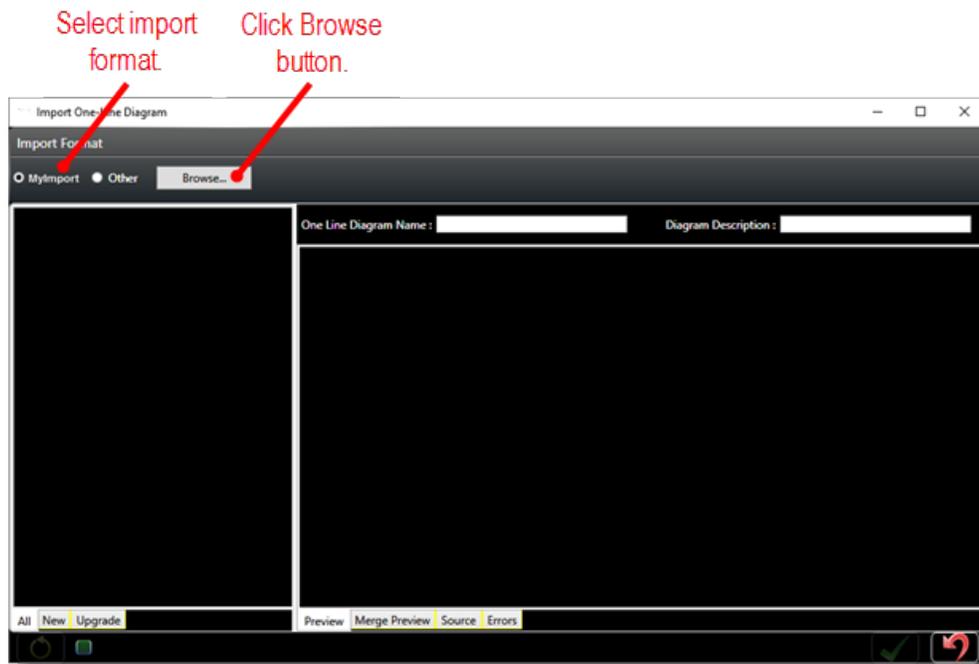
You can use the [import feature](#) to re-import previously [imported diagrams](#) if those diagrams have since changed (the import feature is an add-on module that requires an additional license). One-Line Diagram Kit will assist you in importing changes and merging diagrams.

➤ To re-import an updated diagram:

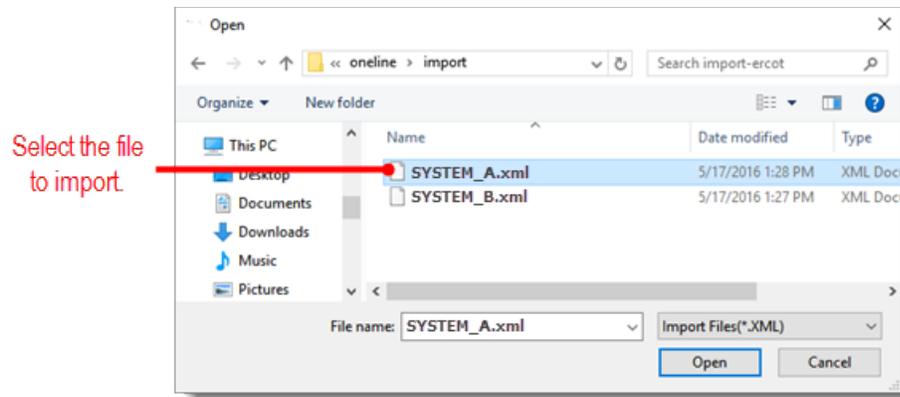
1. Under the [Home tab](#), click the **Import from File** command.



2. When the **Import One-Line Diagram** screen opens, select the file format option for the file you want to re-import, and then click the **Browse** button.

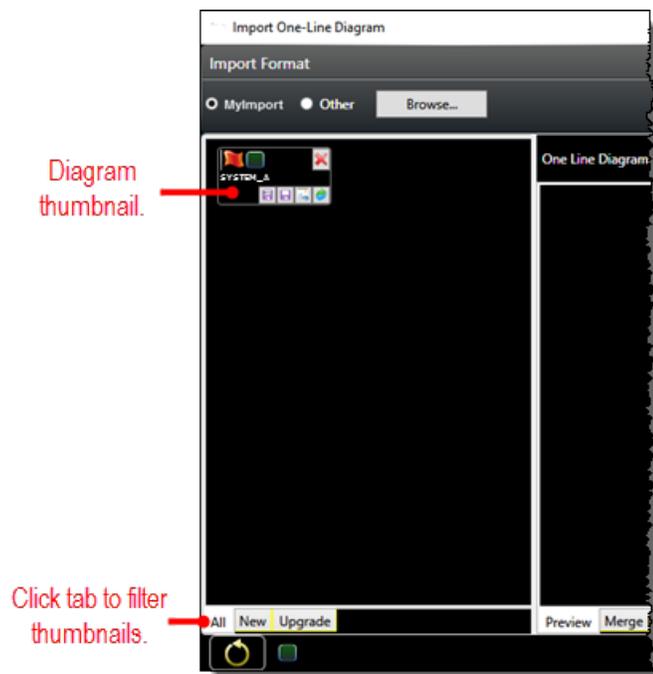


3. When the pop-up window opens to select a file, browse to and select the diagram file you want to re-import.

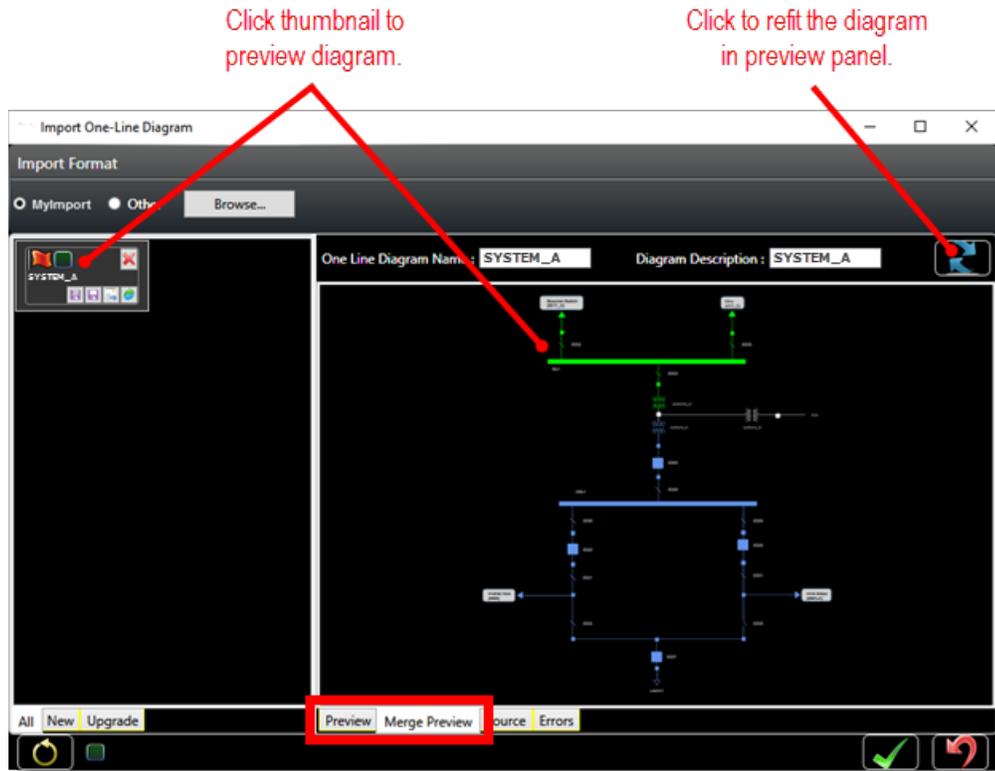


4. When the file is loaded to the **Import One-Line Diagram** screen, a thumbnail appears for each diagram. You can also click tabs at the bottom of the thumbnail panel to filter the thumbnails:

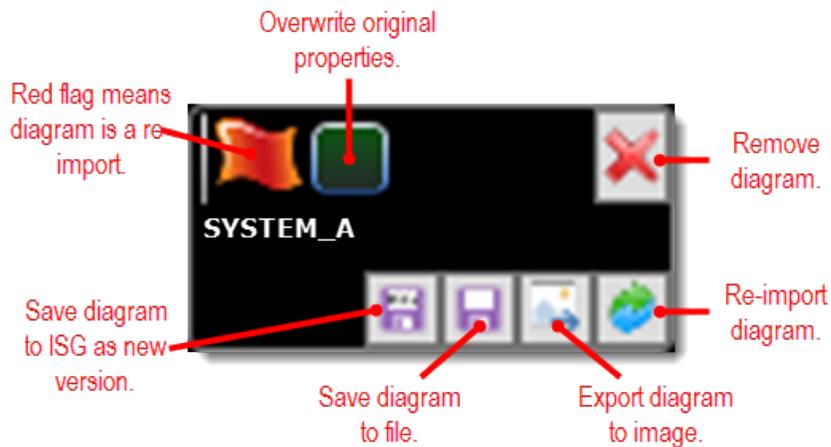
- **All:** Show thumbnails for all diagrams, regardless of whether they are new or updated.
- **New:** Show thumbnails for new diagrams while hiding diagrams that have been previously imported.
- **Upgrade:** Show thumbnails for previously imported diagrams while hiding new diagrams.



5. Click a thumbnail to preview the corresponding diagram on the **Preview** tab. You can also view the merged diagrams from the original and updated files on the **Merge Preview** tab. While previewing a diagram, use your mouse scroll wheel to zoom in and out of the diagram. You can refit the diagram in the preview panel at any time by clicking the refit icon (🔄).



6. Click any of the thumbnail commands depending on the task you want to perform on the corresponding diagram.



The thumbnail includes the following commands:

- **Save to ISG as new version:** Save the corresponding diagram to your ISG as a [new version](#) of the originally imported diagram. When you click this command, the diagram is automatically [saved to your ISG as a new version](#) with the same diagram name as the original.

Note: You can click the save all icon (📁) at the bottom of the **Import One-Line Diagram** screen if you have multiple diagrams and want to save them all to ISG at the same time. New diagrams will be saved as new, and updated diagrams will be saved as new versions.

- **Save to file:** Save the corresponding diagram to a file. When you click this command, you perform the same task as [saving a standard diagram to file](#).
 - **Export to image:** Export the corresponding diagram to a PNG image file. When you click this command, you perform the same task as [exporting a standard diagram to an image](#).
 - **Re-import:** If necessary, re-import the corresponding diagram.
 - **Remove:** Remove the thumbnail and corresponding diagram from the screen.
 - **Overwrite properties:** Overwrite the properties in the previously imported diagram with those from the update diagram.
 - **Red flag (informational only):** Confirms that the corresponding diagram has been previously imported (a yellow flag means the diagram has not been previously imported). You can hover the mouse over the flag for more information about the diagram.
7. At any point, you can click the clear icon (🗑️) at the bottom of the **Import One-Line Diagram** screen if you need to clear all diagrams from the screen and start over.

Saving Diagrams

One-Line Diagram Kit offers multiple methods for saving diagrams depending on how you want to work with your diagrams:

- Save to your ISG if you are [working online](#) and want the diagram to be available for visualization through the RTDMS client application. When you save to your ISG, you can save the diagram either as the [same version](#) or as a [new version](#). Refer to the [Understanding Diagram Versions](#) section for more information on diagram versions.

- [Save to a file](#) if you are [working offline](#) or if you otherwise do not want the diagram to be available on your ISG for visualization through the RTDMS client application.

Note: You can also [export diagrams to image](#) files; however, this feature is for creating static diagram images only. You cannot use the exported image to open or import as a diagram later.

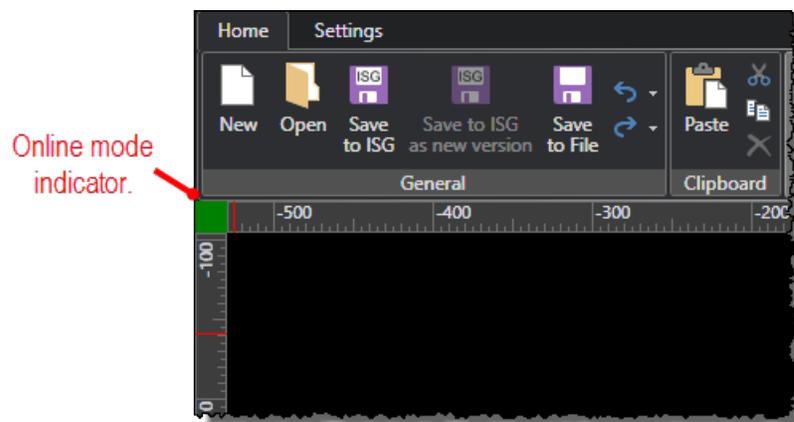
Saving Diagrams to ISG as the Current Version

If you are [logged in](#) and working in [online mode](#), you can save diagrams to your ISG. While often times you might prefer to [save a diagram as a new version](#), there are a few situations in which you may want to save as the current [version](#):

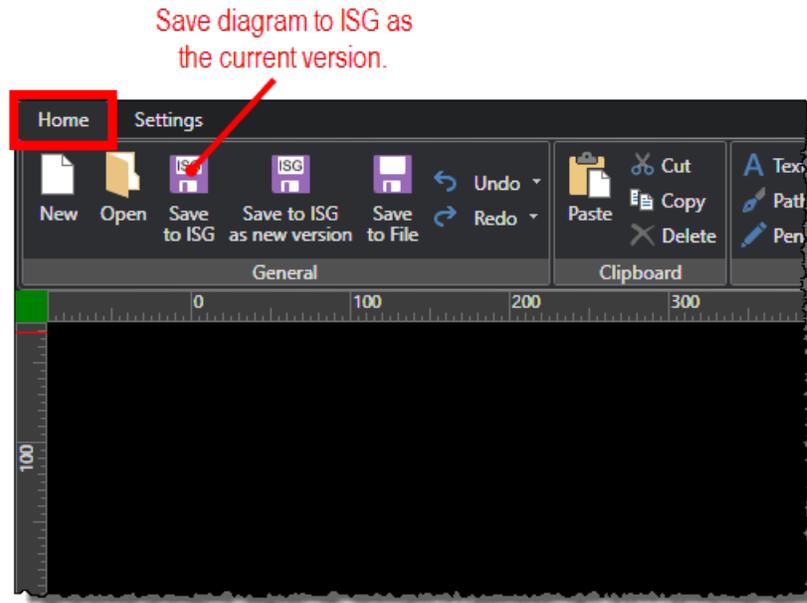
- You are working with a [newly created diagram](#).
- You opened the diagram [from a file](#) (instead of [from your ISG](#)) and are saving the diagram to your ISG for the first time. When you do so, the saved diagram becomes version 1 of that diagram on your ISG.
- You [imported the diagram](#) from your existing visualization system and are saving the diagram to your ISG for the first time (the import feature is an add-on module that requires an additional license). When you do so, the saved diagram becomes version 1 of that diagram on your ISG.
- You do not want a new version of the diagram and simply want to save updates to the same diagram version.

➤ To save a diagram to your ISG as the current version:

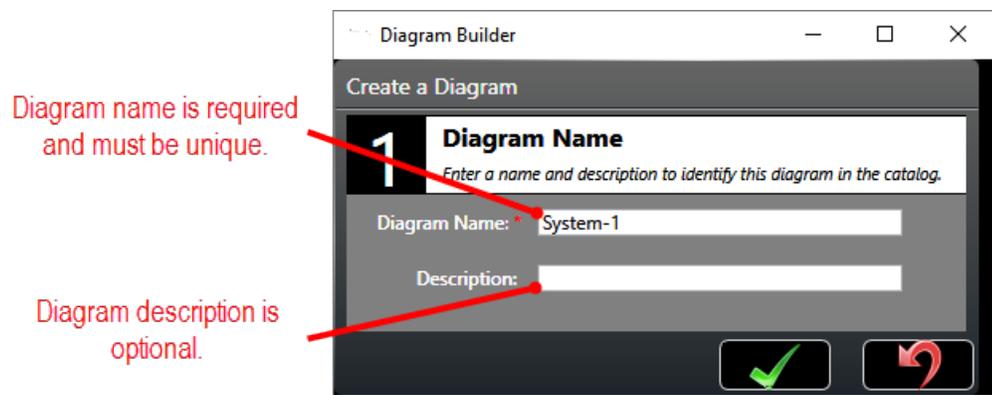
1. Make sure you are working in online mode.



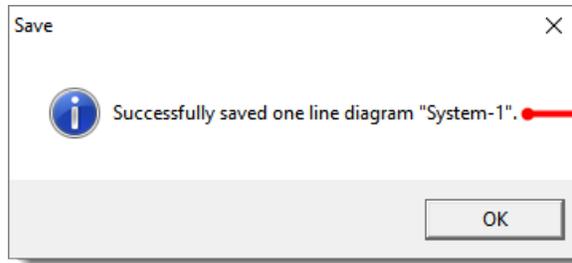
2. Under the [Home](#) tab, click the **Save to ISG** command.



3. If this is the first time the diagram is being saved to your ISG, the **Diagram Name** screen opens for you to name the diagram. Type the required name in the **Diagram Name** field and an optional description in the **Description** field, and then click the OK icon (✓) if naming the diagram. The diagram name must be unique across all diagrams on your ISG.



4. The diagram is saved to your ISG as the same version (version 1 if this is the first time saving it to your ISG). If this is the first time the diagram is being saved to your ISG, a pop-up message confirms that the diagram has been saved with the assigned diagram name.



Confirmation message shows diagram name.

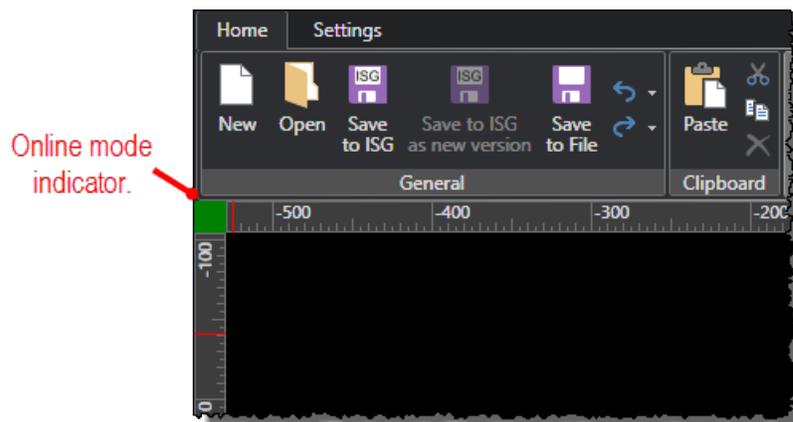
Note: If the diagram you are saving is one that was opened from a file, the **file version** remains open and active. You must [open the ISG version](#) to work with that version.

Saving Diagrams to ISG as New Versions

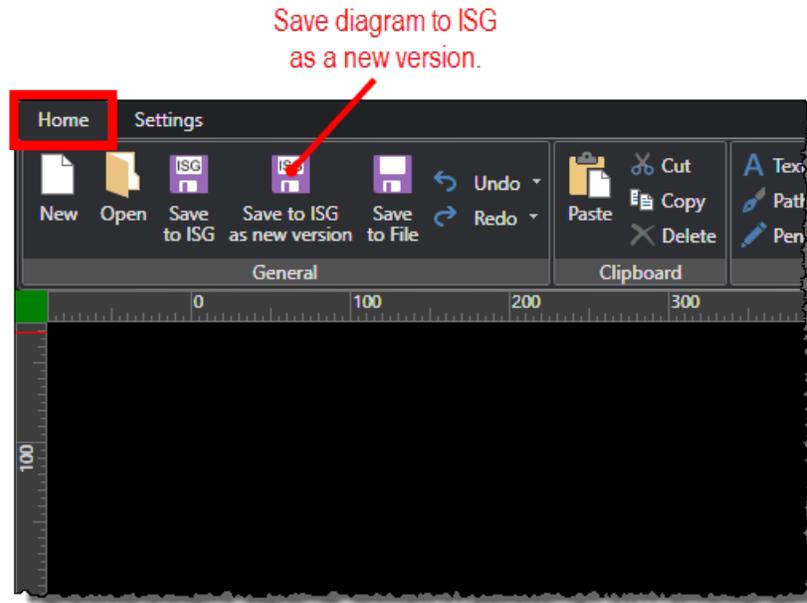
As you update diagrams from your ISG, you may want to save your changes as a new [version](#) of the diagram instead of [saving the changes to the current version](#). When you save as a new version, the diagram saves your updates while also retaining all unchanged signal and behavior configurations from the previous version. Your previous diagram versions also remain on your ISG, and you can [open](#) and work with those earlier versions at any time.

➤ **To save a diagram to your ISG as a new version:**

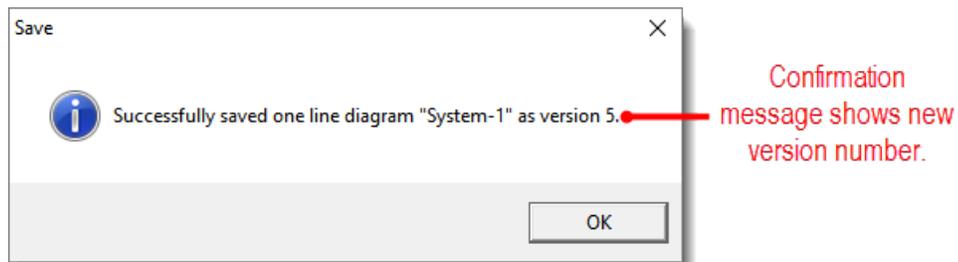
1. Make sure you are working in [online mode](#).



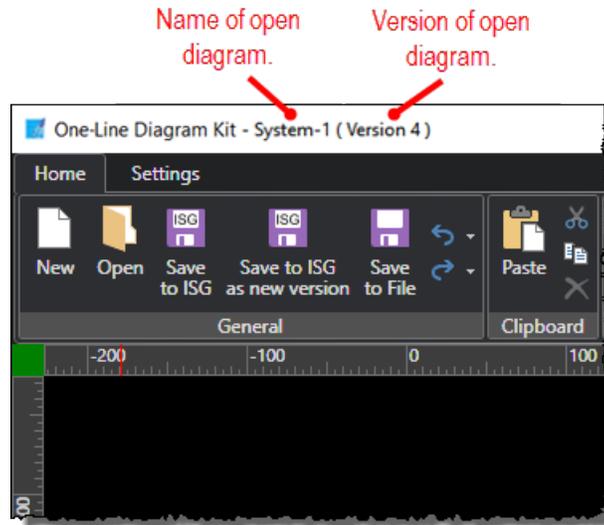
2. Under the [Home](#) tab, click the **Save to ISG as new version** command.



3. The diagram is saved as a new version on your ISG, and a pop-up message confirms that the version has been given the next incremental version number.



Note: When you save as a new version, the version you were previously working with remains as the open diagram on the canvas. You can [open the new version](#) from your ISG to continue working with it. You can always confirm the version number of the open diagram in the application title bar.



4. If the saved diagram was already open (as the previous version) in the RTDMS client application, and if that diagram has been set in the RTDMS client application to [load the latest version](#), then the user can refresh to the latest diagram version by resetting their profile.

Saving Diagrams to Files for Future Use

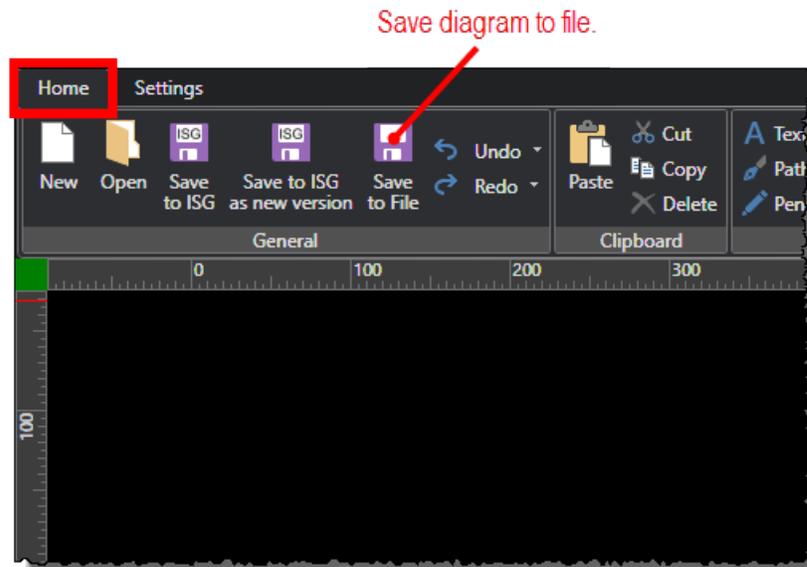
If you are not ready to make a diagram available on your ISG, you can save it to a file on your local system or to a shared folder. The file is saved in EPG One-Line Diagram file format (**.epgold** file extension), and then you or anyone with access to the file can [open that file](#) and continue to work on the diagram until you are ready to [save it](#) to your ISG.

Note: You can save diagrams to files when working in both [online](#) and [offline](#) mode. However, you can only save to file when working in offline mode.

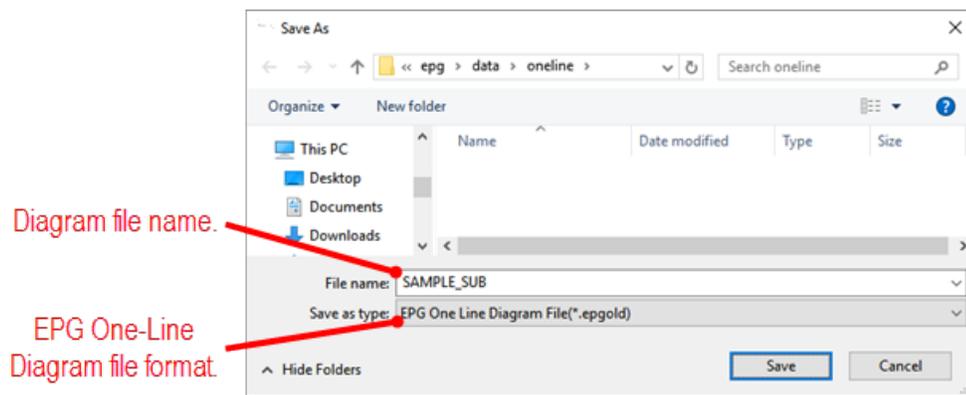
When you save to file, you do not have the option to save as a [version](#) the way you do when [saving to your ISG](#). However, you can achieve a result similar to diagram versions simply by using unique file names for saving updated versions of diagrams (for example, appending numbers at the end of the file name).

➤ **To save a diagram to a file:**

1. Under the [Home tab](#), click the **Save to File** command.



2. When the pop-up window opens to save a file, browse to the folder where you want to save the file and enter the file name you want to use.

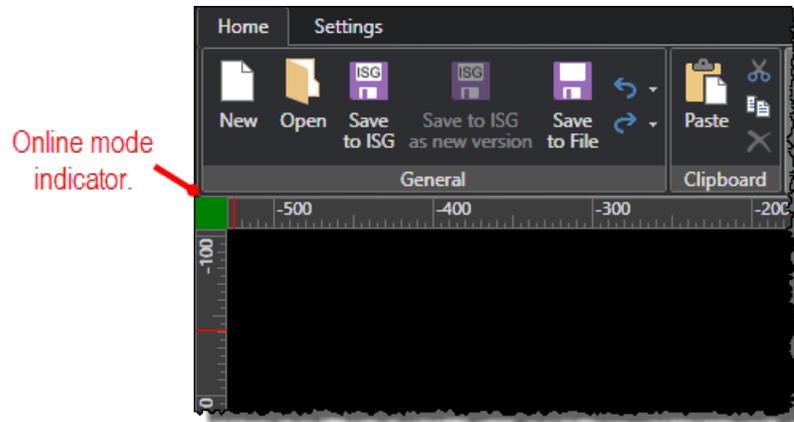


Deleting Diagrams from Your ISG

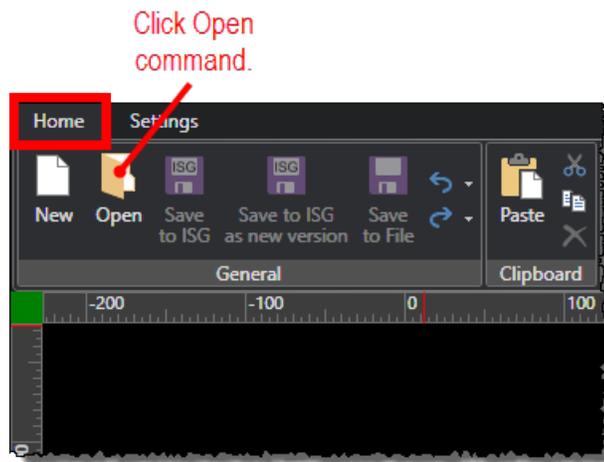
If you no longer use a diagram or a specific [version](#) of a diagram, you can delete it from your ISG. Before deleting a diagram, make sure it is not used in a view in the RTDMS client application.

➤ To delete a diagram from your ISG:

1. Make sure you are working in [online mode](#).



2. Under the [Home](#) tab, click the **Open** command.



3. When the **Select a Diagram** screen opens, select the **From ISG** option if it is not already selected, and then select the diagram you want to delete. If the diagram has multiple versions, you can select a specific version to delete. If you have a large list of diagrams, you can use a [filter](#) to find a specific diagram.

Select from ISG.

Click to view available versions.

Select the diagram to delete.

Click delete icon to delete diagram.

Filter for specific diagrams if necessary.

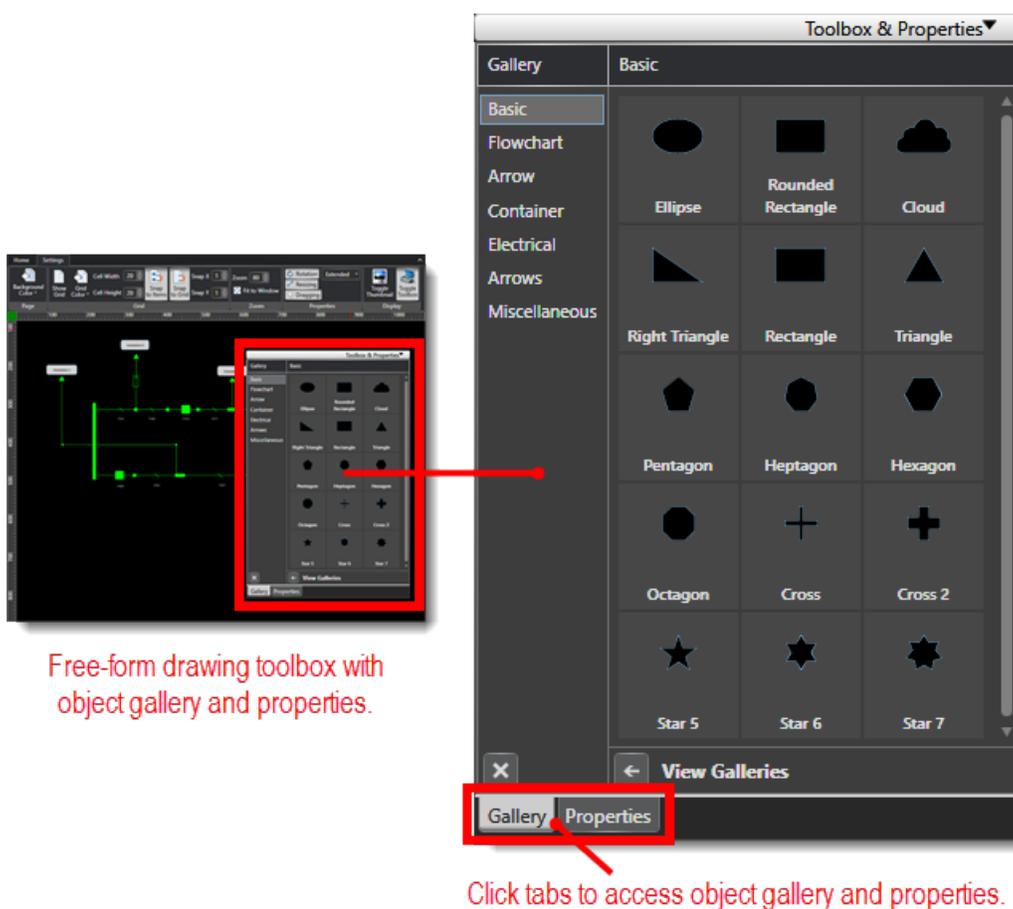
CAUTION: You will not be prompted to confirm deletion. Be sure you have selected the diagram you want to delete before clicking the delete icon.

4. Click the delete icon (🗑️).

4 Drawing Diagram Objects

One-Line Diagram Kit provides free-form drawing tools for you to draw both system and substation-level diagrams. These drawing tools allow you to add shapes, arrows, and electrical components such as busses, switches, breakers, and transformers to your diagrams. The primary feature for free-form drawing is the free-form drawing toolbox, which provides the following tools:

- A [gallery of objects](#) allows you to quickly [add shapes and electrical symbols](#) to diagrams.
- [Properties](#) allow you to set [visual settings](#), [data sources](#), [links](#), and actions to be triggered under specified [conditions](#).



- One-Line Diagram Kit also provides [additional tools](#) to help you add text and draw connectors and paths on the diagram.

Note: If the free-form toolbox is not visible on the screen, you can open it by [selecting the **Toggle Toolbox** command](#) on the [Settings](#) ribbon.

Object Gallery Types

The [free-form drawing toolbox](#) includes the following object gallery types:

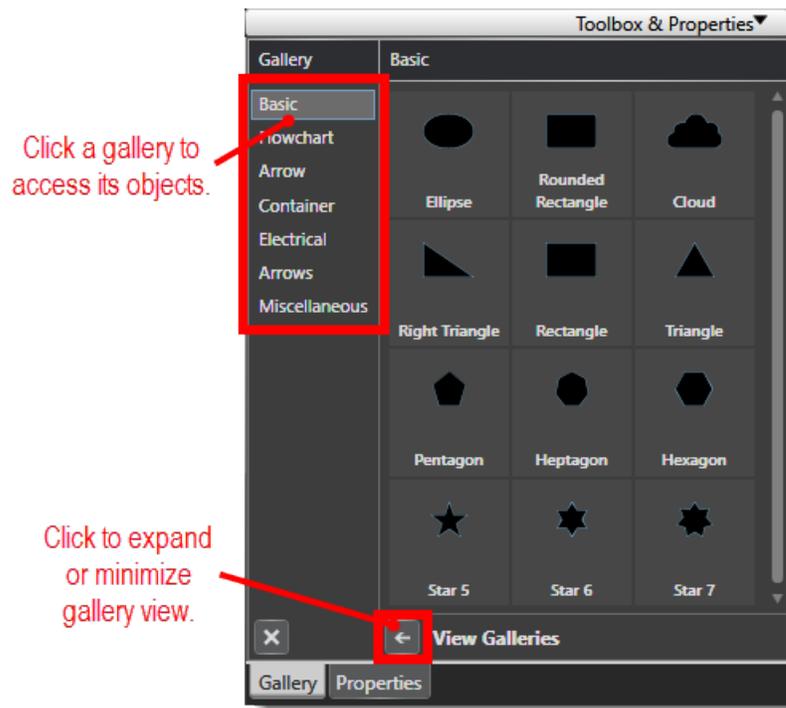
Gallery	Description
Basic	Standard geometric shapes such as rectangles, circles, triangles, clouds, and other shapes.
Flowchart	Objects that demonstrate directions, processes, and functions found in standard flowcharts.
Arrow	Geometric arrows that represent paths that flow left, right, and both. You can use arrows to show power flow or to show connections to substations. They differ from the Arrows gallery in that they offer different geometric types and sizes while the Arrows gallery contains fixed arrow heads for placement at the end of a bus or line.
Container	Boxes that hold other objects or diagrams and can be moved on the canvas collectively as one group. You can drag and drop objects into an existing container to include those objects in the collective group. A container can be static, or it can be collapsible, allowing you to click the top-right corner arrow to collapse the container and hide its contents. Since a container holds multiple objects as one collective group, you can use it for free-form drawing of the entire set of objects and for adding notes, secondary One-Line diagrams, and reference charts.
Electrical	Symbols that represent electrical components such as busses, switches, breakers, transformers, and other electrical objects.
Arrows	Standard up, down, left, and right arrows you can connect to the end of a bus or line. They differ from the Arrow gallery in that they are fixed arrow heads for attaching to other objects while the Arrow gallery contains geometric arrows of different types and sizes.
Miscellaneous	Objects that serve special purposes, including: <ul style="list-style-type: none"> • Labels that function as standard text labels • Label values that include not only the label but also data values from a specified data source • Buttons that can link to other diagrams

Adding Objects to Diagrams

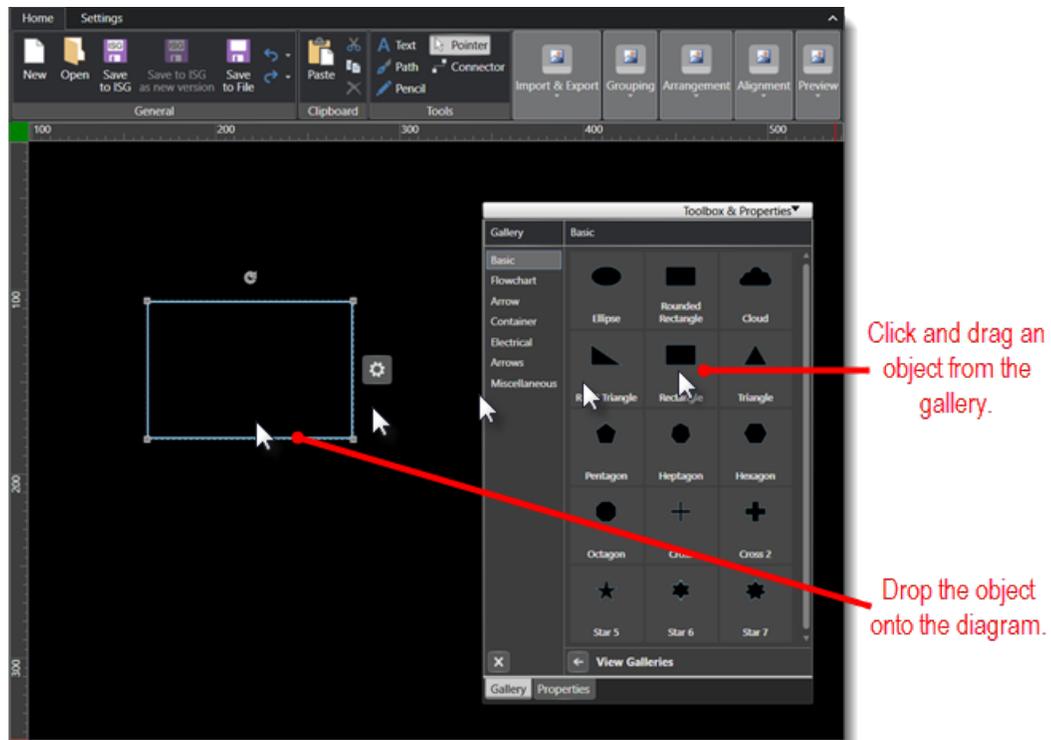
The [free-form drawing toolbox](#) provides galleries of standard shapes and electrical symbols that you can add to a [new](#) or [existing](#) diagram that is open on the [canvas](#).

➤ To add an object to a diagram:

1. If the free-form toolbox is not visible on the screen, open it by selecting the [Toggle Toolbox command](#) under the [Settings tab](#).
2. On the toolbox, click a [gallery type](#) to access its objects.



3. Click and drag an object from the gallery, and then drop the object onto the diagram.



4. With the object drawn on the canvas, you can [set object properties](#) or make such adjustments as [resizing the object](#), [rotating the object](#), or making any other necessary [modifications](#).
5. With multiple objects drawn on the canvas, you can [group them](#) to manage as one item.

Using Miscellaneous Drawing Tools

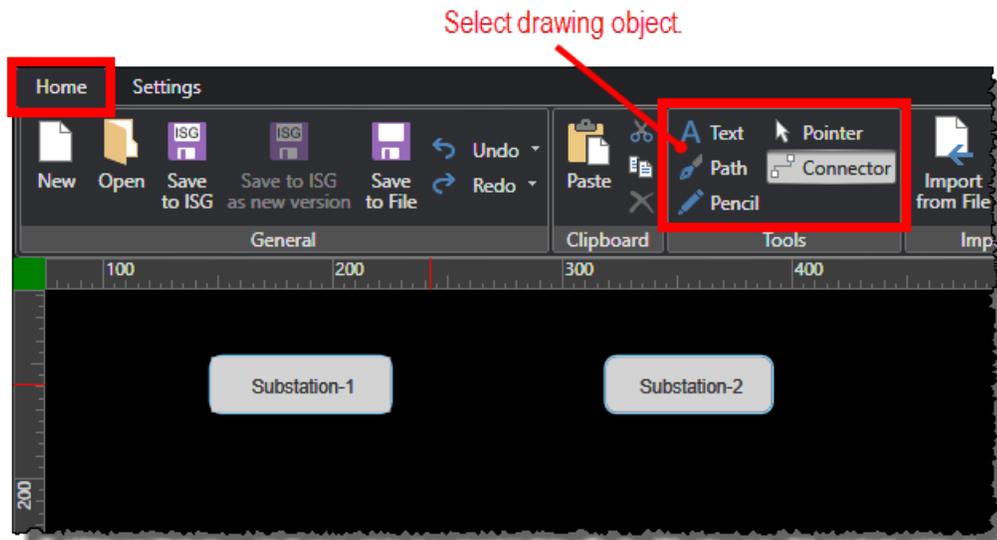
One-Line Diagram Kit provides tools to help you add text and draw connectors and paths on the diagram. These tools are not available through the [toolbox object gallery](#) and do not have settings for [standard properties](#) such as [signals](#) and [conditions](#). However, they do allow for design [properties](#) that help you specify visual properties for the drawn object (for example, color, size, and text).

➤ To use miscellaneous drawing tools:

1. Under the [Home](#) tab, click to select any of the following commands in the **Tools** group:
 - **Text:** Allows you to add a text box to type text onto the diagram.
 - **Path:** Assists in drawing objects by allowing you to draw a straight line between two paths and another curve that is tangent to the two paths. This shape can then be modified by adjusting the angle between two paths.
 - **Pencil:** Assists in drawing objects by setting boundaries for a straight line and another boundary that traces the movement of the pencil tool.

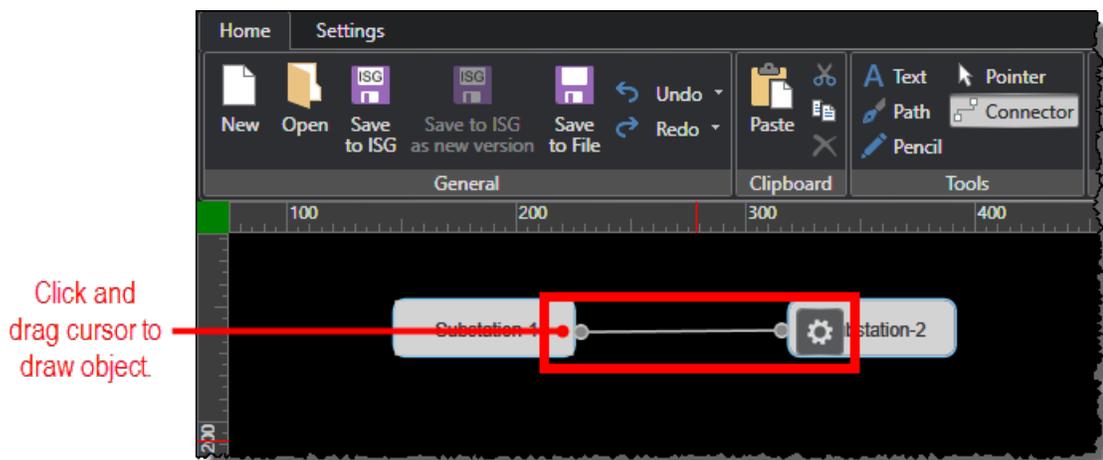
- **Connector:** Allows you to draw a line to show a connection between objects. It is different from the [arrow object gallery](#) in that it does not support standard properties such as signal information.

Note: Path, pencil, and connector drawings are not commonly used for creating One-Line diagrams. The object gallery provides most of the objects you need for drawing diagrams. These supplemental tools are provided to offer flexibility in unique drawing situations.

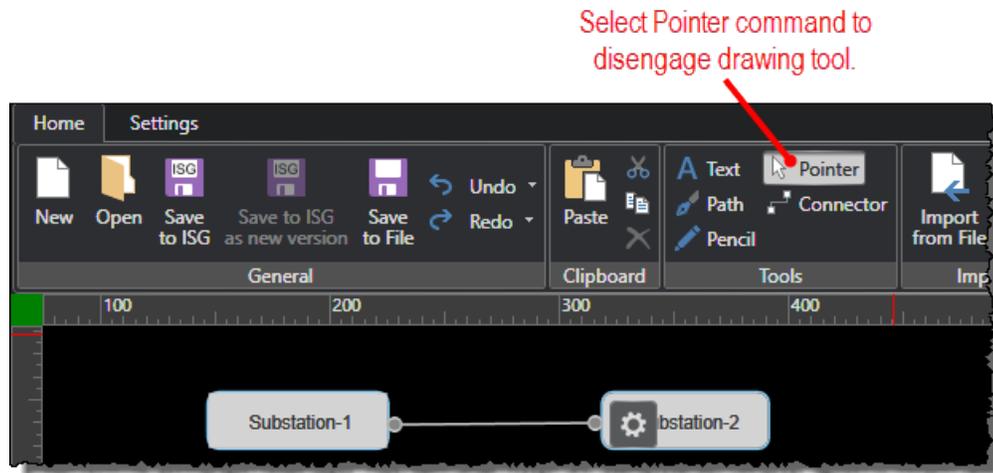


The cursor changes to an icon that represents your selected drawing tool.

2. Click and drag the cursor to draw the selected object. For example, with **Connector** selected, you could draw a connecting line to show a connection between substation buttons.



- Optionally, click to select the **Pointer** command to return the cursor to the standard pointer. The pointer stops any drawing functionality but allows you to select the drawn objects to specify design properties or otherwise modify them.



- Optionally, click the gear icon (⚙️) for a selected object to specify design properties [using the pop-up editor](#). For example, you could use this feature to add text for a text object, change the color of a path object, or change the line end points of a connector object.

5 Setting Object Properties

Free-form drawing objects have properties that dictate visual settings, data sources, links, and actions that are triggered upon specified conditions. There are two ways to set properties for a selected diagram object:

- Set common properties using a visual pop-up editor.
- Set all properties manually through the toolbox (more comprehensive).

There are also specific properties you can use for adding behaviors to diagram objects:

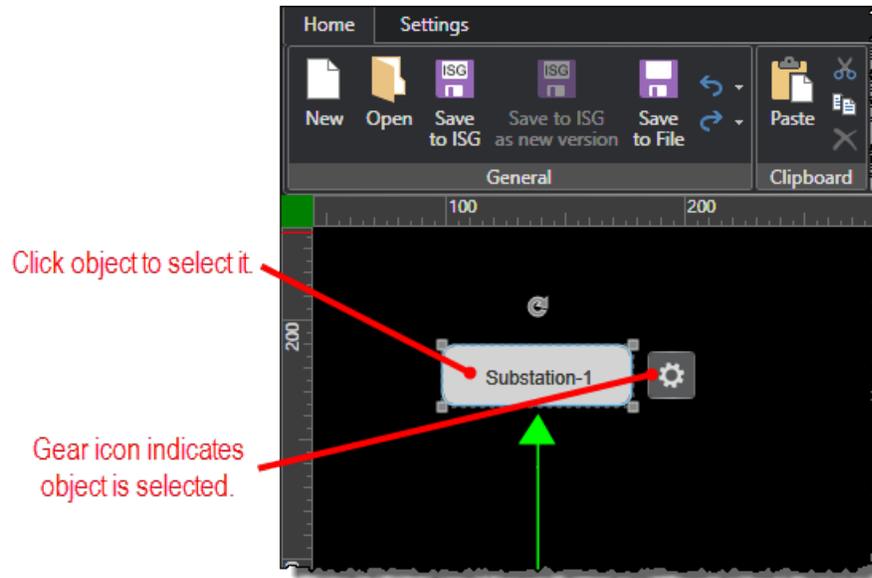
- Set data sources for objects to show corresponding real-time data.
- Set object actions to be triggered under specified conditions.
- Create links to other diagrams.

Setting Properties Using the Pop-up Editor

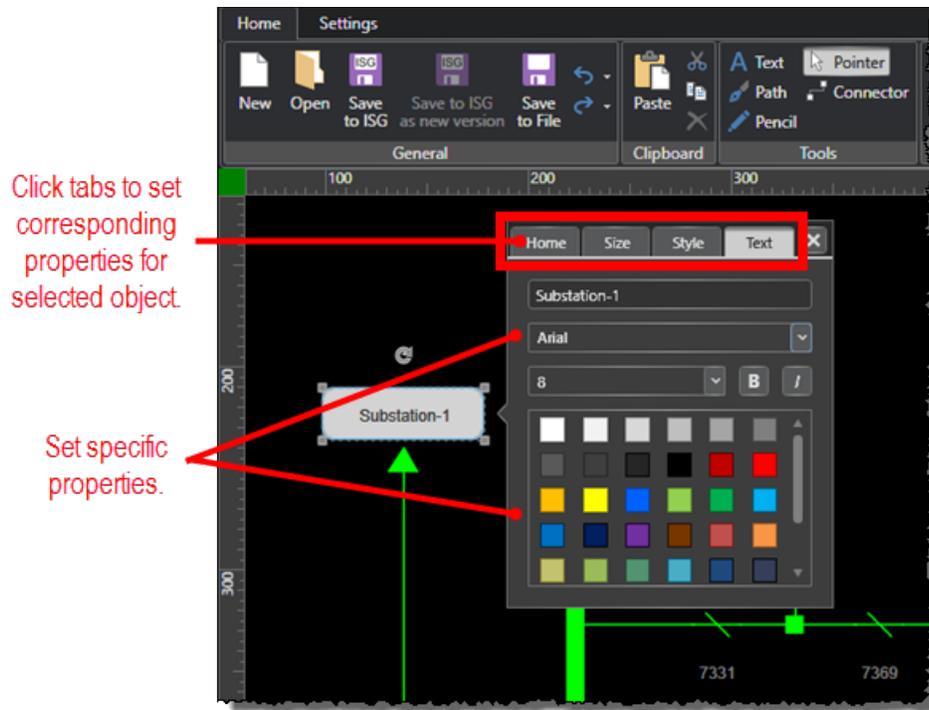
One-Line Diagram Kit allows you to use a visual pop-up editor to quickly set properties of drawn objects. Unlike the toolbox properties editor, which provides comprehensive editing of all properties, the pop-up editor provides access to only the most common object properties.

➤ To set properties using the pop-up editor:

1. Select the object you want to set properties for by clicking it in the diagram. You can select multiple objects to set properties for at the same time by pressing the **CTRL** key while you click the objects.



2. Click the gear icon (⚙️) for the selected object.
3. When the pop-up editor opens, click any of the following tabs to edit the corresponding properties:
 - **Home:** Provides general [cut](#), [copy](#), [paste](#), and [delete](#) tools as well as features for arranging the [order](#) and [alignment](#) of the selected object.
 - **Size:** Allows you to set precise settings for the selected object's [dimensions](#), placement on diagram, and degrees for [rotation](#).
 - **Style:** Provides selections for visual properties such as object color and gradient.
 - **Text:** Allows you to specify properties for button [text](#) and object [labels](#).



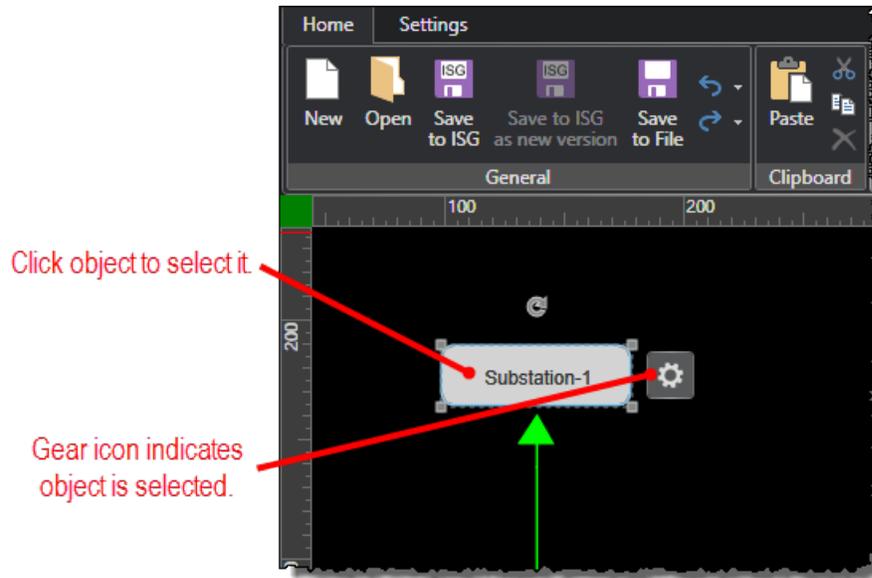
Refer to the [Property Reference](#) section for a reference that lists all available properties and explains their purpose.

Setting Properties Using the Toolbox

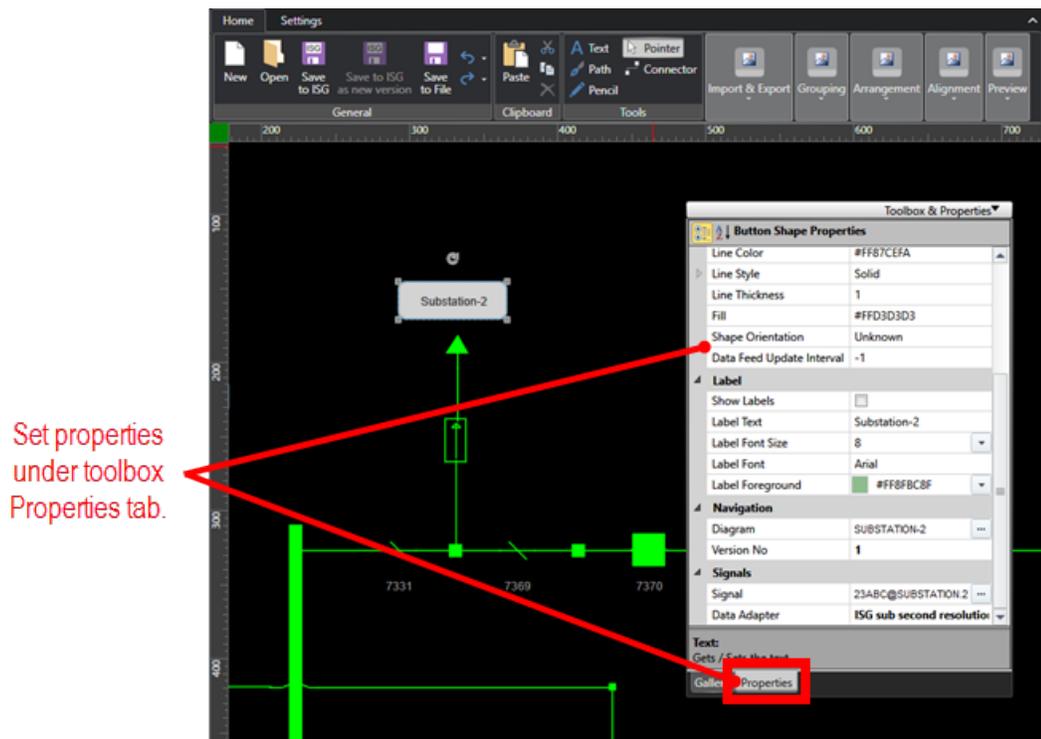
While the [pop-up properties editor](#) provides easy visual editing of common properties of [drawn objects](#), the **Properties** tab in the [free-form drawing toolbox](#) provides a comprehensive editor for all properties that pertain to the selected object.

➤ To set properties using the toolbox:

1. If the free-form toolbox is not visible on the screen, open it by [selecting the Toggle Toolbox command](#) under the [Settings](#) tab.
2. Select the object you want to set properties for by clicking it in the diagram. You can select multiple objects to set properties for at the same time by pressing the **CTRL** key while you click the objects.



3. Click the **Properties** tab in the free-form drawing toolbox, and set object properties as needed. Refer to the [Property Reference](#) section for a reference that lists all available properties and explains their purpose.



Setting Signal Data Sources

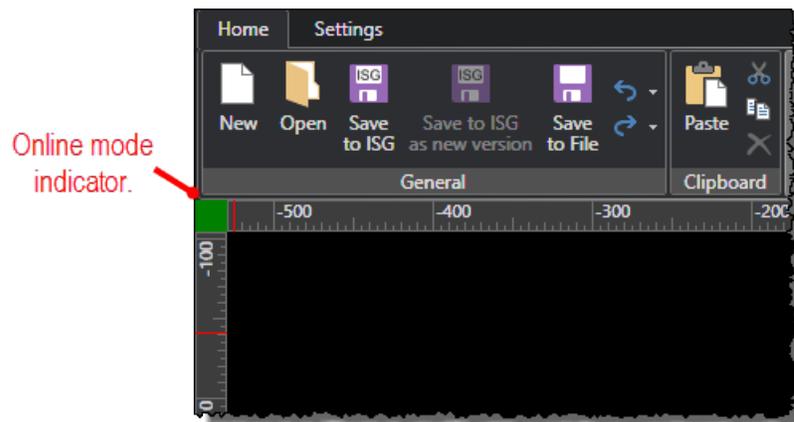
One-Line Diagram Kit allows you to set the following types of PMU signals as data sources for [drawn objects](#), enabling those objects to show the corresponding signal data in real time:

- Synchrophasor data
- Calculated values such as power, power corridors, and angle differences

For example, you could draw an electrical object on a diagram and then map a corresponding PMU signal to display with that object.

➤ **To set a data source for a diagram object:**

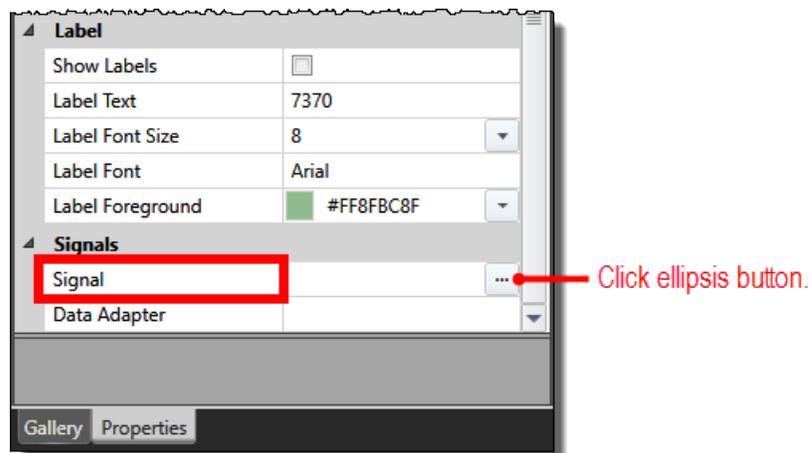
1. Make sure you are working in [online mode](#).



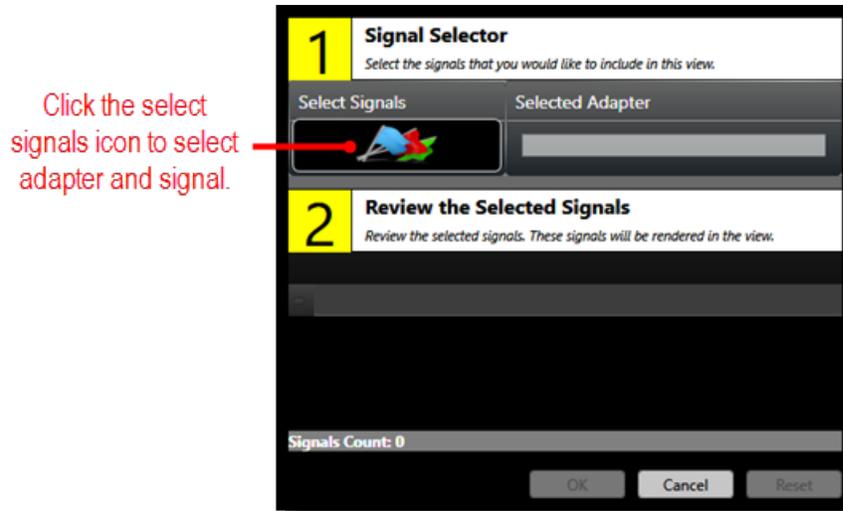
2. If the free-form toolbox is not visible on the screen, open it by [selecting the Toggle Toolbox command](#) under the [Settings tab](#).
3. Select the object you want to set a data source for by clicking it in the diagram. You can select multiple objects to set a data source for at the same time by pressing the **CTRL** key while you click the objects.



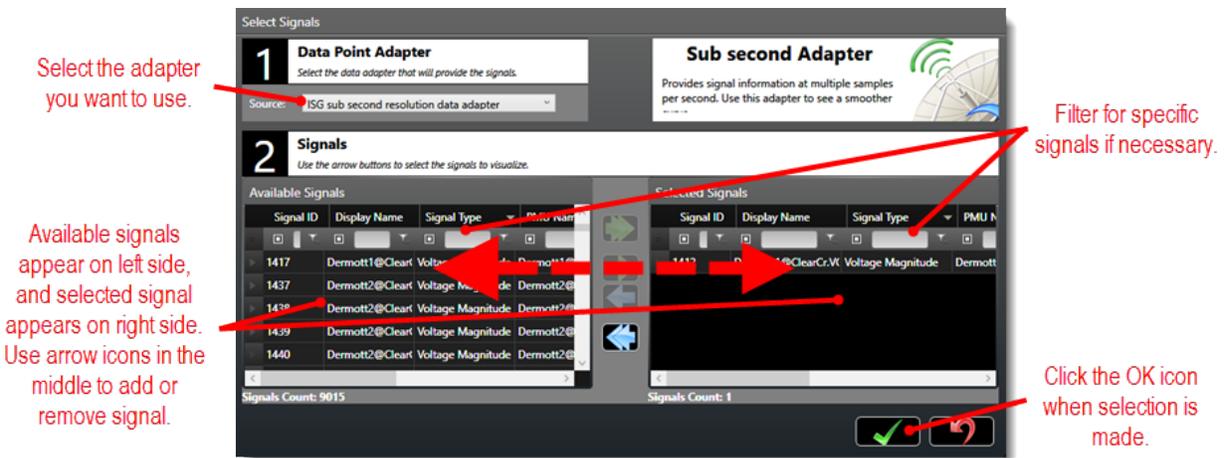
4. Under the **Properties** tab in the free-form drawing toolbox, click the ellipsis (...) button for the **Signal** property.



5. When the **Signal Selector Editor** screen opens, click the select signals icon in the **Signal Selector** section.

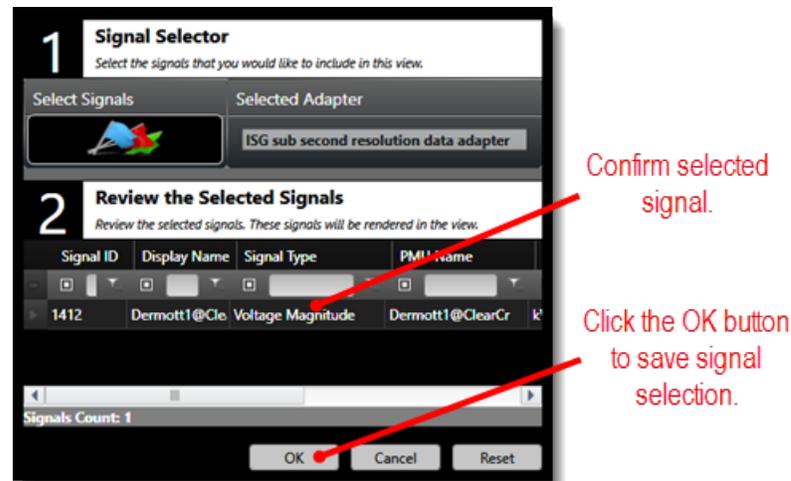


- When the **Data Point Selector** screen opens, select an adapter and signal to use for the selected object. If you have a large list of signals, you can use a [filter](#) to find a specific signal.

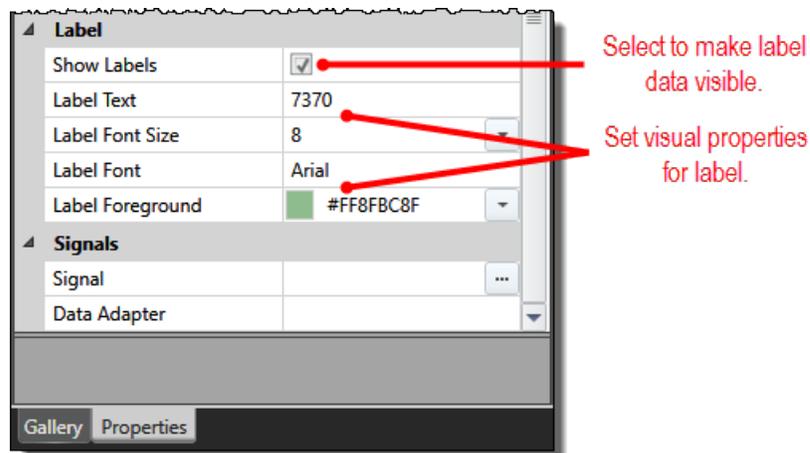


After you make your selection in the **Data Point Selector** screen, click the OK icon (✓) to return to the **Signal Selector Editor** screen.

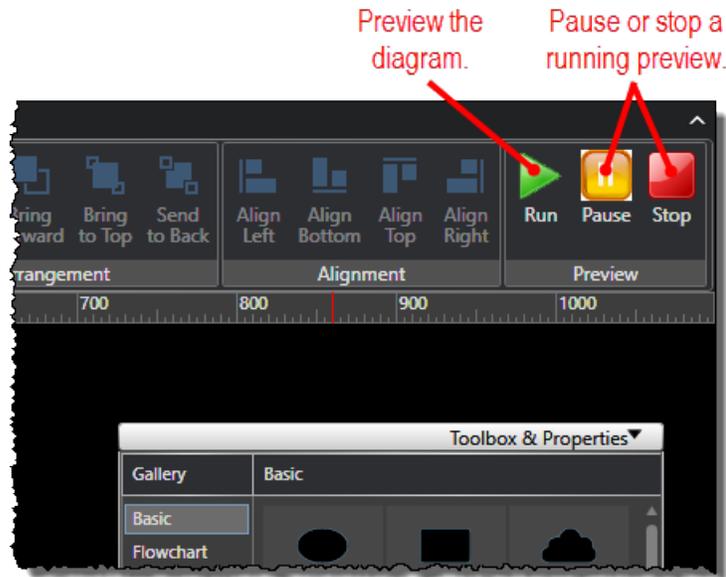
- Click the **OK** button in the **Signal Selector Editor** screen to save your signal selection.



8. When you return to the properties toolbox, select the [Show Labels](#), property check box to make the signal data visible in the diagram. You can also [set other properties](#) such as [Label Text](#) and [Label Font Size](#) to change the appearance of the signal information in the diagram.



9. Change the [Data Feed Update Interval \(ms\)](#) property as needed to adjust the adapter speed.
10. [Preview](#) the diagram if you would like to test your changes.

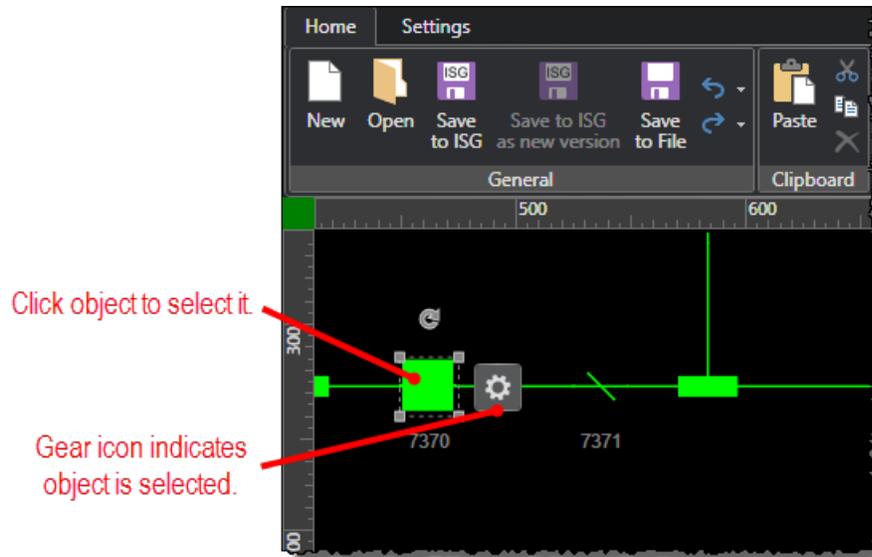


Setting Conditional Actions

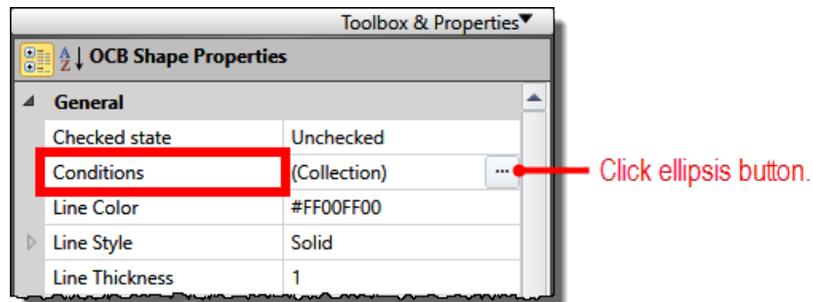
One-Line Diagram Kit allows you to add conditions to [drawn objects](#) so that the objects dynamically change when specified conditions are met. For example, you could set an electrical object in a diagram to change color from yellow to red when the voltage exceeds a predefined threshold. You can set more than one condition for the same object so that multiple actions can occur under different conditions. For example, you could set multiple conditions so that the diagram object changes from green to yellow under one condition and then from yellow to red under another condition.

➤ **To set conditional actions:**

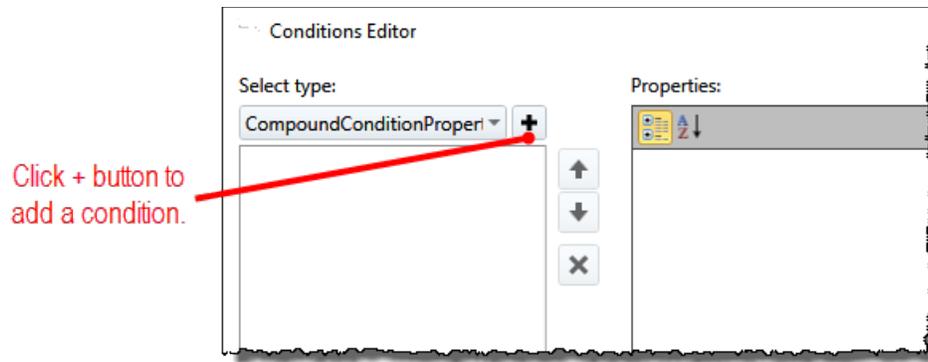
1. If the [free-form toolbox](#) is not visible on the screen, open it by [selecting the Toggle Toolbox command](#) under the [Settings](#) tab.
2. Select the object you want to set conditional actions for by clicking it in the diagram.



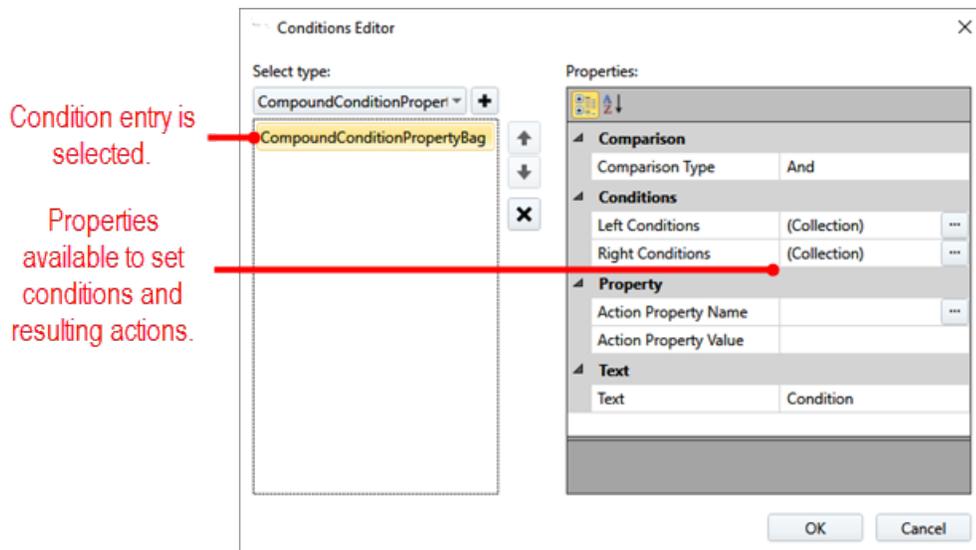
3. If a signal is not already set for the selected object, then [set the signal data source](#) you want to use. This is the data source on which the specified conditions will be based.
4. Under the **Properties** tab in the free-form drawing toolbox, click the ellipsis (...) button for the [Conditions](#) property.



5. When the **Conditions Editor** window opens, click the + button next to the **Select Type** selection box to add a condition entry to the list. This is an entry you will use to specify the conditions and resulting action you want to take on the selected object.



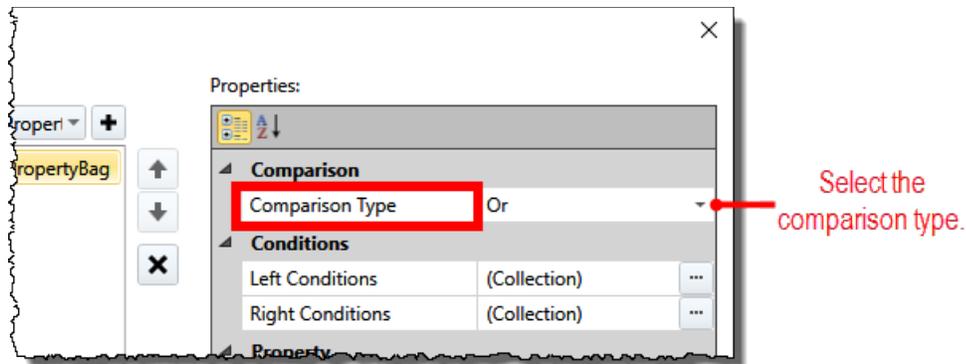
After the condition entry is added, it is selected in the list and its properties are available for you to specify conditions and resulting action.



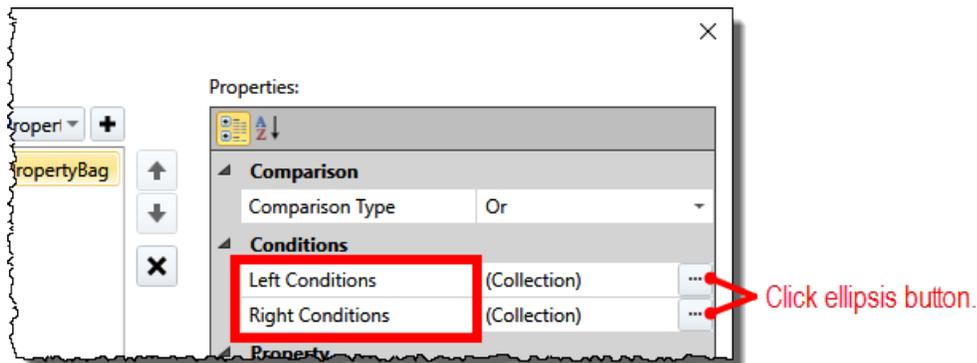
6. With the condition entry selected in the list, select **And** or **Or** for the [Comparison Type](#) property to use in evaluating the left and right conditions (left and right conditions are specified next):

- **And** means that both the left and right conditions must be met for the condition to be triggered and the resulting action activated. If only one of the conditions is met, the action is **not** activated.
- **Or** means that either the left or right condition can be met for the condition to be triggered and the resulting action activated. If only one of the conditions is met, the action **is** activated.

For example, to trigger a condition when voltage either drops below 210 kV or spikes above 260 kV, you would select **Or**.



7. To specify the parameters of the condition, click the ellipsis (...) button for the [Left Conditions](#) or [Right Conditions](#) property (depending on which one you are setting). You can set both the left and right conditions or set only one of them. If you set only one of the conditions, the system ignores the **Comparison Type** property set in the previous step.



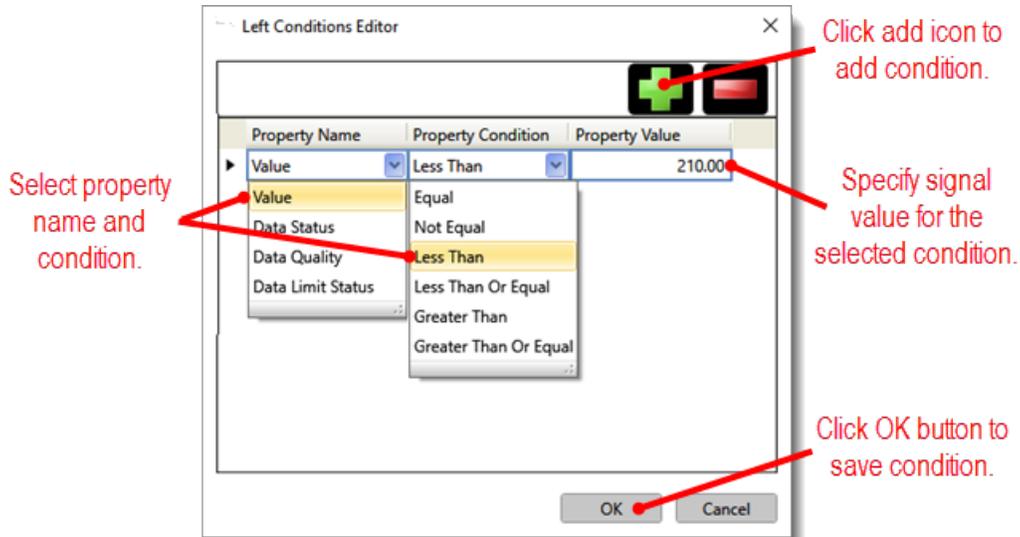
8. When the **Left** or **Right Conditions Editor** window opens, click the add icon (■) at the top of the window to add a condition, and then specify the signal's property, condition, and value that must be met for the resulting action to be activated. For example, to trigger a condition when voltage either drops below 210 kV or spikes above 260 kV, you would specify the following:

- **Left Condition:** Signal **Value** to drop **Less Than** the value of **210.00**
- **Right Condition:** Signal **Value** to spike **Greater Than** the value of **260.00**

These conditions work with the **Comparison Type** selection of **Or** (from the previous example) to trigger the specified action (action properties are specified next). The example above means the specified action will be triggered when **the corresponding signal's value drops below 210.00 OR spikes above 260.00**. You can specify conditions for the following property names:

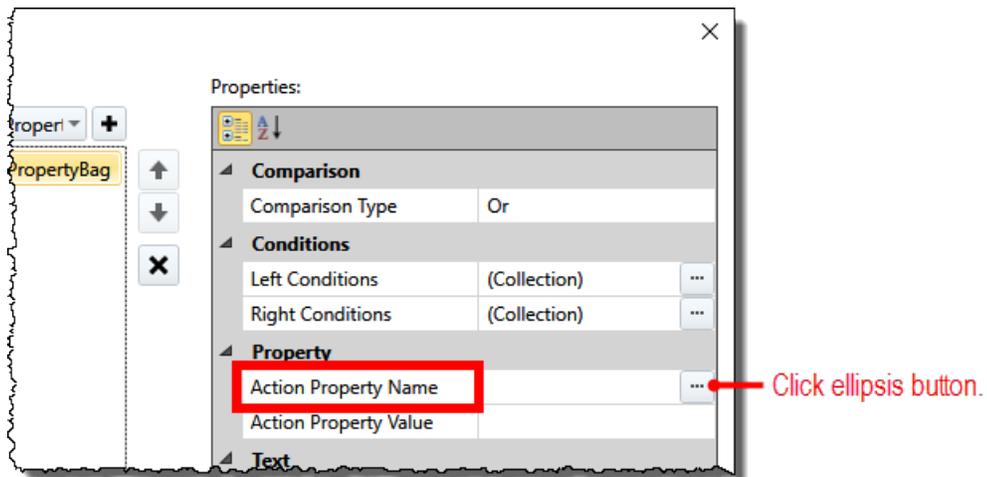
- **Value:** Value of the corresponding signal
- **Data Status:** Value of the status flag associated with the PMU of the signal

- **Data Quality:** Quality flag set by the data quality filter algorithm
- **Data Limit Status:** Flag set by the engineering value check algorithm

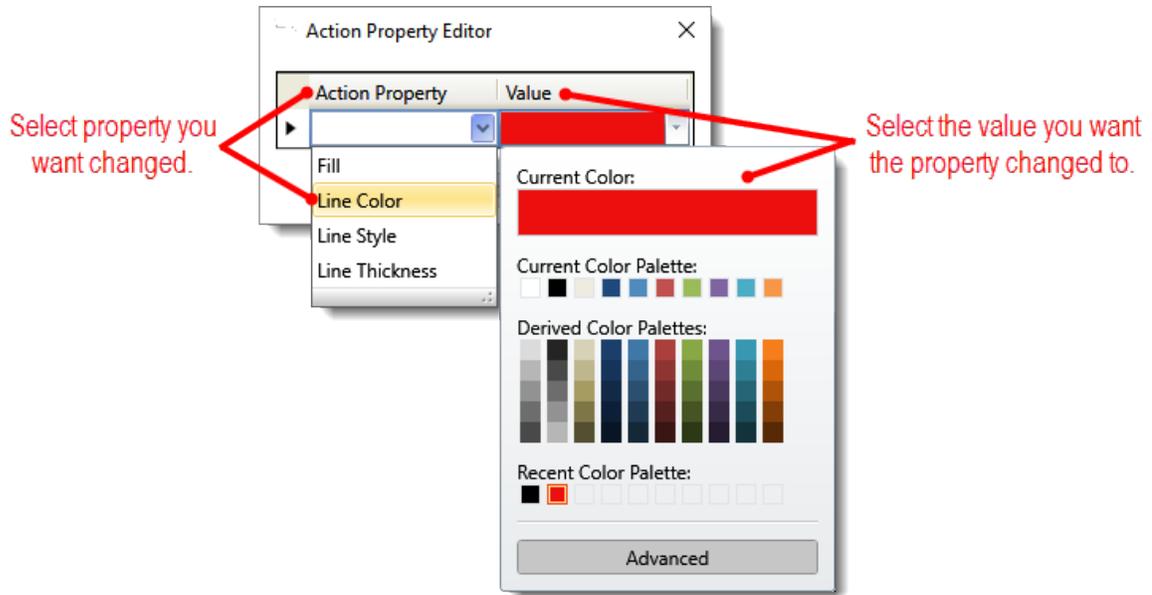


9. Click the **OK** button to return to the **Conditions Editor** window.

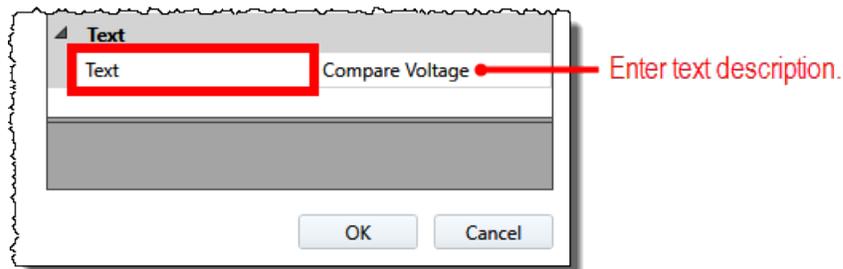
10. To specify the action to take when the condition is met, click the ellipsis (...) button for the **Action Property Name** property in the **Conditions Editor** window.



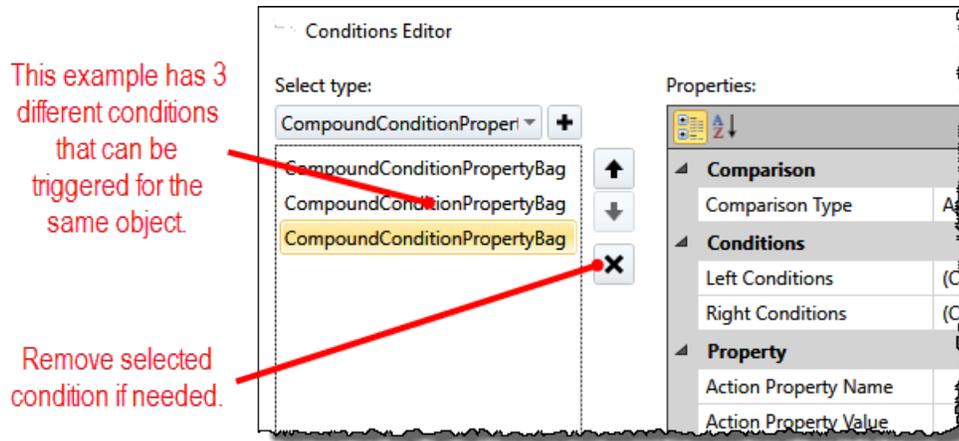
11. When the **Action Property Editor** window opens, select the property you want changed in the **Action Property** selection box, and specify the value you want the property to change to in the **Value** box. For example, to have the line color of a bus change to red when the corresponding conditions are met, you would select **Line Color** as the **Action Property** and select the color red as the **Value**.



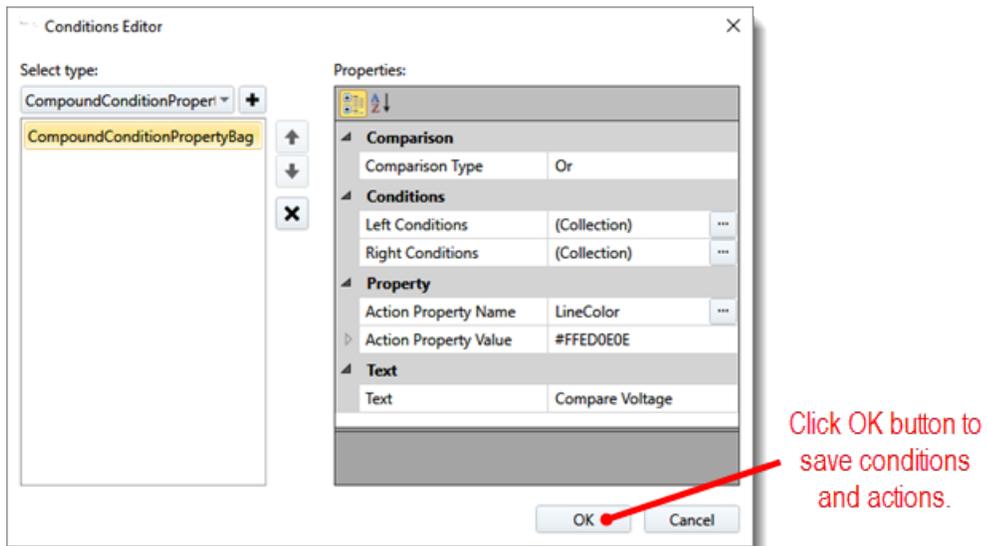
12. Click the **OK** button to return to the **Conditions Editor** window. The action property and the corresponding value are updated in the **Action Property Name** and [Action Property Value](#) properties.
13. Optionally, in the [Text](#) property, enter text that will help you identify the condition. This text is simply a way for you to identify the purpose of the condition. It does not appear in the diagram.



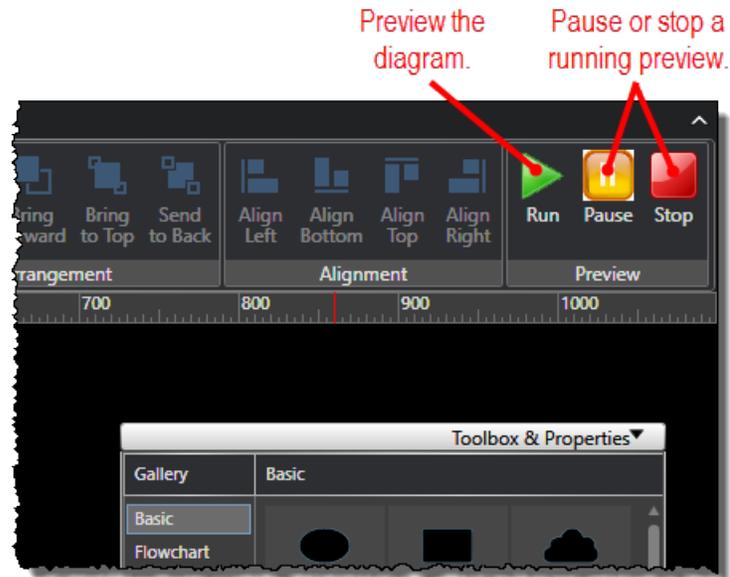
14. Repeat steps 5-13 for any additional conditions you want for the selected object. If you need to remove a condition, click the **X** button.



15. Click the **OK** button in the **Conditions Editor** window to save the specified conditions and resulting actions.

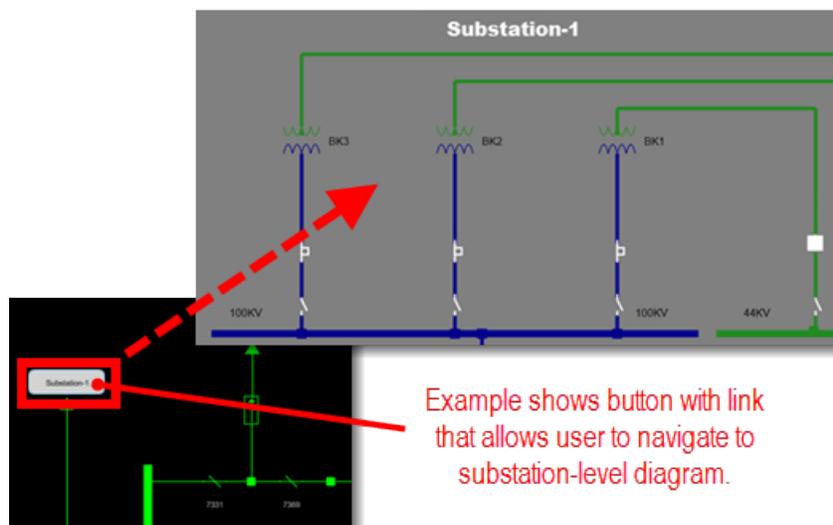


16. [Preview](#) the diagram if you would like to test your changes.



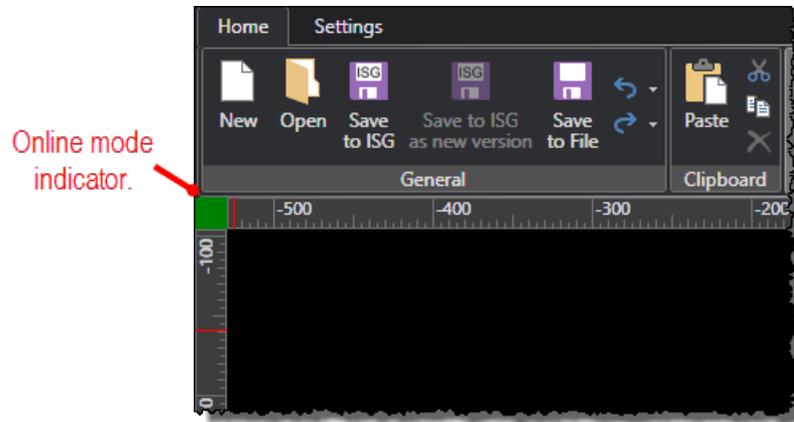
Creating Links to Other Diagrams

After you have multiple diagrams created, you might want to add links that allow for easy navigation from one diagram to another, allowing users to fully explore the relationships between diagrams. For example, if you have a system-level diagram, you can draw buttons that link to related substation-level diagrams.

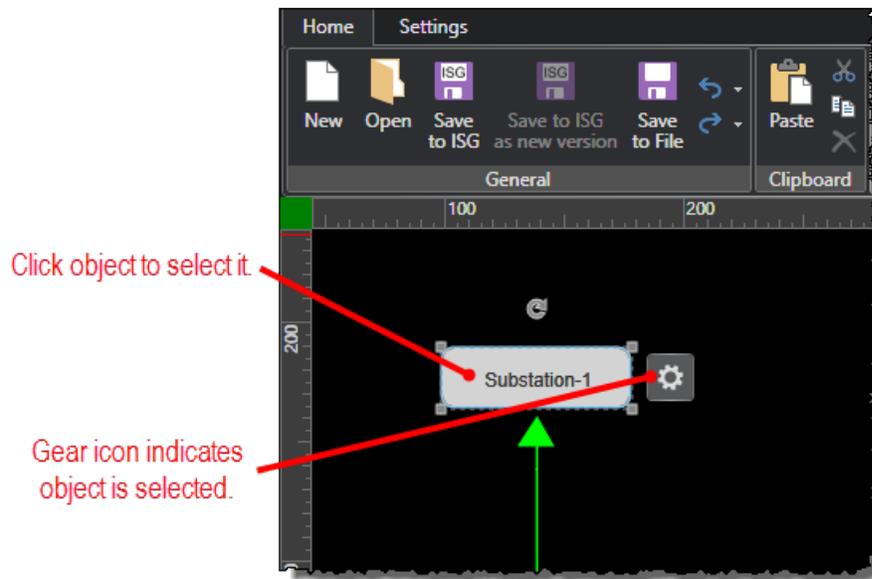


➤ To create a link from one diagram to another:

1. Make sure you are working in [online mode](#).



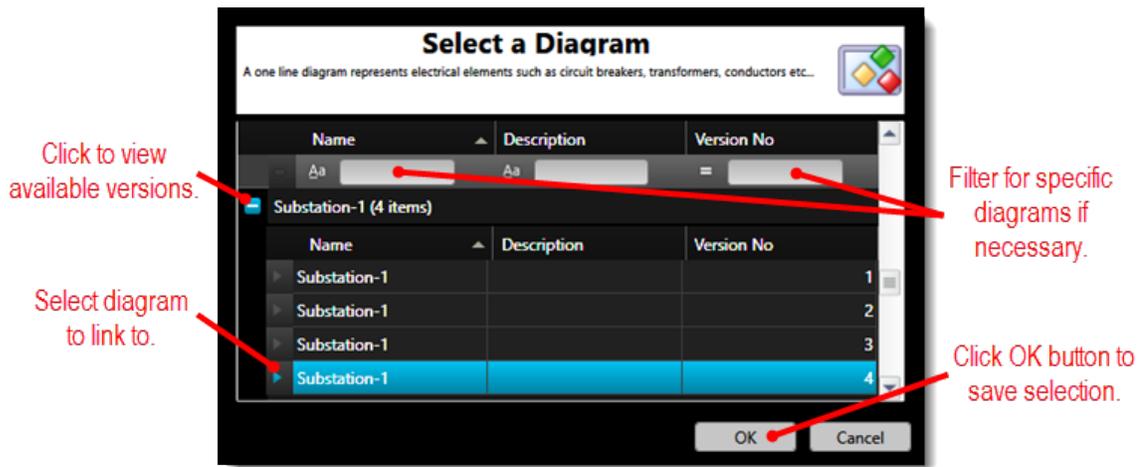
2. If the free-form toolbox is not visible on the screen, open it by [selecting the Toggle Toolbox command](#) under the [Settings tab](#).
3. If the diagram does not already have one, [draw a button object](#) to represent the diagram to which you are linking.
4. Select the button that represents the diagram you are linking to by clicking it in the diagram. You can select multiple buttons to set the diagram link for at the same time by pressing the **CTRL** key while you click the buttons.



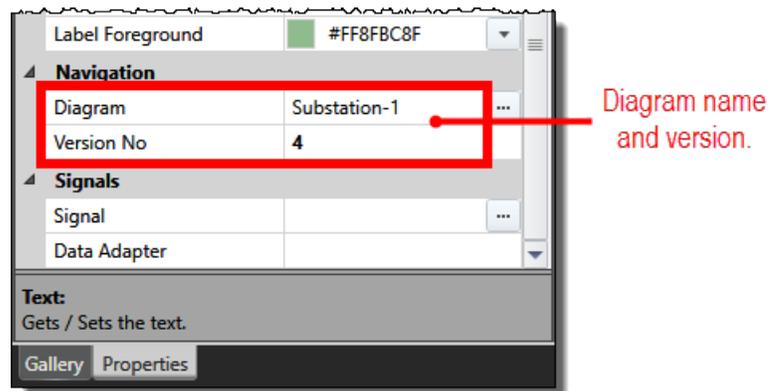
5. Under the **Properties** tab in the free-form drawing toolbox, click the ellipsis (...) button for the [Diagram](#) property.



- When the **Select a Diagram** screen opens, select the diagram from your ISG that you want the button to link to. If the diagram has multiple **versions**, you can select any of them. If you have a large list of diagrams, you can use a **filter** to find a specific diagram.



- Click the **OK** button to save the selection and close the **Select a Diagram** screen. The diagram name and version number are updated in the **Diagram** and **Version No** properties in the toolbox.



Properties Reference

The following table provides an alphabetical list and description of all object [properties](#):

Property	Description
Action Property Name	Property type that will be changed for the selected object when the corresponding conditions are met. Click the ellipsis (...) button to open an editor window to specify both the property type and the corresponding value (which will be reflected in the Action Property Value property). Refer to the Setting Conditional Actions section for specific instructions on setting conditions and actions.
Action Property Value	Value or setting that will be applied to the property specified in the Action Property Name property for the selected object when the corresponding conditions are met. This value is informational only and can be changed only when editing the Action Property Name property. Refer to the Setting Conditional Actions section for specific instructions on setting conditions and actions.
Checked State	Special property available for circuit breaker (OCB), gang, and switch electrical shapes to change the shape based on the corresponding signal's on/off status. By default the shape is set to Unchecked . Select Checked to check the on/off status either manually or programmatically based on signal value change. Select Indeterminate when the state of the shape is unknown.
Comparison Type	Comparison to evaluate Left Conditions and Right Conditions properties to evaluate whether or not a condition should trigger an action for the selected object. Select one of the following options: <ul style="list-style-type: none"> • And means that both the left and right conditions must be met for the condition to be triggered and the resulting action activated. If only one of the conditions is met, the action is not activated. • Or means that either the left or right condition can be met for the condition to be triggered and the resulting action activated. If only one of the conditions is met, the action is activated. Refer to the Setting Conditional Actions section for specific instructions on setting conditions and actions.
Conditions	Conditions under which specified actions for the selected object will occur. For example, a bus color could change from yellow to red if a condition is set to do so when the voltage exceeds a predefined threshold. Click the ellipsis (...) button to open an editor window to specify the conditions and resulting action. Refer to the Setting Conditional Actions section for specific instructions on setting conditions and actions.
Dashes	Dashed line pattern that will be used when a dashed line type is selected in the parent Line Style property. This property is informational only and cannot be edited.
Data Adapter	Corresponding data adapter when a signal is selected in the Signal property. This property is informational only and cannot be edited.
Data Feed Update	Frequency in milliseconds that the data stream for the signal selected in the Signal property should be refreshed. Use this property to slow down any fast-changing value at the raw 30 samples/sec rate. Type the number of milliseconds (only the number

Interval (ms)	without ms or milliseconds) in the text box. -1 is the default value, which is set as a placeholder to ignore this value and instead use the default data stream rate from ISG. Enter a positive value to override the default data stream rate and update based on the specified number.
Diagram	Diagram to which the selected object links when clicked by the user. For example, this is the diagram the user navigates to when they click a button. Click the ellipsis (...) button to open a selection window to select the diagram to which the object links. Refer to the Creating Links to Other Diagrams section for specific instructions on creating diagram links.
Fill	Color of the inside of the selected object. For example, the fill would be the color of the inside of a shape. Set the color using the color settings in the selection box.
Font Name	Name of the font to use for the corresponding text on or with the selected object. Select the name of the font from the selection box.
Font Size	Size of the font in points to use for the corresponding text on or with the selected object. Select the number of points from the selection box.
Font Style	Font formatting, such as bold or italic text, for the corresponding text on or with the selected object. Select the formatting style from the selection box.
Foreground Color	Color of the related property for the selected object. For example, if this property appears with font properties, it will set the color of the text using that font. Set the color using the color settings in the selection box.
IsPositive	Special property available for the pricing vector electrical object to change the object's Shape Orientation based on whether the price is positive or negative. When defining the pricing vector, select an arrow direction using the Shape Orientation property. This orientation is then used when the price is positive or negative based on whether or not the IsPositive check box is selected. When the corresponding pricing vector electrical object receives pricing data that is opposite to the defined direction, then the pricing vector arrow reverses its orientation in the diagram.
Label Font	Name of the font to use for the text specified in the Label Text property. Select the name of the font from the selection box.
Label Font Size	Size of the font in points to use for the text specified in the Label Text property. Select the number of points from the selection box.
Label Foreground	Color of the label text for the text specified in the Label Text property. Set the color using the color settings in the selection box.
Label Text	Text that appears as a label to introduce Signal data for the selected object. Type the text in the text box as you want it to appear with the data for the object. For the label text and data to be visible, you must also enable the Show Labels property. You can specify the visual design properties of the label text using the Label Font Size , Label Font , and Label Foreground properties.
Left Conditions	Conditions for the Signal property that must be met for an action to be activated. For example, you could specify a left condition so that a corresponding action is triggered when voltage for a signal drops below 210 kV. Click the ellipsis (...) button to open an

	editor window to add the conditions. Used with Comparison Type and Right Conditions properties. Traditionally, the left condition is used for the lower value of a condition while the right condition is used for an upper value of a condition. Refer to the Setting Conditional Actions section for specific instructions on setting conditions and actions.
Line Color	Color of the selected object's line or outline. Set the color using the color settings in the selection box. Typically used in combination with the Line Style and Line Thickness properties.
Line Style	Pattern of the selected object's line or outline. Select a pattern from the selection box. Typically used in combination with the Line Color and Line Thickness properties.
Line Thickness	Width in pixels of the selected object's line or outline. Type the number of pixels (only the number without px or pixels) in the text box. Typically used in combination with the Line Color and Line Style properties.
Offset	Number of pixels from the left and from the top that the corresponding object's top left corner is placed in relation to its position on the diagram. For example, 5, 10 means that the object's top left corner will appear 5 pixels to the left and 10 pixels from the top, in relation to its position as it was drawn on the diagram. This is a child property of Line Style . This property is informational only and cannot be edited.
Right Conditions	Conditions for the Signal property that must be met for an action to be activated. For example, you could specify a right condition so that a corresponding action is triggered when voltage for a signal spikes above 260 kV. Click the ellipsis (...) button to open an editor window to add the conditions. Used with Comparison Type and Left Conditions properties. Traditionally, the right condition is used for an upper value of a condition while the left condition is used for the lower value of a condition. Refer to the Setting Conditional Actions section for specific instructions on setting conditions and actions.
Shape Orientation	Default rotation of the selected object when the rotation value is 0°. For example, when you draw an electrical object, the default orientation might appear horizontal. However, you might prefer the default orientation to appear vertical. You can also rotate the object using the free-form drawing tool, but the 0° rotation value will be the value selected as the shape rotation. Select the default orientation you want to set for the shape from the selection box.
Show Labels	Selection that specifies whether or not the Signal data for the selected object will be visible in the diagram. Usually you will also specify label text in the Label Text property to introduce the data. Select the check box to make the label text and data visible. Clear the check box to hide the label text and data.
Signal	Signal to display with the selected object. For example, you could draw an electrical object on a diagram and map a corresponding PMU signal to display with that object. Click the ellipsis (...) button to open an editor window to select the adapter and signal. The corresponding data adapter selected here appears in Data Adapter property.
Text	When setting this property for a toolbox object (for example, a button or label), this is the text that appears on or with the object. For example, this is the text that appears on a button. Type the text in the text box that want to appear on or with the object. When setting this property as part of the Conditions property, this is text you can use to identify the purpose of the condition. It does not appear in the actual diagram. Type

	text in the text box that will help you identify the condition.
Version No	Version number of the diagram selected in the Diagram property. This value is informational only and can be changed only when editing the Diagram property. Refer to the Creating Links to Other Diagrams section for specific instructions on creating diagram links.

6 Modifying Diagram Objects

You can modify objects after you have initially [drawn](#) them to a diagram. In addition to [setting properties](#) for objects, you can change how they appear in the diagram using any of the following tasks:

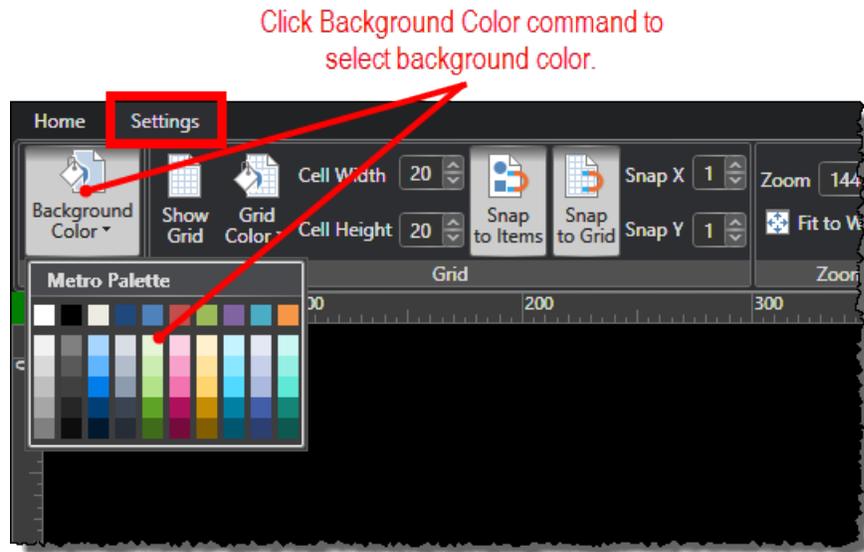
- [Change the background color](#) of the diagram.
- Use [standard clipboard](#) tool to [cut](#), [copy](#), and [paste](#) objects on the diagram as well as [delete](#) them from the diagram.
- [Adjust](#) the objects as they are arranged and laid out in the diagram.
- [Undo and redo](#) recent changes to the diagram.

Changing the Diagram Background Color

You can change the color of the diagram background to best support your chosen color scheme for [diagram objects](#).

➤ **To change the diagram background color:**

- Under the [Settings tab](#), click the **Background Color** command to select your preferred background color.



Using Standard Clipboard Tools

One-Line Diagram Kit supports the following standard clipboard tasks:

- [Cut and copy](#) objects on the diagram.
- [Paste](#) objects that have been cut or copied on the diagram.
- [Delete](#) objects from the diagram.

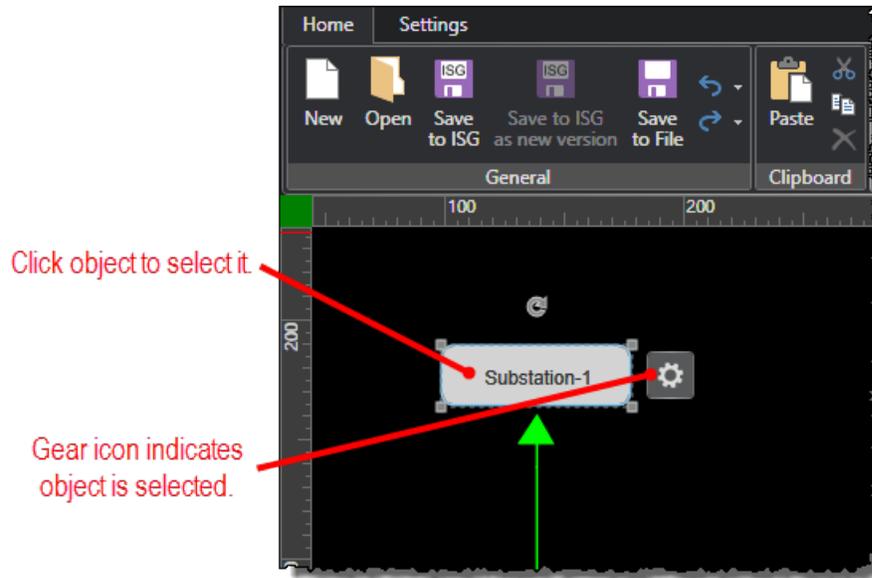
Cutting and Copying Objects

One-Line Diagram Kit provides standard cut and copy features for [diagram objects](#). Use these features when you want to duplicate or otherwise continue using existing the objects, as opposed to the [delete](#) feature, which you would typically use to remove objects altogether. Typically you would follow a cut or copy operation with [pasting](#) the object to the diagram.

Note: One-Line Diagram Kit supports standard keyboard shortcuts, so you can use the **CTRL+X** (cut) and **CTRL+C** (copy) keyboard shortcuts as alternatives to the command functions documented here.

➤ To cut or copy objects:

1. Select the object you want to cut or copy by clicking it in the diagram. You can select multiple objects to cut or copy at the same time by pressing the **CTRL** key while you click the objects.

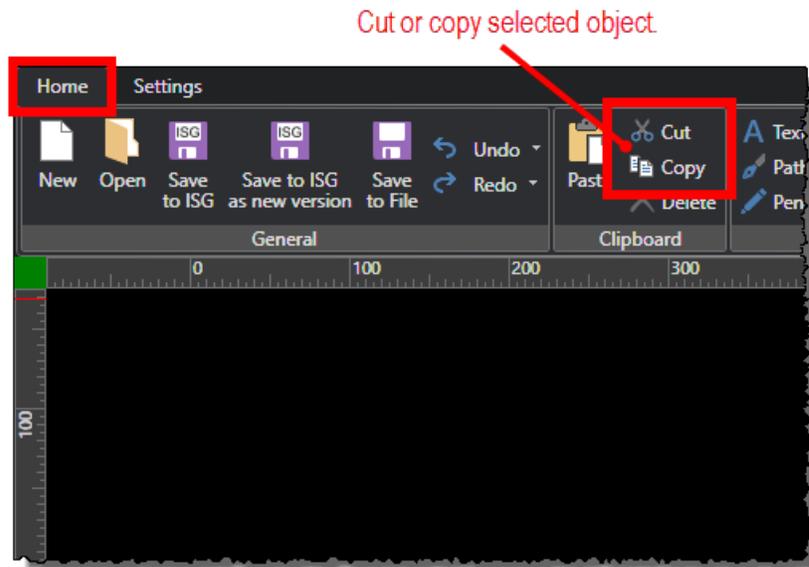


2. Under the [Home](#) tab, click either of the following commands in the **Clipboard** group:

- **Cut:** Cuts the selected object from the diagram so that it no longer exists on the diagram, and saves it to the clipboard for later use.

CAUTION: If you plan to paste the cut object elsewhere, you must do so before cutting, copying, or otherwise placing new content in the clipboard. You lose the existing clipboard contents as soon as you place new contents in the clipboard.

- **Copy:** Copies the selected object while keeping the original on the diagram, and saves the copy to the clipboard for later use.



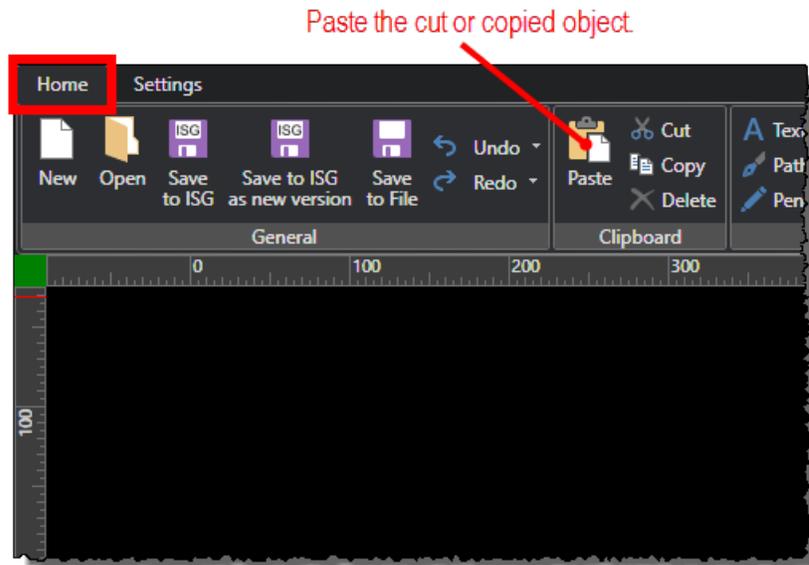
Pasting Cut or Copied Objects

If you [cut](#) or [copy](#) diagram objects, you would typically follow by pasting the objects to the diagram to duplicate them or otherwise continue using them.

Note: One-Line Diagram Kit supports standard keyboard shortcuts, so you can use the **CTRL+V** (paste) keyboard shortcut as an alternative to the command function documented here.

➤ **To paste objects that have been cut or copied:**

- Under the **Home** tab, click the **Paste** command.



The pasted object appears directly over the original. You can [move](#) the pasted object as needed on the diagram.

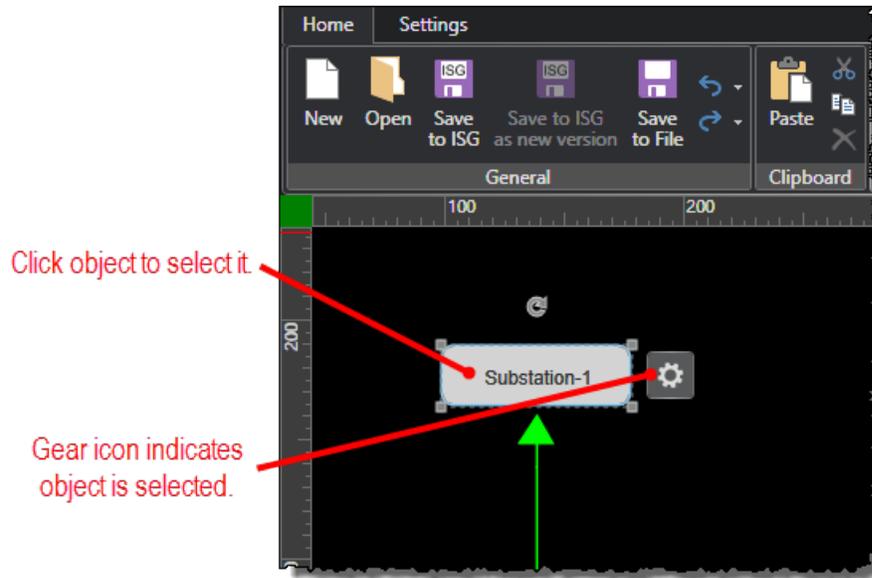
Deleting Objects

One-Line Diagram Kit provides a standard deletion feature for [diagram objects](#). Typically you would use this feature when you want to remove objects altogether from the diagram, as opposed to the [cut](#) feature, which you would typically use to continue using the cut objects (for example, to paste the cut objects elsewhere).

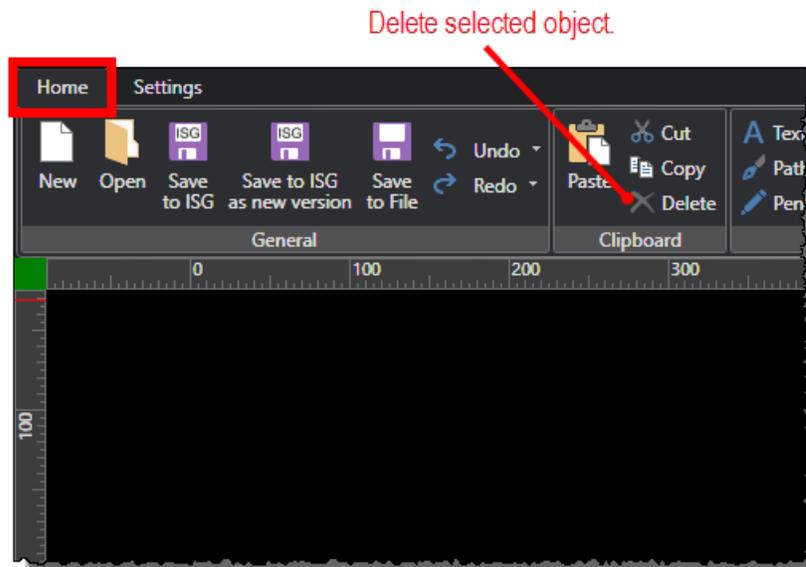
Note: One-Line Diagram Kit supports standard keyboard keys, so you can use the **DELETE** key as an alternative to the command function documented here.

➤ To delete objects:

1. Select the object you want to delete by clicking it in the diagram. You can select multiple objects to delete at the same time by pressing the **CTRL** key on your keyboard while you click the objects.



2. Under the **Home** tab, click the **Delete** command. Alternatively, you can press the **DELETE** key on your keyboard.



Note: If you mistakenly delete an object, you can **undo** the deletion.

Adjusting Objects

After adding **objects** to a diagram, you can perform several tasks to make any necessary adjustments:

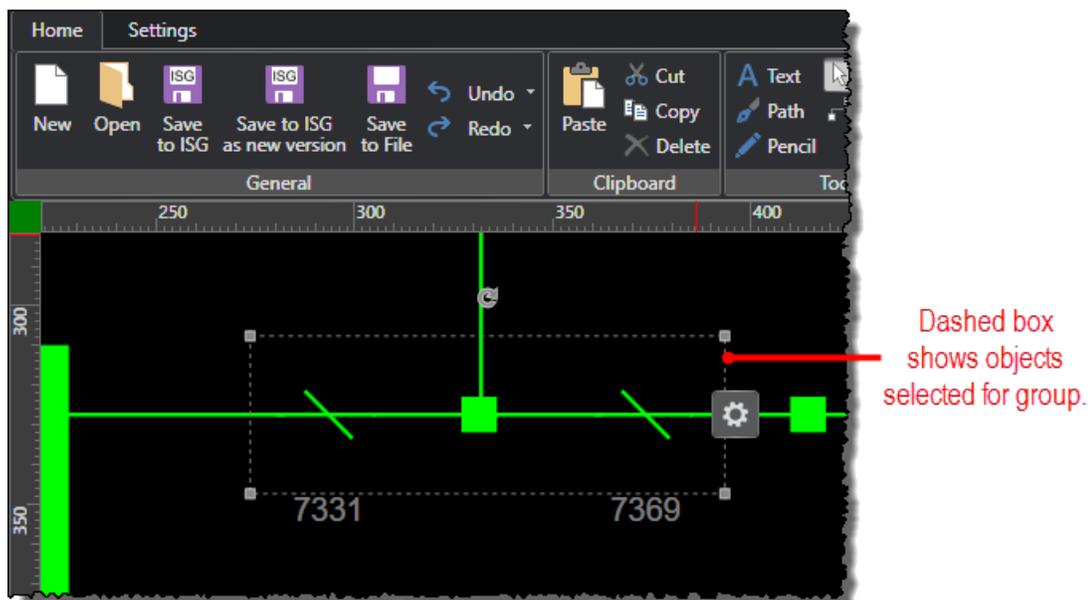
- [Group](#) and [ungroup](#) multiple objects.
- [Arrange the order](#) of objects on the diagram.
- [Align](#) objects to one another.
- [Resize](#) and [rotate](#) objects.

Grouping Objects

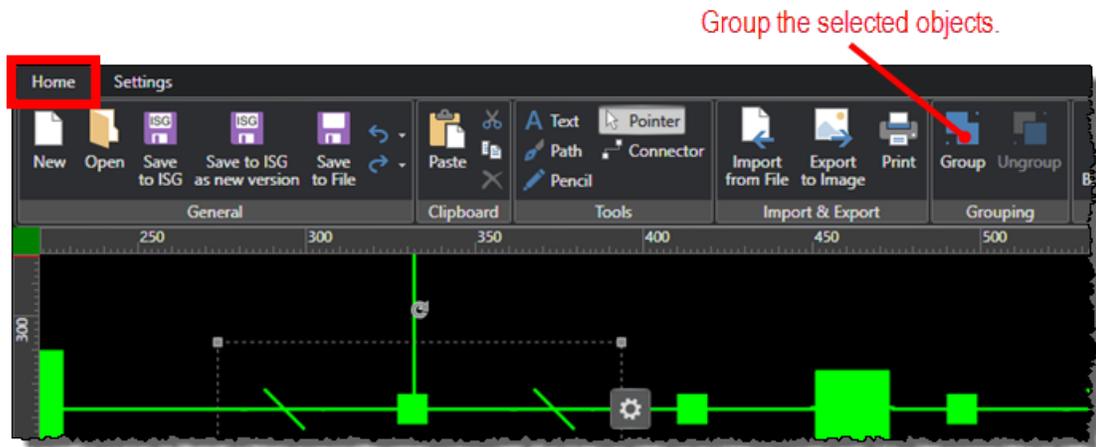
You can group diagram objects if you want to manage them together as one item. For example, you might have a combination of arrows and electrical components that you want to treat as one item when [moving](#), [aligning](#), or performing [other tasks](#) on the diagram.

➤ To group objects:

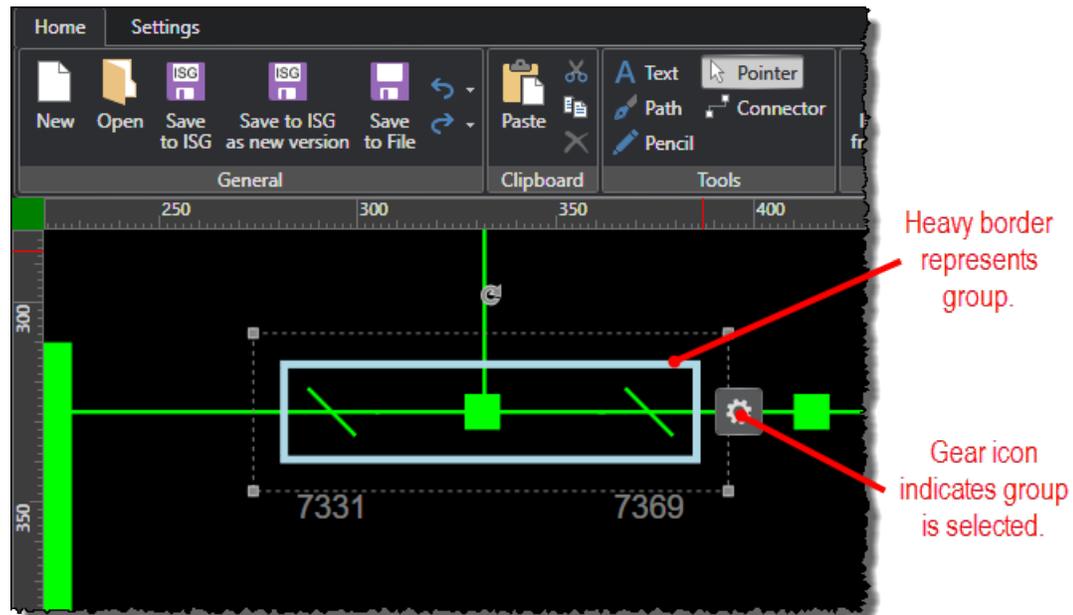
1. Select the objects you want to group on the diagram by pressing the **CTRL** key while you click each object. A dashed box appears around the selected objects as you click them. If you click an object a second time, it will be excluded from the grouping.



2. Under the [Home](#) tab, click the **Group** command.



A heavy border identifies the grouped objects.



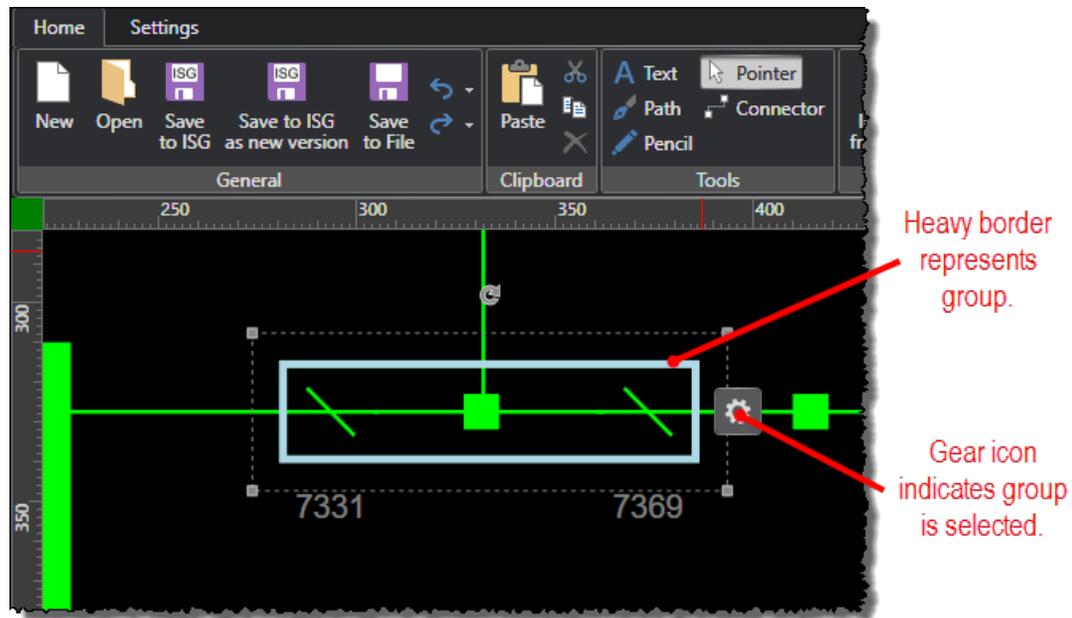
3. [Modify](#) the group or [set properties](#) as you would for individual objects.

Ungrouping Grouped Objects

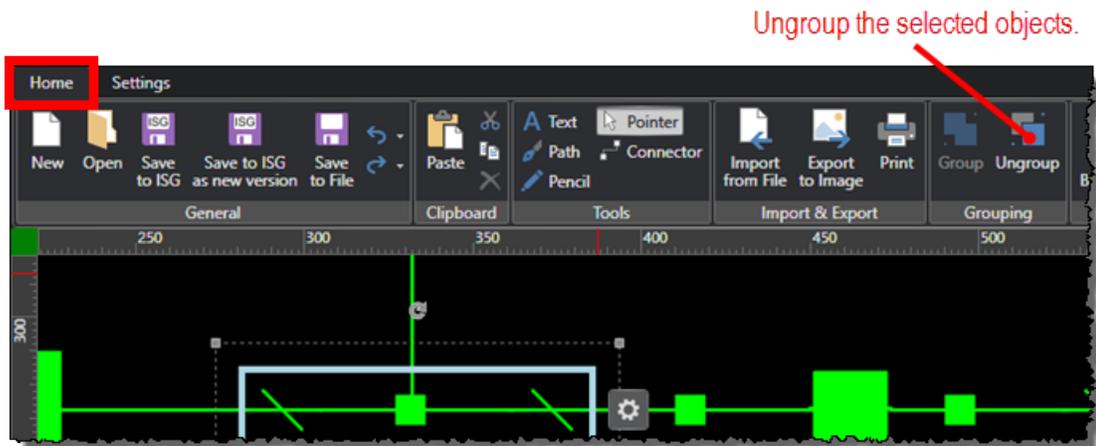
You can ungroup [group objects](#) if you decide you do not want to keep the objects grouped as one item. After you ungroup the objects, you can [modify them](#) and [set properties](#) as individual objects.

➤ To ungroup objects:

1. Click the area of the grouped objects to select the group you want to ungroup on the diagram.



2. Under the [Home](#) tab, click the **Ungroup** command.

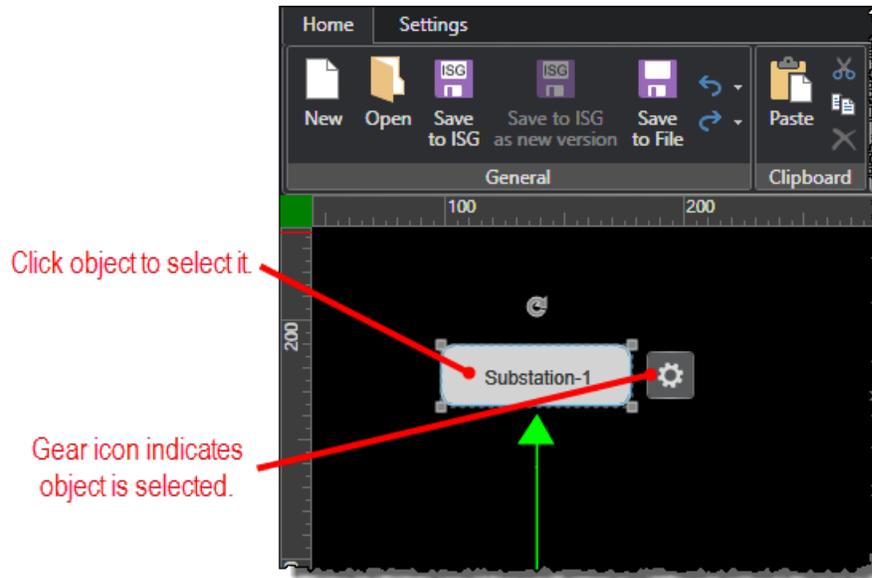


Arranging the Order of Objects

As you add [objects](#) to a diagram, you might find that you need to arrange the objects in a specific order so that some objects are placed in front of others. For example, you might draw several buttons, arrows, and lines and then want to place the buttons in front of the lines and arrows.

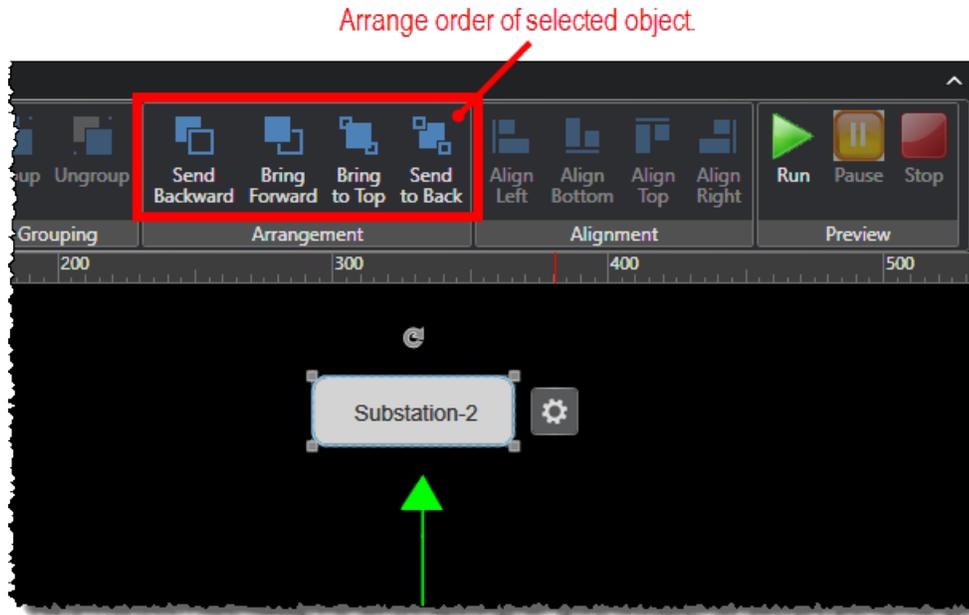
➤ To arrange the order of objects:

1. Select the object you want to set properties for by clicking it in the diagram. You can select multiple objects to set properties for at the same time by pressing the **CTRL** key while you click the objects.



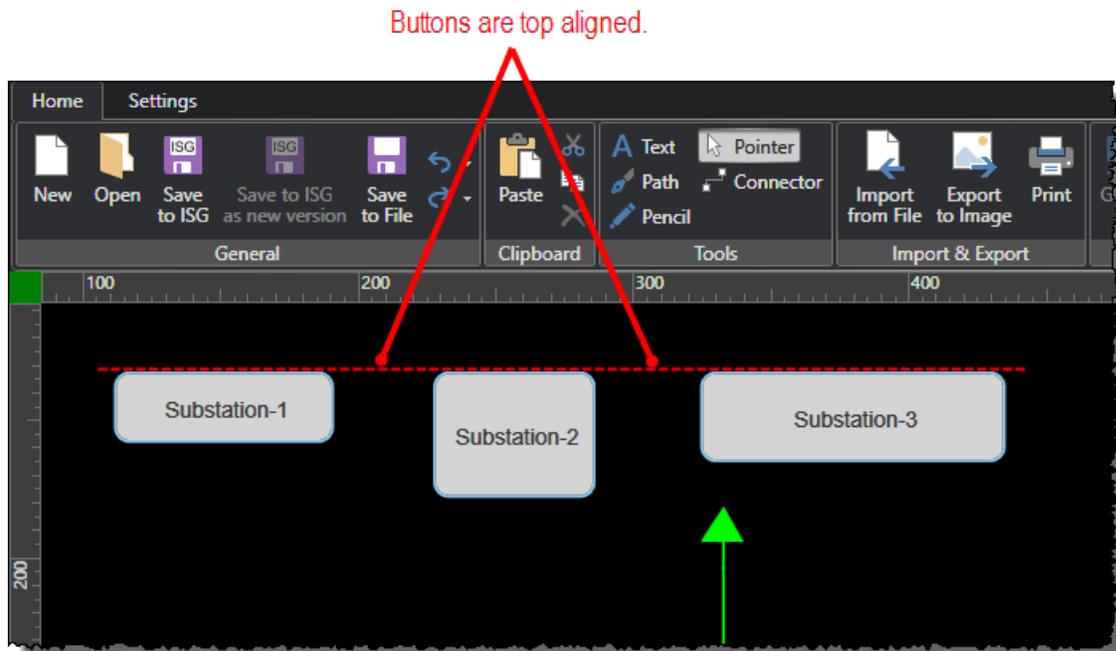
2. Under the [Home](#) tab, click any of the following commands in the **Arrangement** group:

- **Send Backward:** Moves the selected object backward one level from its current place in the order. You can continue clicking the command to continue moving the object backward in one-level increments.
- **Bring Forward:** Moves the selected object forward one level from its current place in the order. You can continue clicking the command to continue moving the object forward in one-level increments.
- **Bring to Top:** Moves the selected object to the front of all other objects.
- **Send to Back:** Moves the selected object to the front of all other objects.



Aligning Objects

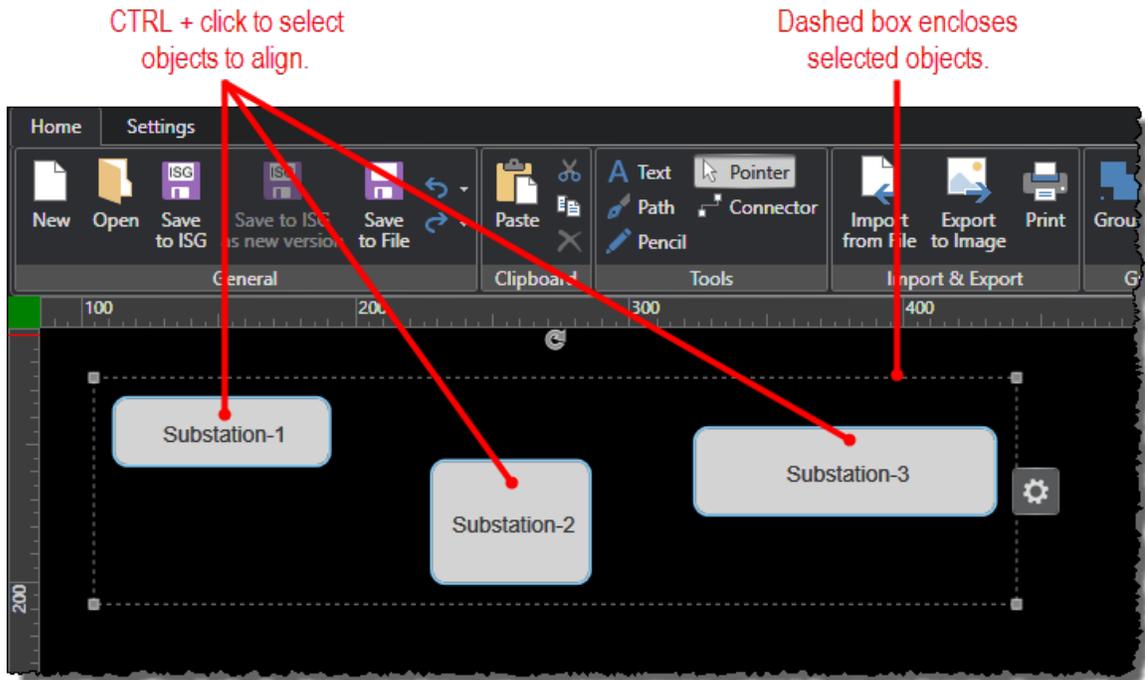
As you add **objects** to a diagram, you might want to align the objects a specific way against one another. For example, you might want multiple buttons to be aligned along their tops so they appear in a straight line across the diagram.



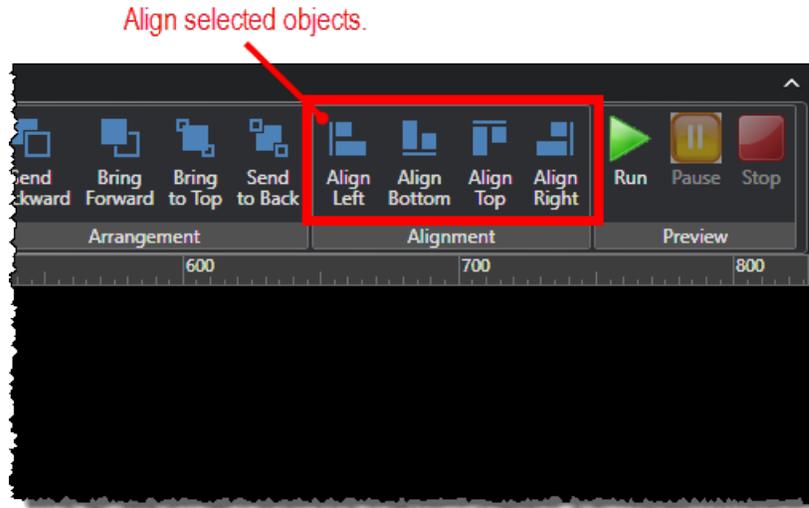
While you could use the canvas [grid](#) to align the objects [manually](#), you can quickly and more accurately use the object-alignment feature.

➤ **To align objects:**

1. Select the objects you want to align by pressing the **CTRL** key while you click the objects.



2. Under the [Home](#) tab, click any of the following commands in the **Alignment** group:
 - **Align Left:** Aligns the selected objects against their left edge.
 - **Align Bottom:** Aligns the selected objects against their bottom edge.
 - **Align Top:** Aligns the selected objects against their top edge.
 - **Align Right:** Aligns the selected objects against their right edge.

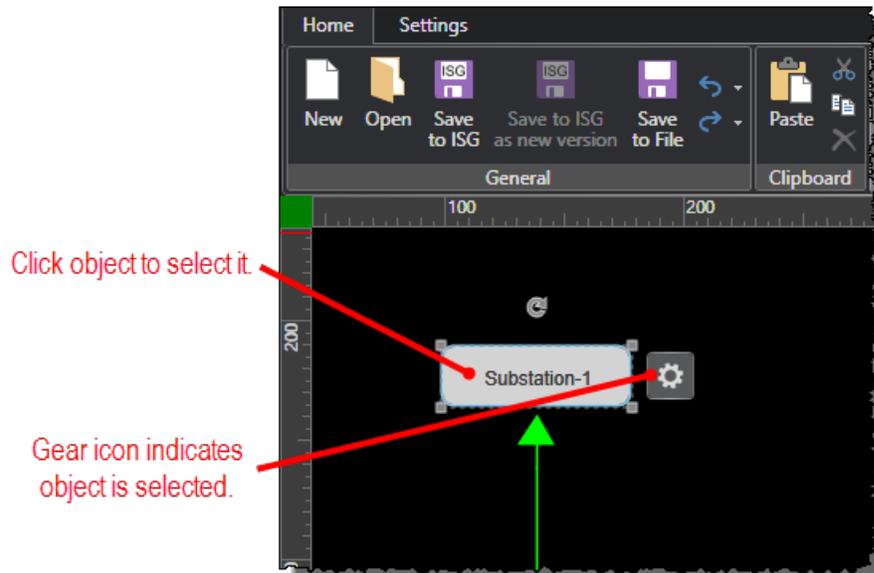


Resizing Objects

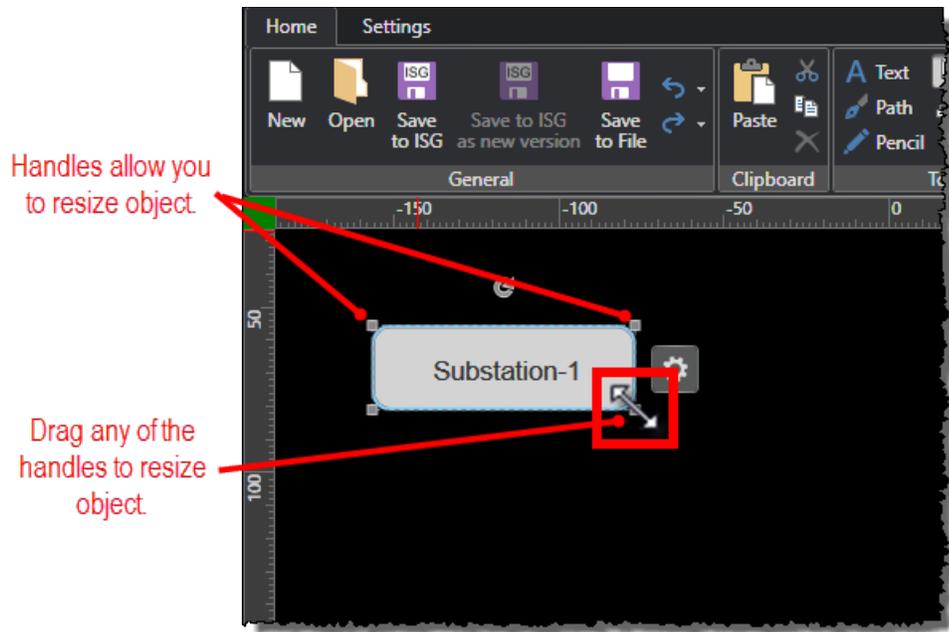
After adding [objects](#) to a diagram, you can resize them as needed.

➤ To resize objects:

1. Select the object you want to resize by clicking it in the diagram. You can select multiple objects to resize at the same time by pressing the **CTRL** key while you click the objects.



2. Click and drag an object handle to resize the object.



Note: If the handles for resizing the object are not available, then resizing is locked. You can [unlock resizing](#) on the [Settings ribbon](#).

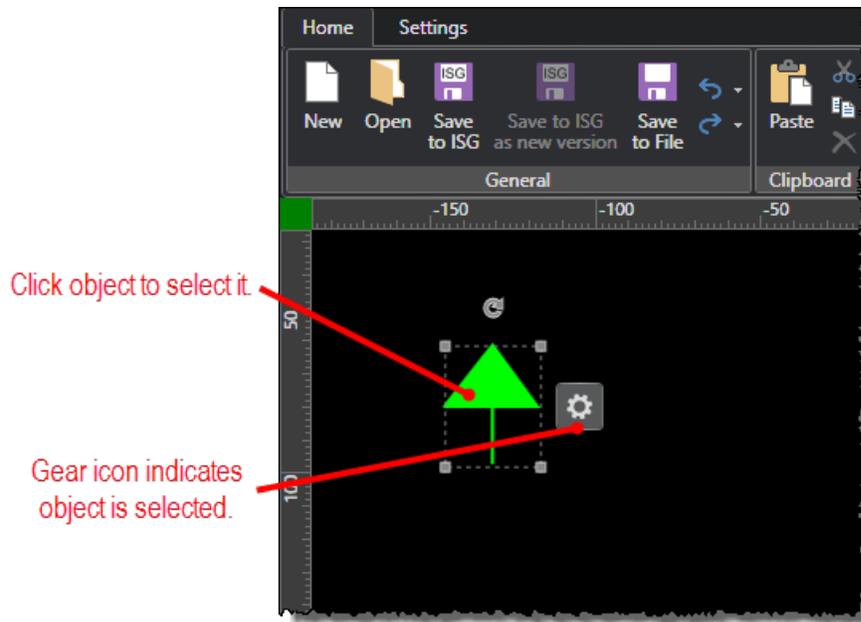
3. Alternatively, use the **Size** tab on the [properties pop-up editor](#) to specify exact measurements for the object.

Rotating Objects

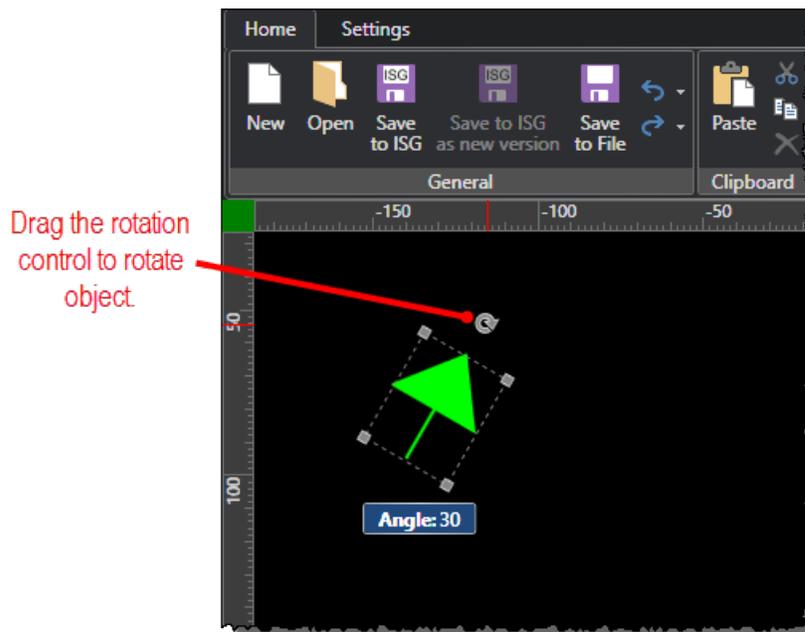
After adding [objects](#) to a diagram, you can rotate them as needed to obtain any necessary layout effects for your diagram.

➤ To rotate objects:

1. Select the object you want to rotate by clicking it in the diagram. You can select multiple objects to rotate at the same time by pressing the **CTRL** key while you click the objects.



2. Click and drag the rotation control to rotate the object.



Note: If the rotation control is not available, then rotation is locked. You can [unlock rotation](#) on the [Settings](#) ribbon.

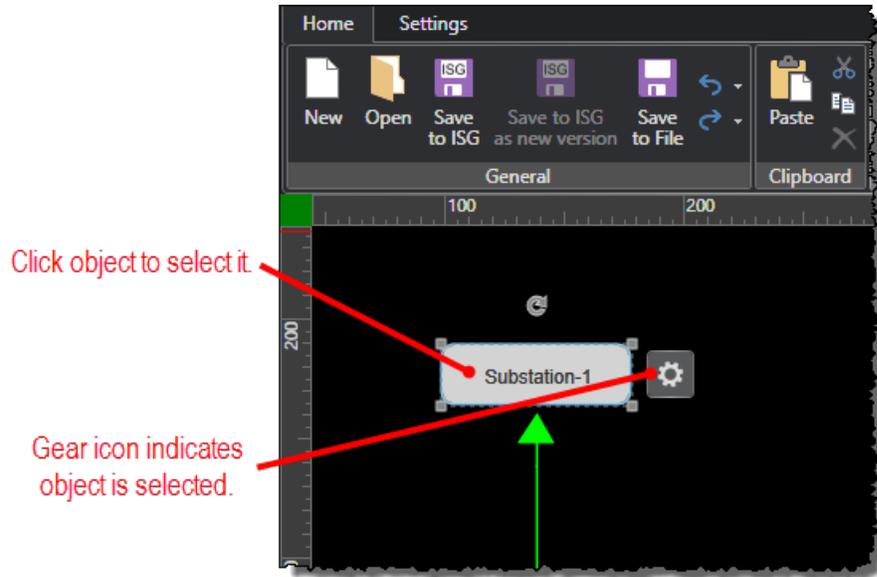
3. Alternatively, use the **Size** tab on the [properties pop-up editor](#) to specify exact degree of rotation for the object.

Moving Objects

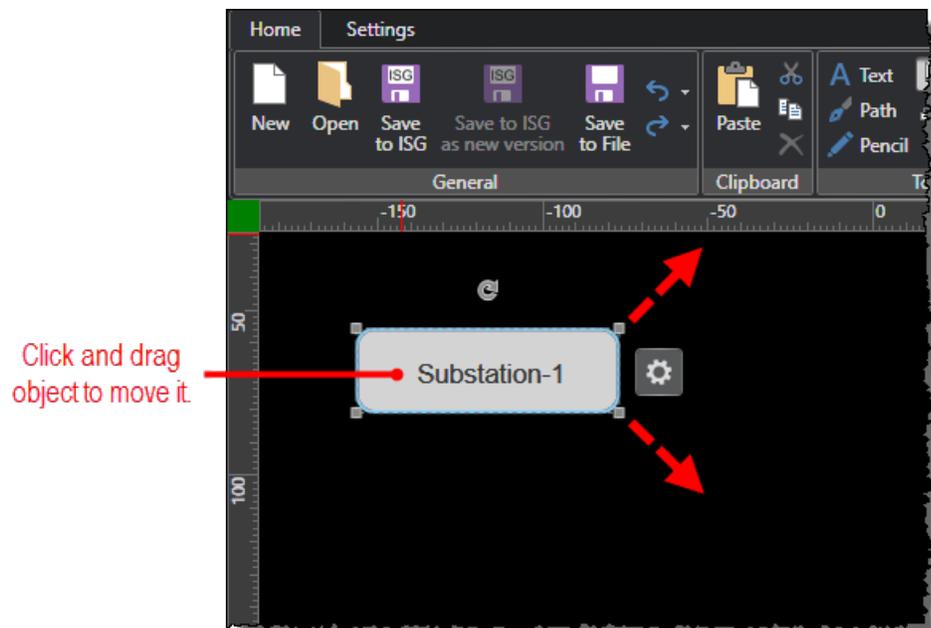
After adding [objects](#) to a diagram, you can move them to different areas of the diagram as needed.

➤ To move objects:

1. Select the object you want to move by clicking it in the diagram. You can select multiple objects to move at the same time by pressing the **CTRL** key while you click the objects.



2. Click and drag an object to move it.



Note: If you cannot move the object, then dragging (moving) is locked. You can [unlock dragging](#) on the [Settings](#) ribbon.

3. Alternatively, use the **Size** tab on the [properties pop-up editor](#) to specify exact X and Y coordinates for the object's position on the diagram.

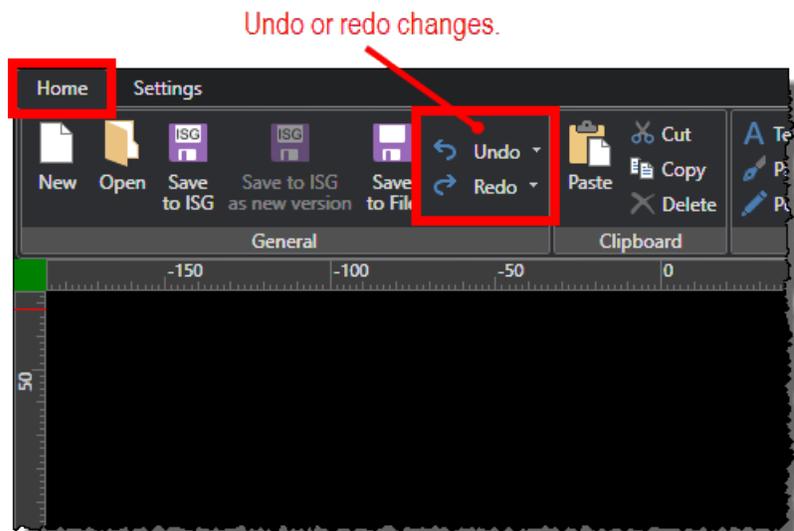
Undoing and Redoing Changes

One-Line Diagram Kit provides standard undo and redo features you can use when [modifying](#) diagram [objects](#).

Note: One-Line Diagram Kit supports standard keyboard shortcuts, so you can use the **CTRL+Z** (undo) and **CTRL+Y** (redo) keyboard shortcuts as alternatives to the command functions documented here.

➤ To undo and redo changes:

1. Under the [Home](#) tab, click either of the following commands in the **General** group:
 - **Undo:** Undoes the most recent change. Use this command if you make an error and want to revert to the most recent setting.
 - **Redo:** Redoes a change that you undid. Use this command if you mistakenly used undo and want to reapply the change.



2. Continue clicking the command as needed to continue undoing or redoing changes incrementally.

7 Working with the Canvas

The canvas is the main area where you [draw](#) and [update](#) diagrams and [specify properties](#) for diagram objects. You can change canvas settings and use canvas tools to better help you as you draw objects. The tools that you use on the canvas (such as grid lines) are visible only with the canvas. They do not appear in the actual diagrams drawn on the canvas.

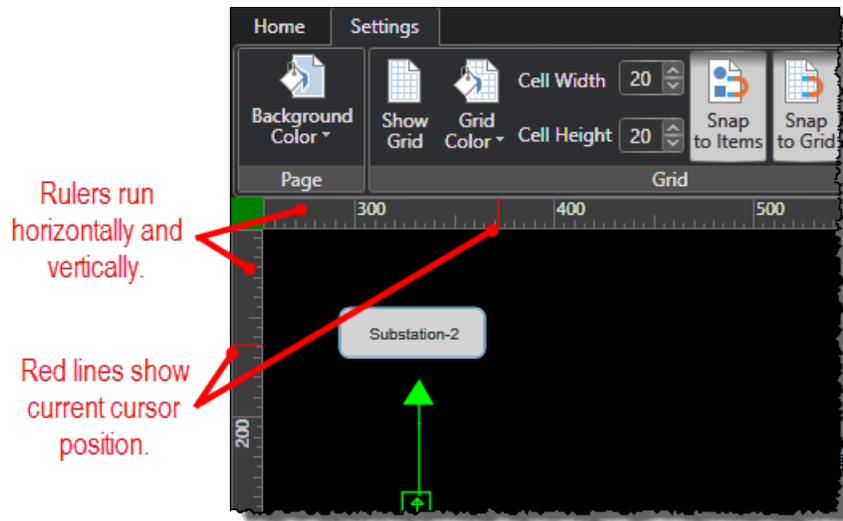
The following canvas settings and tools can help as you work with diagrams:

- Vertical and horizontal [rulers](#) help you lay out the diagram.
- A [grid](#) helps you draw objects in exact locations on the diagram.
- [Zooming](#) allows you to zoom in and out of areas on the diagram.
- [Locking and unlocking](#) the sizing and positioning of objects help prevent unwanted adjustments of diagram objects on the canvas.
- A [thumbnail toggle](#) allows to see the section of the diagram you are viewing with respect to the entire diagram and to pan to different parts of the diagram.
- A [toolbox toggle](#) allows you to show or hide the free-form drawing toolbox if it visually obstructs the diagram.

Understanding the Canvas Rulers

[Canvas](#) rulers help you determine [object](#) positions and their overall layout on the canvas. The rulers appear horizontally along the top of the canvas and vertically along the left side of the canvas and appear under both the [Home](#) and [Settings](#) tabs. The rule increments are in pixels for new diagrams. For imported diagrams, the increments are based on those used in the imported source.

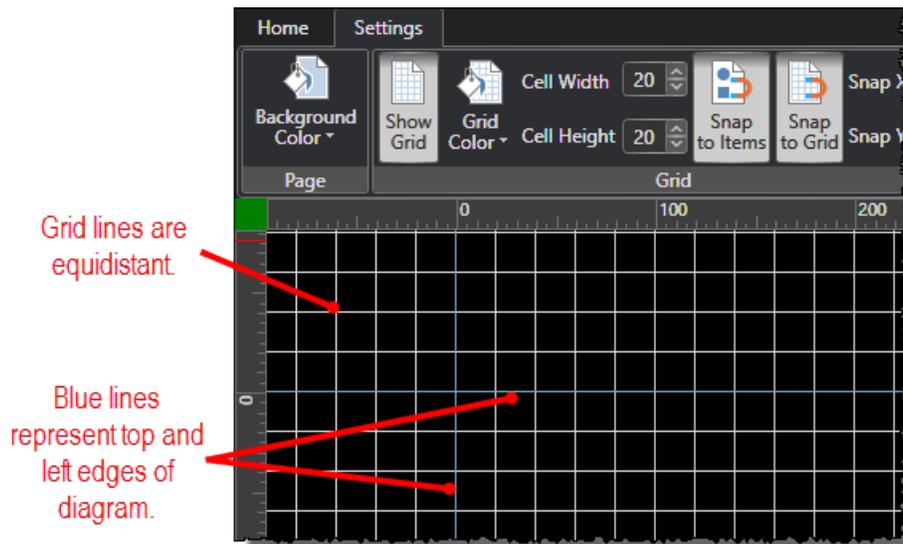
You can quickly see the current mouse position on the rulers by identifying the red lines on the rulers.



Using the Grid

The grid is a set of horizontal and vertical lines that overlay the entire [canvas](#) area to help you [draw objects](#) in exact locations on the diagram. When the grid is visible, it appears under both the [Home](#) and [Settings](#) tabs; however, the grid appears only on the canvas when working with diagrams and does not appear on the diagram itself.

The grid lines are equidistant to help with exact object alignment. Blue grid lines quickly show where the left and top edges of the diagram are.



One-Line Diagram Kit offers different preferences depending on how you want to work with the grid:

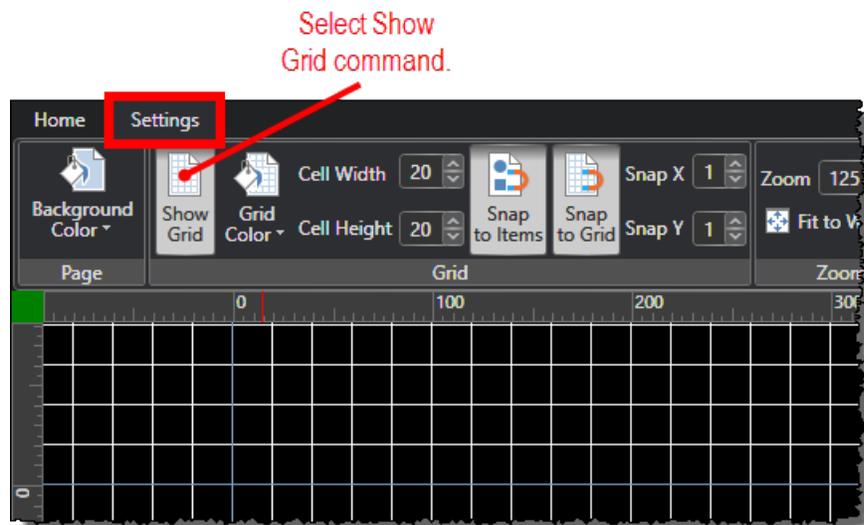
- [Show or hide](#) the grid depending on whether or not you want to use it.
- [Adjust such properties](#) on the grid as grid line color and cell width and height spacing (the spacing between lines).
- [Snap objects](#) on the canvas to help with object alignment on the grid or against other objects.

Showing and Hiding the Grid

You can show and hide the canvas [grid](#) so that it is visible when you need it to help with alignment and hidden when it disrupts your view while working with the diagram. When you show the grid, it appears only on the [canvas](#) when working with diagrams and does not appear on the diagram itself.

➤ To show and hide the grid:

1. Under the [Settings tab](#), click to select the **Show Grid** command to show the canvas grid.



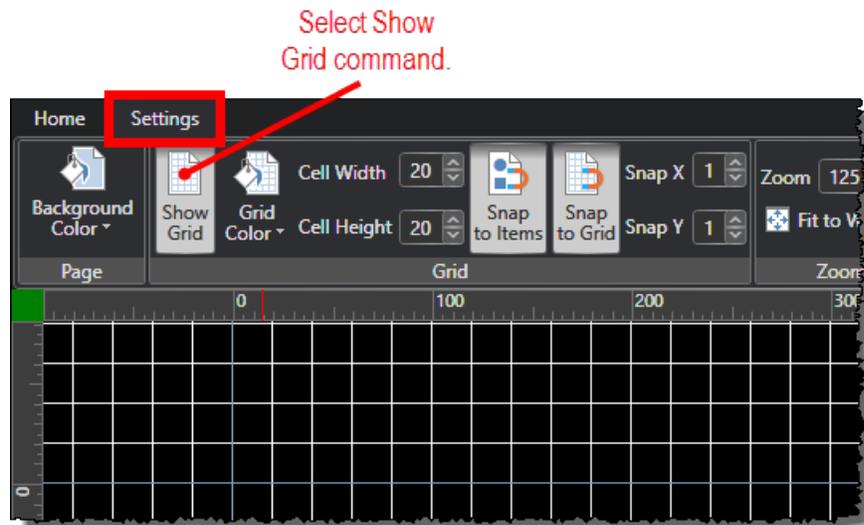
2. Click to deselect the **Show Grid** command to hide the canvas grid.

Adjusting Grid Properties

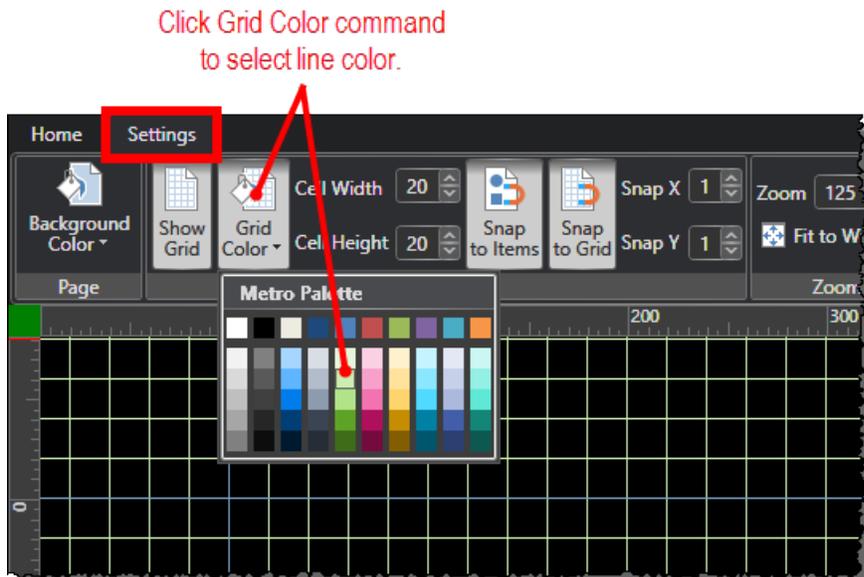
Depending on your preferences, you can change the color of [grid](#) lines on the [canvas](#). You can also change the grid line spacing by increasing or decreasing the grid cells.

➤ To adjust grid properties:

1. Under the **Settings** tab, optionally **show the grid** on the canvas. You can change grid properties regardless of whether or not the grid is visible on the canvas; however, showing the grid makes the process easier.

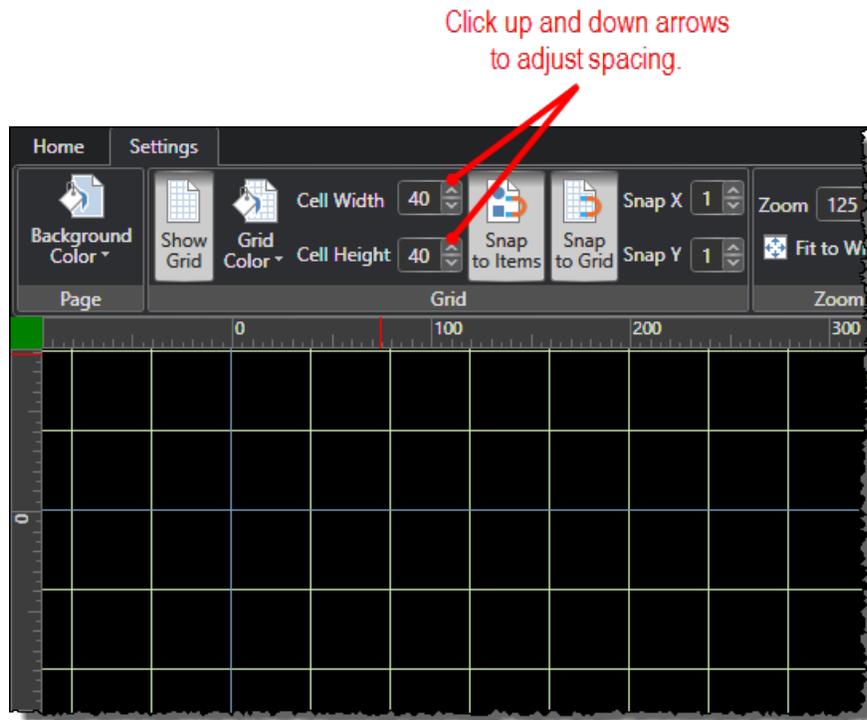


2. To change the color of the grid lines, click the **Grid Color** command under the **Settings** tab to select your preferred color.



Note: You cannot change the color of the diagram edge lines, which always appear blue. Therefore, avoid blue grid lines if you intend to use the diagram edge lines to help guide you as you manage objects.

3. To change the distance between grid lines, click the up and down arrow buttons for the **Cell Width** and **Cell Height** values to increase and decrease cell spacing.

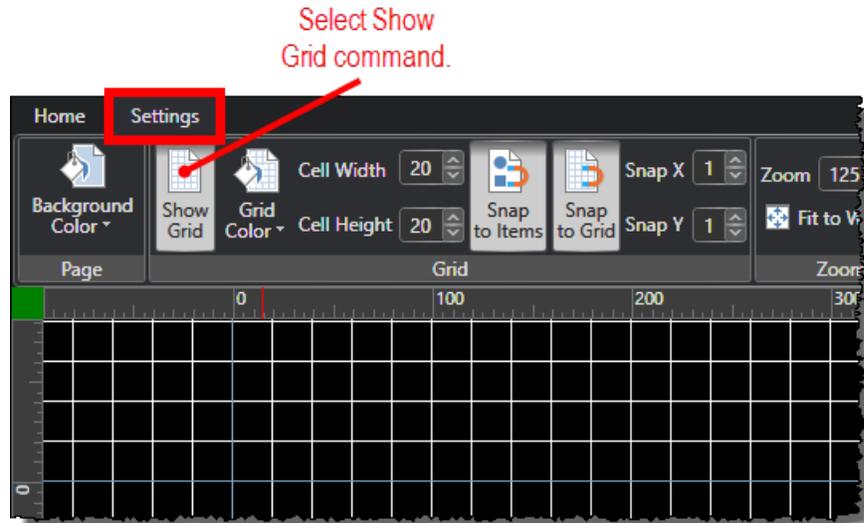


Snapping Objects on the Grid

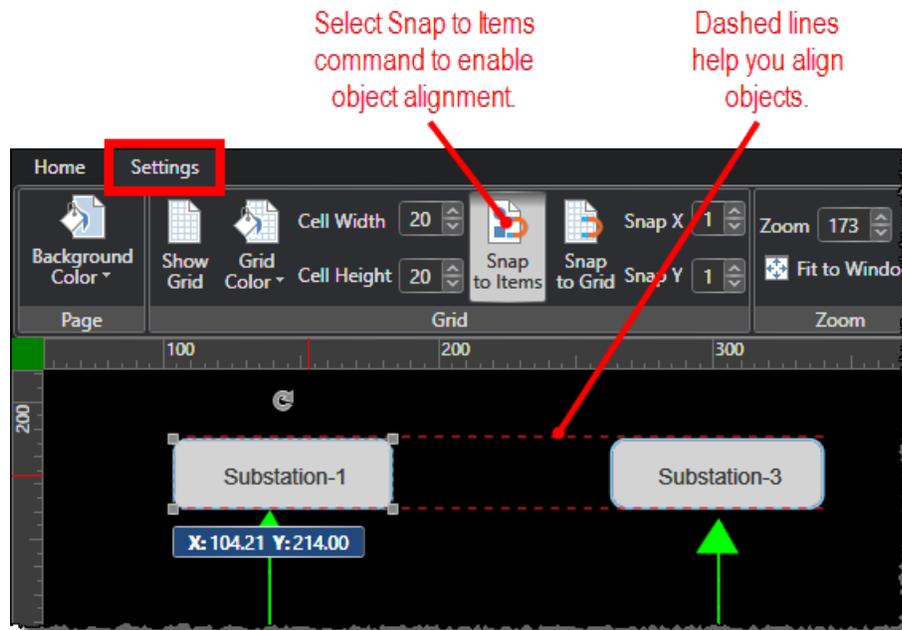
When aligning **objects** on the **canvas**, you can use "snap" features to help with object alignment on the grid or against other objects. When you enable snapping, One-Line Diagram Kit helps move the objects to specific pixels and shows guiding lines that line the object up against other objects on the canvas.

➤ **To snap objects on the grid:**

1. Under the **Settings** tab, optionally **show the grid** on the canvas. You can change snapping properties regardless of whether or not the grid is visible on the canvas; however, showing the grid may make the process easier.

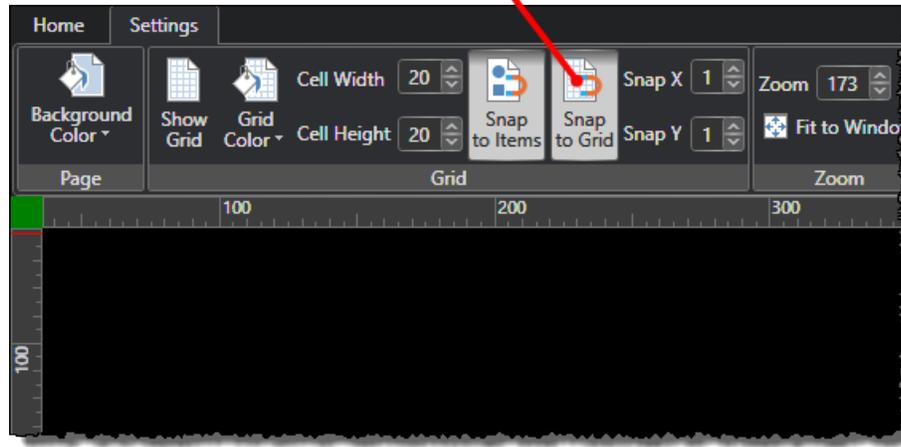


- To enable snapping objects against one another, click to select the **Snap to Items** command under the **Settings** tab. When this command is selected, a dashed red line appears when you drag objects close to the vertical or horizontal positions of other objects. You can then use the dashed line to help determine where to place the selected object.



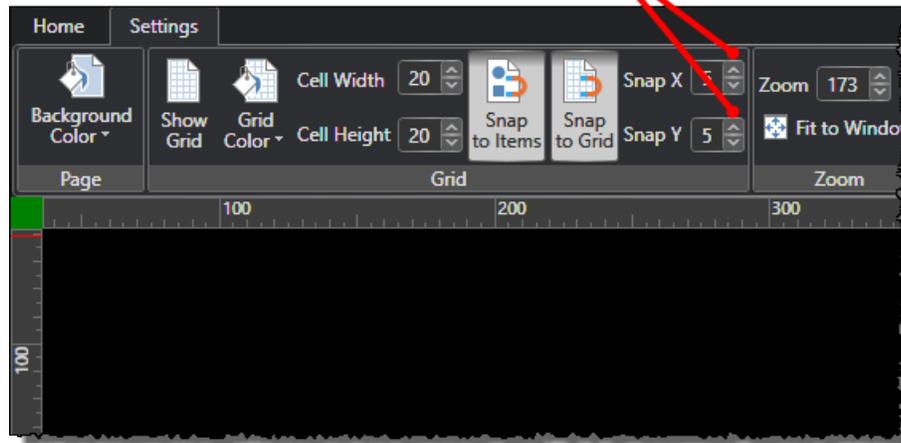
- To enable snapping objects against grid lines (whether grid lines are visible or not), click to select the **Snap to Grid** command. When this command is selected, One-Line Diagram Kit guides where you can drag and drop objects based on the nearest grid lines. You can enable both the **Snap to Items** command and the **Snap to Grid** command simultaneously.

Select Snap to Grid
command to enable
alignment against grid lines.



4. To increase or decrease the sensitivity of snapping to grid, click the up and down arrow buttons for the **Snap X** and **Snap Y** values. This controls the distance of the X and Y coordinates for snapping objects to the grid.

Click up and down arrows
to adjust snapping to grid.



5. Click to deselect the **Snap to Items** command and the **Snap to Grid** command to disable the snapping features.

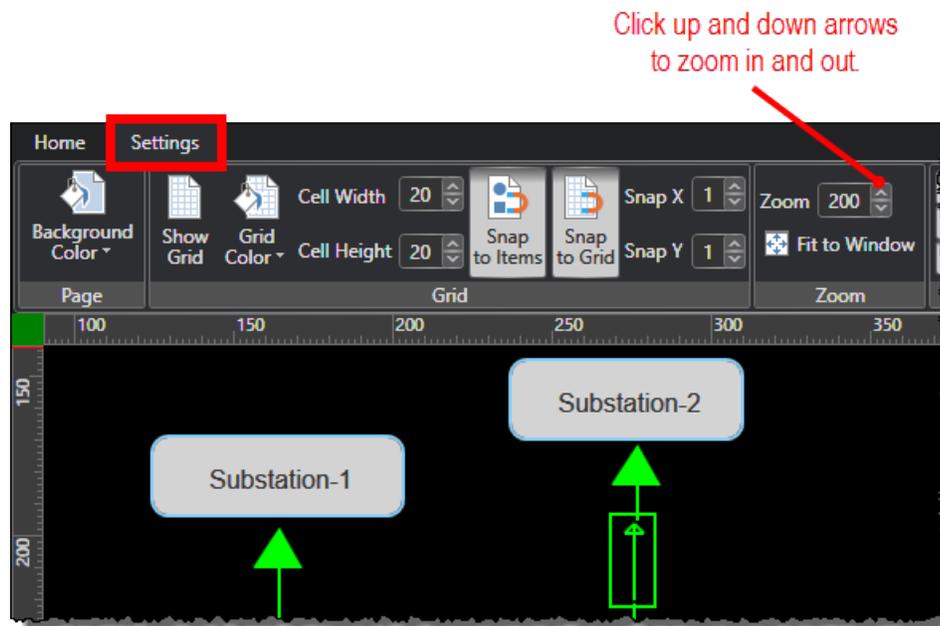
Zooming within Diagrams

You can zoom in and out of diagrams to enlarge a specific area or fit more of the diagram on the screen. The easiest way to zoom in and out is to hover your mouse cursor over the diagram and then scroll up and down on your mouse. You can also use the zoom commands on the [Settings ribbon](#).

Note: As you zoom in and out of a diagram, you may want to see different parts of the diagram that are not visible on the [canvas](#). You can do so using the [thumbnail toggle](#), which allows you to see a thumbnail perspective of the area of the diagram you are viewing and to pan to different parts of the diagram.

➤ **To zoom within diagrams using the Settings commands:**

1. Under the **Settings** tab, click the up and down arrow buttons for the **Zoom** values to increase and decrease the percentage of the zoom value.



2. To reset the zoom back to 100% and place the diagram in the viewable portion of the canvas, click the **Fit to Window** command.

Click reset the zoom to 100% and fit diagram back on canvas.



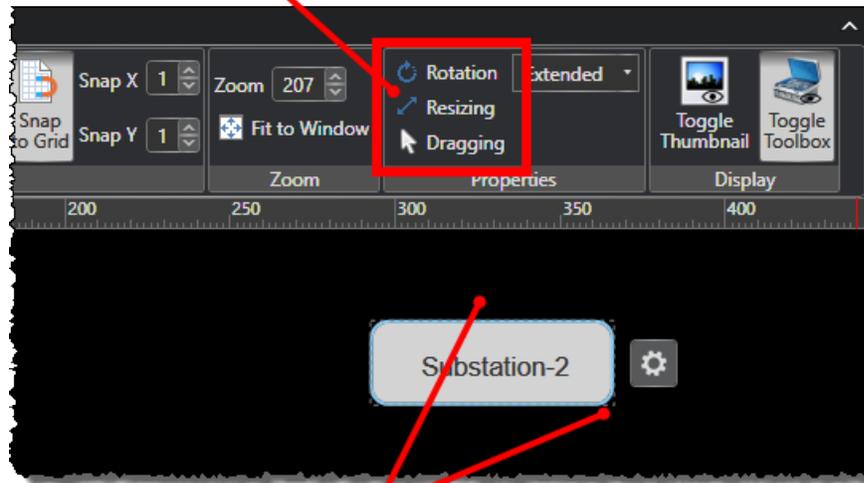
Locking and Unlocking Objects from Adjustments

You can control unwanted adjustments to diagram **objects** by locking and unlocking the sizing and positioning of them the **canvas**. You might find it useful to leave these features unlocked while you are in the process of creating and editing diagrams and then locking them when the diagrams are completed to avoid erroneous adjustments.

➤ To lock and unlock objects from adjustments:

1. Under the **Settings** tab, click to **deselect** any of the following command toggles in the **Properties** group to **lock** them from being adjusted:
 - **Rotation:** Controls whether or not a selected object can be rotated.
 - **Resizing:** Controls whether or not a selected object can be made larger and smaller.
 - **Dragging:** Controls whether or not a selected object can be dragged to a new location.

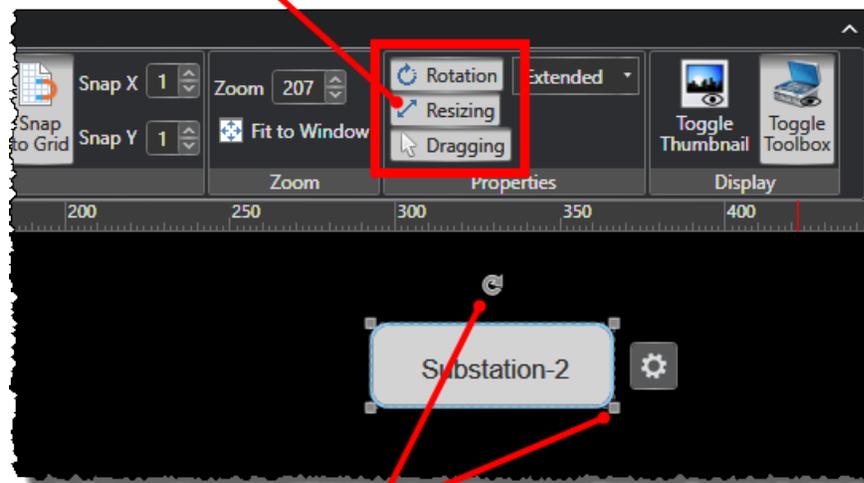
Click to deselect command toggle to lock and prevent adjustments.



Controls to rotate, resize, or drag a selected object are not available.

2. Click to **select** any of the command toggles to **unlock** them so they can be adjusted.

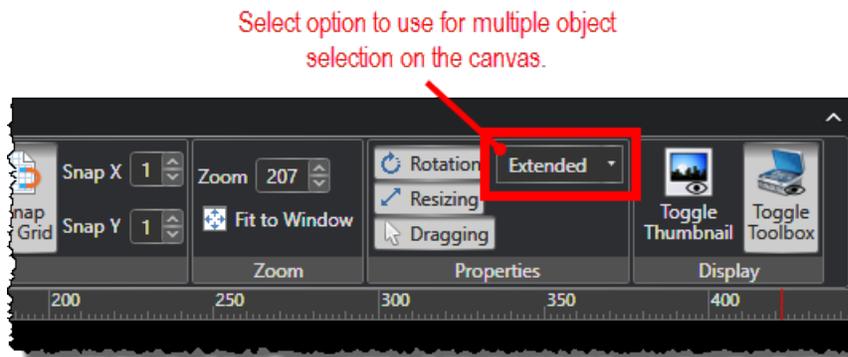
Click to select command toggle to unlock and allow adjustments.



Controls to rotate, resize, or drag a selected object are available.

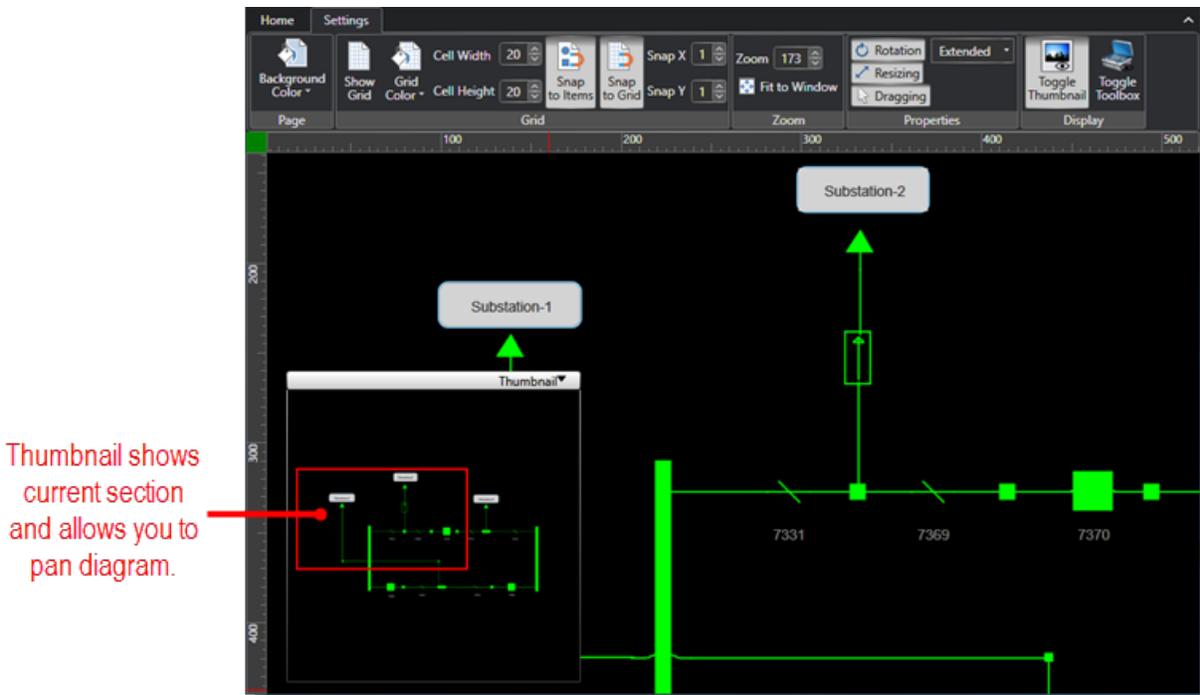
3. Select an option for allowing the selection of multiple objects on the canvas at the same time. You can select from the following options:

- **Extended:** Allows the selection of multiple objects by clicking and dragging a box around the objects. You can also select multiple objects by holding down the **CTRL** key on your keyboard as you click the objects. **Extended** is the default selection.
- **Multiple:** Allows the selection of multiple objects simply by clicking those objects. You can also select multiple objects by clicking and dragging a box around them.
- **Single:** Allows the selection of only one object at a time.
- **None:** Disables the selection of any objects.



Viewing Thumbnail and Panning Diagram

You can view a thumbnail perspective of the area of the diagram currently visible on the [canvas](#) and then pan to different parts of the diagram. This feature is useful as you [zoom](#) in and out of a diagram and then want to change the focus to different sections of the diagram.

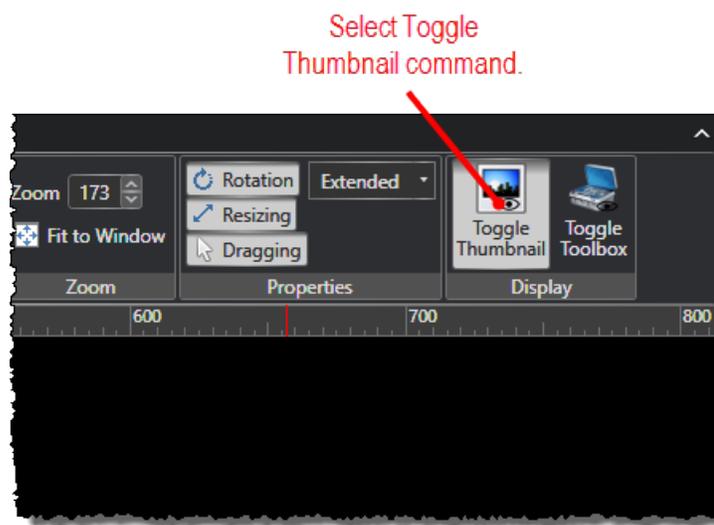


➤ **To quickly pan a diagram:**

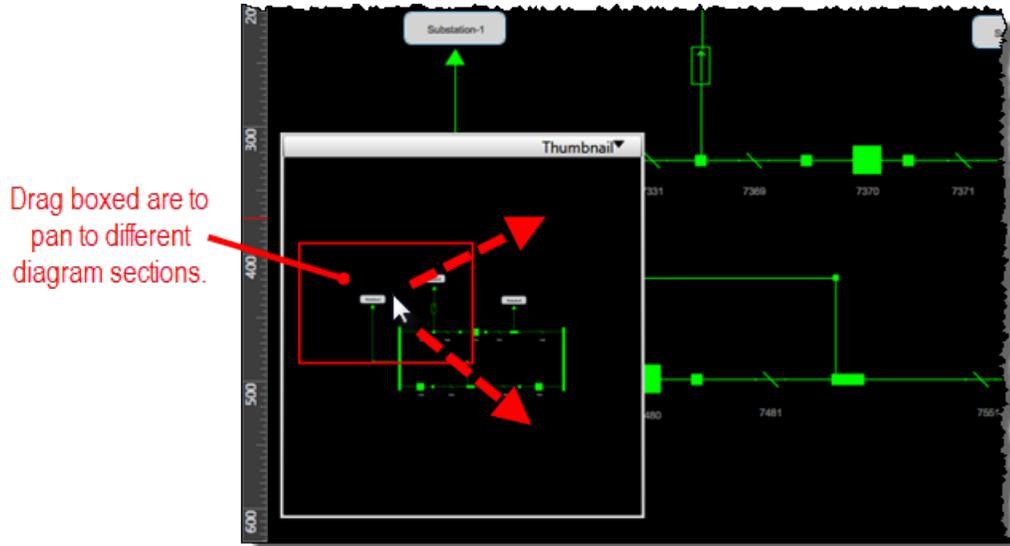
- Hold down the **CTRL** key on your keyboard while clicking and dragging the canvas. A hand icon appears as the cursor as you drag the canvas to pan.

➤ **To view a thumbnail and pan a diagram:**

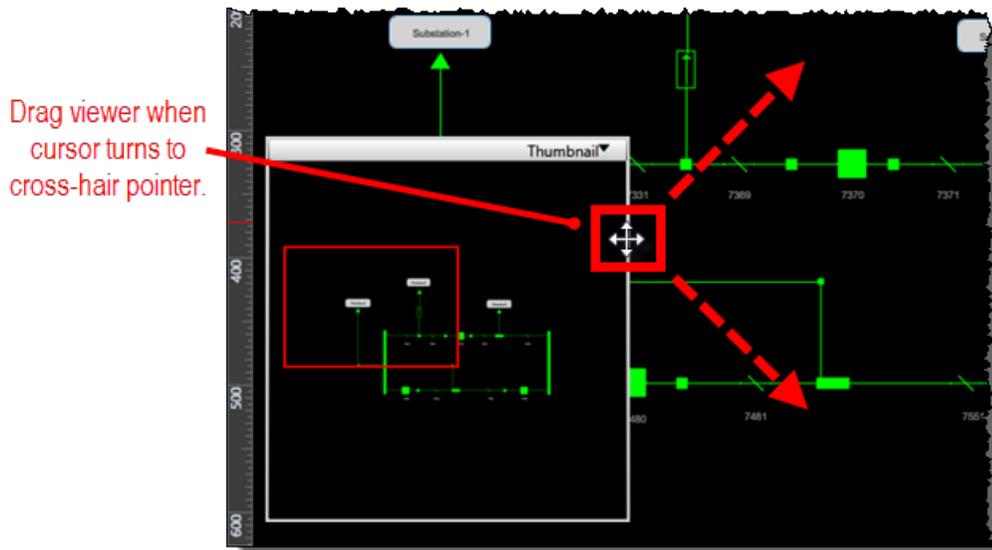
1. Under the [Settings](#) tab, click to select the **Toggle Thumbnail** command to show the thumbnail viewer.



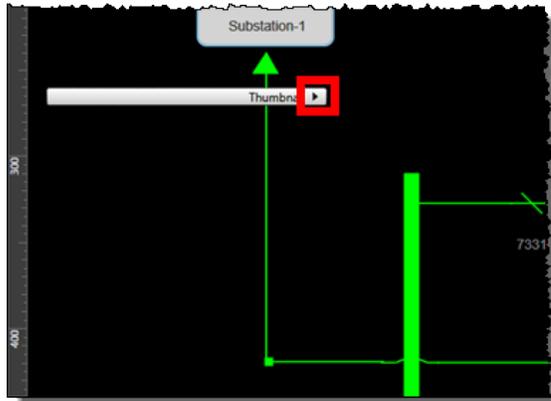
- The boxed area inside the viewer shows the section of the diagram that is in view on the canvas. Click and drag the boxed area inside the viewer to pan to different sections of the diagram. The diagram moves simultaneously to show the corresponding section in the diagram.



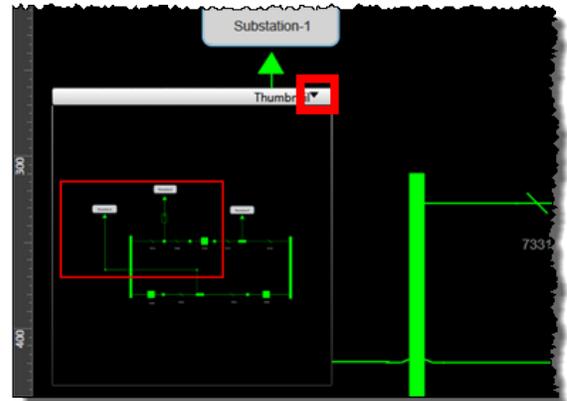
- You can move the entire thumbnail viewer as needed by hovering the mouse over the edge. When the cursor turns to a cross-hair pointer, you can click and drag the viewer.



- You can minimize and expand the thumbnail viewer by clicking the viewer minimize/expand toggle.



Click toggle to expand minimized thumbnail viewer.



Click toggle to minimize thumbnail viewer.

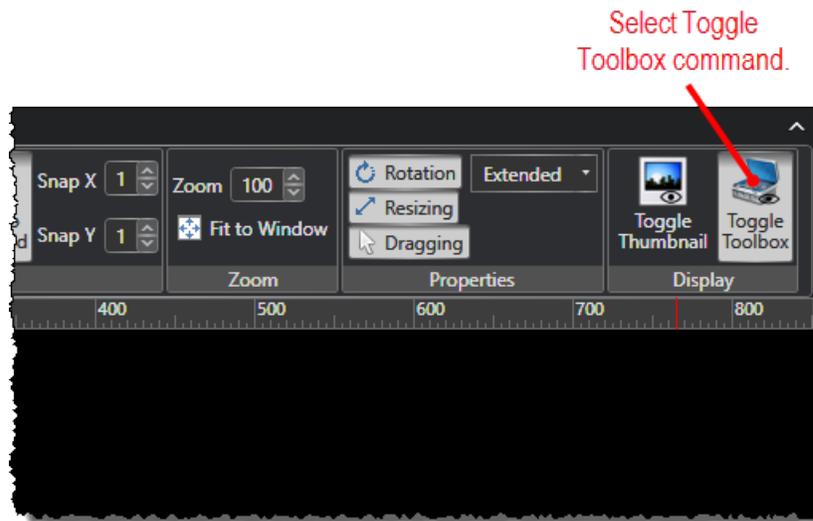
5. Click to deselect the **Toggle Thumbnail** command to hide the thumbnail viewer.

Showing and Hiding the Toolbox

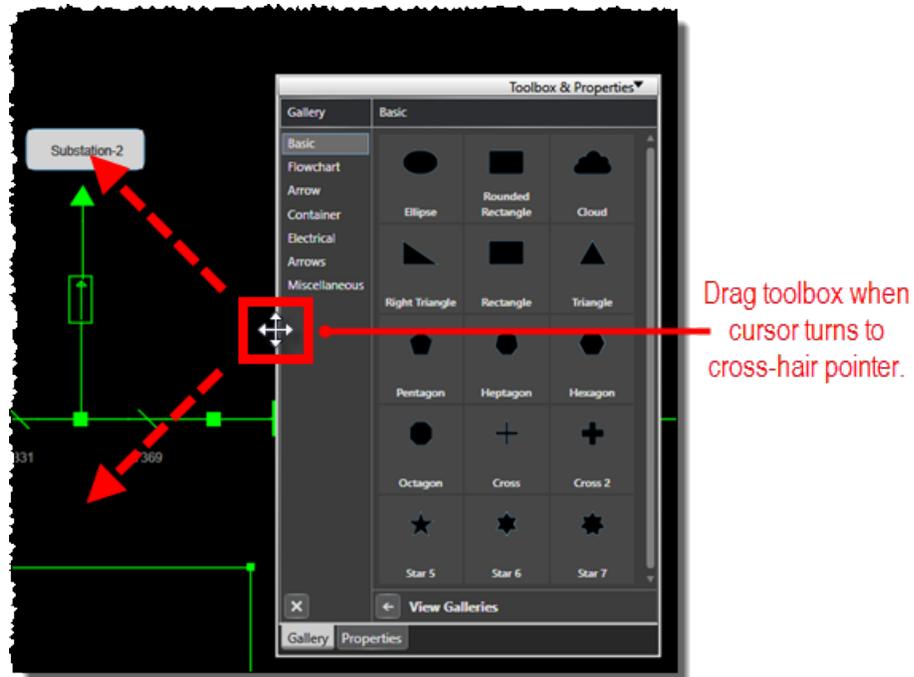
To use the free-form drawing toolbox to add **objects** and **properties** to the **canvas**, you must make sure the toolbox is visible.

➤ To show and hide the toolbox:

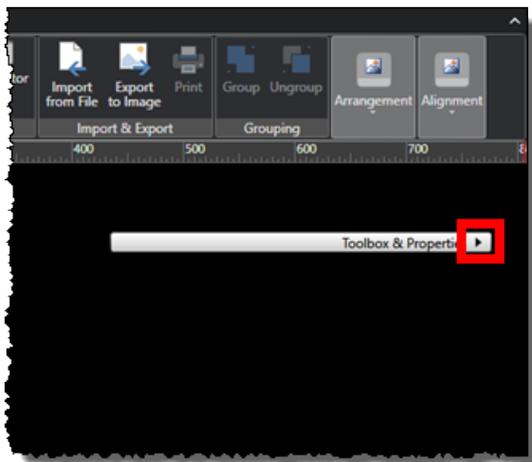
1. Under the **Settings** tab, click to select the **Toggle Toolbox** command to show the toolbox.



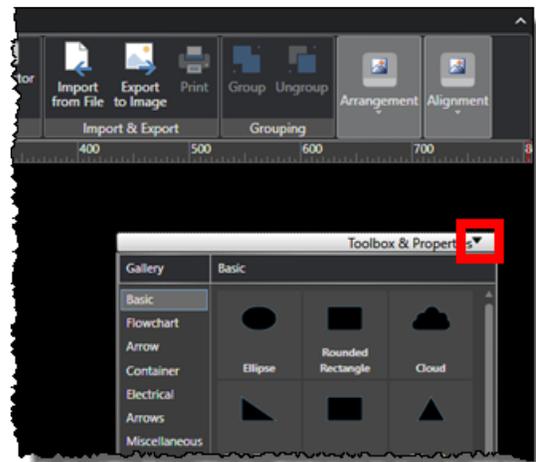
2. You can move the toolbox as needed by hovering the mouse over the edge. When the cursor turns to a cross-hair pointer, you can click and drag the toolbox.



3. You can minimize and expand the toolbox by clicking the toolbox minimize/expand toggle.



Click toggle to expand minimized toolbox.



Click toggle to minimize toolbox.

4. Click to deselect the **Toggle Toolbox** command to hide the toolbox.

8 Working with Other Tools

One-Line Diagram Kit includes the following miscellaneous tools that help you work with the application and the diagrams you create:

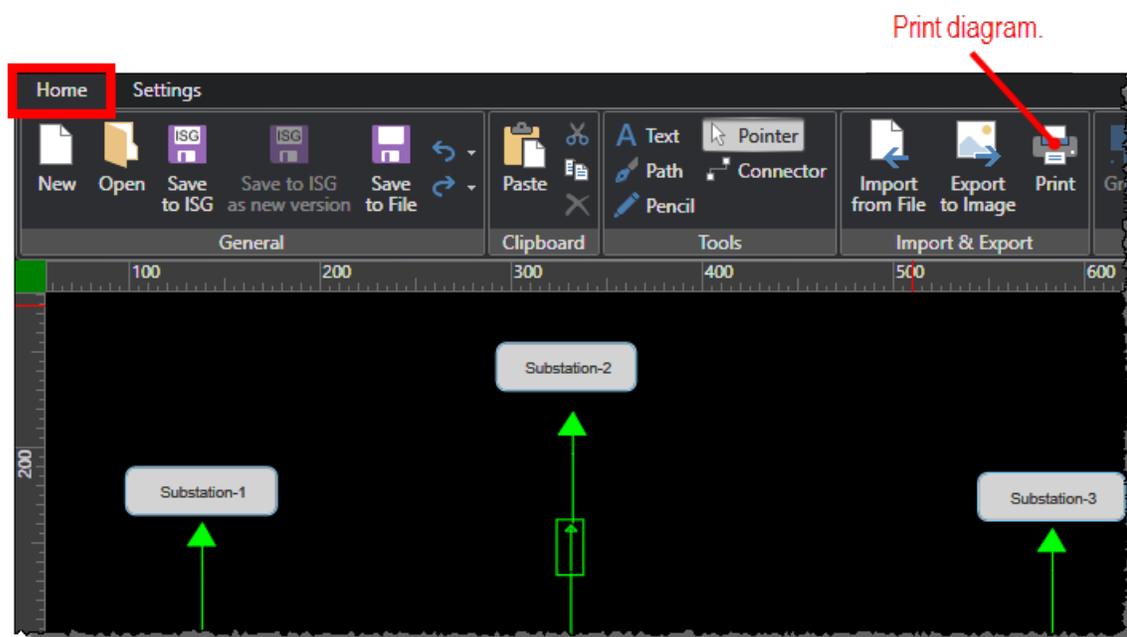
- [Printing](#) allows you to print diagrams to printers.
- [Image exporting](#) allows you to export diagrams to PNG image files.
- [Filters](#) help you quickly find diagrams you want to work with.
- A [configuration editor](#) allows you to edit your One-Line Diagram Kit configuration file through a user interface instead of a text editor.

Printing Diagrams

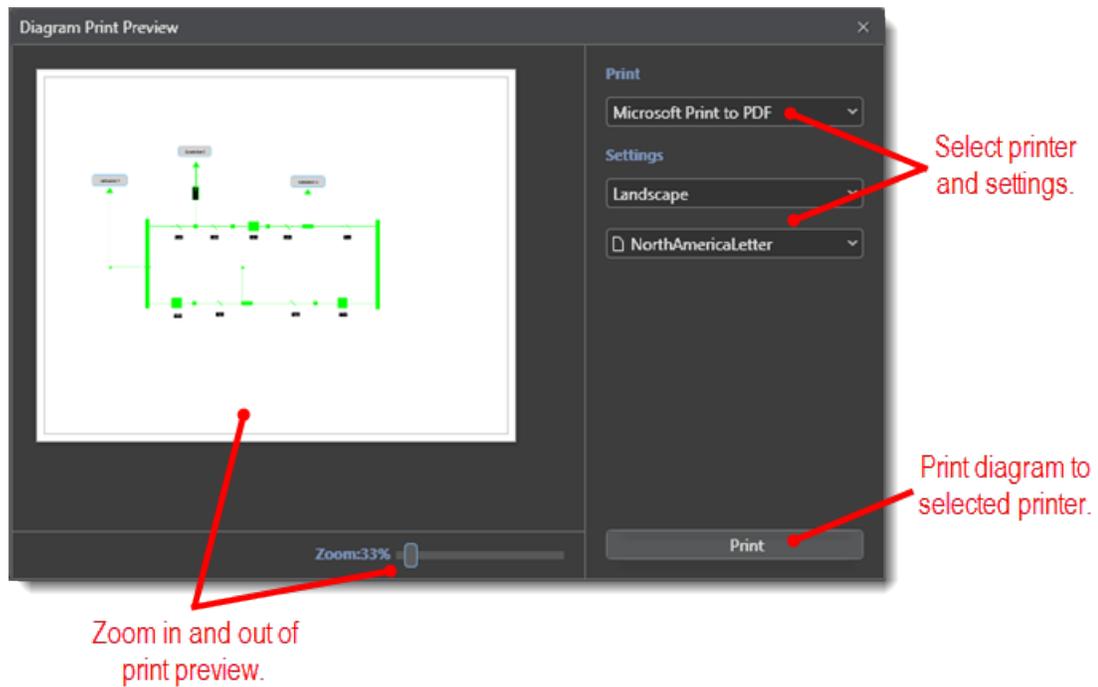
One-Line Diagram Kit allows you to perform standard print operations with an open diagram.

➤ **To print an open diagram:**

1. Under the [Home](#) tab, click the **Print** command.



2. When the **Diagram Print Preview** window opens, select your printer and settings and then click the **Print** button.

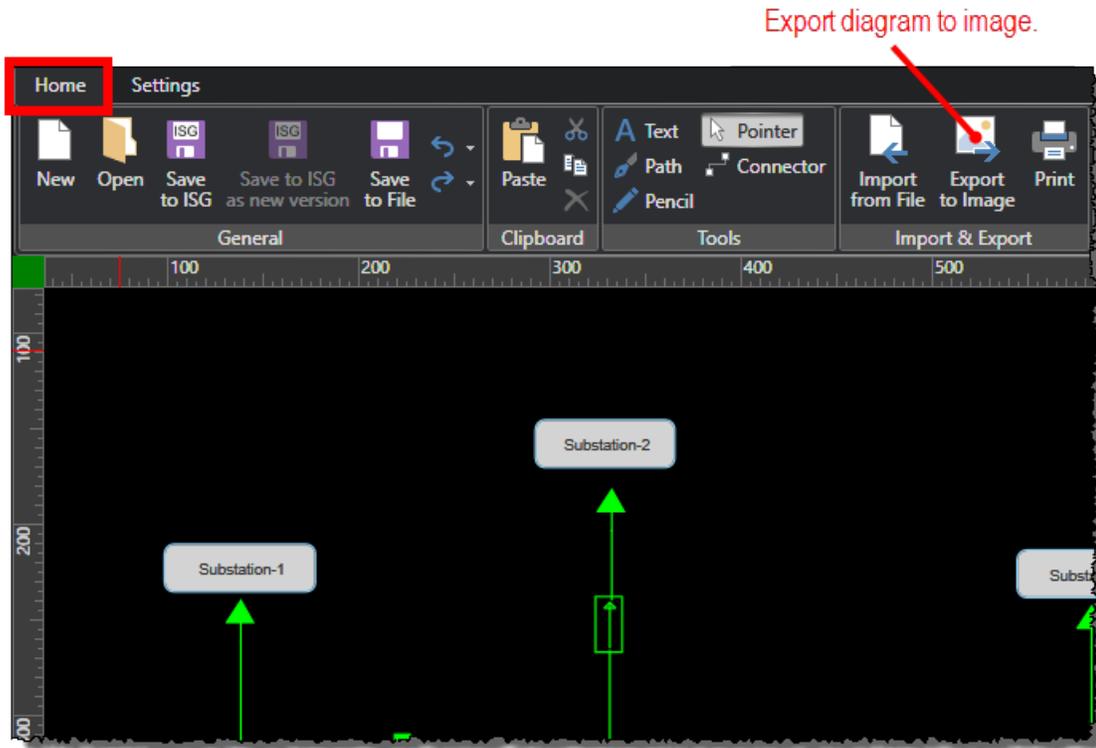


Exporting Diagrams to Images

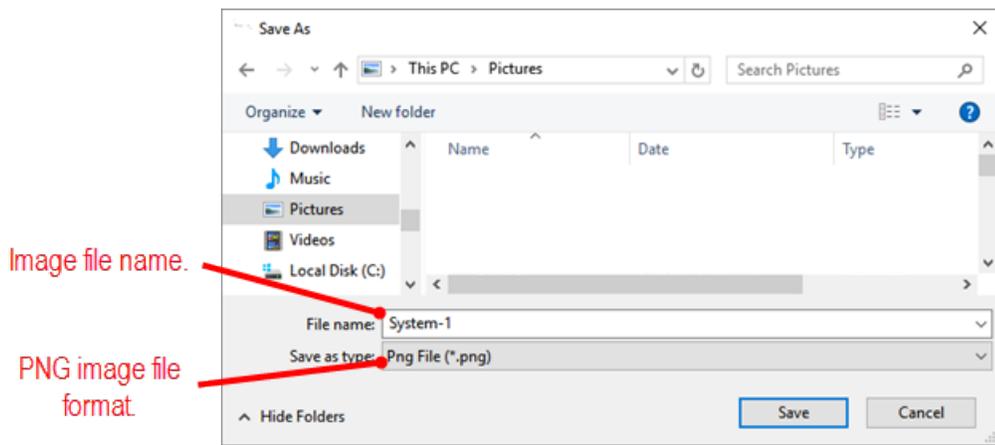
One-Line Diagram Kit allows you to export an open diagram to a PNG image file. This feature allows you to create static diagram images only. You cannot use the exported image to open or import as a diagram later.

➤ To export an open diagram to an image:

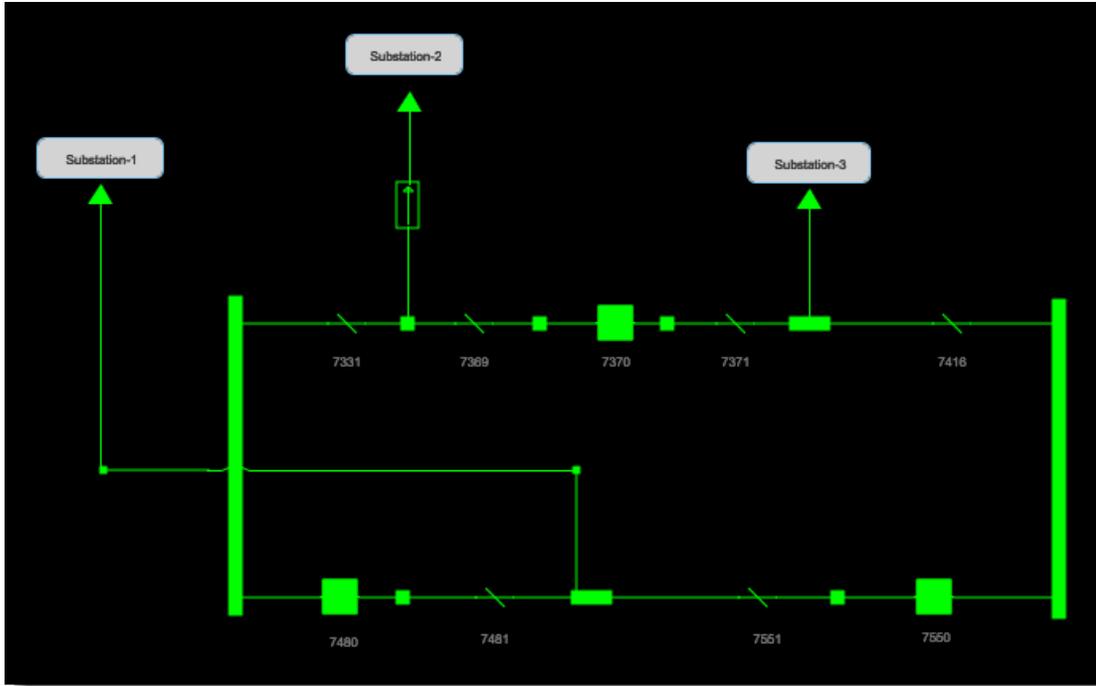
1. Under the [Home](#) tab, click the **Export to Image** command.



2. When the pop-up window opens to save a file, browse to the folder where you want to save the image file and enter the file name you want to use.

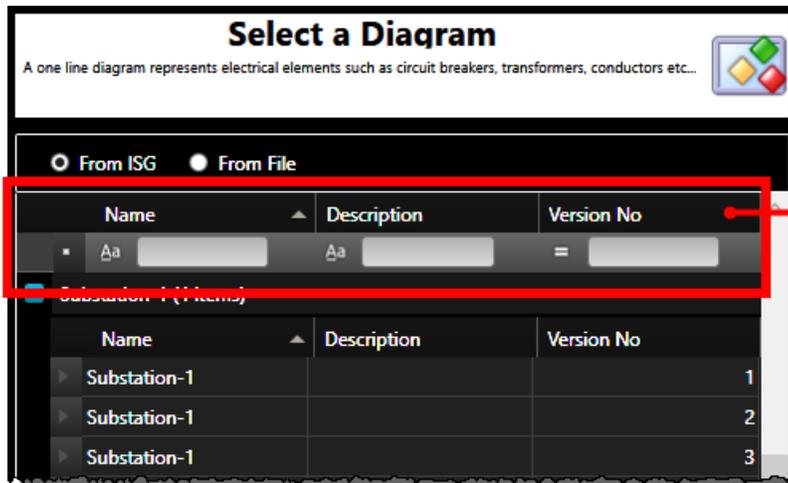


3. The diagram is saved as a PNG image file, which you can open and view in any image viewer or editor.



Using Filters

Filters help you narrow down selection lists in cases where the list is too long to easily find the object for which you are searching. For example, when you [open a diagram](#) or [select a diagram at login](#), you can narrow the list of diagrams by using a filter to find diagrams that match your search parameter. Similarly, you can use a filter to help narrow a list when you [select data sources](#) to map to diagram objects.



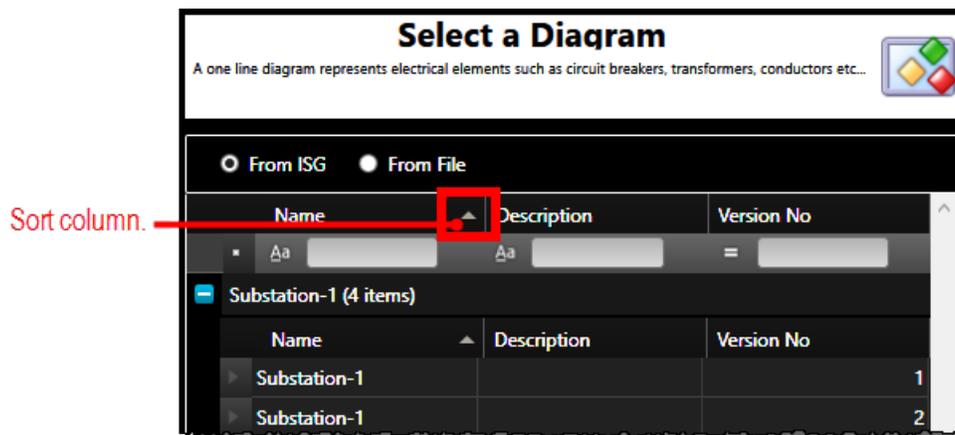
Object filters.

There are three types of filters:

- Simple **sorting** allows you to change the order that objects appear in a selection list.
- The **basic filter** offers a text box where you can quickly type a search string and an operator menu where you can select from a list of common query operators to apply to your search string.
- The **custom filter** allows you to set up a complex filter with multiple strings and operators working together to narrow your filter.

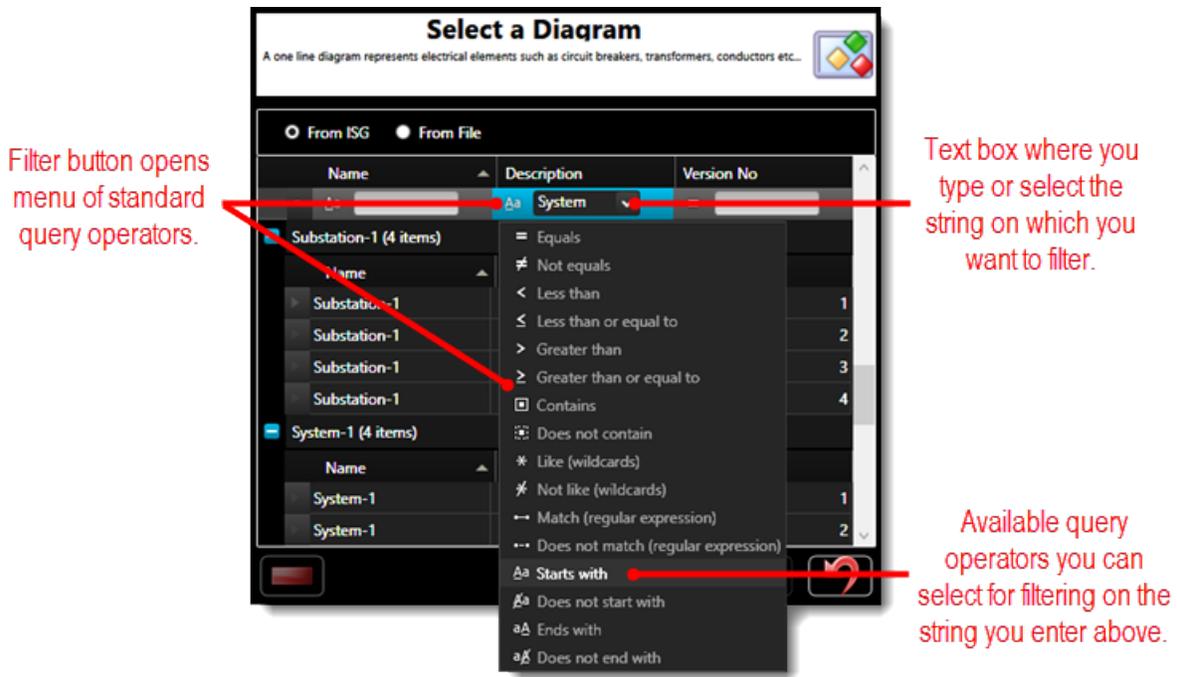
Sorting Selection Lists

Sorting is the simplest form of **filtering**, allowing you to change the alphabetical and numerical order in which objects appear in a selection list. To sort a column in a selection list, click the sort up and down toggle.



Using Basic Filters

Basic **filtering** tools allow you to quickly filter available selection screen objects such as signal sources, diagram names, descriptions, and version numbers. To use a basic filter, open the filter menu, select the operator for filtering, and type or select the search string in the text field. The operators in the filter menu are standard search query operators. For example, **Equals** returns only the object that exactly matches the string you enter in the text field. **Contains** returns all objects that contain the string anywhere in the name or description (whichever you are searching on).



In the example above, the diagram list would be filtered to include only those diagrams that **start with** the word **System**.

If you need a more complex method for filtering, you can use the [custom filter](#).

Using Custom Filters

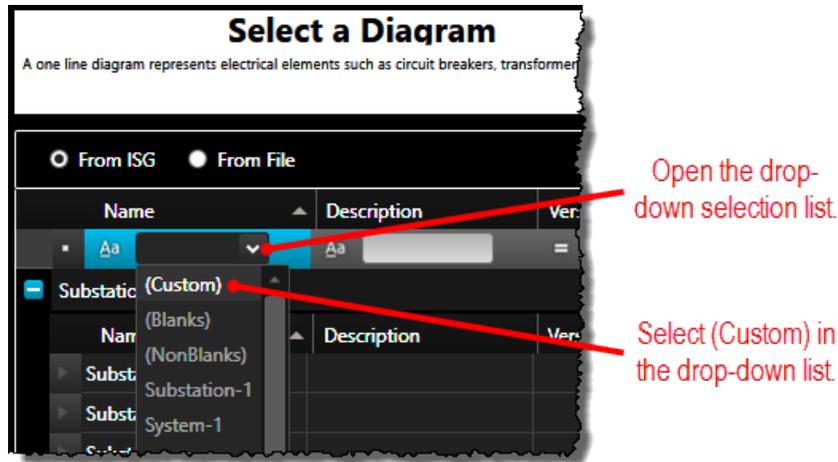
If a [basic filter](#) does not provide enough search options to help you [filter](#) for the object you need, you can use a custom filter. With a custom filter, you can apply a complex query to filter on selection screen objects such as signal sources, diagram names, descriptions, and version numbers.

You can use the same operators in the filter menu that you use with a basic filter, however in a more complex arrangement. A process you might follow to create a complete custom filter includes:

1. [Creating an individual condition](#)
2. [Combining individual conditions into a more complex query](#)
3. [Grouping conditions](#)

You will probably have to repeat one or more of these steps (and maybe in a different order) until the custom filter yields the results you want.

To open the **Custom Filter Selection** screen, where you perform these custom filtering tasks, select **(Custom)** on the basic filter menu for the field on which you want to filter. In the following example, custom filtering would apply to the diagram **Name** field because that is the field under which you would be selecting the custom filter option.

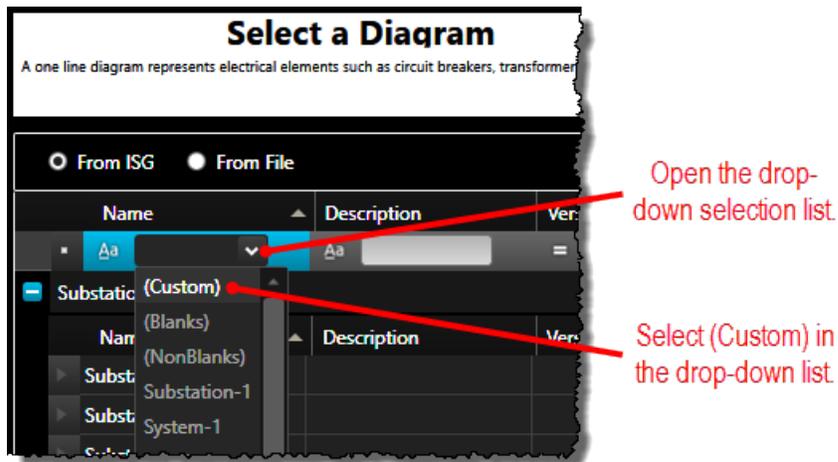


Creating a Condition in a Custom Filter

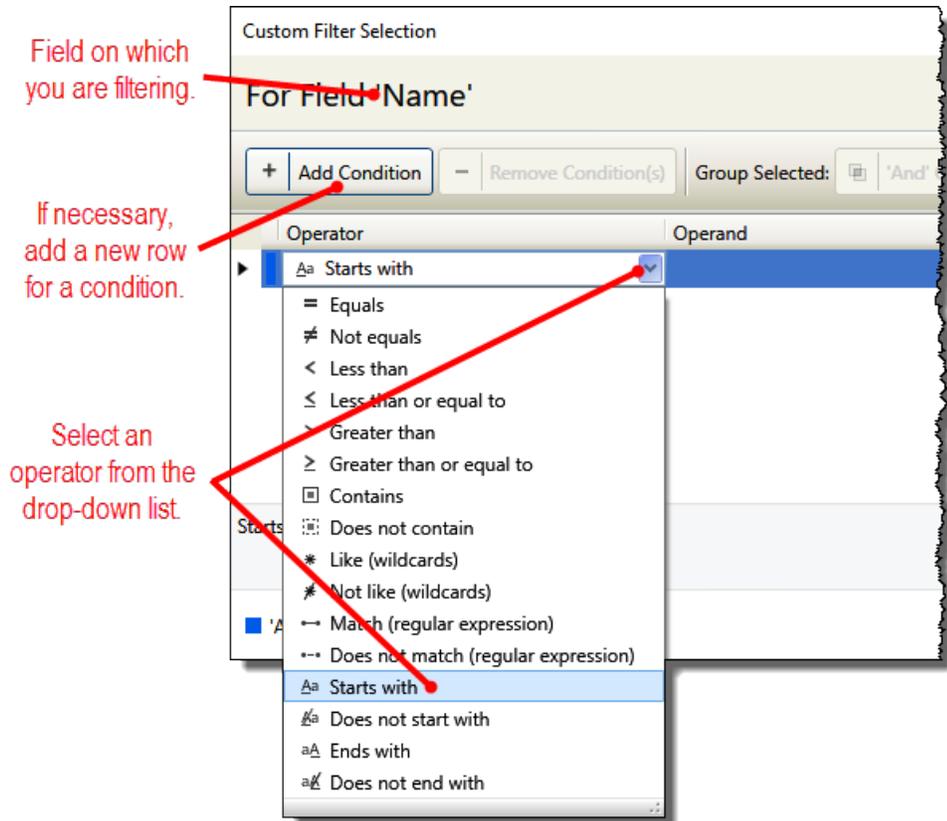
The basic building block in a [custom filter](#) is a condition. A condition is a string that specifies what to search for and how to search for it. For example, a condition might say to include only results where the selected field starts with specific letters. In a custom filter, you would likely [combine multiple conditions](#) to form a complex query.

➤ To create a condition:

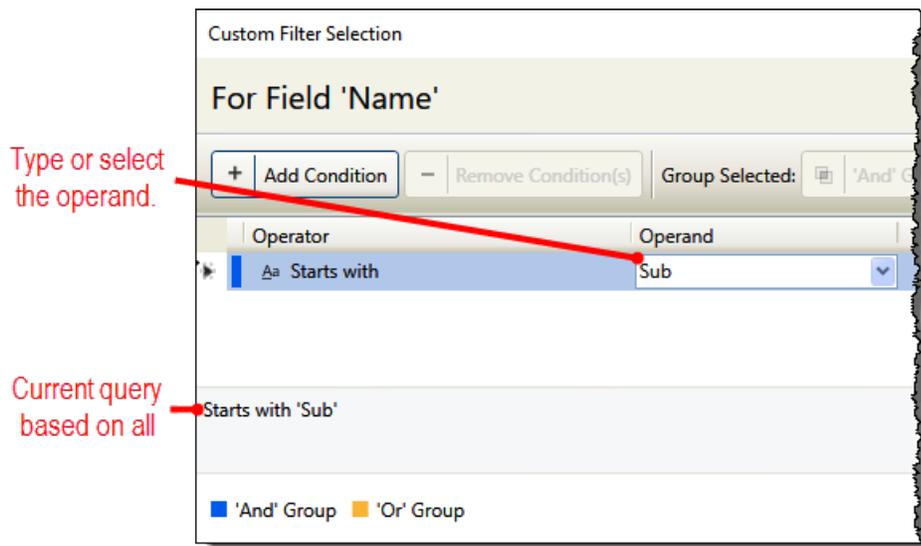
1. Select **(Custom)** as the selection for the field on which you are basing your filter.



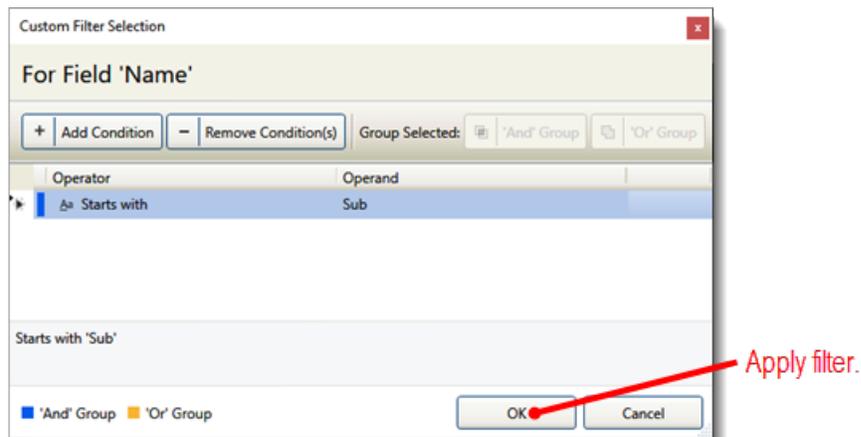
2. When the **Custom Filter Selection** screen opens, select the operator to use for the condition. For example, select **Starts with** to include only results that start with the operand that you specify (discussed next). If a row is not available on the screen for you to specify the condition, click the **Add Condition** button to add one.



3. Type the operand you want to use with the operator. For example, if you want to find only fields that start with **Sub**, you would select **Starts with** as the operator (discussed above) and type **Sub** as the operand. You can also select the operand if an item in the list matches the text you want to use. The selection list includes all values for the field as they exist on the server.



- Optionally, [combine multiple conditions](#) to form a more complex filter. To apply the specified filter, click the **OK** button.

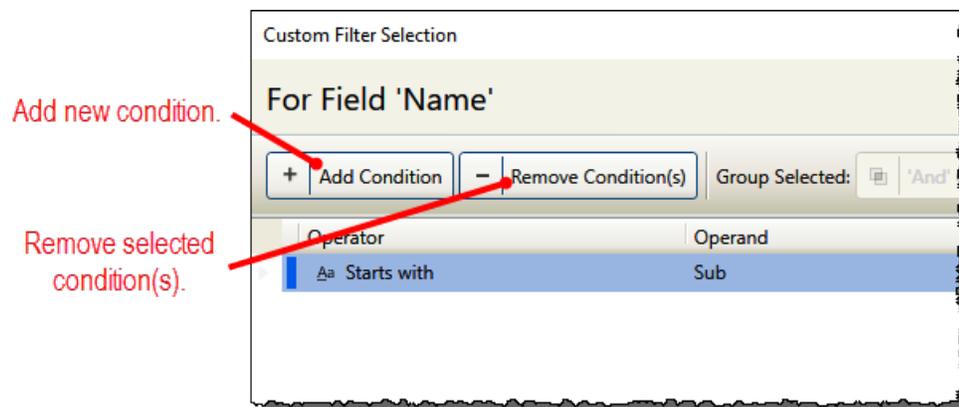


Combining Conditions in a Custom Filter

When [creating conditions](#) for a [custom filter](#), you can create more than one condition and combine them to result in one complex query.

➤ To combine conditions into a more complex query:

- Create more than one condition, as discussed in the [Creating a Condition in a Custom Filter](#) section. To add a new condition, click the **Add Condition** button in the **Custom Filter Selection** screen. This will add a new row where you can specify a new operator and operand.



Note: If you need to remove one or more conditions, select those conditions and then click the **Remove Condition(s)** button.

- Continue adding conditions until you have a set of conditions that collectively yield the results you need. By default, each condition works collectively to make the final query more restrictive by inserting an **AND** statement. As you add conditions, you can see how the final query is being assembled below all of the conditions.

Custom Filter Selection

For Field 'Name'

+ Add Condition - Remove Condition(s) Group Selected: [icon]

Operator	Operand
Starts with	Sub
Does not start with	Subcr
Not equals	Substation-5

Starts with 'Sub' AND Does not start with 'Subcr' AND != 'Substation-5'

Legend: [blue square] 'And' Group [yellow square] 'Or' Group

Color code helps to identify statements.

All conditions work collectively.

By default, conditions form with AND statements.

The conditions in the example above would yield results where the diagram name starts with the letters **Sub**, except for the **Substation-5** diagram or any diagrams that start with the letters **Subcr**.

- You can toggle the **AND** statements in the query to make them **OR** statements (makes the conditions less restrictive), or vice versa, by clicking the **Toggle** button.

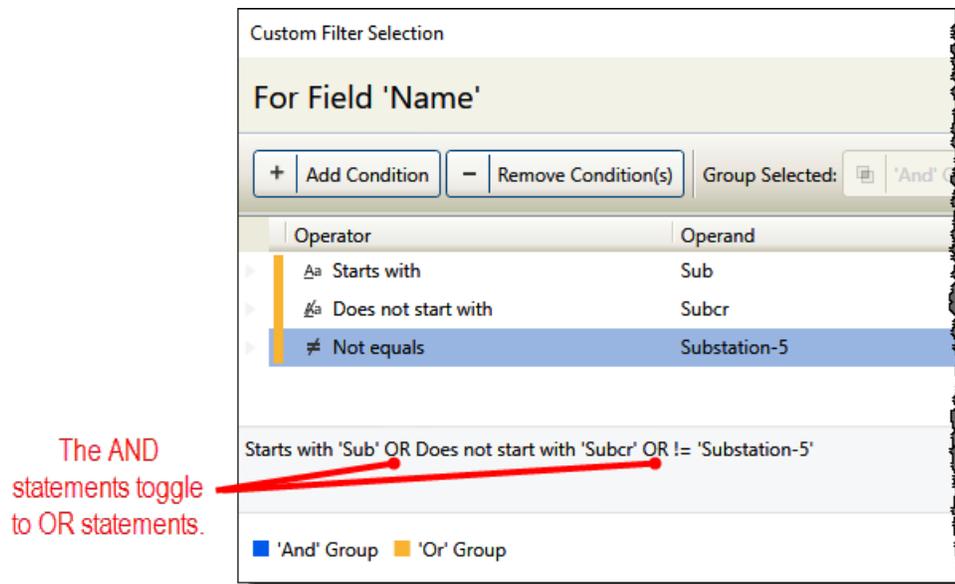
Condition(s) Group Selected: [icon] 'And' Group [icon] 'Or' Group [icon] Toggle [icon]

Operand
Sub
Subcr
Substation-5

'Subcr' AND != 'Substation-5'

Click to toggle between AND and OR statements.

You can verify that the toggle changed the statements by looking at the updated query.



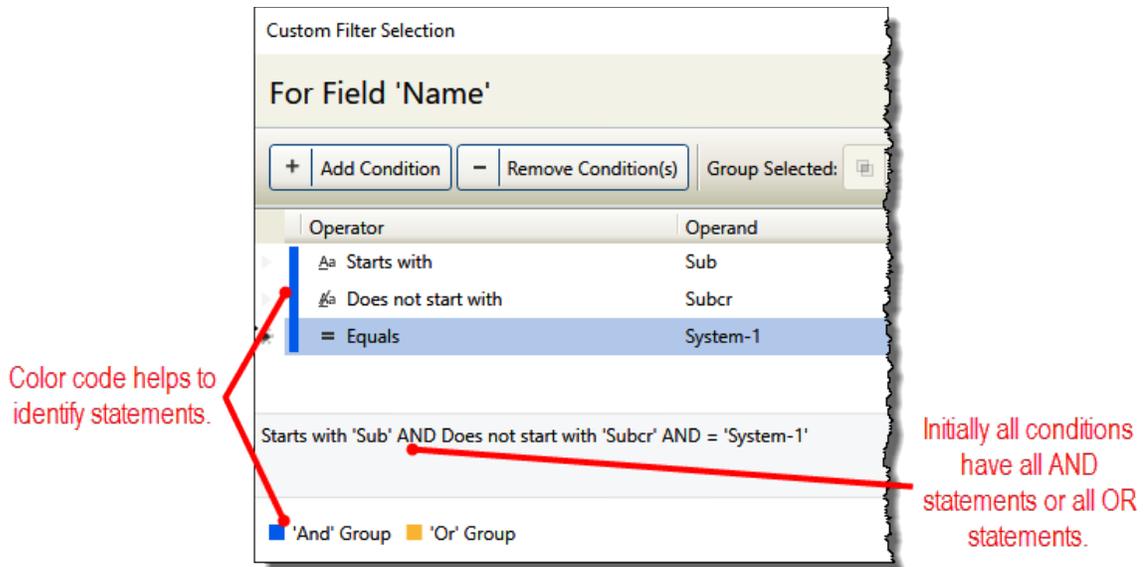
- Optionally, you can [group the conditions](#) to make a more complex query that combines different sets of conditions.
- To apply the specified filter, click the **OK** button.

Grouping Conditions in a Custom Filter

As discussed in the [Combining Conditions in a Custom Filter](#) section, the **Toggle** button allows you to switch all of the conditions in a [custom filter](#) so that they are connected by **AND** statements (more restrictive) or connected by **OR** statements (less restrictive). However, the **Toggle** button applies to **all** of the conditions, requiring you to use either **AND** or **OR** statements between all conditions. For example, the custom filter would result in either the query **Condition 1 AND Condition 2 AND Condition 3** or the query **Condition 1 OR Condition 2 OR Condition 3**. However, there may be times where you want to mix the **AND** and **OR** statements, for example in a query such as **(Condition 1 AND Condition 2) OR Condition 3**. In this situation, you can group conditions so that you mix the **AND** and **OR** statements.

➤ To group conditions:

- Create the conditions you need for your filter, as discussed in the [Creating a Condition in a Custom Filter](#) and the [Combining Conditions in a Custom Filter](#) sections. When you first create the conditions, they are combined with **AND** statements, which can be toggled to **OR** statements.

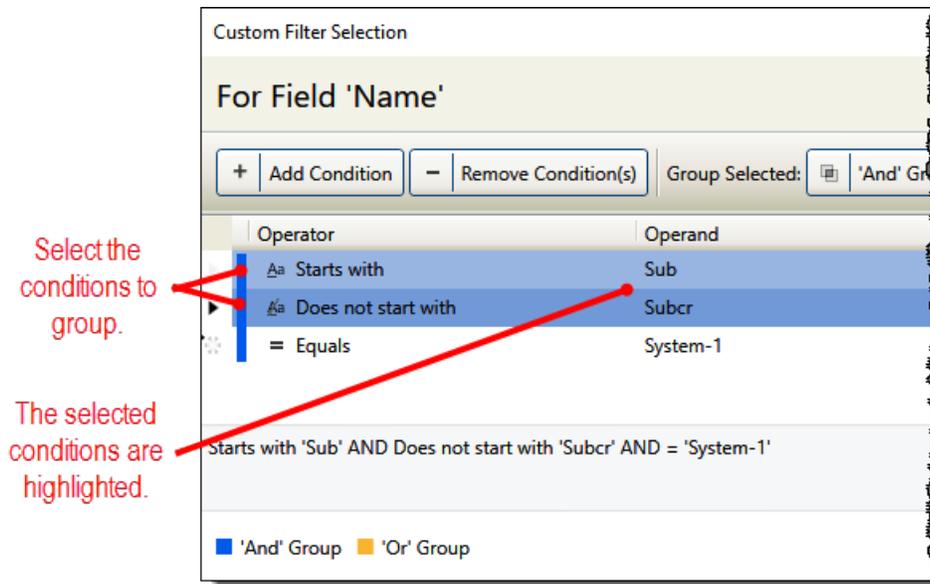


The remaining examples in this procedure assume you want to group these conditions so that the first two are combined by an **AND** statement and separated from the third condition by an **OR** statement. The corresponding query would be **(Condition 1 AND Condition 2) OR Condition 3**, or more specifically **(Starts with 'Sub' AND Does not start with 'Subcr') OR = 'System-1'**. In plain terms, this would result in all diagram names beginning with the letters **Sub**, as long as they do not begin with the letters **Subcr**, or the diagram name **System-1**.

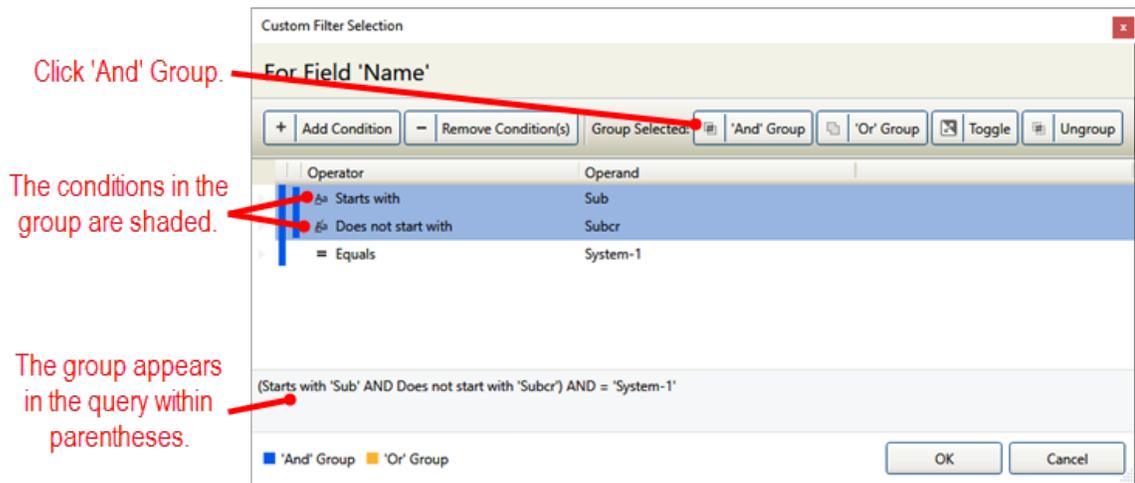
2. Select the conditions you want to place in the same group:

- You can select a group of conditions in a sequence by holding down the **SHIFT** key on your keyboard as you click the first and last condition you want to place in the group.
- You can select conditions in different places by holding down the **CTRL** key on your keyboard as you click each condition.

Using the above example, you would select the first two conditions so that they will be grouped together.

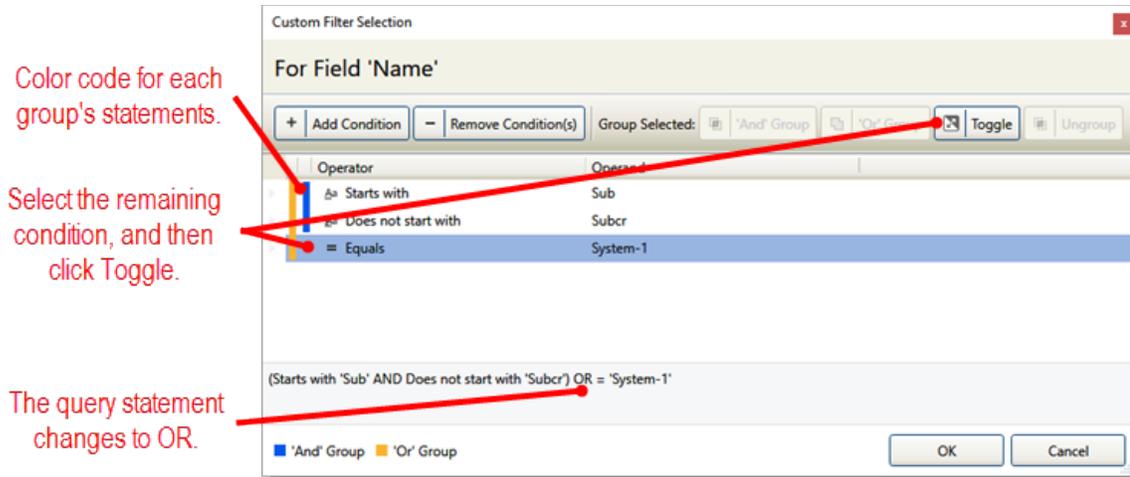


- Click the **'And' Group** button or the **'Or' Group** button, depending on whether you want to use the **AND** or **OR** statement with that group. Using the example above, you would click the **'And' Group** button.



Note: You can repeat steps 2 and 3 for each set of conditions you want to group (for example, if you were working with a more complex filter). Also, you can ungroup the group of conditions later if necessary by selecting them and then clicking the **Ungroup** button.

- Using the above example, by default the query would still contain **AND = 'System-1'** (instead of **OR**) because the system initially sets the statements to **AND**. Click the third condition to select it, and then click the **Toggle** button to toggle the statement to **OR**.



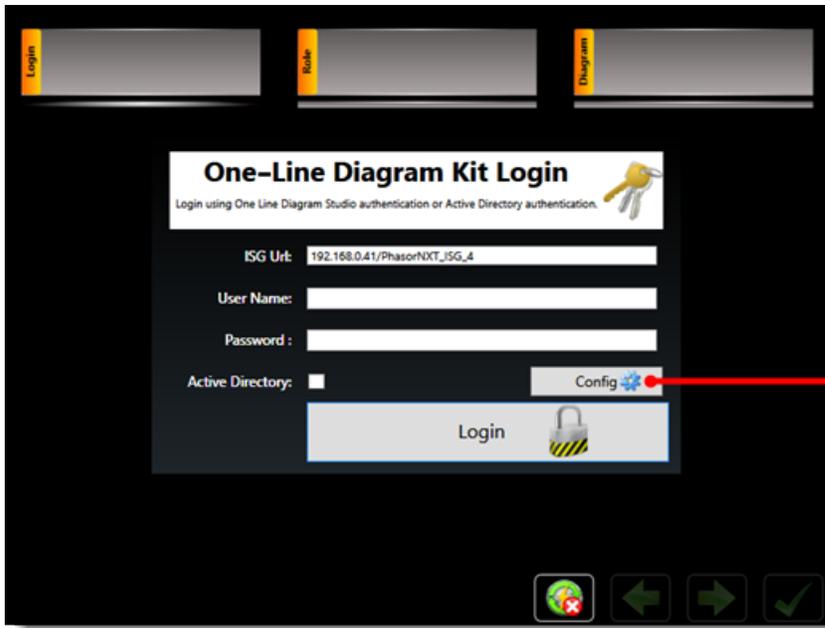
5. To apply the specified filter, click the **OK** button.

Working with the Configuration Editor

The One-Line Diagram Kit configuration editor allows you to edit your One-Line Diagram Kit configuration file through a user interface instead of editing it manually through a text editor. You can use the tool to perform the following configuration tasks:

- Configure bindings, behaviors, and endpoints.
- Test configuration changes, and synchronize configuration files.

You can access the configuration editor by clicking the **Config** button on the login screen when you [start the application](#).



Click Config button to open configuration editor tool.