SP3D Automation Toolkit

User Guide

Intergraph PPM – SP3D Automation Services Group

Contents

How to Install & Configure Menus

1. Unzip the files into a Local Directory say C:\Program Files\SP3DAutomation,
2. Run the **Install.VBS** from the Local Directory (double-click it from Windows Explorer)

In case of any installation errors, review Install.Log generated in the local directory and take appropriate corrective action.

Uninstallation

1. Run the **Uninstall.BAT** from the Local Directory where you installed the toolkit. (double-click it from Windows Explorer)

Customizing Commands and Utilities in this Toolkit

A file named S3DAutomationToolkitConfig.txt is delivered with this toolkit. This provides means to customize the toolkit in the below mentioned manner.

1. Specify your own Configurable Select Filters to add to ALL or a specific list of tasks.

   [All Tasks] or [*TaskName*] sections in config file.

2. Specify your own Configurable Filters for the Filter Selected objects command.

   [Filter Selected Objects Command] section in config file.

3. Specify which commands in this toolkit are restricted and disabled for all users except those controlled users/permission groups. Administrator can use this facility to disable commands as per his need.

   [Restricted Commands], [Users Without Command Restrictions], [Permission Groups Without Command Restrictions] sections in in config file.

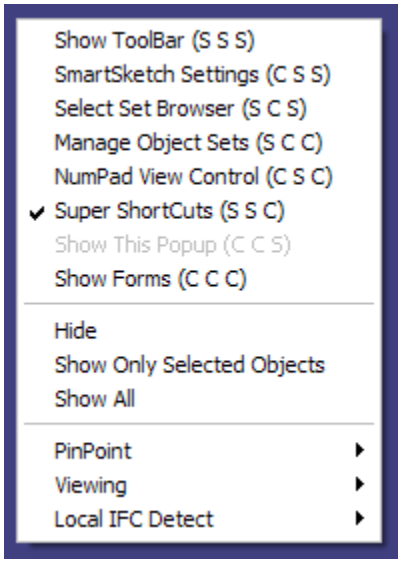
4. Specify a list of Custom Commands accessible from the Admin/User Configurable portion of the ToolBar (3rd column of Buttons on S3D Automation Toolkit's Toolbar)

   [Custom Super ShortCuts] section in config file.

Advanced Configuration – Adding Custom Menu items to Toolkit's Popupmenu

A file named menuSP3DAutomationCustomPopupTools.xml is delivered with the toolkit. You can customize it before /after installing the toolkit. This allows you to add your own menu items and menus to the toolkit's popup menu, which appear at the bottom. Note that this being an Advanced Configuration, any customization to this file must be done carefully and ensured it works on a local machine before deploying to many machines. For more information, refer to the comments in the file delivered with the toolkit.

Super ShortCuts



This functionality called the "Super ShortCuts", is something which uses **C**trl and **S**hift key combinations to invoke some of the most commonly used commands in this toolkit. Tapping them (i.e. press and release) in **quick succession** (anywhere inside the SP3D application, but not on any active command form) will invoke the functionality.

For example, tapping Shift key thrice, i.e. **S**hift – **S**hift – **S**hift shows up the Toolbar that provides access to all commands in this toolkit.

Similarly, another Super ShortCut is **C**trl – **C**trl – **S**hift. Tapping that key sequence in quick succession brings up the PopupMenu of this Toolkit at the mouse position. This Toolkit PopupMenu has the most commonly accessed commands and also to Show toolbar that provides access to all additional commands.

In the above menu which includes all Super ShortCuts, **C** stands for Ctrl, **S** for Shift.

Super **S**hort**C**ut keys can be enabled / disabled by using the key combination **S**hift – **S**hift – **C**trl.

Tip: To turn off the Windows "Sticky Keys" functionality from getting invoked with 5 consecutive shift key taps, turn off Sticky keys functionality from the Settings option on the sticky keys dialog which shows up.

Using Commands and Utilities in this Toolkit

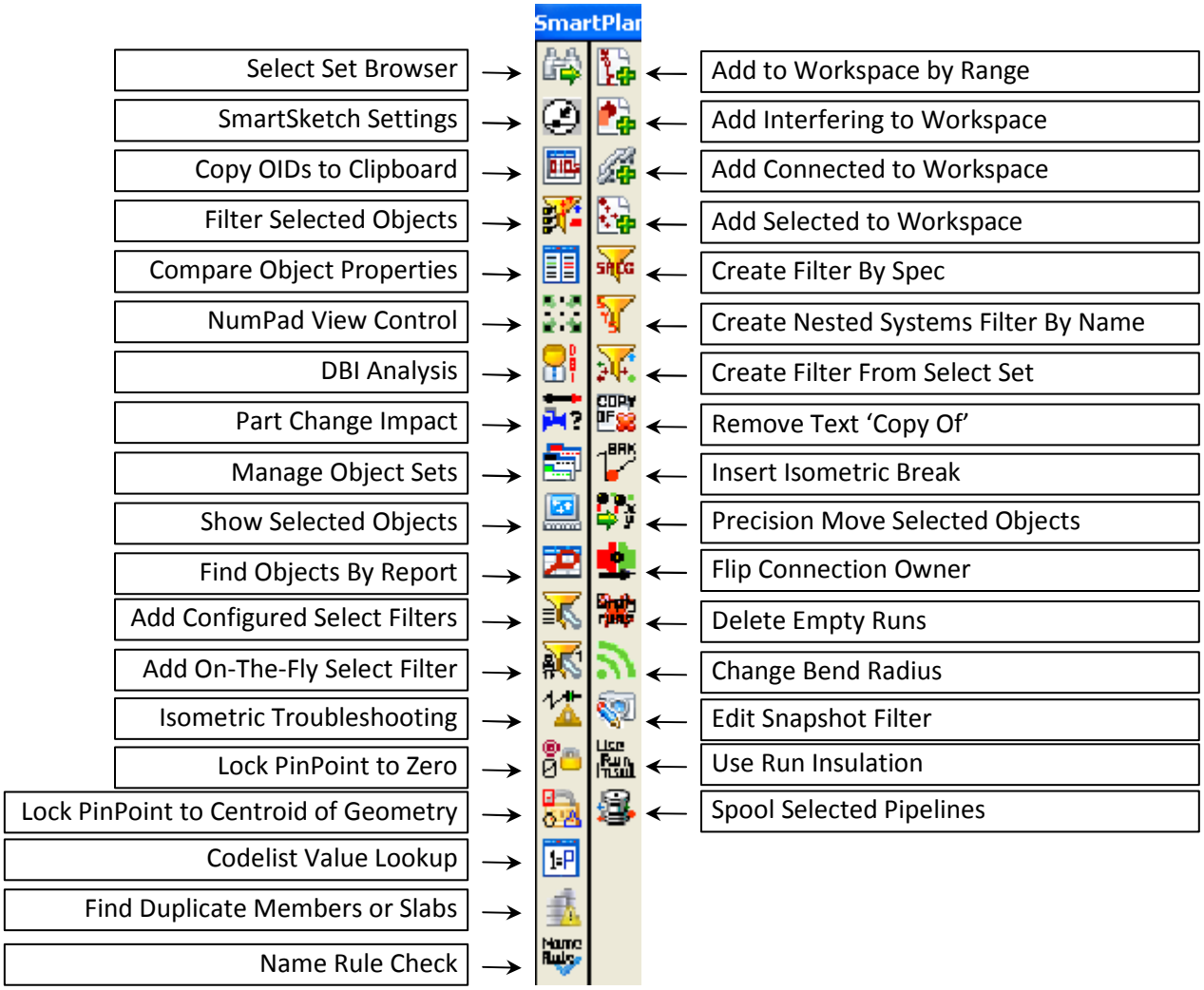
All the functionality in this toolkit is made available from

- The Toolbar of the Toolkit → shows up with **S**hift – **S**hift – **S**hift Super ShortCut.
- The PopupMenu of the Toolkit → shows up with **C**trl – **C**trl – **S**hift Super ShortCut.
- Super ShortCuts →Explained in above section.
- Other Keyboard ShortCuts offered from this toolkit. → Listed in different sections later in this document.

Toolbar

The Toolbar may be invoked by using the Super ShortCut **S**hift – **S**hift – **S**hift.

This is how the toolbar appears on the screen. It provides easy access to commonly used commands.



Cycles 3rd column of buttons - 'configurable' Custom Super ShortCuts [CC, CS, SC, SS] with a numeric[0-9] or alphabetic [A-Z] key.
You can also have your own icons for these.
See [Custom Super ShortCuts] section in config file for more information.

Toggles ToolBar Positioning – Left/Right of main window.

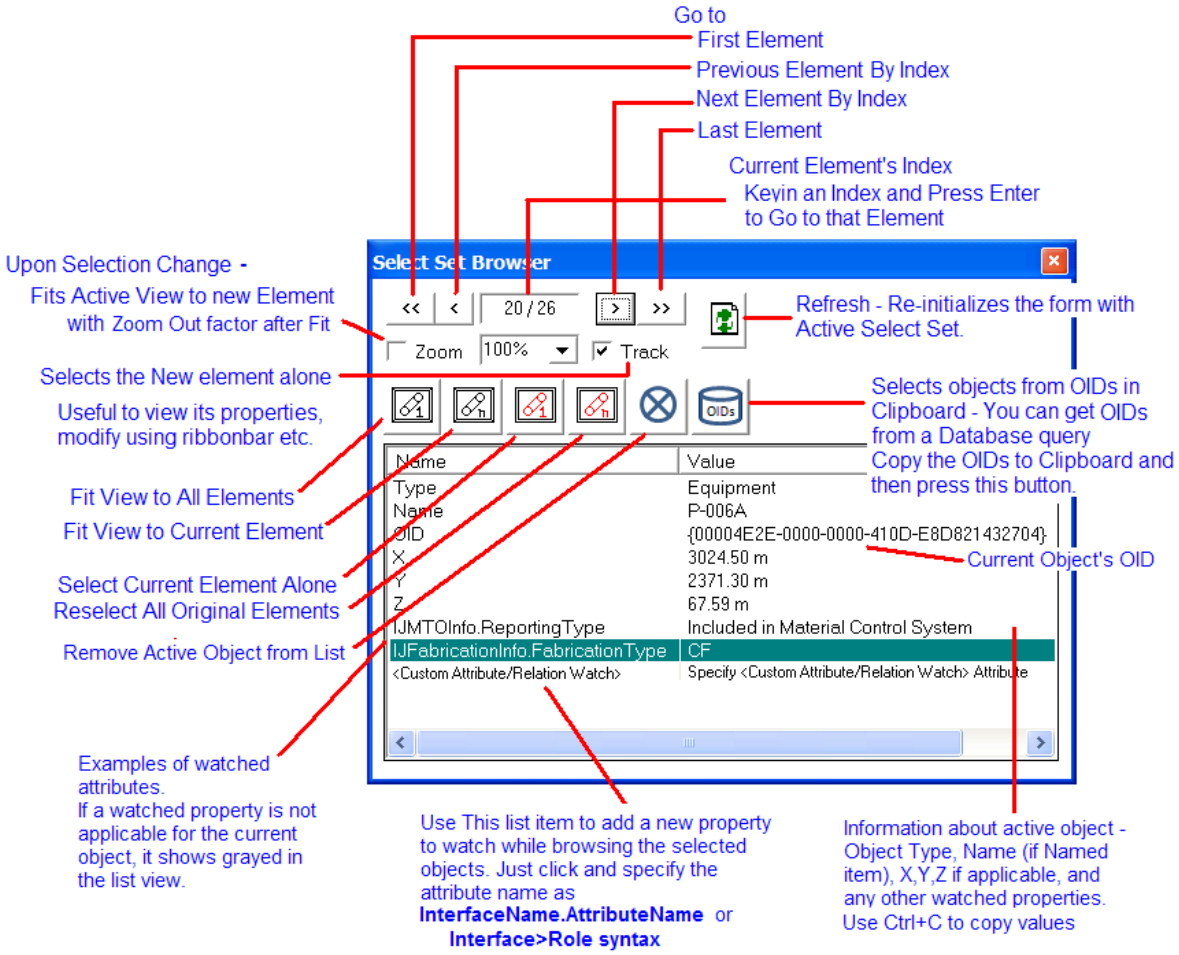
Delivered Example of a 'Configurable' Custom Super ShortCut.
Simple ONE line entry in config file adds a command to the toolbar.

Select Filters and Object Set Manipulation Commands

Select Filter Commands with only Keyboard Shortcuts

Ctrl Tilde (~) Ctrl Shift Tilde (~)	Change Active Select Filter up / down.
Ctrl Space	Set Active Select Filter to 'All'
Note: These shortcuts get disabled if Super ShortCuts are disabled.	

Select Set Browser for SmartPlant 3D



You can invoke the Select Set Browser function using the **S**hift – **C**trl – **S**hift Super ShortCut. The Select Set Browser form stays on top of all windows. For any reason, if it goes behind and you cannot see it, you can use the **C**trl - **C**trl - **C**trl Super ShortCut to bring it back to the top, along with any other active forms from this toolkit.

Object Navigation: Use the ***Go To*** navigation keys

First Object (Home Key),
Next Object (PageDown Key),
Previous Object (PageUp Key),
Last Object (End Key),
Object by Index (Keyin the Object # and press Enter).

Information:

The Entire set of Objects being browsed is hilited in Yellow and the Current Object is hilited in Red. The Active Object's Index within the List being browsed and its OID are displayed. Coordinates are also displayed if the object has any meaningful Location or Origin. If the Object is a Named Item, its name is displayed. To add a custom watch (object's attribute, or Object's related Object attributes, or count of related objects over a given relation/role …), you can edit the **(<Custom Attribute/Relation Watch>)** placeholder row. Specify Custom watch as below.

Custom Watch text Format	Purpose / Remarks/Example
InterfaceName.AttributeName	Show value of an attribute of the currently browsed object. Ex: On any Object, ***IJDObject.ApprovalStatus*** shows approval status of the object.
InterfaceName>RoleName	Show currently browsed object's related object count. Relation specified by Interface and Role names Ex: On a PathRun (Piping/Cabletray/Cableway/Ducting) Object ***IJDesignParent>thePathSystemFeatures*** shows count of features on the currently browsed PathRun object (Piping/Cabletray/Cableway/Ducting)
InterfaceName>RoleName(Interface)	Same as above, but only shows count of Related Objects which only satisfy a given interface. Ex: On a PathRun object (PipeRun/Cabletray/Cableway/DuctRun), ***IJDesignParent>thePathSystemFeatures(IJRteStraightPathFeat)*** shows count of Straight path features of the currently browsed PathRun object.
InterfaceName>RoleName[n]	Refers to n^{th} related object over given Interface/Role names. Can be used to further traverse its related objects or show its properties. Ex 1: On a PipeRun object, ***IJRtePathRun>Spec[1]:IJDPipeSpec.SpecName*** shows Spec Name of the browsed PipeRun object. Ex 2: On any PathRun object (PipeRun/Cabletray/Cableway/DuctRun), ***IJSystemChild>SystemParent[1]:IJNamedItem.Name*** shows Parent System name. Notice the use of colon ":" to separate two or more relationship traversal paths, and/or attributes.
InterfaceName1>RoleName1(Interface2)[n]: InterfaceName3>RoleName3[1]:	Traverses Interface1>RoleName1, gets related Objects which implement Interface2, gets n^{th} such object, then traverses such object's

InterfaceName4>RoleName4[1]: Interface5.Attribute	Interface3>RoleName3 and gets 1st such related object, further traverses InterfaceName4>RoleName4 of such object and gets 1st such related object and finally get such object's Interface5.Attribute As an Example, the below Custom watch text gets you the number of runs in the model which use a selected run's spec. ***IJRtePathRun>Spec[1]:IJDSpec>PathRun***

Options:

Zoom: Fits the Active View to the new Object on Selection Change. Checking this ON is equivalent to pressing the 'Fit View to Current Object' button on each Selection Change. The Zoom Out Factor can be specified.

Track: On each Selection Change, the Select Set is cleared and loaded with the new Object. Any associated commands / ribbon bars active will reflect this change. For example, if you have Property Page up, then it would show the properties of the new object which we navigated to. Checking this ON is equivalent to pressing the 'Select Current Object alone' button on each Selection Change.

Actions:

Fit View to Current Object: Fits the Active View to the Current Object.

Fit View to All Objects: Fits the Active View to All the Objects.

Select Current Object alone: Clears the Select Set and adds the active Object alone to it. If the Object representing the active Object has a ribbon bar, it comes up. Or, if the Property page is active, it refreshes to the new object.

Reselect All Original Objects: Restores the Original Select Set, with which this Command was initialized. If the **"Refresh"** action was performed earlier, or a **"Remove"** Action was performed, then it will Restore to that last known Select Set.

Refresh (F5) – Restarts this command with Active Select Set.

> **Note:** Remember, if you have Track option ON, then you would only have ONE object, the active object in the Select Set as you navigate. If you press Refresh at this time, then the Select Set Browser form would restart with that one object in the list.

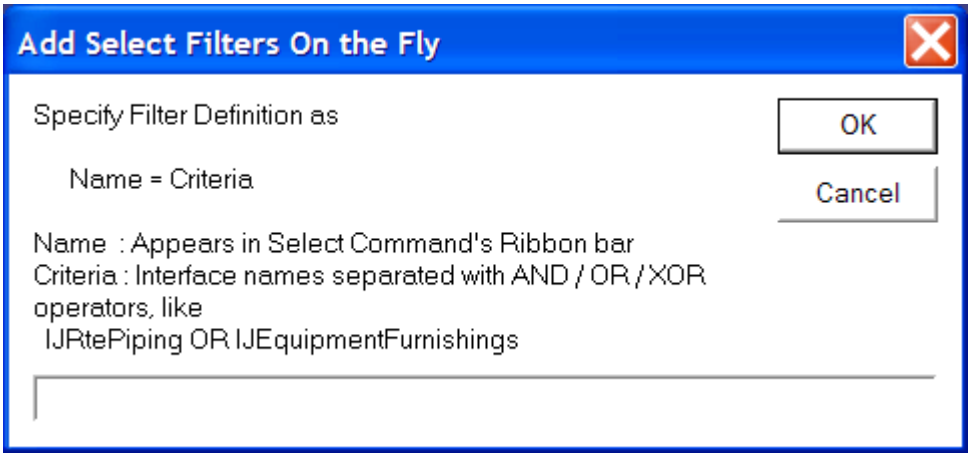
Remove Current Object from List: Removes this object from the Current Browsed List and moves to the next object. If you do not have **Track** option ON, then the browsed object list is not the same as Selected Object List. In such case, this action doesn't remove it from the Select Set.

Objects from Clipboard OIDs: If your clipboard contains OIDs list (eg from a Database Query results list), you can use this function to initialize Select Set with the objects representing those OIDs. Later you can use the Object Navigation Commands.

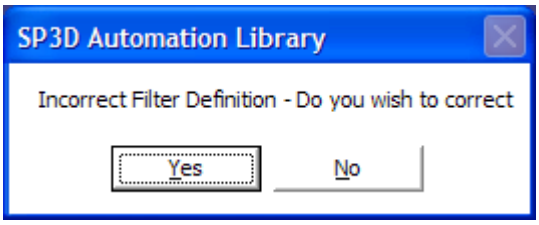
Add On-the-Fly Select Filter

This command allows user to add Select Filters interactively.

When invoked it shows the below input box. Provide the necessary input, i.e. the Filter definition in **Name = Criteria** format as explained in the picture.

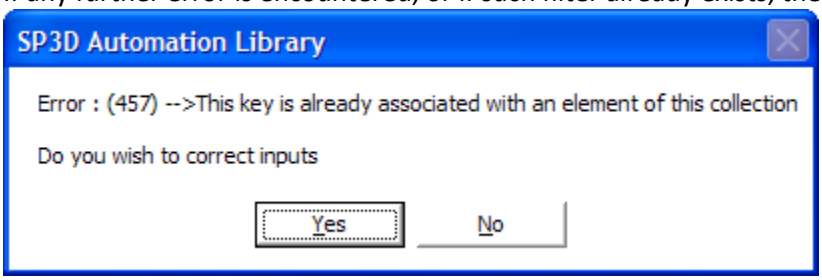


If you do not provide correct inputs **Name** and **Criteria**, you get an error as below



Choosing **No** cancels the command.
Choosing **Yes** shows back the earlier input box, and you can retry with corrected inputs.

If any further error is encountered, or if such filter already exists, then it prompts



Finally, after all correct inputs are specified your Select Filter is ready and is added to the list of available select filters.

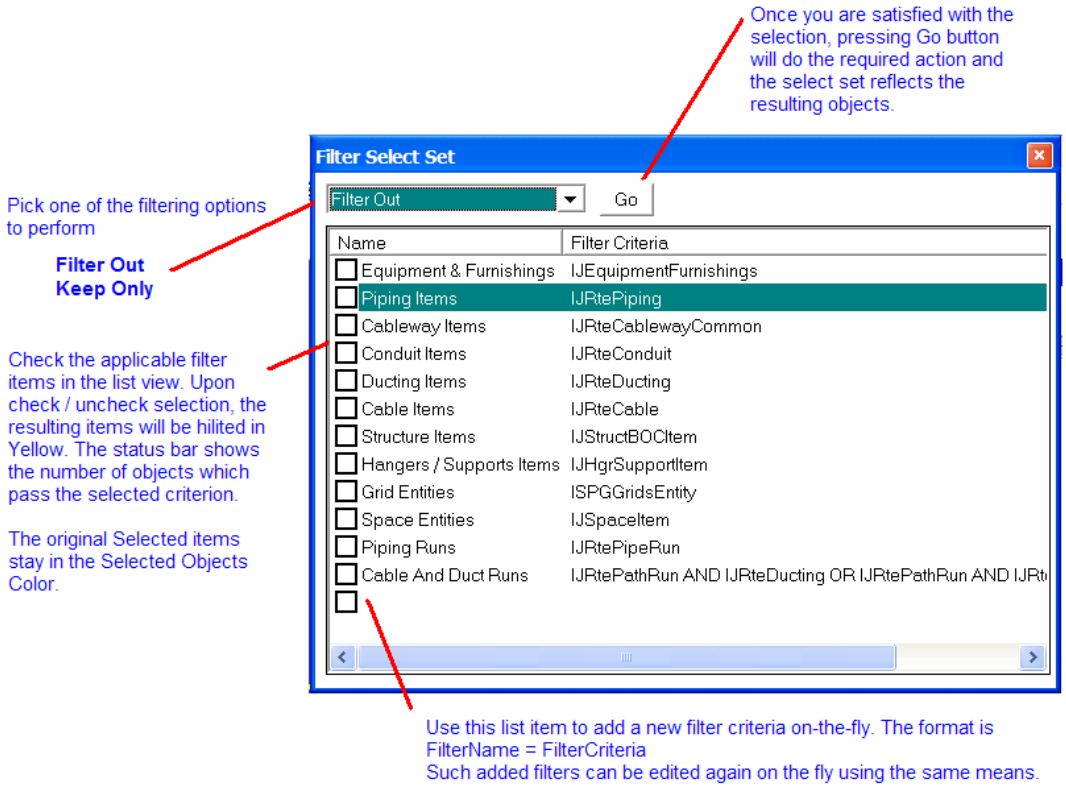
Add Configured Select Filters

This command adds the Configured Select Filters in the **S3DAutomationToolkitConfig.txt** file in the active plant's symbol share. See the **S3DAutomationToolkitConfig.txt** delivered with this toolkit for more information on how to configure your own select filters. Typically an administrator will finalize this file based on the requirements he sees. Note that the added filters are lost on task switch (done so with an intent to revert to select filters as delivered with SmartPlant 3D / SmartMarine 3D product). This gives facility to administrators to define new select filters at individual task, group of tasks and all tasks.

Filter Selected Objects

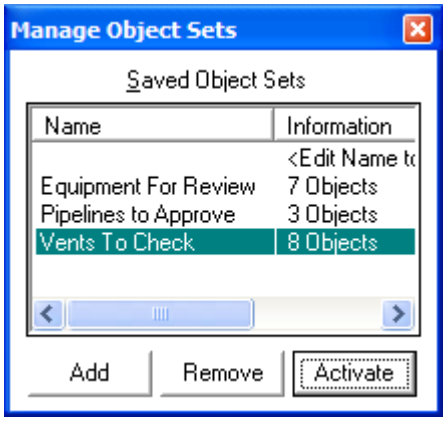
This command facilitates Filtering of the Selected Objects. One can use this command to either **Filter-Out** or **Keep-Only** certain types of objects by criteria specifiable in a simple means. The command comes with some predefined filters and also allows the user to interactively define filters on-the-fly by specifying a Filter Name and Filter Criteria string. Further, an administrator can configure more filters by editing the **S3DAutomationToolkitConfig.txt** file in the active plant's symbol share – the section in the file to edit is **[Filter Selected Objects Command]**. See the delivered **S3DAutomationToolkitConfig.txt** for more information on how to configure the same. Typically an administrator will finalize this file based on the requirements he sees. This gives facility to administrators to define mostly used filter criteria to apply on select set.

See below for more information on the User Interface.



Manage Object Sets

This Command is used to Manage Object Sets. Its Super ShortCut is **Ctrl – Shift – Shift**. This allows one to create private Selected Sets of objects for further use in the active session. Note that the object set information is not saved to session file and will not be available when you re-open the session file.



For example, while you are modeling, you arrived at a list of Equipment you realized you have to review later. You would select them and invoke this command, save them by giving the set of objects a name of your choice – Later, you would just use the same User interface to select those objects back as a set.

The active select set can be saved as a given name by just typing in a name of your choice in the 'Name field'. Just click to start the edit and then type the name of your choice. It gets saved as a new entry. You can also rename existing sets, or refresh them with active select set. The sets always are in sync with model contents i.e. any deletes done in the model will update the lists accordingly.

Later you can add more sets of elements in the same workflow. To remove one or more saved Object Set(s), just select the row(s) and press delete.

These saved select sets can be accessed anytime – just click on the entry to Hilite them. Double clicking a row, or pressing **Activate** will activate the objects in the saved set of that row to the select set.

The **Add** button adds the saved object sets representing the selected row(s) to the current selected elements set. The **Remove** button removes the objects in the saved object sets rows from the current selected elements set.

Also note, you can select more than one rows to Activate/Add/Remove, in which case all the selected rows are processed.

Just in case there is an ambiguity with the graphic colors, the hilite colors and weight can be changed interactively as below (The keys are expected to be pressed on the command's form).

To cycle between available Hilite colors, press "Ctrl + 0" (upward) or "Ctrl + 9" (downward).

To increase/decrease the hilite line weight, press "Ctrl + Shift + 0" / "Ctrl + Shift + 9".

Note that the above mentioned keys are from the main keypad and **not** the Numeric Keypad.

Helper Commands

SmartSketch Settings Palette

The SmartSketch Settings Palette allows one to **C**ontrol active **S**mart**S**ketch Options. The Super Shortcut key to show up this Palette is **C**trl - **S**hift - **S**hift.

The palette will show up at the current mouse position whenever invoked via menu/shortcut key. When the form is active already, it will move it to the current mouse position.

It stays on top of all windows. For any reason, if it goes behind and you cannot see it, you can press the Super Shortcut key combination again and it comes back to the top, at your current mouse position. You can also use the **C**trl - **C**trl - **C**trl Super ShortCut which brings all active Forms from this toolkit to Top.

Whenever you want, the options can be toggled, or the 'Number of Divisor points' or the Offset value can be set. When Number 'Number of Divisor points' is changed, intuitively the ‘Divisor Point’ option is turned on.

The Smart Sketch options currently ON show up in “Pressed” state (green), and those OFF will be in “UnPressed” state (red).

Some options require other options turned on. For example, **Intersection** option requires **Point on Curve** option.

The button labeled 'X' is used to clear the active Smart Sketch Objects list. Intuitively, it turns off the 'Locate only from List' option.

The button labeled '+' is used to add currently selected objects to active Smart Sketch Objects list. Intuitively, it turns on the 'Locate only from List' option. If the stack size is lesser than the number of selected elements, the active stack size is increased (to a maximum of 10). If you selected fewer objects than the active stack size, the stack size is not altered, and the list is rolled up, i.e. oldest elements are cleared to add the selected elements.

The combo box at the end shows the active stack size and can be set anytime.

Pressing Escape key dismisses the Palette.

PinPoint Lock / Unlock Commands

The PinPoint commands facilitate locking and unlocking of all the three PinPoint fields (E,N,El) with one menu click on the Automation Toolkit Popup Menu (which shows up with **C**trl – **C**trl – **S**hift Super ShortCut).

Use **PinPoint > Lock to Zero** menuitem or  icon to lock all PinPoint fields (E, N, El) to zero.

Use **PinPoint > Lock** menuitem to Lock all the three PinPoint fields (E, N, El) at their current values.

Use **PinPoint > Unlock** menuitem to unlock all PinPoint fields (E, N, El).

Lock PinPoint to Centroid Of Geometry Command:

This command is useful to get centroid of a Planar surface, Open Curve, Closed Curve or a Structural Opening [on Slab or Plate etc]. If the PinPoint ribbonBar is active, it locks the Pinpoint to the Centroid Point it calculates. This is useful in situations where you want the centroid point as a reference point for some other operation, like measure or use as a placement reference. The advantage of locking the pinpoint to this point is that you can just click in graphics anywhere to pick that point when any command is expecting a point. The calculated centroid point is also added to the constrained points generated by SmartSketch on that object. This is similar to the Tools > Get Point command, but it has the additional facility to get centroid of Structural openings and also lock the PinPoint to the centroid calculated. For example, this provides a convenient means to pick geometric center of Triangular, Rectangular, Rounded Square/Rectangular or Oval openings while you intend to route pipe through them.

View Manipulation Commands

View Commands with only Keyboard shortcuts

The below keyboard shortcuts work for view manipulation even when any other modeling command is active.

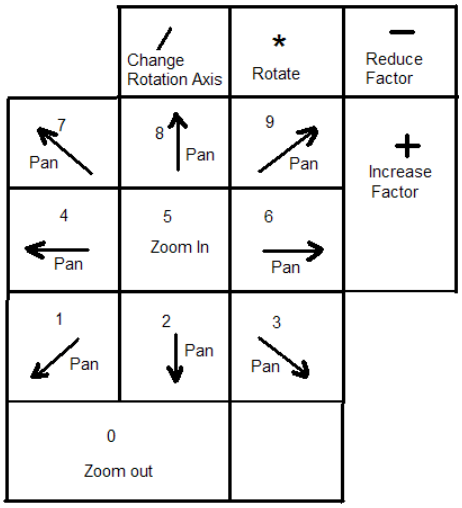
Ctrl **+**	Zoom-in in the active view.
Ctrl **–**	Zoom-out in the active view.
Ctrl Shift **+**	Rotate active view clockwise about Active axis.
Ctrl Shift **–**	Rotate active view clockwise about Active axis.
Ctrl Shift BackSpace	Change Active Axis (cycle between X Y Z)
Ctrl Shift Capslock	Change zoom/rotate factor (fast/slow)
Ctrl Shift V	Active View Style Cycle between Wireframe/Shaded/Smooth style
Ctrl-0	Set Active View to Next Standard Viewing direction.
Ctrl-9	Set Active View to Previous Standard Viewing direction.
Note: These shortcuts get disabled if Super ShortCuts are disabled.	

View Manipulation with Numeric Keypad

The Super Short Cut key for this is **C**trl – **S**hift – **C**trl.

Upon Mouse Move in Graphic Views, this command displays 3D Co-ordinates of Mouse Position in the Status Bar with assistance from active SmartSketch settings. If a Local Coordinate System is active and is not same as Global Coordinate System, both the Local and Global Coordinates are shown in the Status bar. Holding down the Ctrl Key turns off SmartSketch support for interpreting Point and picks up the 3D point from the Screen Point.

The Command also provides Basic View Manipulation (Pan, Zoom, Rotate) using Numeric Keypad as indicated in the picture.



The direction reverses when Ctrl Key is pressed in combination with the below keys. For example, 'Ctrl *' will rotate in opposite direction as just '*' would do. In case of Zoom-In or Zoom-out, pressing Ctrl key would give fine control on the zoom factor.

Double Clicking in any view area will zoom in about that point.

When the view is in Perspective mode, the Up/Down Arrow keys will simulate a walk in effect, and the Left/Right arrow keys will simulate a turn effect. The Ctrl and Shift keys provide control on axis of turn with the Left/Right keys.

All in One View Command

An all in one view Command (dynamic zoom, rotate, pan, window area) is provided. Currently this is added to the toolkit as a Custom Super ShortCut (C-C-V), see below picture. This functionality will later be merged into the 'View Manipulation with Numeric Keypad' command functionality.

The functionality of this command is as follows.

Left Mouse Drag → Rotate view. Can rotate about an Object / Axes.

Left + Right Mouse Drag → Pan View.

Right Mouse Drag → Dynamic View Zoom.

Right Mouse Click or Esc Key → Exit command.

Middle Mouse Scroll → Zoom In / Out.

Middle Mouse Drag → Window Area.

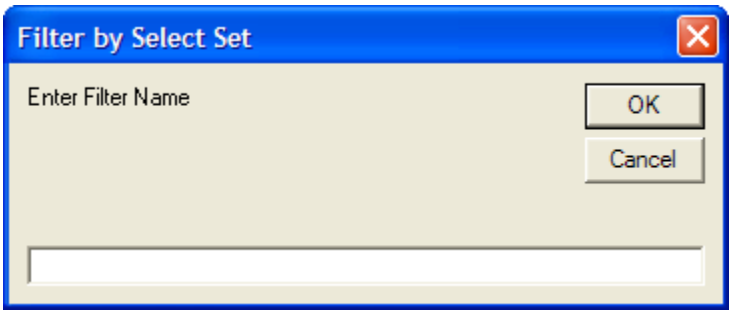
Home Key → Fit View

Filter creation commands

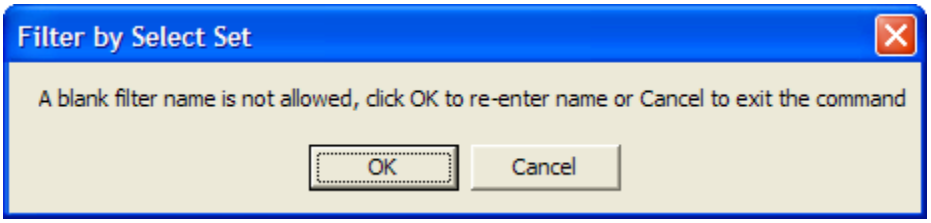
Create Filter from Select Set

At times one may have a need to create a persisted filter out of all selected objects. This could be just to record the results of a selection operation or some other arbitrary set that needs to be persisted. This command will create such a filter.

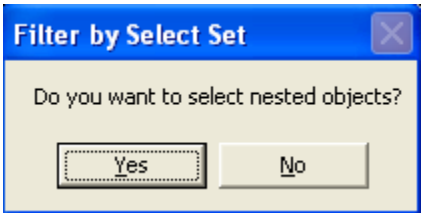
When the command is invoked with a non-empty select set, a message box is shown asking for a name for the filter.



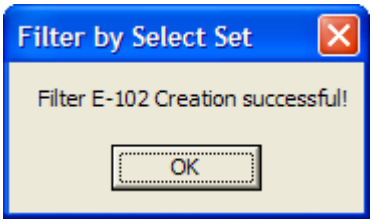
If the user click OK without entering a name (or clicks Cancel), this message is shown, an OK returns to above form, a Cancel exits the command.



Upon entering a name, the user is prompted whether nested objects are to be included.



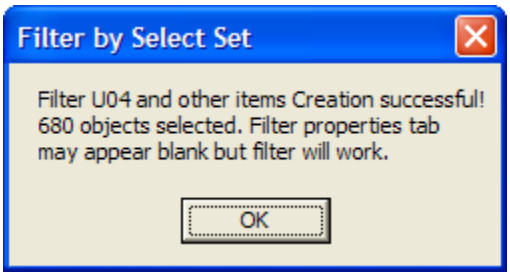
A filter is created under the MyFilters folder and below message is shown.



If the filter name entered by user already exists under MyFilters, below message is shown

If more than 200 items are in the select set, the edit filter dialog may show a blank system tab. However the filter will still work.

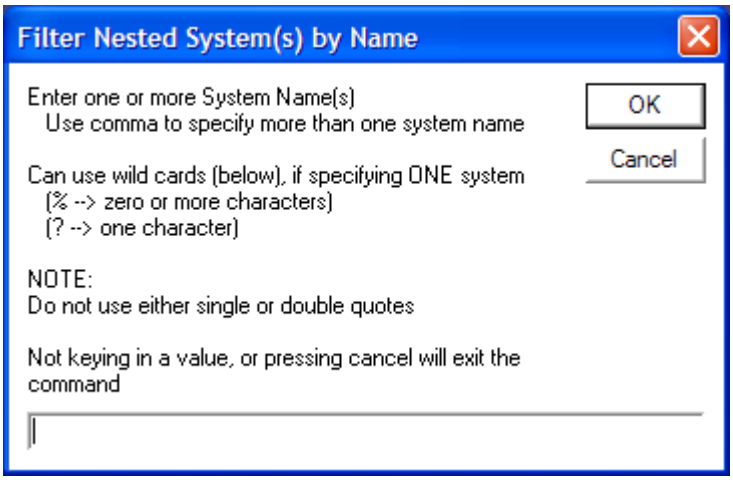
The success message in this case indicates this.



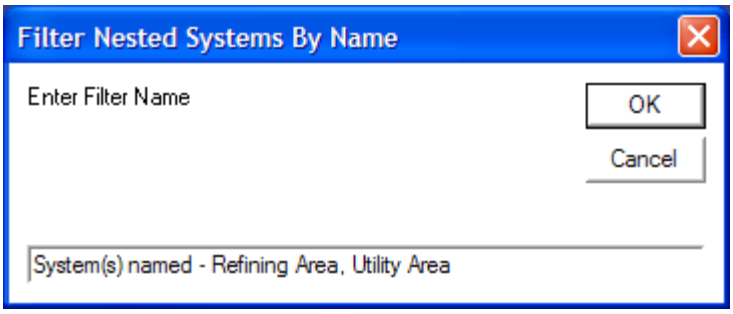
Create Nested Systems Filter by Name

Frequently it is desired to create a filter that selects all systems named a certain way and all their nested children. For instance there may be an electrical system named ‘Lighting’ in every area of a plant. A filter that selects all objects in these lighting systems may need to be defined.

This command prompts for the names of systems. You can also use wild cards

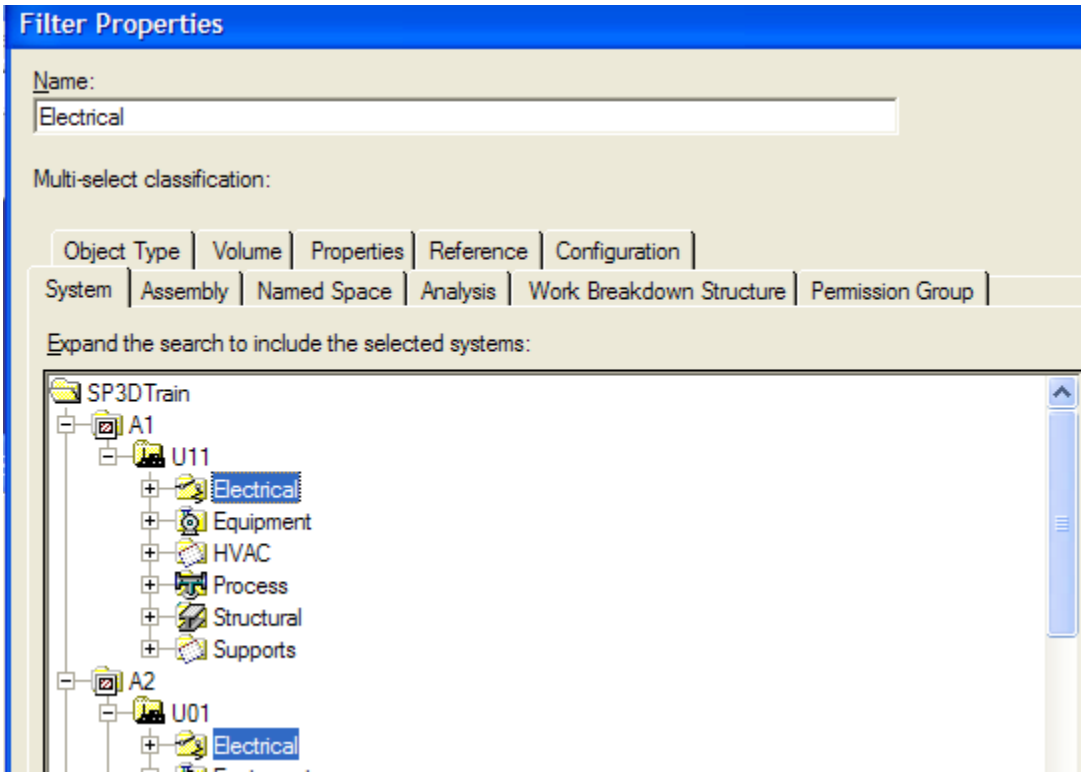


After you enter the system name, the command prompts for the filter name



Similar checks as above for blank names, non-unique names etc are carried out.

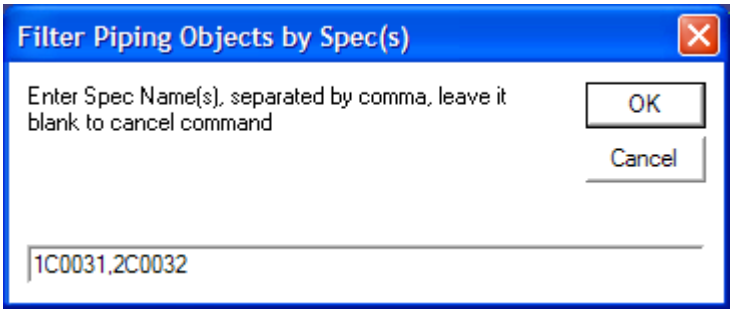
A filter with the same name is created and all systems with that name are selected on the system tab. The 'include nested items' check box is also checked.



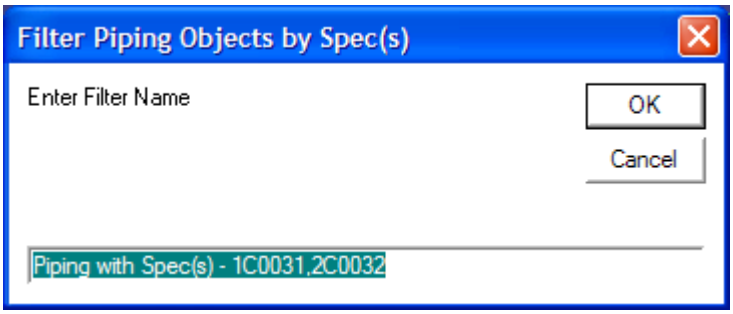
Create Filter by Specification(s)

When dealing with catalog modifications, very often changes are made to a spec and it is marked as modified in the catalog. Such a spec, upon synchronization will cause a recompute of all runs that use that spec. It is often desired to see what is contained in these runs. Using the standard filter mechanism it is possible to define a filter that returns all runs that use a particular spec, however this just returns the runs and not their nested children such as features, parts, connections etc making it difficult to visualize the impact. This command will create a filter that selects all the runs using a particular spec on the system tab and checks the 'include nested items' check box, thus achieving the goal. It can also be run with multiple spec names.

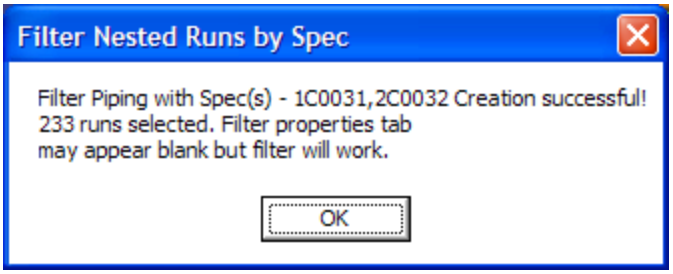
Run the command and below form is shown



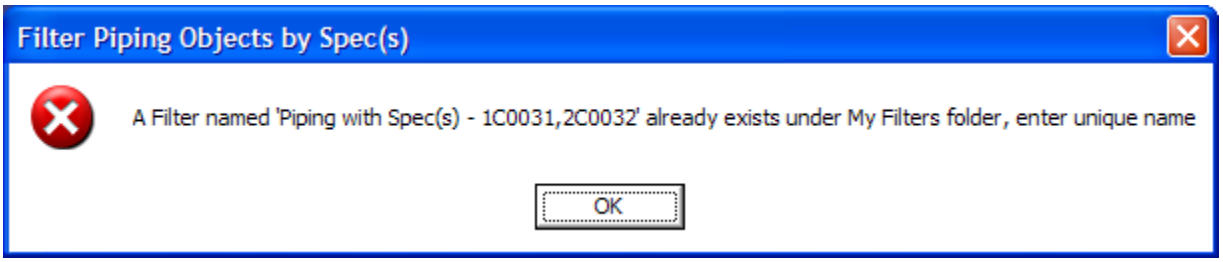
Enter a specification name and the software prompts you for a filter name. To specify more than one Spec, just provide comma separated spec names.



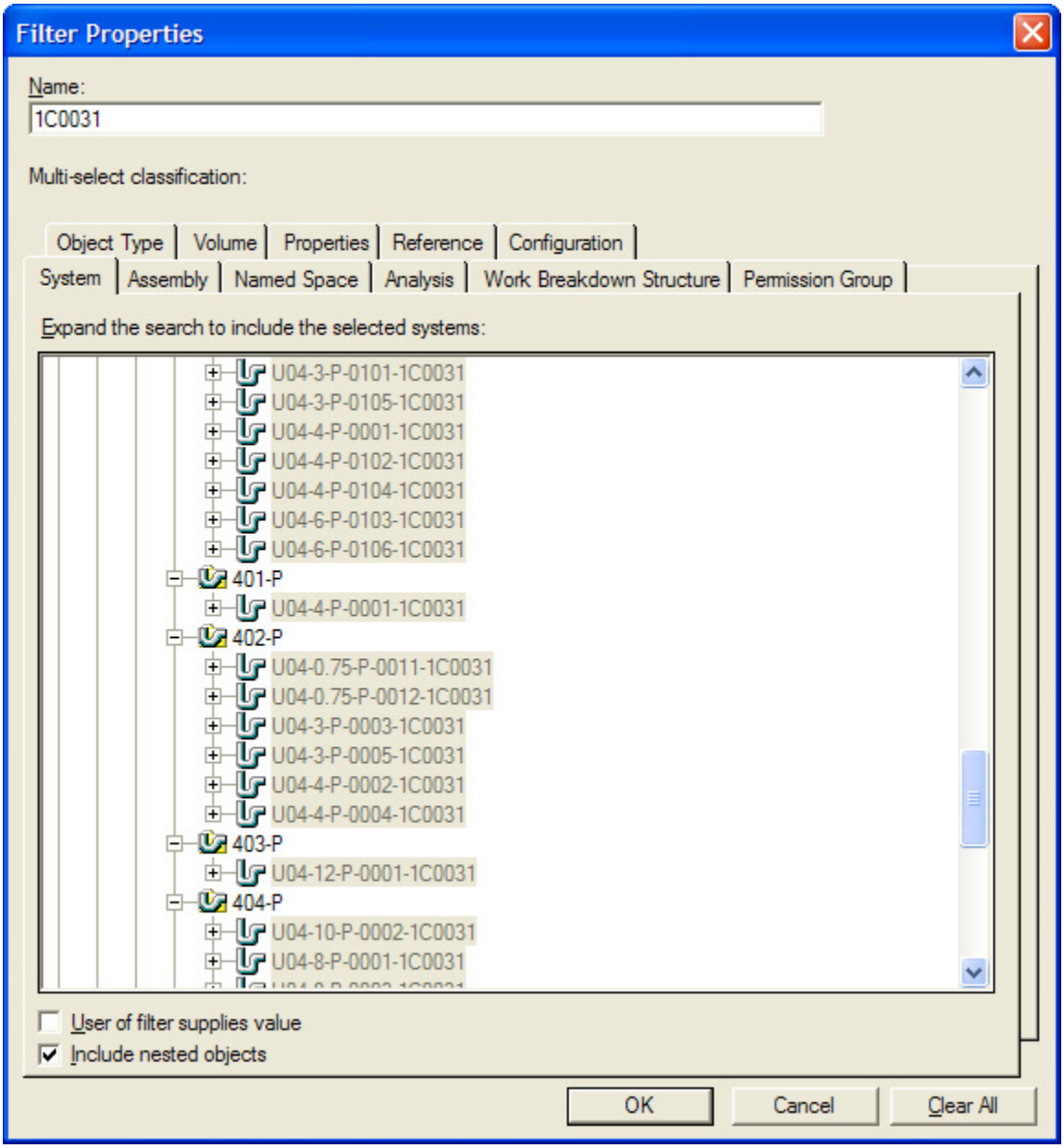
A named filter with this name is created under MyFilters



If a filter with the same name exists, user is warned to enter a new name. At this point, user must provide a unique filter name (or exit the command and rename/delete existing filter and retry this command).



Editing filter properties shows that all runs with specified spec are selected on the system tab.

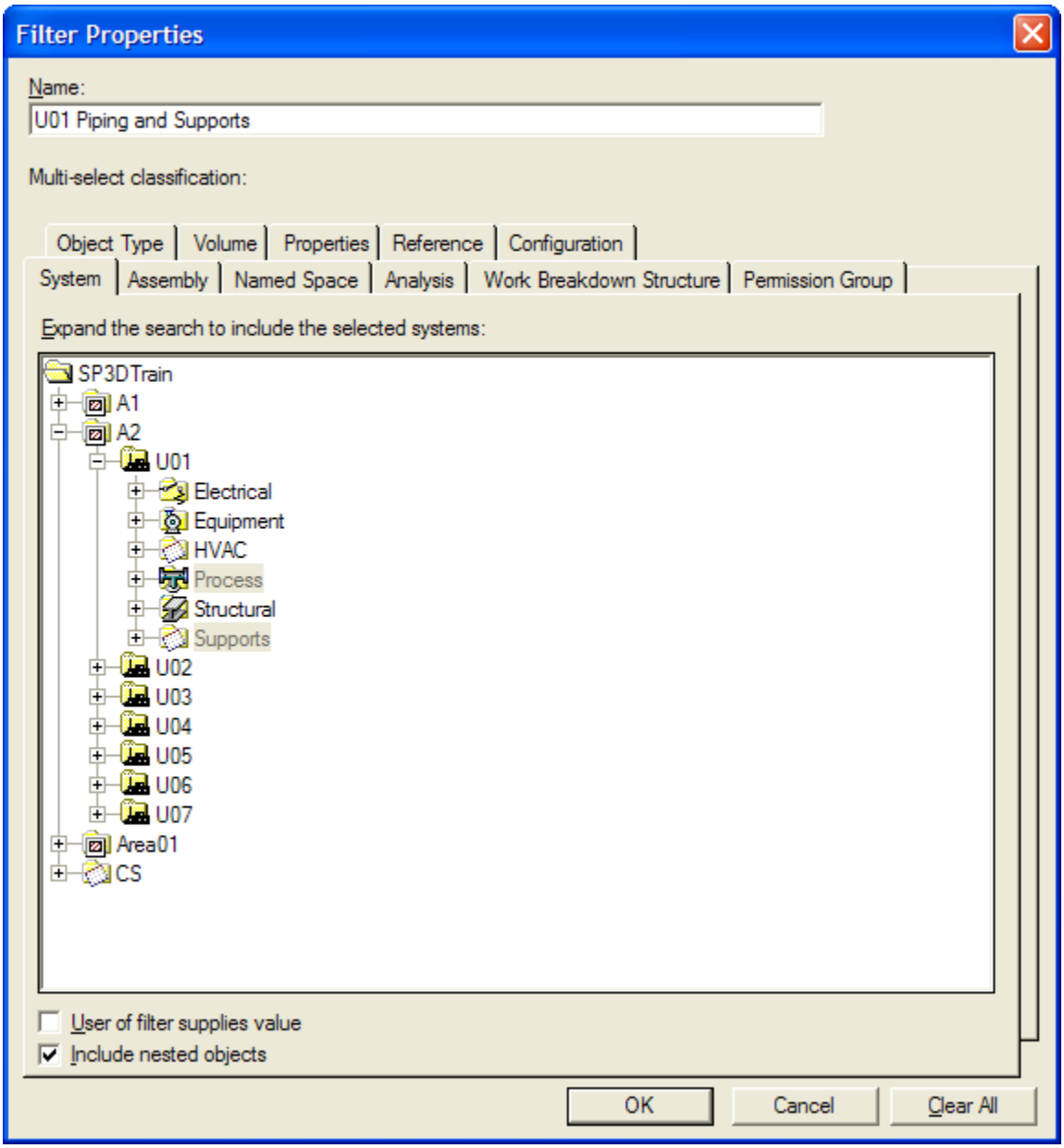


Note that, the filter only remembers the current objects at the time of creation. If further modeling created more runs using that spec, they will not be automatically included. The existing filter needs to be deleted and then this command run again to refresh the filter.

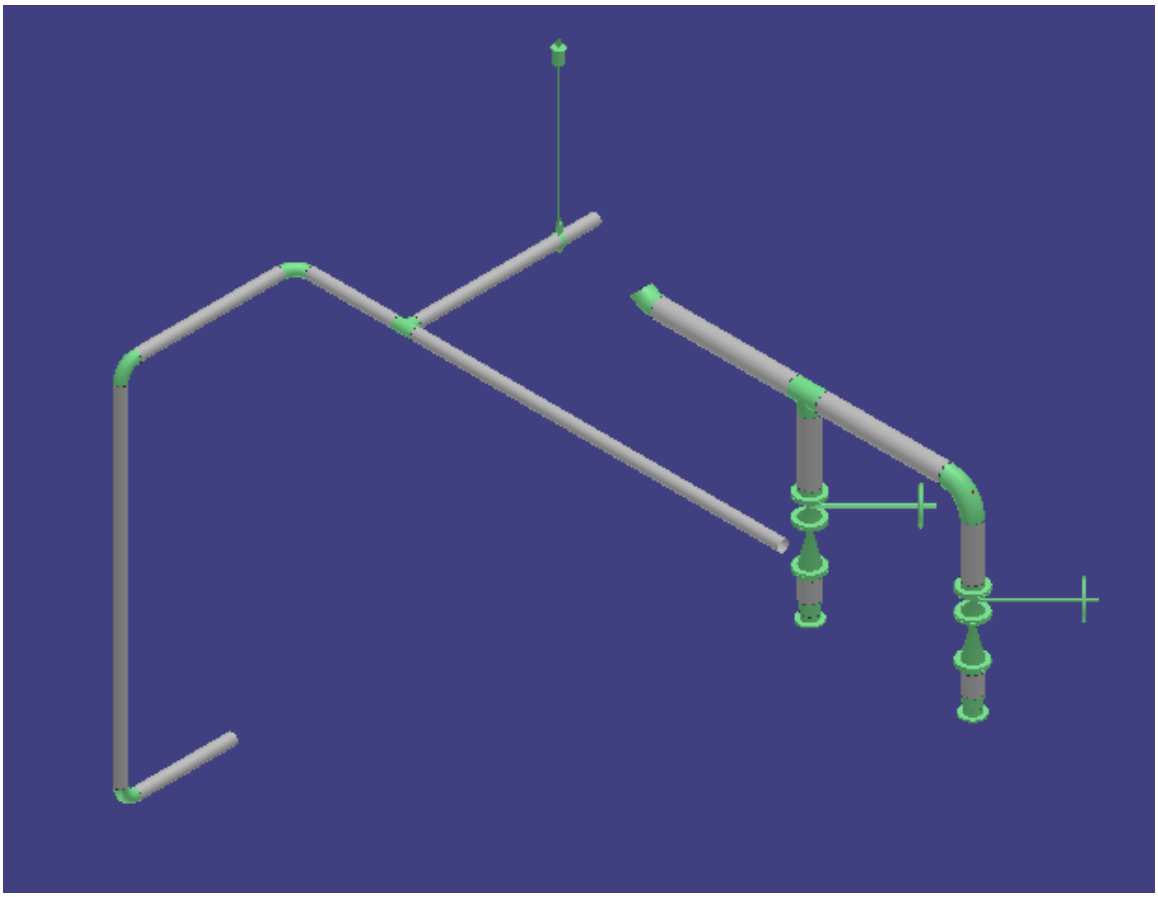
Workspace Modification Commands

Add Selected Objects to Workspace

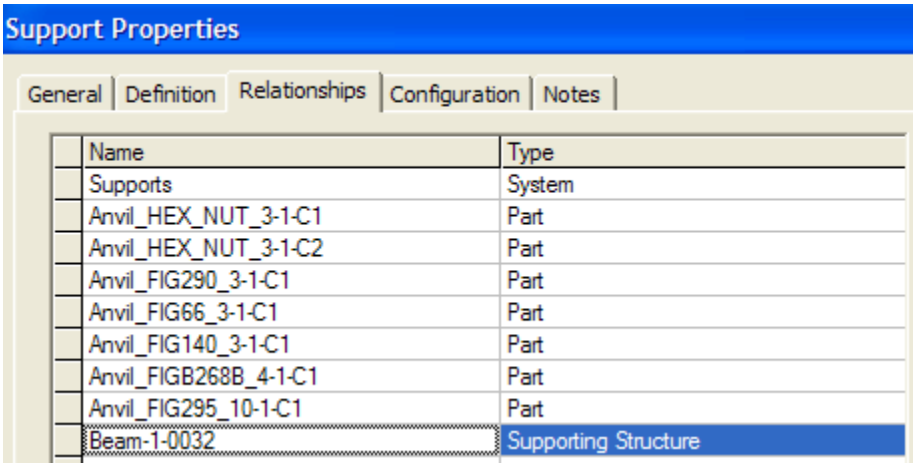
Sometimes relationship navigation from one object will take you to another object which is not in the current workspace filter. Say, you have defined a filter with all piping and supports in a particular unit, say U01.

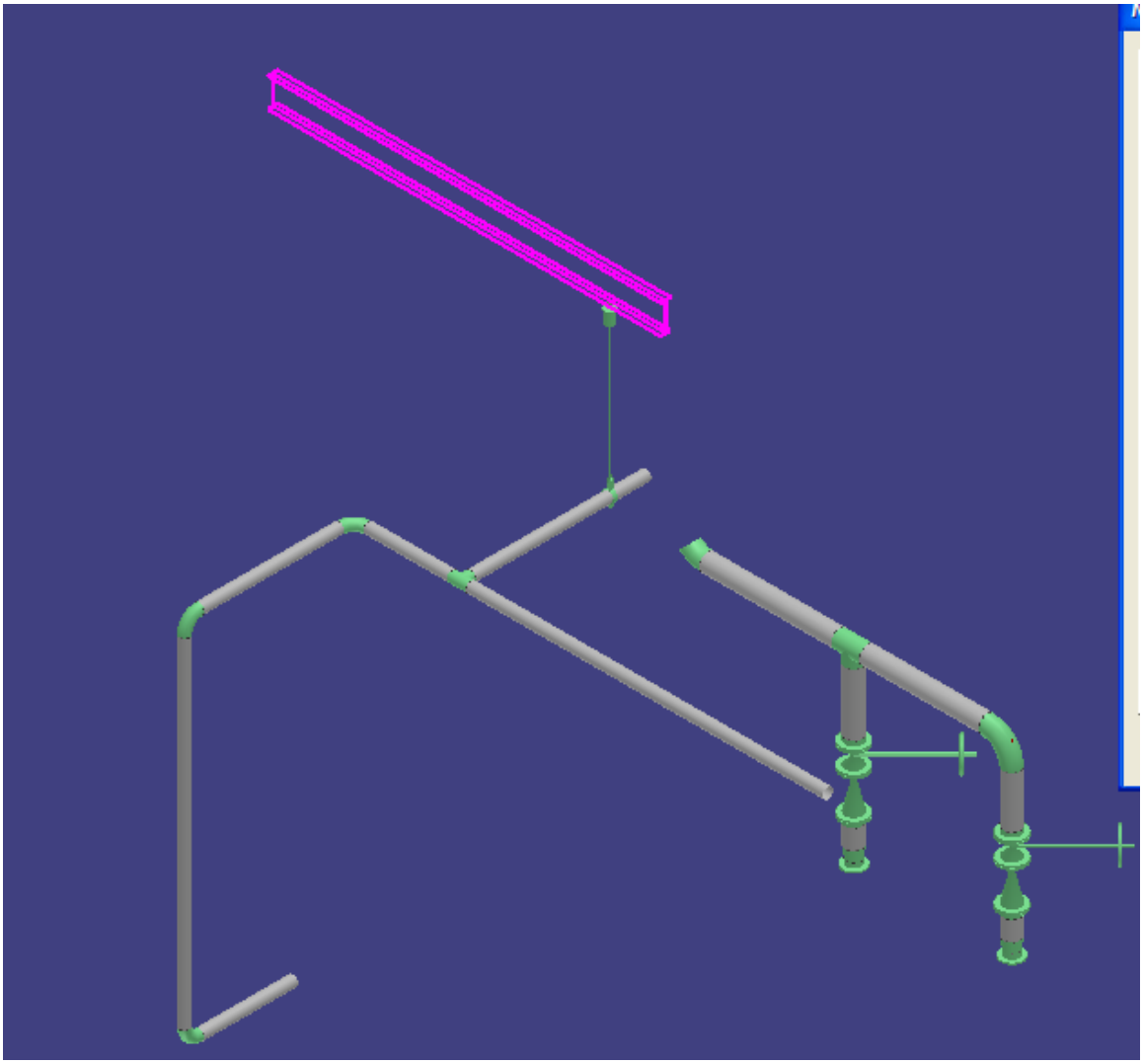


This then shows you the hanger PS-01.



Navigating from properties of the hanger, one can see there is a supporting structure Beam-1-0032. Selecting it and clicking GoTo will put this beam in the select set, bringing in a ghost representation.





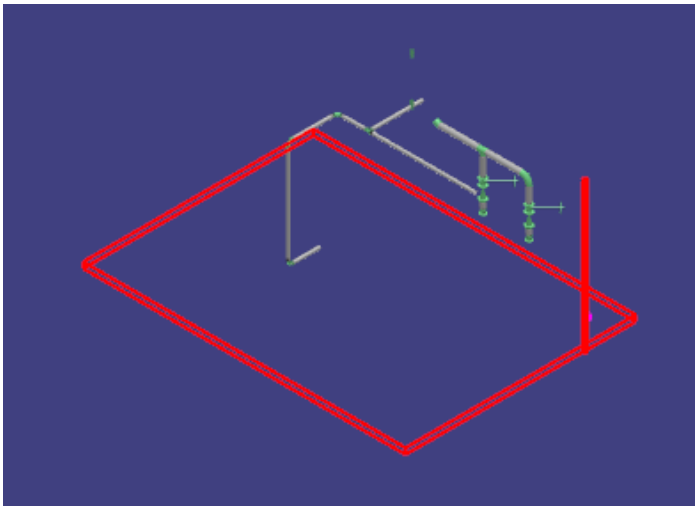
However we cannot measure any distances or visualize the beam properly without adding it to the workspace. This command fills the need. Once the beam is in the select set, one can invoke the command and add the beam to the workspace.

This command can be similarly used to add a volume for a snapshot or composed drawing to a workspace. If the 2D/3D select from drawings is used, the volume is shown in the view, but it cannot be modified until it is added to workspace. The workflow then is

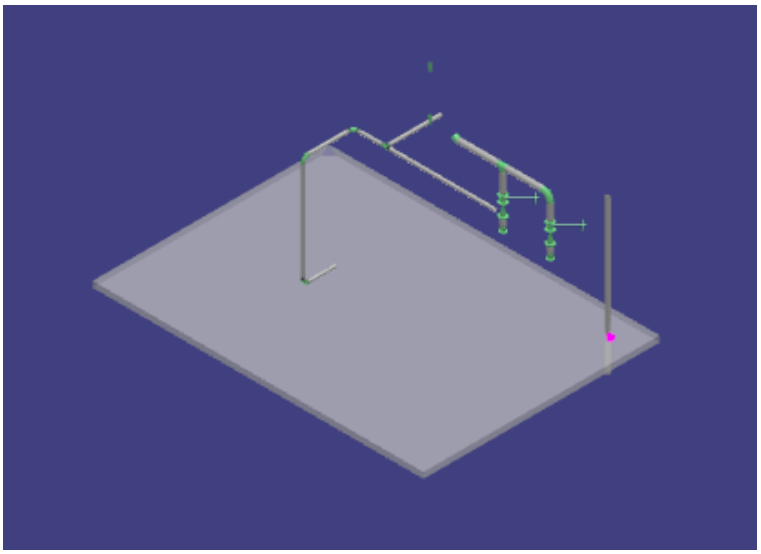
Open drawing for editing.
Start 2D/3D selection command.
Turn view selection ON using space bar.
Select the view; this selects the volume in 3D.
Run the command, this adds the volume to 3D. It can then be modified using any of the space management commands.

Add Interfering Objects to Workspace

Often times, in an example similar to above one may add objects of one discipline to the workspace and this adds all interferences related to those objects to the workspace. For instance if there is an interference between a pipe and a slab, and one is working with pipe in the workspace, the interference marker is shown. Selecting the interference marker highlights the slab in ghost form but does not allow one to work with it anyway.



This command, when used with the interference marker in the select set, adds both interfering objects to the workspace.

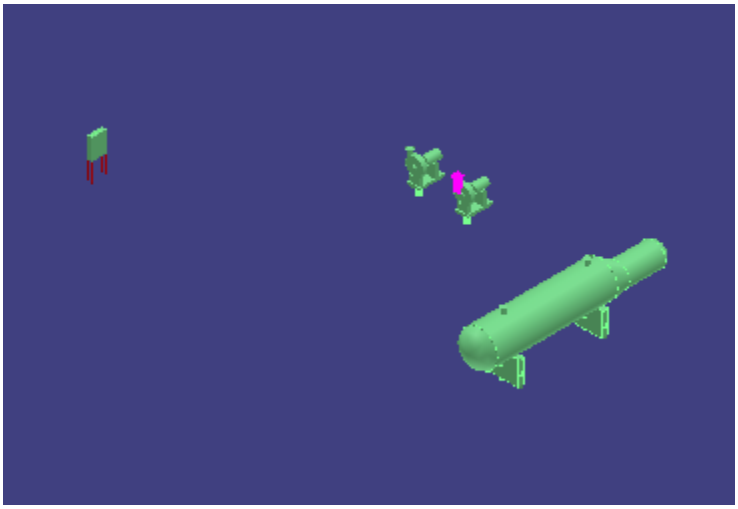


The command also works with multiple interferences in the select set and adds all interfering objects.

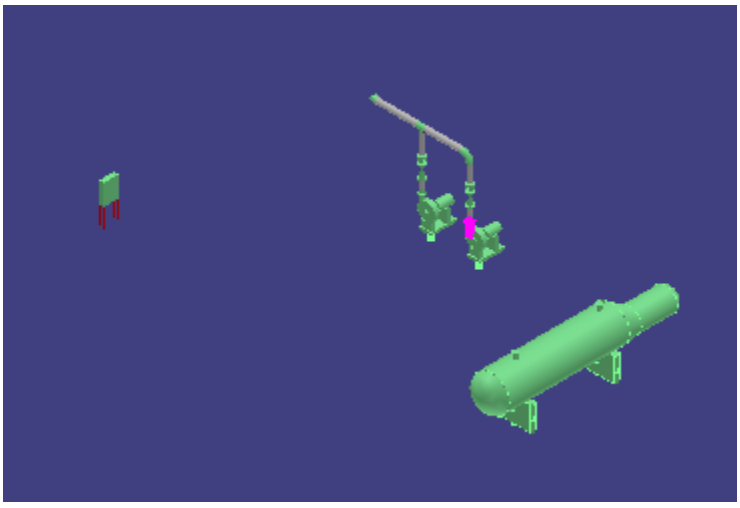
Add Connected Objects to Workspace

Frequently one begins working with a limited workspace and it is desired to progressively expand the workspace to include related/connected objects. A command has been developed to do this for the specific case of piping and equipment nozzles. If the command is executed with a terminal part (i.e. a part which is connected to a part in another pipe run/line/nozzle) in the select set, the command will add the connected pipeline or equipment to the workspace. If the command is invoked with a nozzle in the select set, the connected pipeline is added.

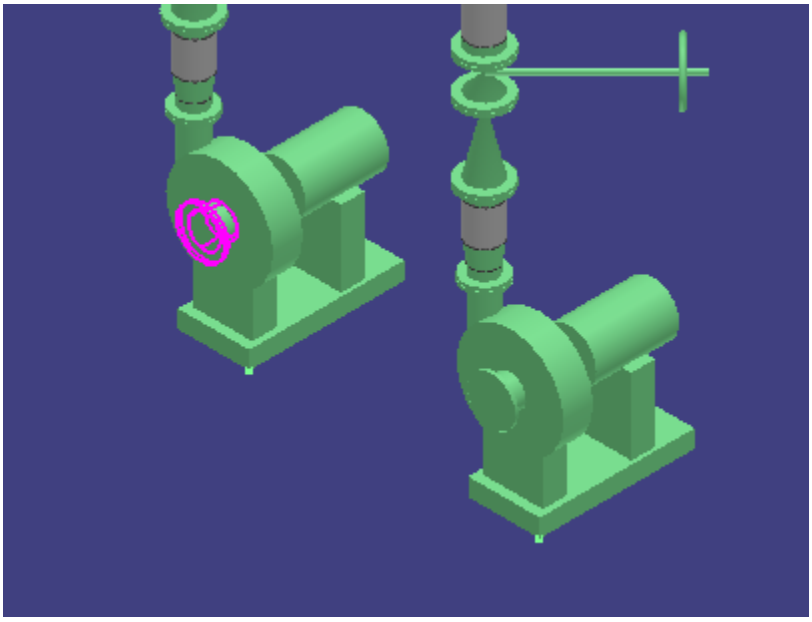
Initially the workspace may consist of just equipment. A pump discharge nozzle is selected and the command is invoked.

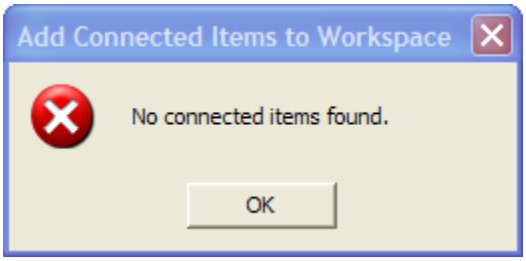


Connected piping is added to the workspace

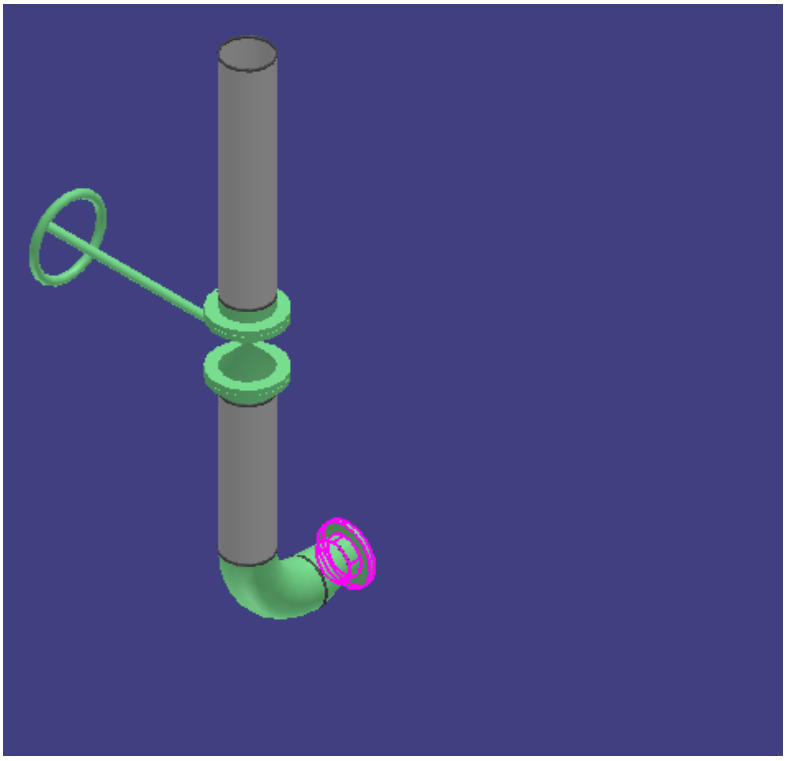


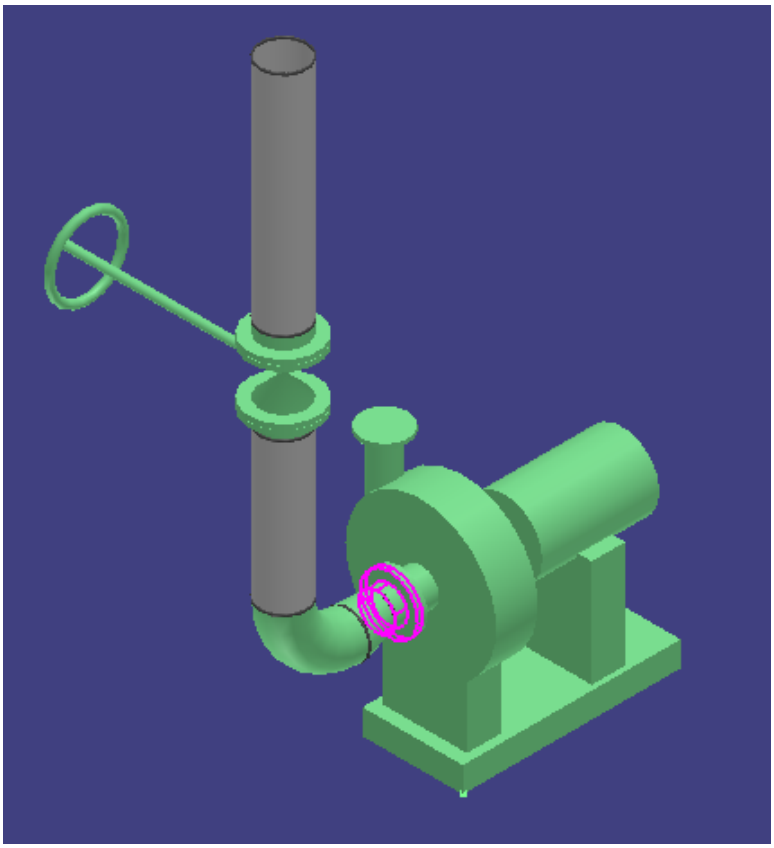
In case the nozzle does not have any connected piping, a message is shown.



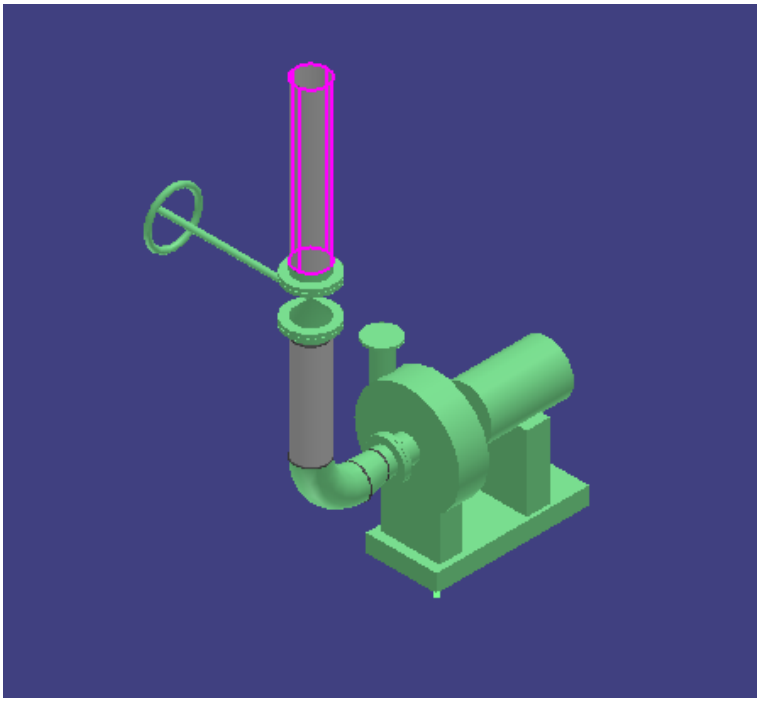


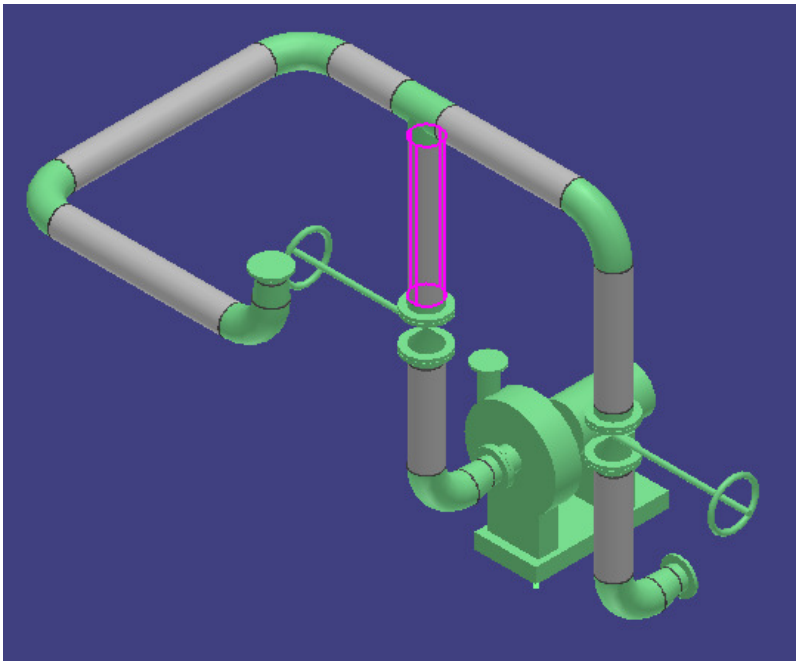
If the selected item is a piping part and the connection is to a nozzle, the connected equipment is added to the workspace.





If there is piping connected to the selected part, then the connected pipeline is added to the workspace.





Add to Workspace by Range

It is often desired to see everything that is “around” a particular object or set of objects that is to say within their range box. This may be needed for a quick review of one’s surroundings and has temporary value. Presently one can use the following workflow:

Define a space management volume by selection set.

Grow the volume by handles as desired if something outside the object range is also needed.

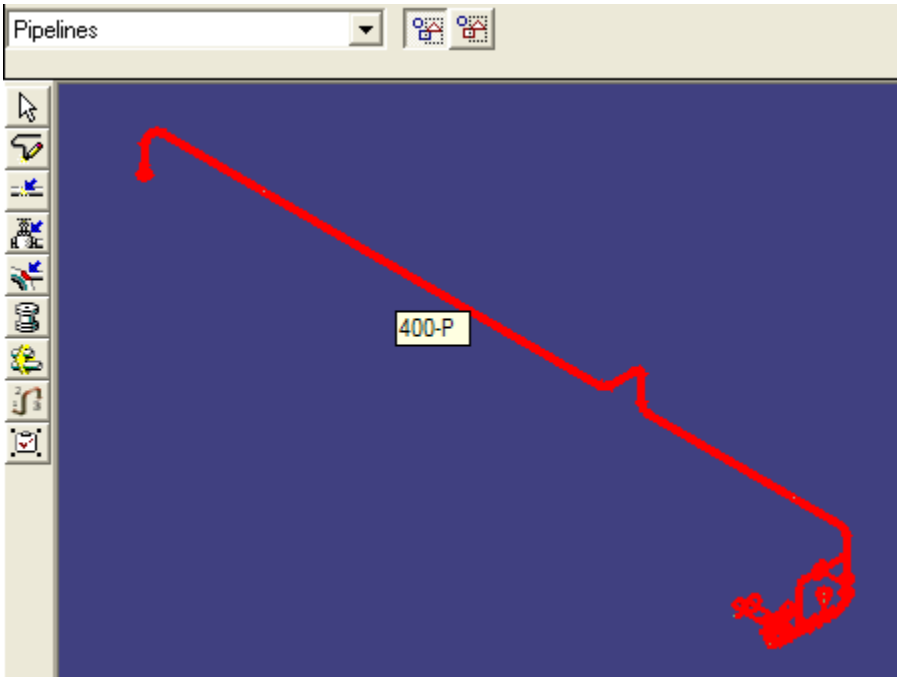
Define a filter which selects the volume on the system tab.

Select object types on the object type tab if you wish to restrict to certain disciplines.

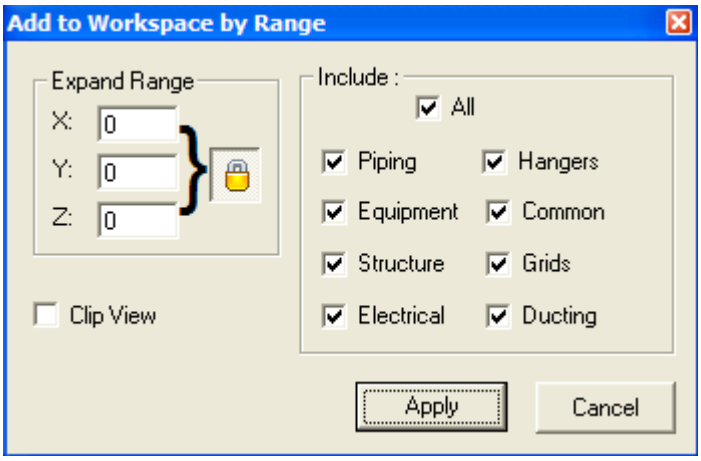
Define workspace using the new filter (this means objects outside the selected range will necessarily get thrown away) or create a compound filter that combines current workspace filter with the newly created volume filter

After the review is complete, delete the filter (and compound filter if created) and the volume.

To simplify above multiple step workflow, this command may be used. Select a set of graphical objects (objects must have range). Pipelines are the only non-graphical object allowed.

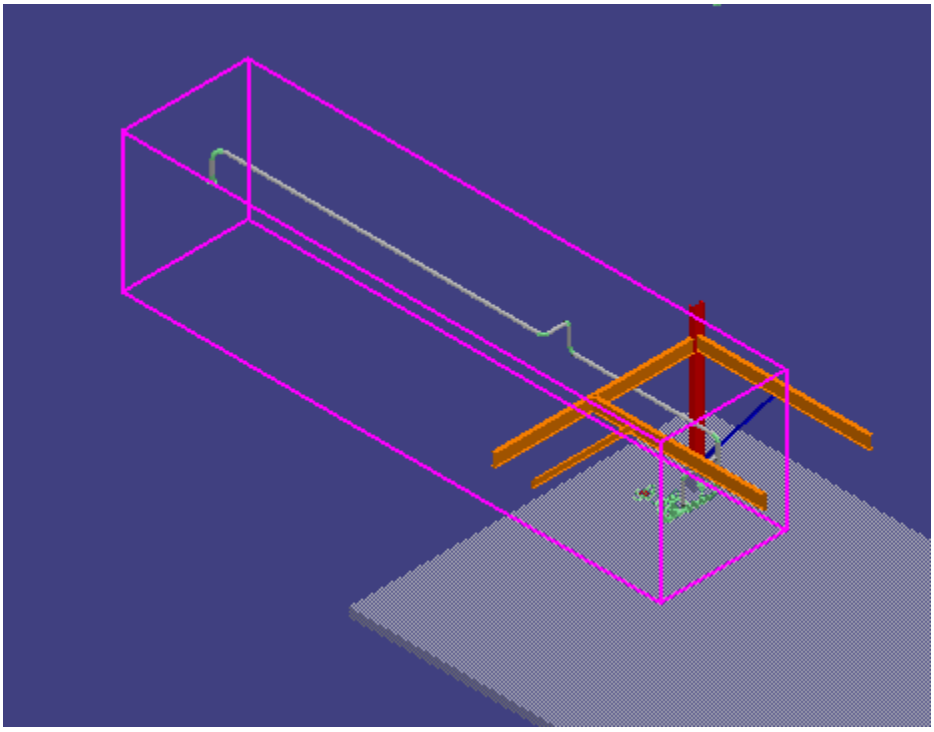


Run the command, and it shows this form.

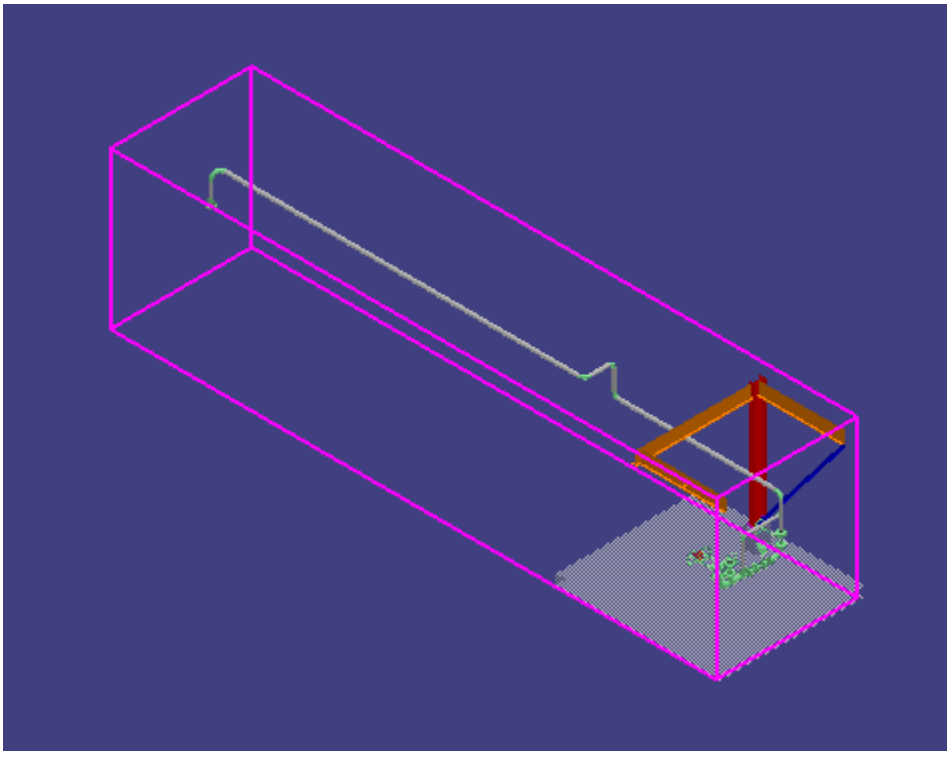


The values will expand the range of the selected objects as shown. By default the lock is on which ensures that the expansion is by the same value on all sides, a value may be entered in any of the fields. To expand by different dimensions on each side, press the lock icon to toggle it to unlock state. One may select the disciplines, whose objects need to be added. A dynamic volume is created by expanding the range. View commands can be

used at this time. On Apply, a range query is run and qualifying objects are added to the workspace. Once you are satisfied with the range expansion and the results obtained, you can exit the command by pressing Cancel.



Checking the “Clip View” check box clips the view to the newly expanded volume.



Invoking Workspace Refresh command (F5) will preserve the added elements in the workspace. However File → Define Workspace and click OK will return to the workspace defined by the filter.

Route Commands

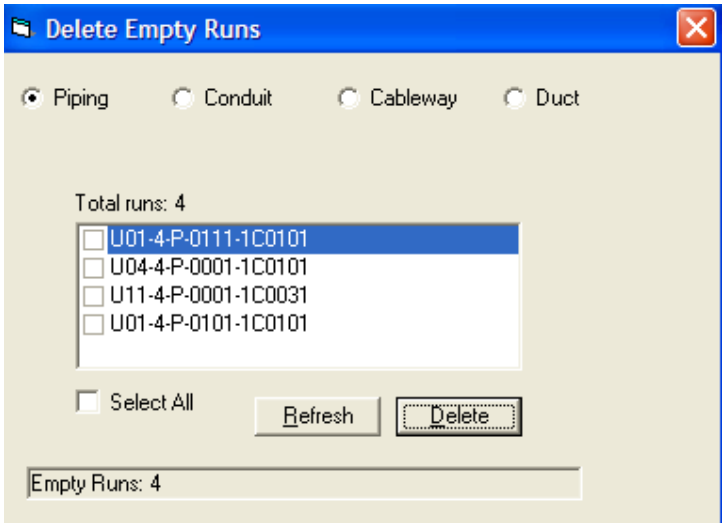
Select Empty Runs

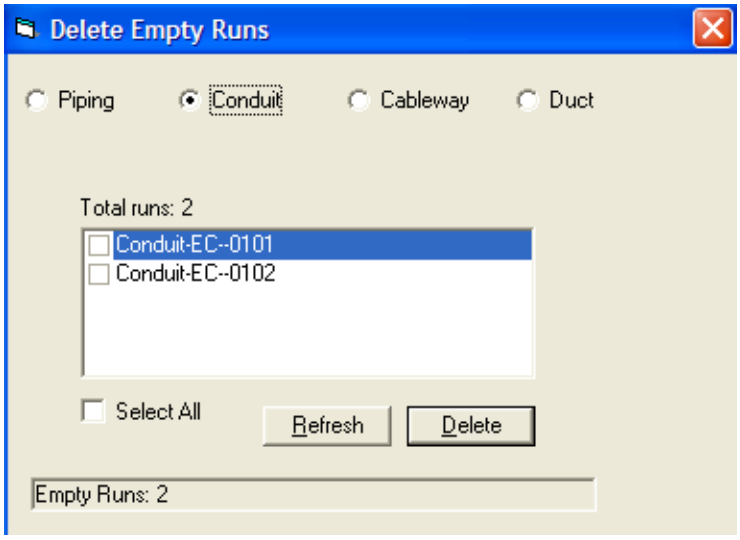
This Command was originally written to help the user find empty pipe runs that clutter up the model when a new run command is started but aborted before any pipe is placed.

When run, the command brings up a form that shows empty pipe runs

The user may select any or all runs and delete them.

Selecting the radio button for the respective discipline loads the runs for that discipline.





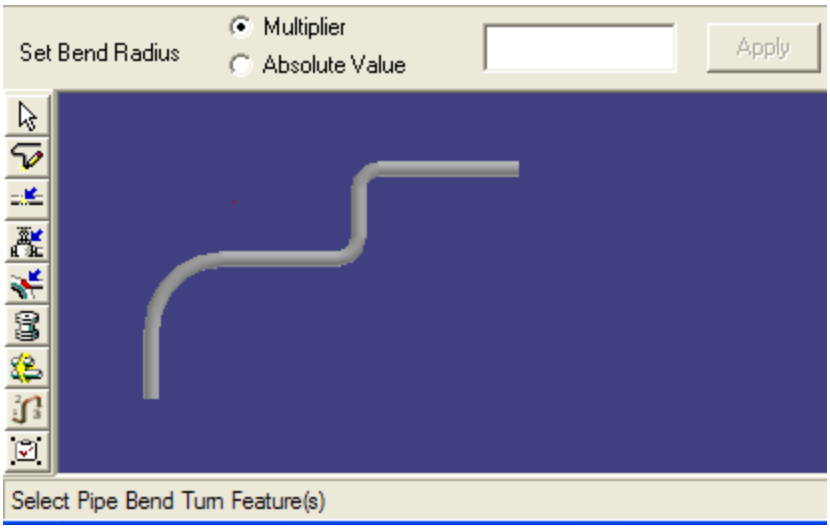
The command is closed using the close box at the top of the form.

Change Bend Radius

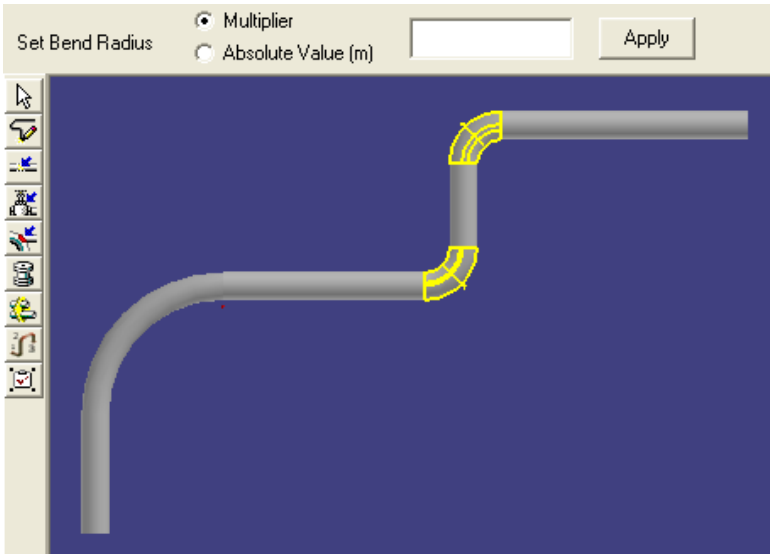
This command was written to allow the user to enter an arbitrary value of bend radius for a pipe bend. Piping specifications currently allow the placement of bends with pre-defined radii, however certain industries need to be able to bend pipe at will.

After the command is invoked, first the value for the catalog option for user defined bend radius is checked. If bend radius by user is disabled, the following message is shown and the command exits

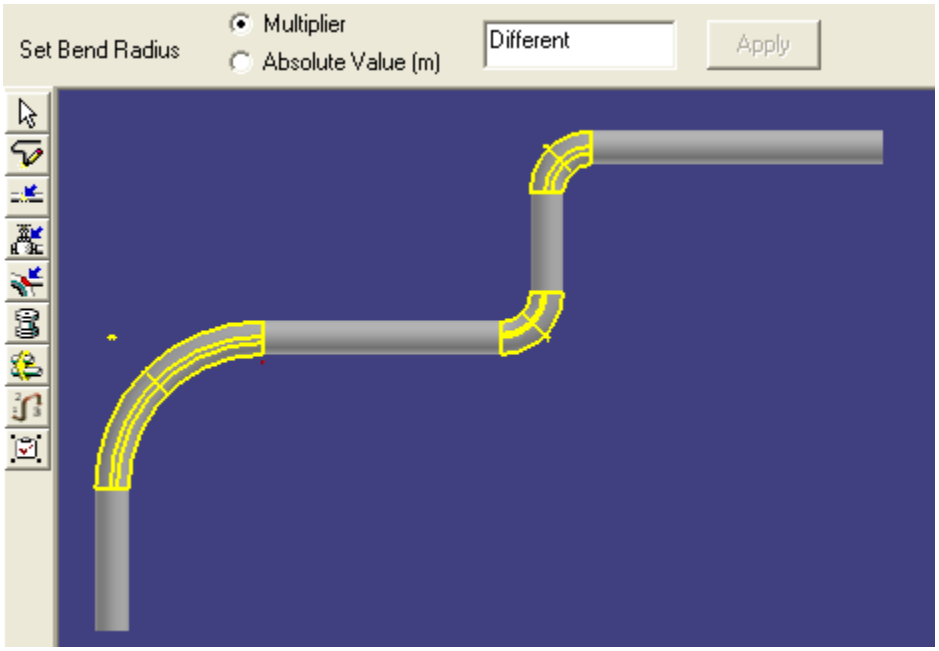
If the command is allowed, first a ribbon is shown and the user is prompted to pick pipe turn feature(s).



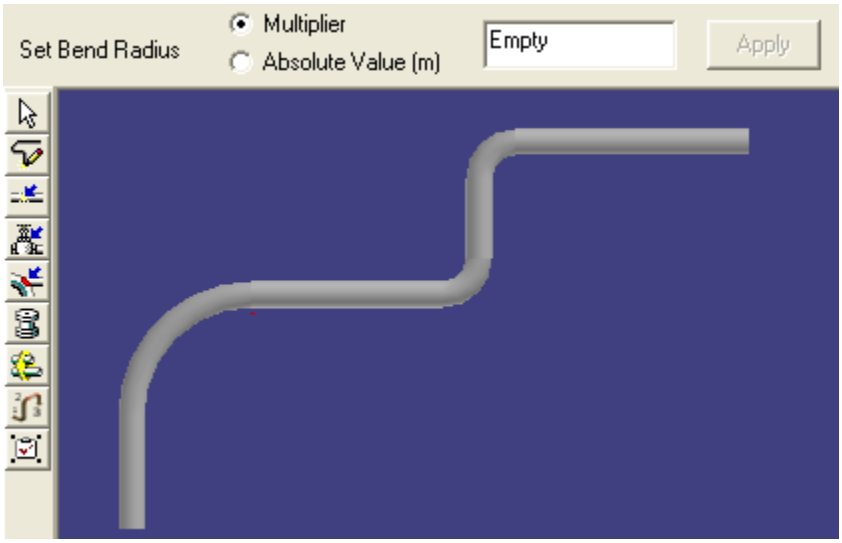
If a single feature is selected, or if multiple features with identical bend radius multiplier are selected, the command shows the current value of the bend radius.



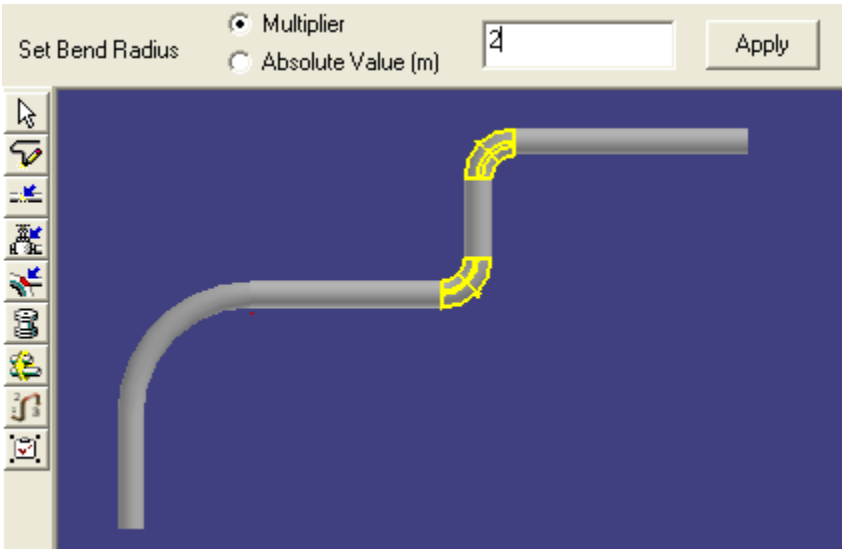
If the selected turn features have different bend radii, this is shown in the ribbon bar.



If all turns are deselected, the ribbon bar shows ‘Empty’



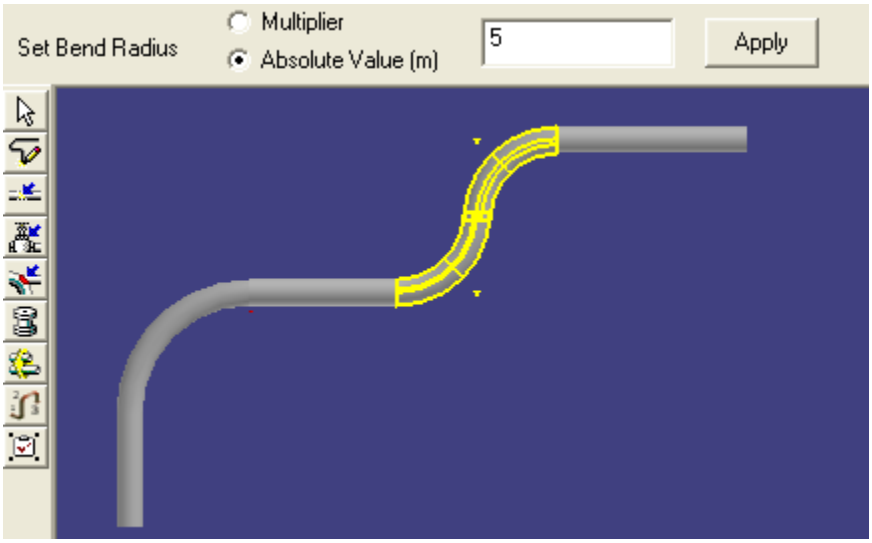
When turn features are selected, and the value in the input field is numeric and positive, the apply button is enabled.



The user may enter a new value and press Apply and the change is committed.

After this the change is committed to the database and the command stays active allowing user to pick more bends.

If user wishes to change absolute value instead of bend radius multiplier, the absolute value entered must be in meters.



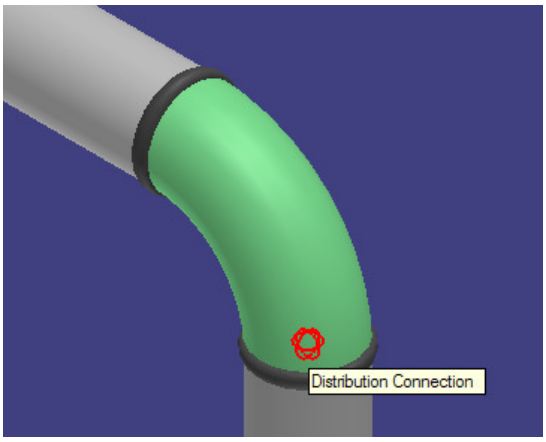
Spool Selected Pipelines

This command allows a user to select one or more pipelines and execute the spooling command. The options stored in the catalog are used to generate the spools. The chief benefit is that the pipelines to be spooled may be added to the select set by any means and it is not necessary to pick the pipelines in the spool generation dialog box one by one.

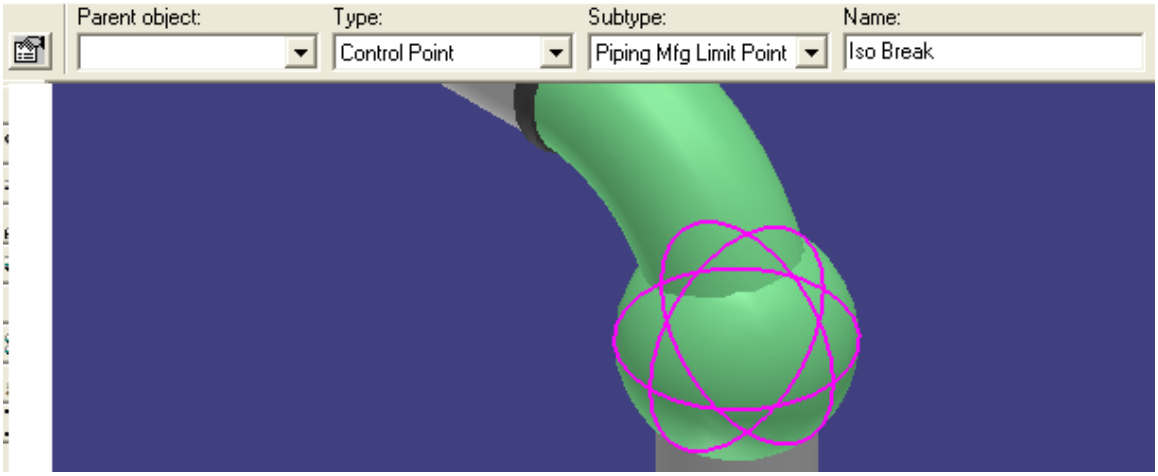
Insert Isometric Break

The current functionality for adding an isometric break point requires many steps. This command simplifies the same.

To place the control point of the type Iso break, select a single route connection and run the command.



A control point, child to the connection, of the type Piping Mfg Limit Point, named 'Iso Break' is placed assoc-on to the connection. This means that it will move with the connection if the connection moves due to any modification. The control point is selected in case the user wishes to change its sub type or rename it. For ease of visibility, the size of the control point is 1.5 times the diameter of the pipe.



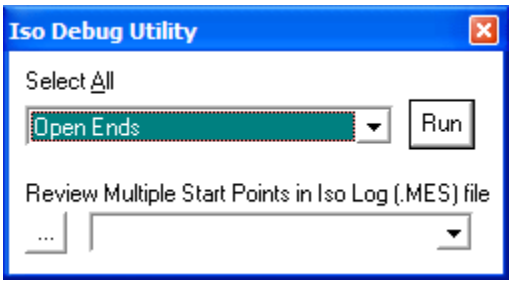
The reference geometry aspect is turned on for all views to show the control point in case it's not already on.

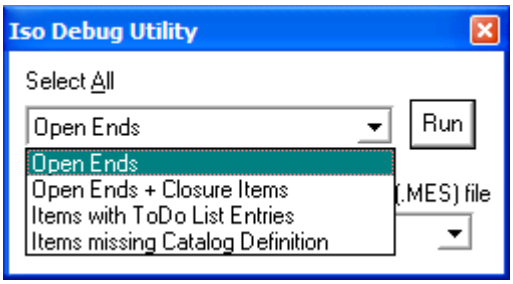
Isometric Troubleshooting Utility

This command helps to troubleshoot some common Isometric extraction issues due to modeling and catalog inconsistencies.

Before you can run this command, you have to select an object which can be used to extract an isometric. That is, a Pipeline, or a PipeRun or a WBSItem.

The command shows up the below form.





You can choose from the below options.

Select All Open Ends : This allows one to investigate the end points of the Pipeline. Typically, useful if you are trying to resolve multiple disconnected segments on the pipeline. When Run with this option, the Open End Features of the Pipeline will be selected (which can be reviewed using Select Set Browser)

Select All Open Ends + Closure Items: This allows one to investigate the end points and terminal items on the Pipeline. Typically, useful if you are trying to resolve multiple disconnected segments on the pipeline. When Run with this option, the Open End Features of the Pipeline along with any Closure items (eg Caps, Plugs etc) will be selected (which can be reviewed using Select Set Browser)

Items with ToDo List Entries: For the selected Isometric Extractable object (Pipeline / PipeRun / WBSItem), this option allows one to check if there are any items with ToDo list entries and selects them.

Items missing Catalog Definition: For the selected Isometric Extractable object (Pipeline / PipeRun / WBSItem) This option allows one to check if there are any items which are now not available in the Catalog. i.e. those objects which have been deleted from Catalog after they have been placed in Model.

Apart from the above options, the command can also be used to review the Multiple Start Points detected by Isogen while processing the Isometric. Save the MES file generated by Isogen and open it using the browse button (…) – The file is read and multiple start points logged in it are listed in the combo box. Picking the Combo item will show the point in the graphic views, and also zooms in the active view to that point. If the Isometric has been configured to use a local coordinate system, then you must have that coordinate system active in the PinPoint active coordinate system to interpret the point correctly.

Structure Commands

Find Duplicate Members and Slabs

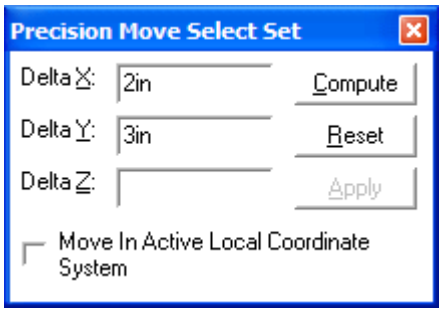
There are times when multiple members or slabs end up at exactly the same position as other members or slabs. Due to the members being constrained to gridlines, when members are copied and pasted, they may end up at the same position as existing members. Also, if structure objects are imported using import commands and the same input file is accidentally imported more than once, it is possible to get multiple members or slabs at the same position. This is not a difference that is easy to spot either visually or using the interference checker.

This command will find such duplicate members or slabs and retain them in the select set. To run the command, add member systems and slabs to the select set and invoke the command. If more than one member is found at a given position, the newer member (the one with a later creation date) is considered to be duplicate and retained in the select set.

Common Commands

Precision Move Selected Objects

This command allows moving selected objects by a precise keyed in values of delta X Y Z. Once can choose to specify the delta values in either Global Coordinate System or Active Local Coordinate System last set on PinPoint RibbonBar. Note that PinPoint RibbonBar need not be active. If there wasn't any last set Active Local Coordinate System, the "Move In Active Local Coordinate System" option will be greyed out.



Select the objects to move, invoke the command, provide the required delta values (can leave fields blank as required, e.g. if you only want to move along **X** by a delta of 2 inches and along **Y** by a delta of 3 inches, just key-in **2in** for the **X** field and **3in** for the **Y** field and leave the **Z** field **blank**) and press Compute. To make another movement, hit Compute again. Can change Delta values at any time and Compute again. Once you have reached the desired position, you can press Commit. To reset to the original state (or the last applied state, if Apply was done earlier) just press Reset.

Note that, all validations which happen in SmartPlant 3D with generic move command will also happen when done with this specialized move command.

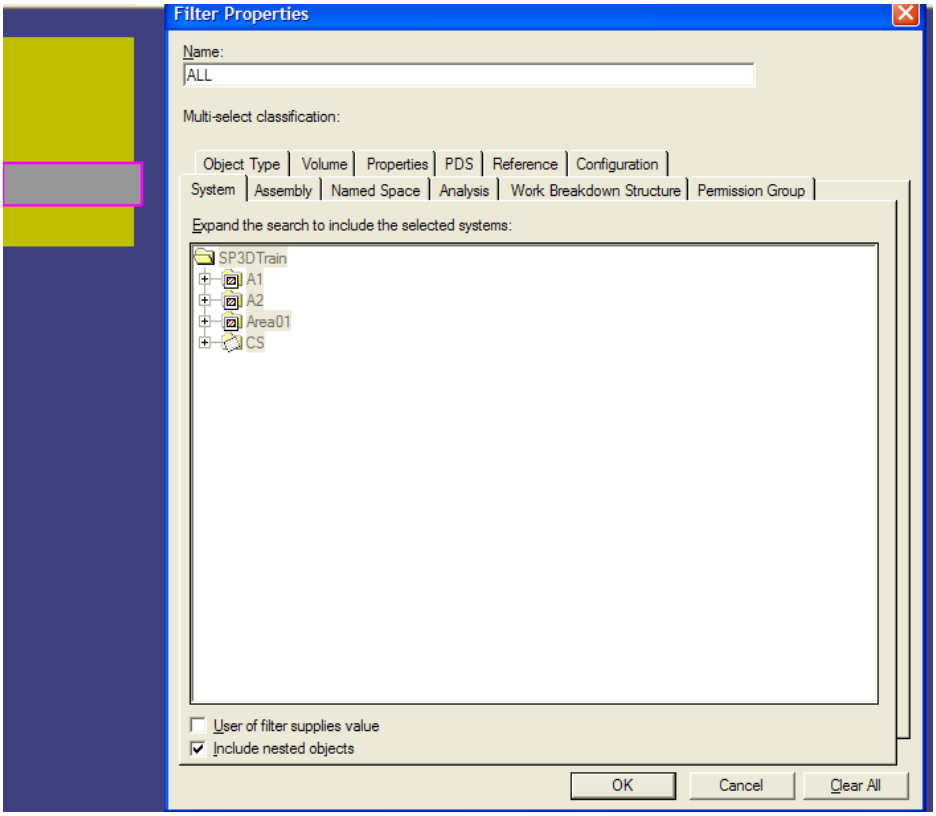
Make sure you don't have parent-child objects in this, e.g. Equipment and Equipment Components. This may result in double movement in some situations.

Show Only Selected Objects

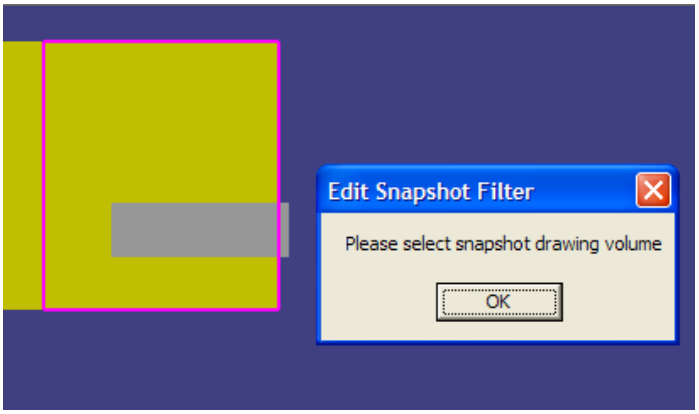
When this command is invoked with a some objects in the select set, only the selected objects are kept visible and all other objects are hidden. This is the counterpart to the Hide command. To return to seeing all objects in the workspace, use Show All command in Tools menu.

Edit Snapshot Filter

When users snapshot views for placement on drawings, the active workspace filter is copied and stored away internally. Sometimes it is desired to view and edit the definition of the filter. This command operates with the snapshot volume and shows the edit filter dialog for the filter associated with the snapshot volume/view. User may edit the filter definition as necessary and commit changes to the database.



In case the object selected is not a snapshot drawing volume, below message is shown

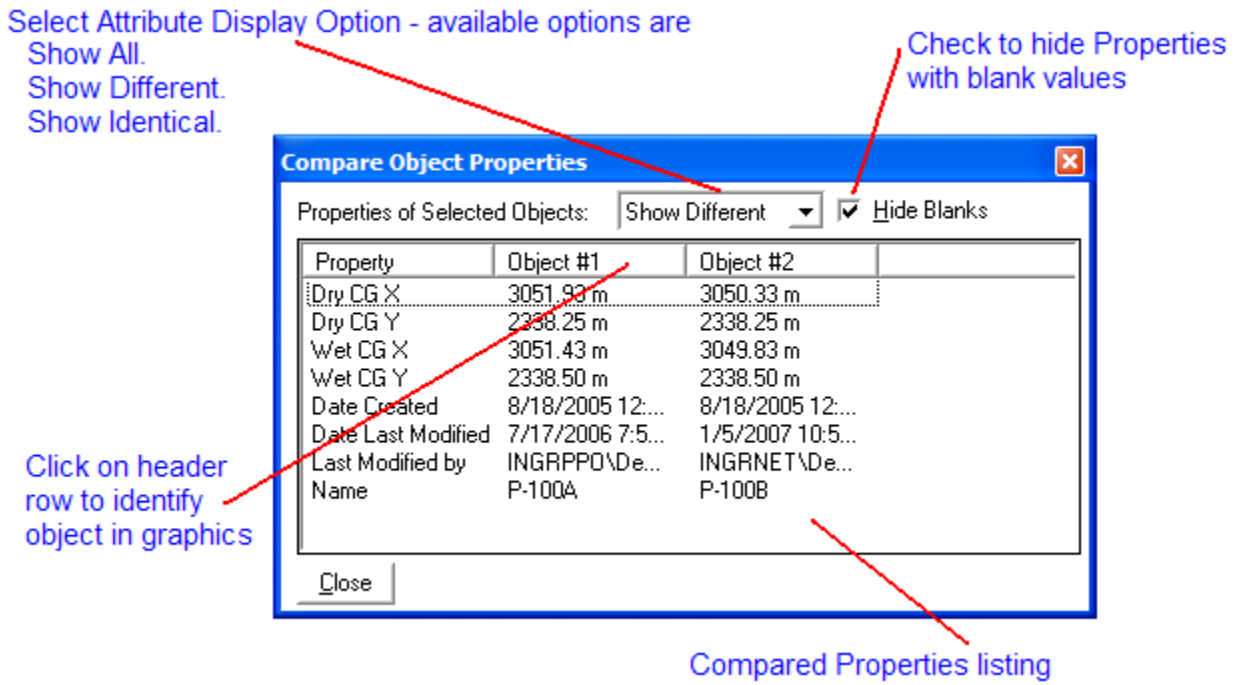


Compare Object Properties

This command facilitates comparing Object properties to show ‘Different’, ‘Identical’ and ‘All’ attribute values.

When invoked with some objects selected, it compares those objects at one time. When invoked without any objects selected, it defaults to compare two items. New Objects can be selected while the command is running for comparison. The objects list is kept rolling, i.e. if objects **A, B, C** are selected for

comparison, later selecting object **D** would forget object **A** and show the comparison status for objects **B, C, D**. Later when Object **E** is selected, it would show comparison status for objects **C, D, E** and so on.



If non-homogeneous objects are selected, then it would show only common properties between them. Clicking on the Header column representing the object hilites the corresponding object in graphics.

IFC Local Detect ON/OFF

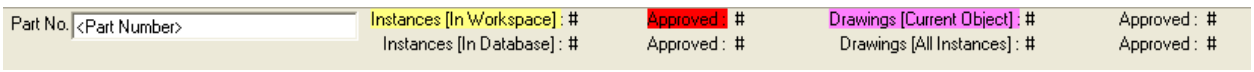
This command is available on the Toolkit's PopupMenu, which you can invoke using the Super ShortCut **C**trl – **C**trl – **S**hift. Use this command to toggle the IFC local detect Status.

This is a quick short cut to the same done using 'Tools > Check Interference' → Click Properties icon on the Interference Toolbar > Local Detect tab > check 'Activate local interference detection' and hitting ok.

Part Change Impact Analysis

This command is useful to analyze the effect of changing a Part in catalog. It can be used in a wide range of situations. For example, Equipment Parts, Piping Parts, equipment Component Parts, Equipment Shape Parts and so on.

When this command is invoked, the below ribbonbar shows up.



The command allows one to select a Part Instance in the model. After selecting one, it shows the part number, and it shows the below information on the ribbon bar.

all occurrences of that part in current workspace

all occurrences of that part in entire database

all approved occurrences of that part in current workspace

all approved occurrences of that part in entire database

all drawings containing the currently selected part

all approved drawings containing the currently selected part

all drawings containing one or more such parts in the entire model database

all approved drawings containing one or more such parts in the entire model database

One sample output is as below.

One can select the objects by double-clicking the label on the ribbon bar pertaining to part occurrences.

One can get the associated drawing names by double-clicking the label on the ribbon bar pertaining to drawings involving those part occurrences.

Apart from graphic Selection of part occurrence, one can also key in the Part Number and hit enter, to search for part instances by such part number. Wild card searches are possible – % matches any number of characters, and ? matches a single character.

DBI Analysis (Analyze objects in DBI)

This command allows one to perform analysis of Database Integrity check results.

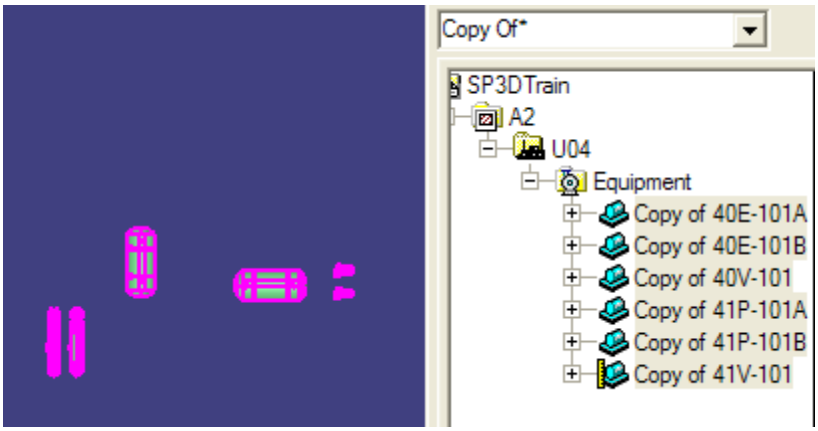
The command brings up the below RibbonBar

It allows one to query the DBI records by Severity, Date Created/Modified, DBI recommended Action DBI Status, and allows one to filter only for First Class Objects. Filtered objects can be selected for further analysis, for example using the Select Set Browser or Manage Object Sets commands.

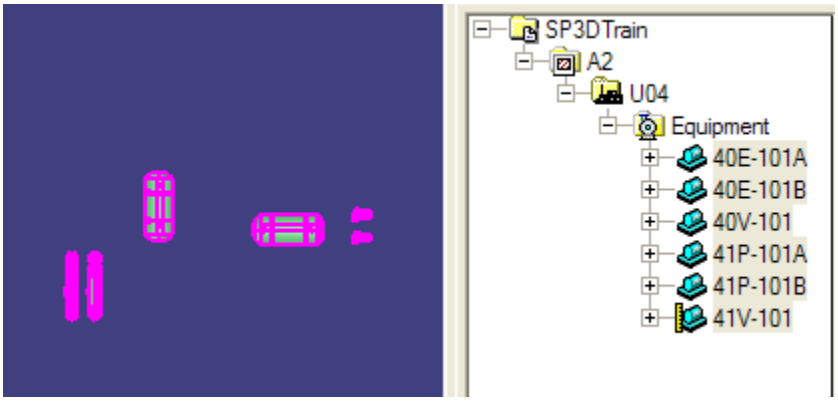
Remove Text 'Copy Of'

After a copy/paste of multiple objects, frequently the object names have ‘Copy Of’ as a prefix. It may be desired to quickly remove this text from multiple objects. This command renames objects removing the text.

Select objects whose name starts with ‘Copy Of’. One way to do this is to set the locate filter to ‘All’ and enter ‘Copy Of*’ in the workspace explorer search combo.

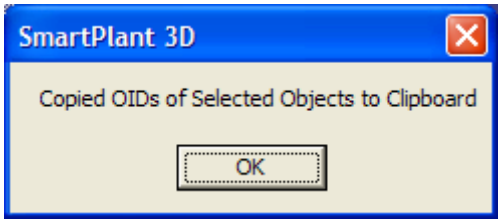


Once the objects are selected, run the command, this removes the text ‘Copy Of’



Copy OIDs to clipboard

This command takes the select set and copies the oids of its contents to the clipboard as a set of comma separated values. A message is shown indicating the copy succeeded.



Find Object By Report

This button invokes the SP3D delivered Find Object By Report command. For documentation of this command, please refer to the Database Integrity Guide delivered as part of the S3D Help.

Show / Hide Reference file(s)

A new popup menu is made available on Reference files. Select one or more Reference file(s) in the References tab of the Workspace Explorer, or graphics view and then press right mouse, which shows up the below menu.