HYDRO*Sketch*
User Manual
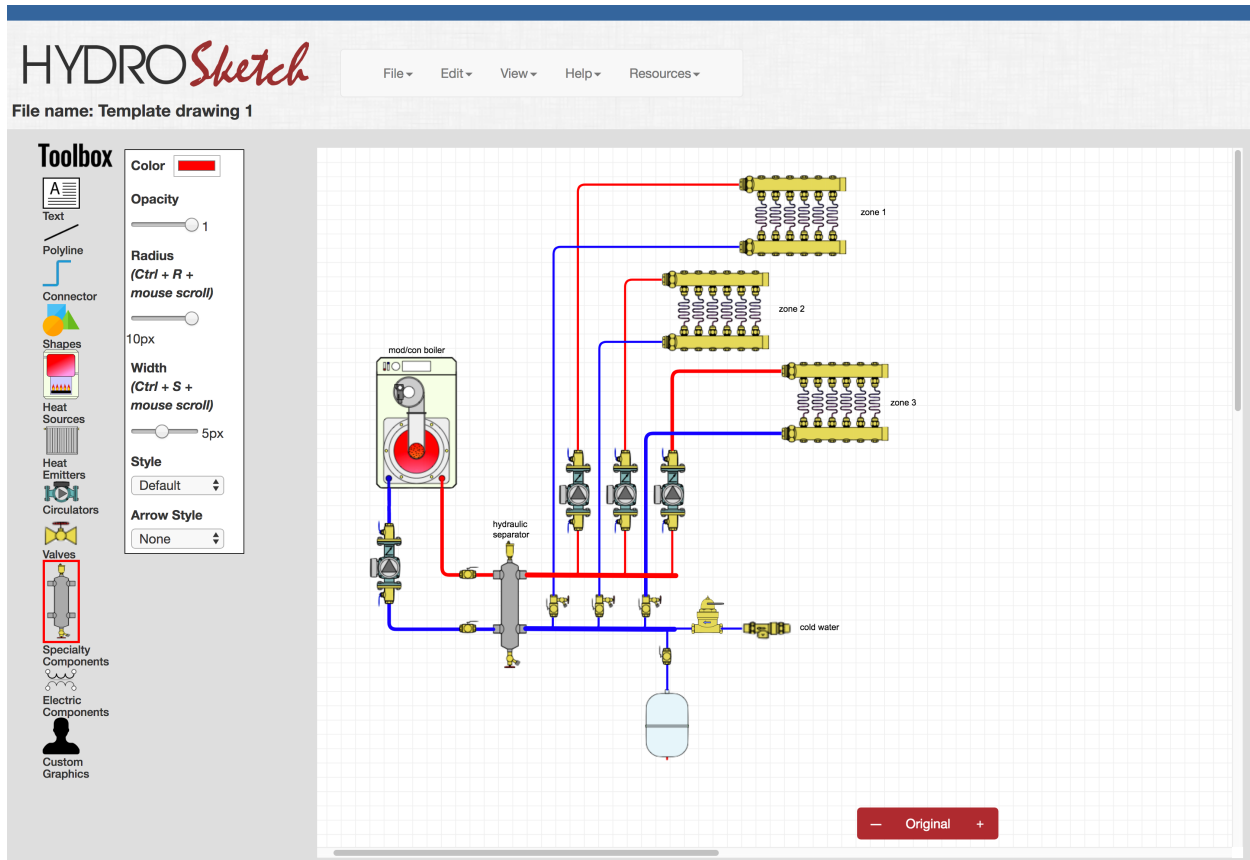

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    f. All prospective HydroSketch users are given the opportunity to try HydroSketch for 30 days at no cost. We encourage all prospective customers to take advantage of this trial to see if HydroSketch meets their needs. *Once a license is purchased there are no refunds available.*

2. Introduction

Thank you for accessing HydroSketch at (www.hydrosketch.com). This software is the first browser-based tool developed specifically to help HVAC (Heating, Ventilating, and Air Conditioning) professionals create piping and electrical schematics for hydronic heating and cooling systems.

Because it is browser-based, HydroSketch can operate on any desktop or laptop computer that can run the Google Chrome browser software (available for free download at https://www.google.com/chrome/browser/).

There are several advantages of using browser-based software. One is that users will always be working with the latest version of the software. As the HydroSketch development team makes improvements, adds features, or creates additional component symbols and drawing templates, all users will have immediate access to those improvements, features, and templates *without cost and without having to download and install new software*.

Another advantage is that your drawings are saved on a secure server. As such you can access them whenever and wherever you have a computer connected to the internet. The files are fully backed up and thus protected against loss due to property damage, theft, or hard drive failures.

Finally, HydroSketch can be run from computers running any operating system (e.g., Windows®, Mac OS, etc.) that supports Google's *Chrome* browser.

HydroSketch vs. CAD software:

Traditional computed aided drawing (a.k.a., CAD) software was developed to let users create a wide variety of drawings. As such it usually offers hundreds of drawing tools and features, many of which may not be used depending on the needs of the user. These tools and features also complicate the learning process and increase the cost of using CAD software. Some CAD software licenses cost thousands of dollars per user. Some CAD software also requires "high end" computers and peripherals to run at optimal speed. The costs associated with weeks of training and marginal productivity during the learning process is perhaps the most expensive aspect of dealing with traditional CAD software.

HydroSketch is not a traditional CAD software!

It was developed specifically to allow those who have no previous computer drawing experience to create simple and accurate schematics associated with hydronic heating and cooling systems.

HydroSketch features a simple and intuitive interface as seen in figure 2-1.

Figure 2-1:
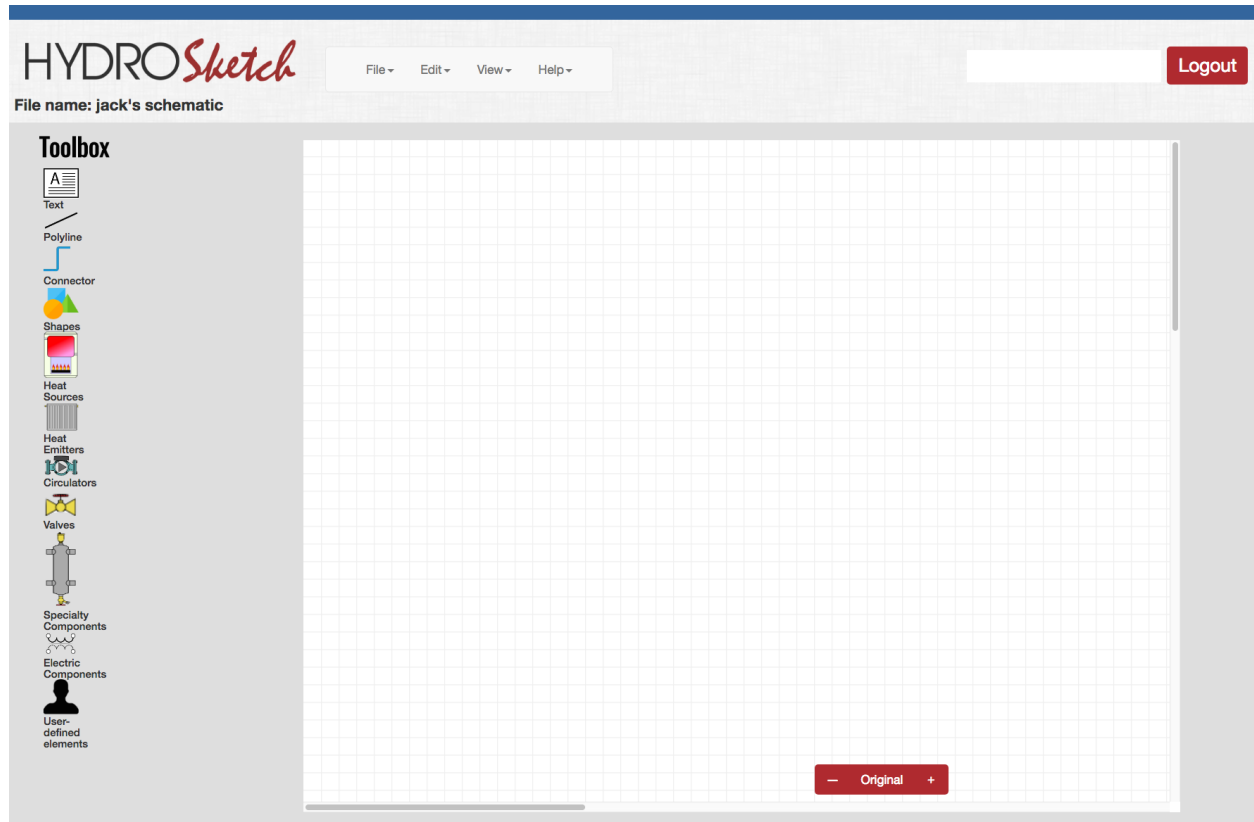
The user selects the piping or electrical components they want to use in the drawing from several "toolboxes" located on the left side of the screen . Each toolbox contains multiple component symbols associated with the name of that toolbox. For example, the heat sources toolbox contains symbols for several types of boilers, as well as for heat pumps and solar thermal collectors.

The individual components within each toolbox are displayed in a scrollable palette whenever the user selects that toolbox by clicking on it. The scrollable palette of heat sources is seen in figure 2-2. The scroll bar at the right of the symbol palette lets the user move up or down within the palette.

Figure 2-2:
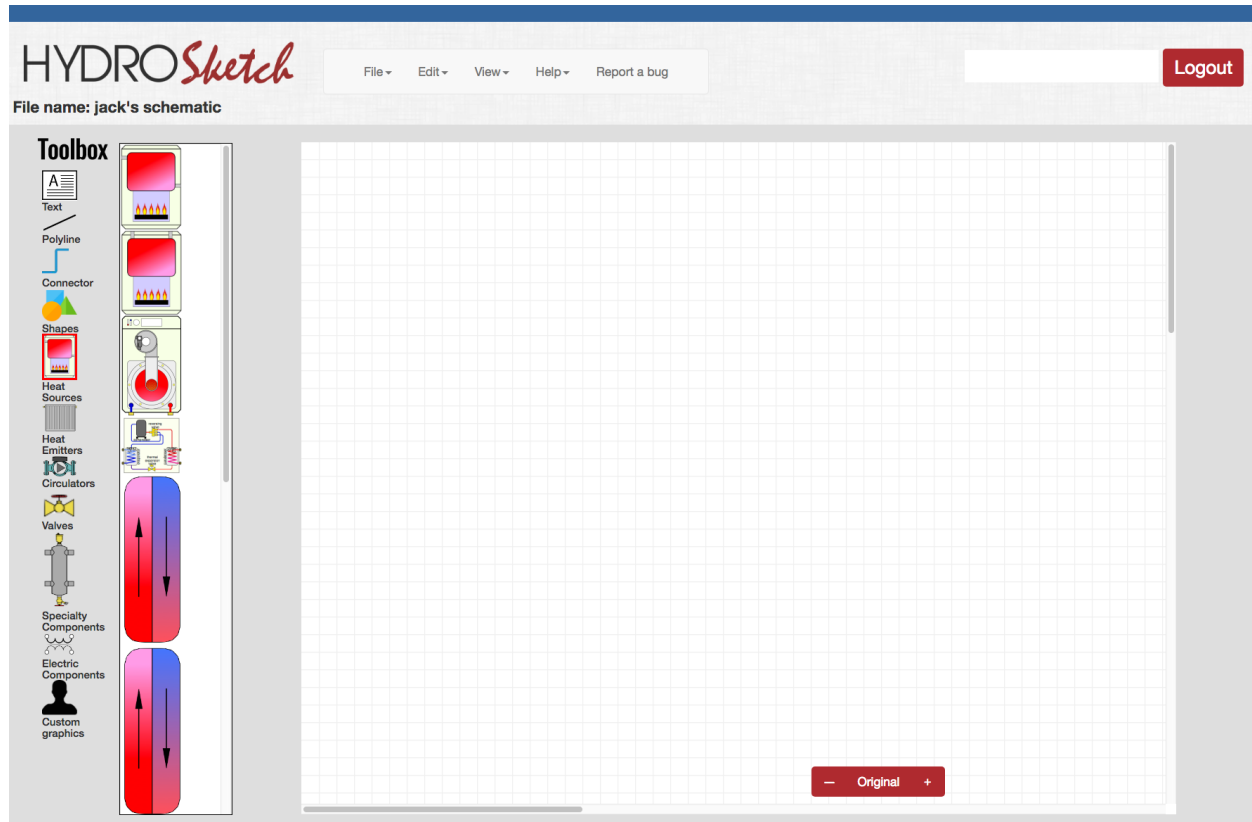
Once a toolbox has been selected the user can drag any of the displayed symbols onto the white canvas area at the right of the screen. This action creates a copy of the symbol on the canvas.

The initial placement of the symbols on the canvas is not important. Symbols can be easily moved by placing the mouse cursor over the symbol, holding down the left mouse button, and dragging the symbol to another location on the canvas.

Each piping or electrical device symbol has one or more "ports," which are points on the symbol where piping or wiring would connect. The ports appear whenever the mouse cursor is close to or over the component symbol, and disappear when the mouse moves away from the symbol. Ports do not show when the drawing is printed.

After two or more symbols have been placed on the canvas they can be connected using "connectors." A connector is not just a simple line. It's a dynamically generated assembly of line segments that spans from a port on one symbol to a port on another symbol. Connectors automatically adjust to the horizontal and vertical distances between these ports. They also automatically adjust as the component symbols they are connected to are moved on the canvas.

After a connector is placed, any segment of the connector that's not directly attached to a component symbol can be dragged to the preferred location. All other segments on the connector automatically adjust to this movement.

The width and color of any connector can be easily changed. It's also easy to add rounded corners (called fillets) to the corners of any connector. These rounded corners make piping schematics look more realistic.

Section 4 will get you started using connectors. You'll quickly see how simple, efficient, and versatile they are.

3. Accessing HydroSketch

The preferred Internet browser for use with HydroSketch is the latest version of Google's *Chrome*.

Please download the latest version of the Chrome browser from the following site, and install it on you computer before working with HydroSketch.

https://www.google.com/chrome/
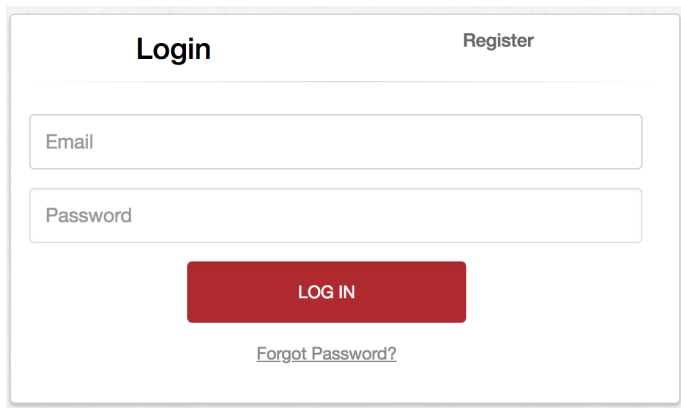
When you have the Chrome browser running, you can access HydroSketch by entering the following URL into the Chrome browser.

http://hydrosketch.com/security/login

This will take you to a page that looks like figure 3-1.

Figure 3-1:

If you are using the 30 day trial of HydroSketch you need to enter an e-mail address and create a password, and enter it at this screen. Then click "Register".

If you already have a user name and password, enter it on this screen, then click the "LOG IN" button.

You will then see the "user dashboard" screen shown in figure 3-2.

Figure 3-2:

User Dashboard

Use HydroSketch

Manage Users

Purchase HydroSketch License
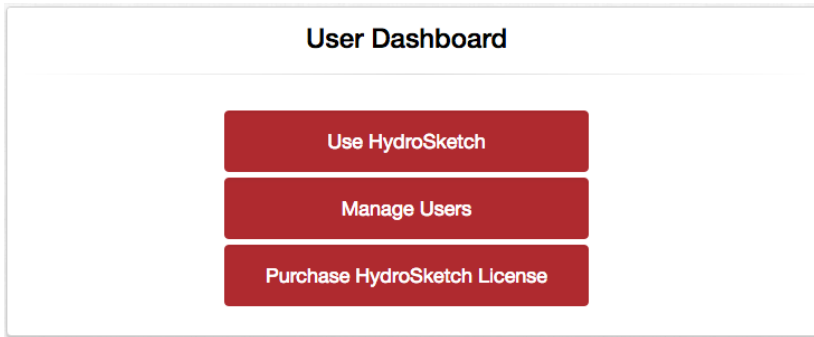
If you are using the 30-day trial period for HydroSketch, or have already purchased a HydroSketch license, and want to draw in HydroSketch, click on the "Use HydroSketch" button in the user dashboard screen.

If you want to purchase a license for HydroSketch click on the "Purchase HydroSketch License" button and follow the instructions.

If you own a HydroSketch license, and want to add or modify information for up to two additional users under that license, click the "Manage Users" button and follow the instructions.

If you clicked on "Use HydroSketch you will see the screen shown in figure 3-3:

Figure 3-3:

Drawings

Create Drawing

New drawing   Name
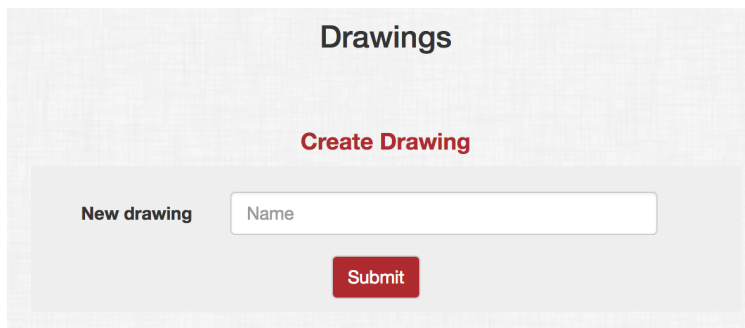
Submit

Enter a name for your drawing, such as *Jack's schematic,* then click on the "Submit" button.

You will now see the main drawing canvas along with the Toolbox column at the left of the screen. These are shown in figure 3-4.

Figure 3-4:
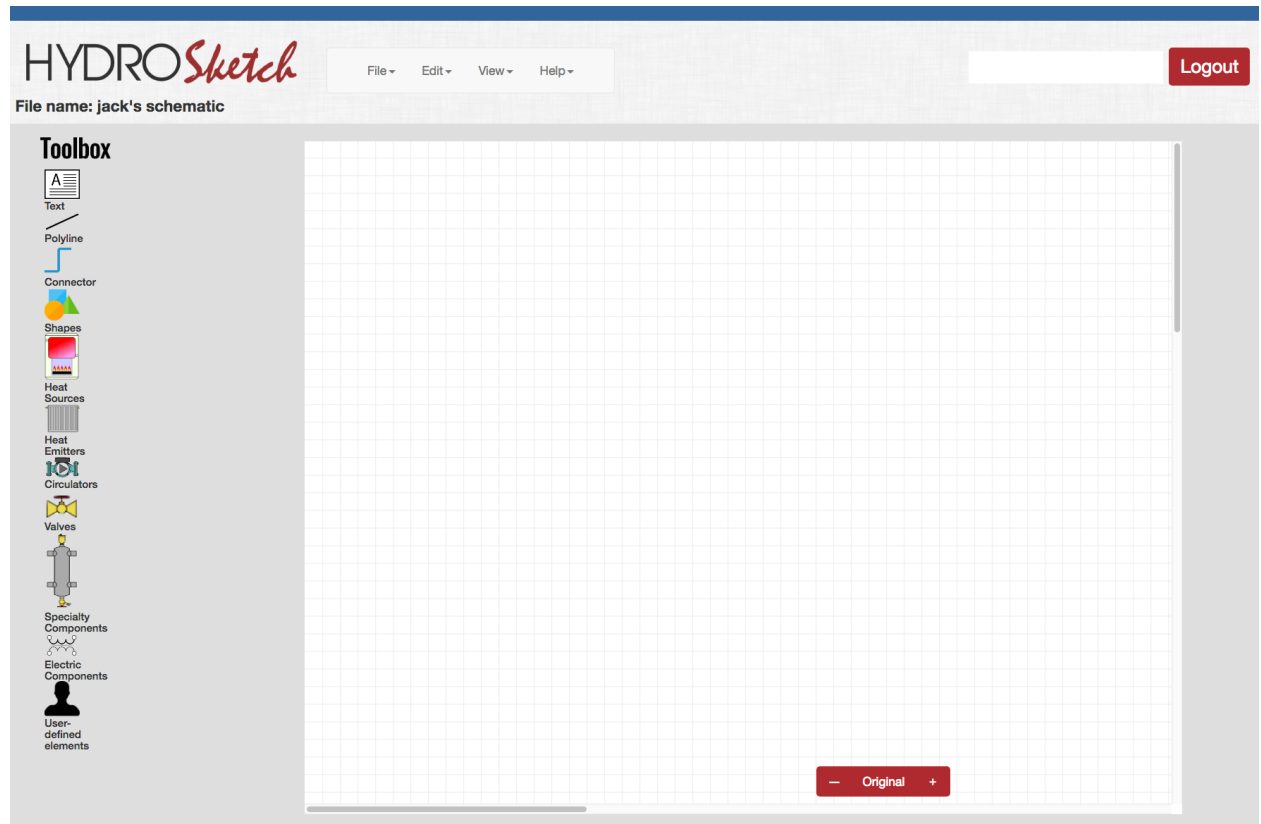
The drawing name you entered will appear below the HydroSketch logo in the upper left portion of the screen.

You're now ready to do some drawing with HydroSketch.

4. Getting familiar with HydroSketch

The best way to start learning HydroSketch is to make a simple drawing using several of the available symbols and other tools.

On the left side of the screen you will see the Toolbox. It's a column of symbol categories with names such as Heat sources, Circulators, Connector, and Text.

Click on the "Heat Sources" symbol under Toolbox. The icon for the "Heat Sources" toolbox will have a red frame around it, indicating that it has been selected.

You will also see a scrollable palette of several heat source symbols appear in a pop-up window that appears between the Toolbox icons column and the drawing canvas, as shown in figure 4-1.

Figure 4-1:
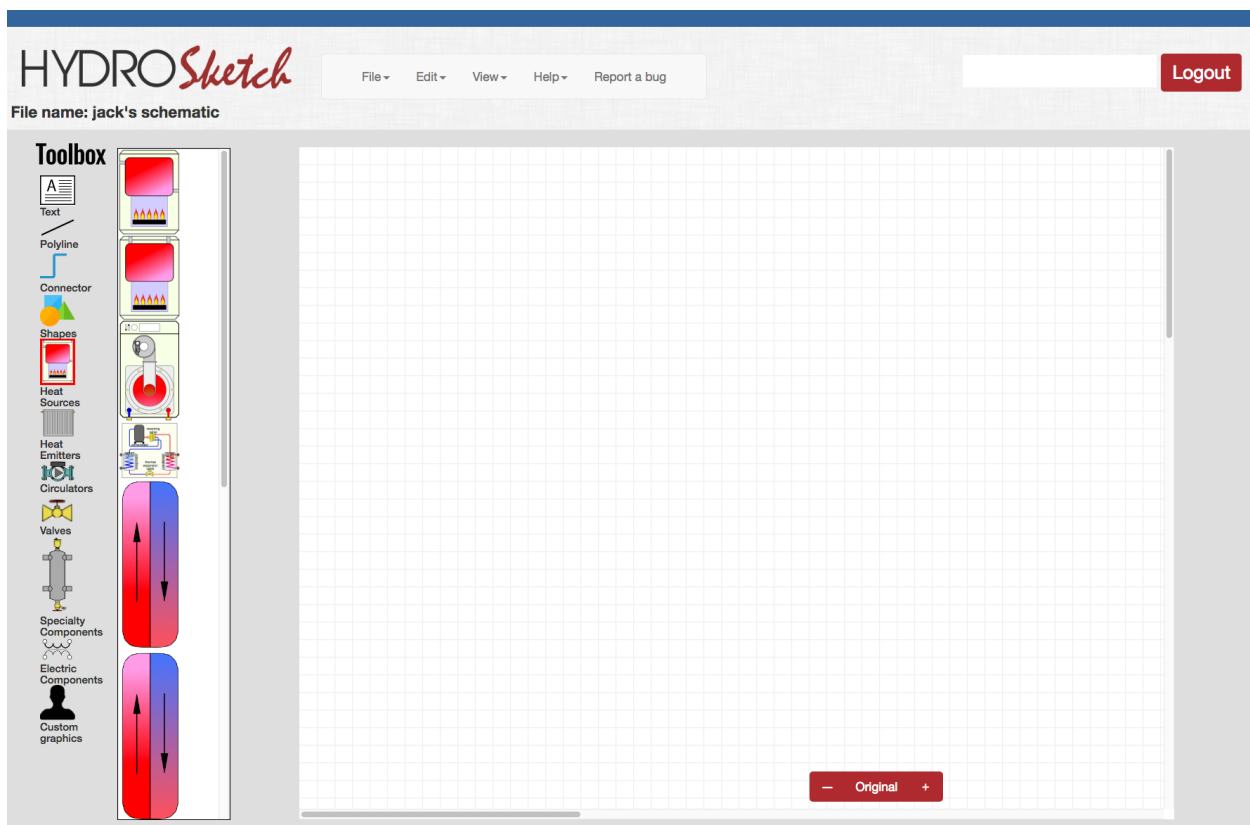
Most toolbox palettes contain more symbols than can be displayed on a single screen. To see all the symbols in a given toolbox use your mouse to move the scroll bar at the right of the symbol palette.

If you place you mouse cursor over one of the component symbols, and hold it there briefly, the name of that component will appear. This is called "hovering" over the symbol. It allows those who don't know what the symbol represents to find its name.

Using your mouse, drag the component symbol for the modulating/condensing boiler from the symbol palette onto the drawing canvas, so it looks similar to figure 4-2:

Figure 4-2:
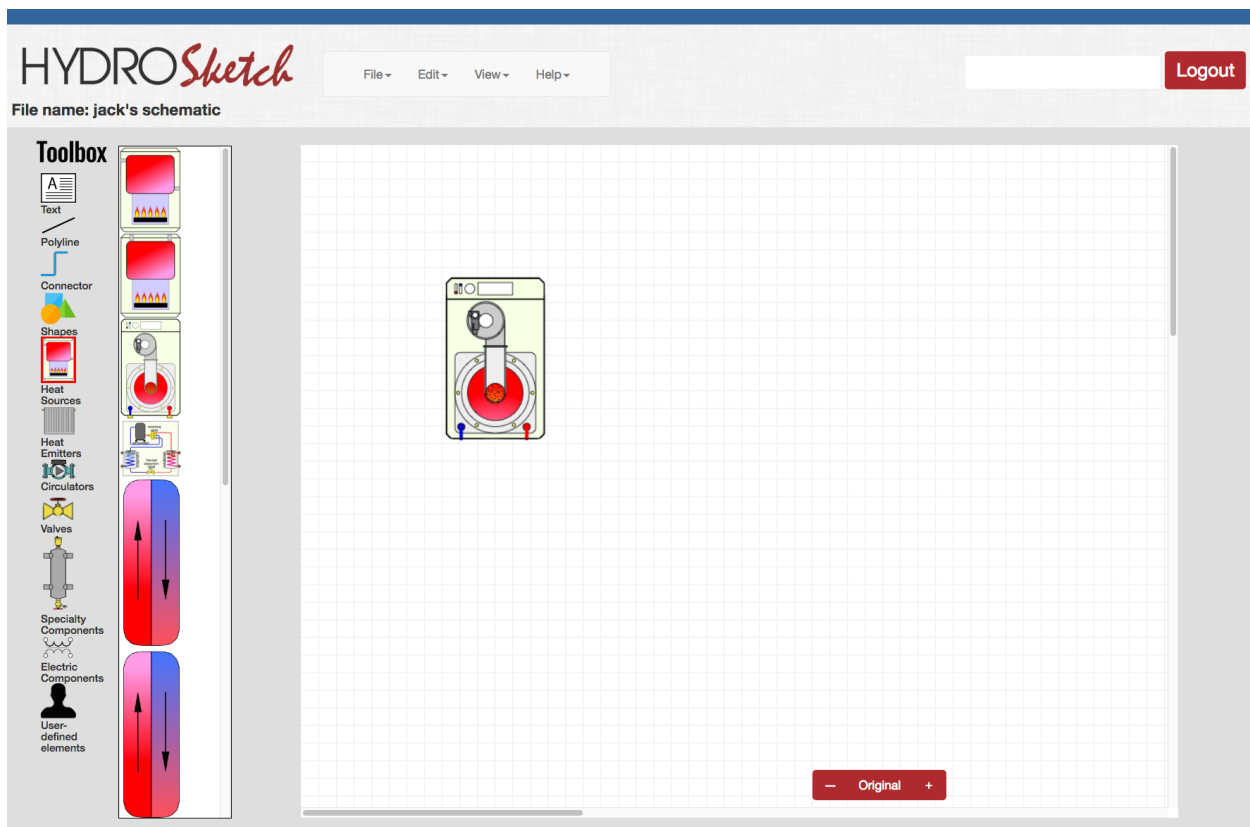
When you drag a symbol from the symbol palette to the canvas a copy appears. The original symbol never leaves the symbol palette.

Once a symbol is on the canvas it can be moved around by dragging it with your mouse. Just place the mouse cursor over the symbol, hold down the left mouse button, and drag the symbol to another location on the canvas. Release the left mouse button

at the desired location of the symbol. You can drag any symbol as many times as you want.

Let's put a few more symbols on the canvas.

Click on the "Specialty Components" under the Toolbox, and drag a symbol for a hydraulic separator onto the canvas as shown in figure 4-3.

Figure 4-3:
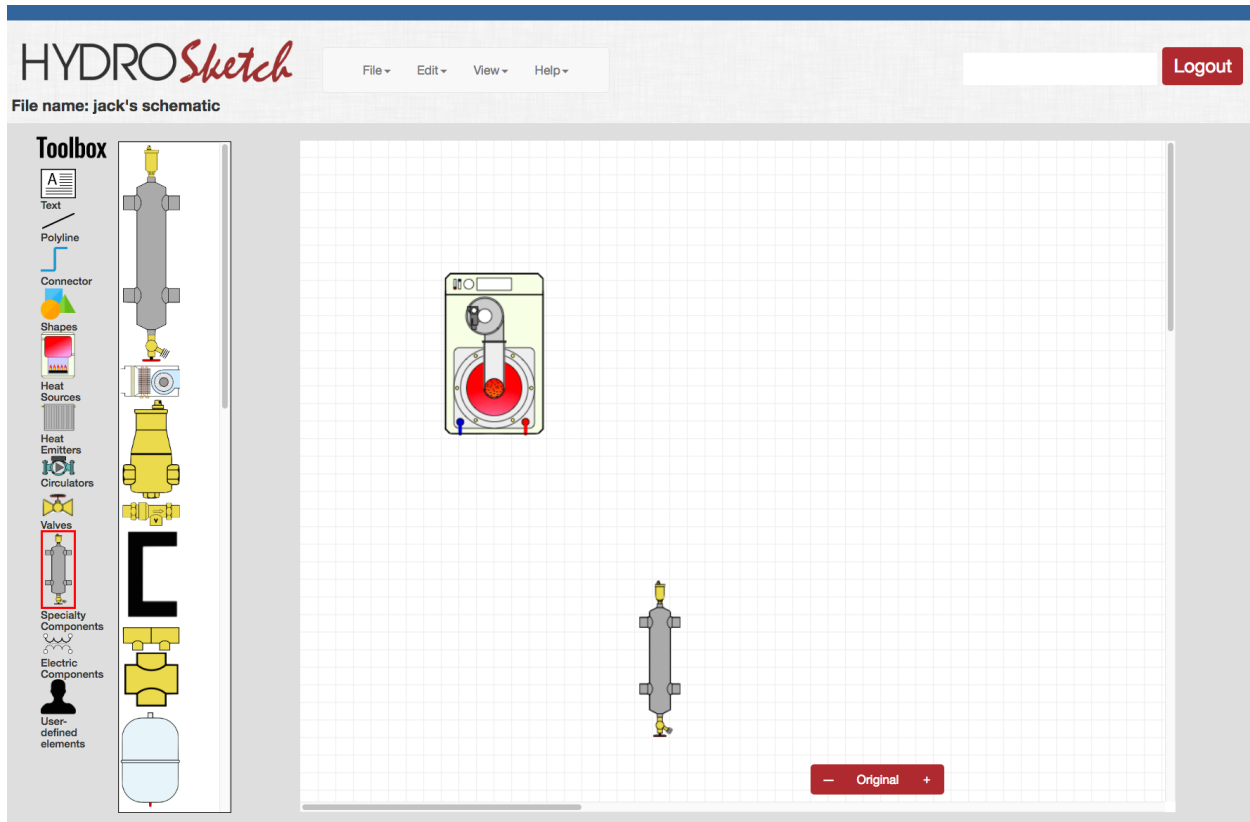
Don't be too concerned about exactly where you put the symbol on the canvas. It can always be dragged to a different location.

Drag a few more symbols from the Circulator, Heat Emitter, and Valve toolboxes onto the canvas.

Do this by clicking on the appropriate Toolbox at the far left of the screen. You will see the symbol palette pop up between the Toolbox column and the drawing canvas. Scroll up or down in the symbol palette to see what's available, then drag a copy of the desired symbol to the canvas, as shown in figure 4-4.

Figure 4-4:
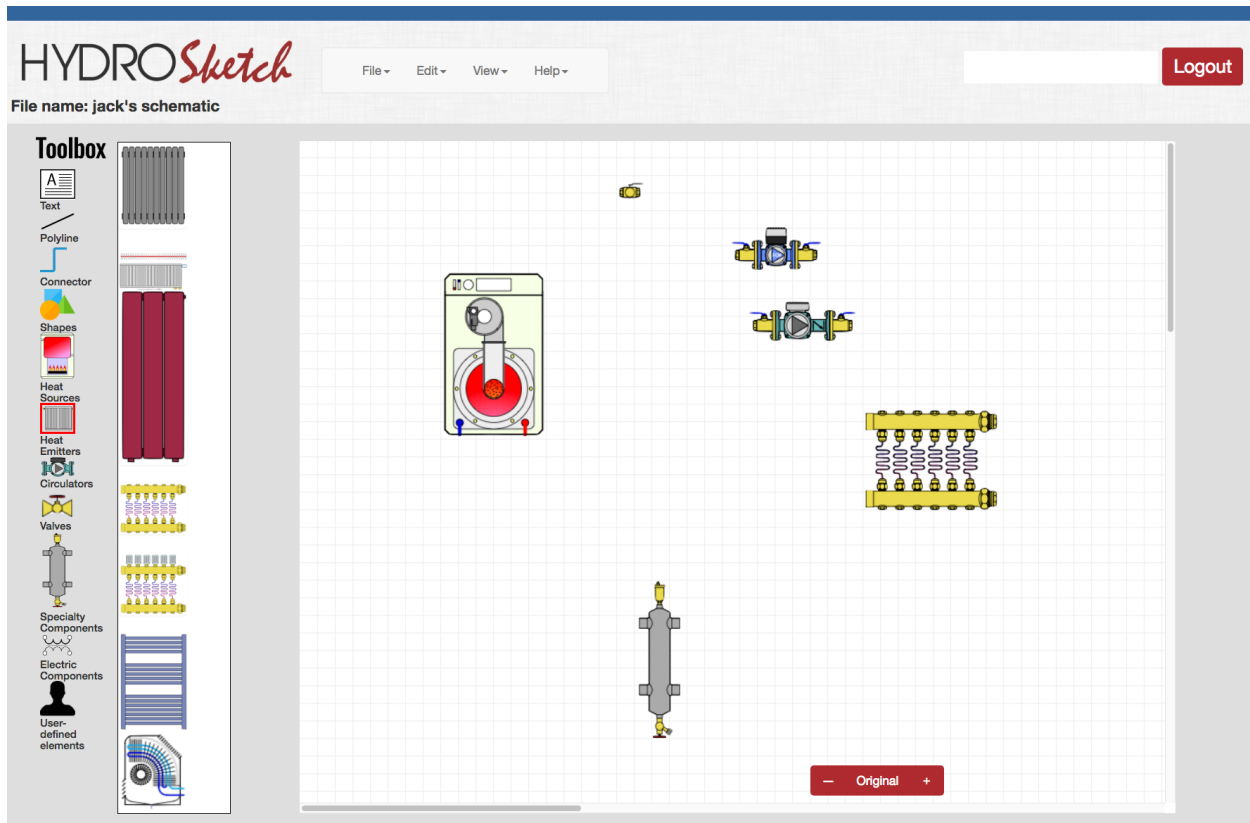
Once you have a few symbols on the canvas, move the mouse cursor toward each of them. As the cursor approaches each symbol you will see small gray circles called "ports" appear at the locations where lines representing piping can be attached to that symbol.
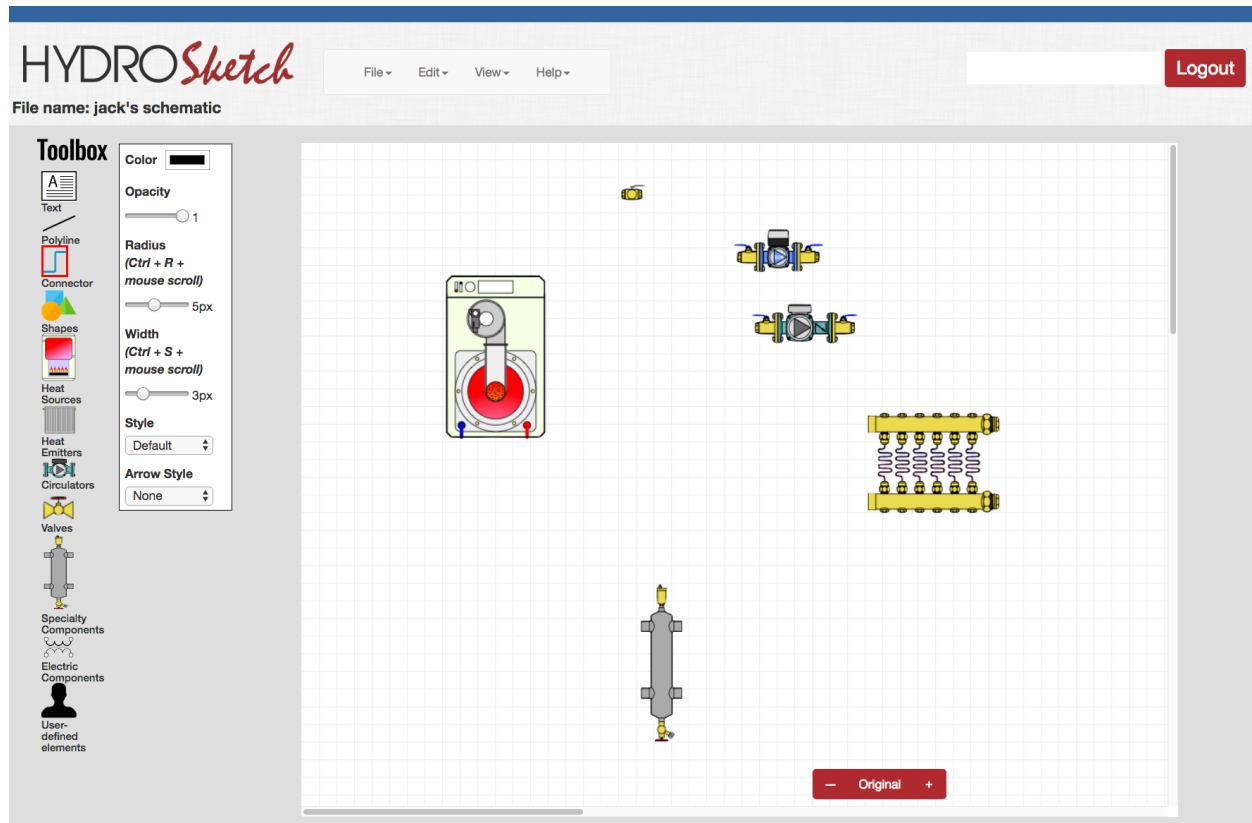
Ports are the points from which, and to which you will drag a "connector."

Using connectors:

Go to the connector tool under the Toolbox and click to select it.

You will see another pop up window appear between the Toolbox column and the drawing canvas, as shown in figure 4-5.

Figure 4-5:

You're now ready to draw a connector between one of the ports on the boiler symbol, and a port on the hydraulic separator.

With the Connector tool already selected under the Toolbox, position the mouse cursor over the lower right side port on the boiler symbol. Hold down the left mouse button and drag toward the upper left port of the hydraulic separator. As you do, you will see a fine dashed line following the cursor. When you have the mouse cursor over the upper left port of the hydraulic separator release the mouse button. You will then see the connector automatically generated between these two ports, as shown in figure 4-6.

Figure 4-6:
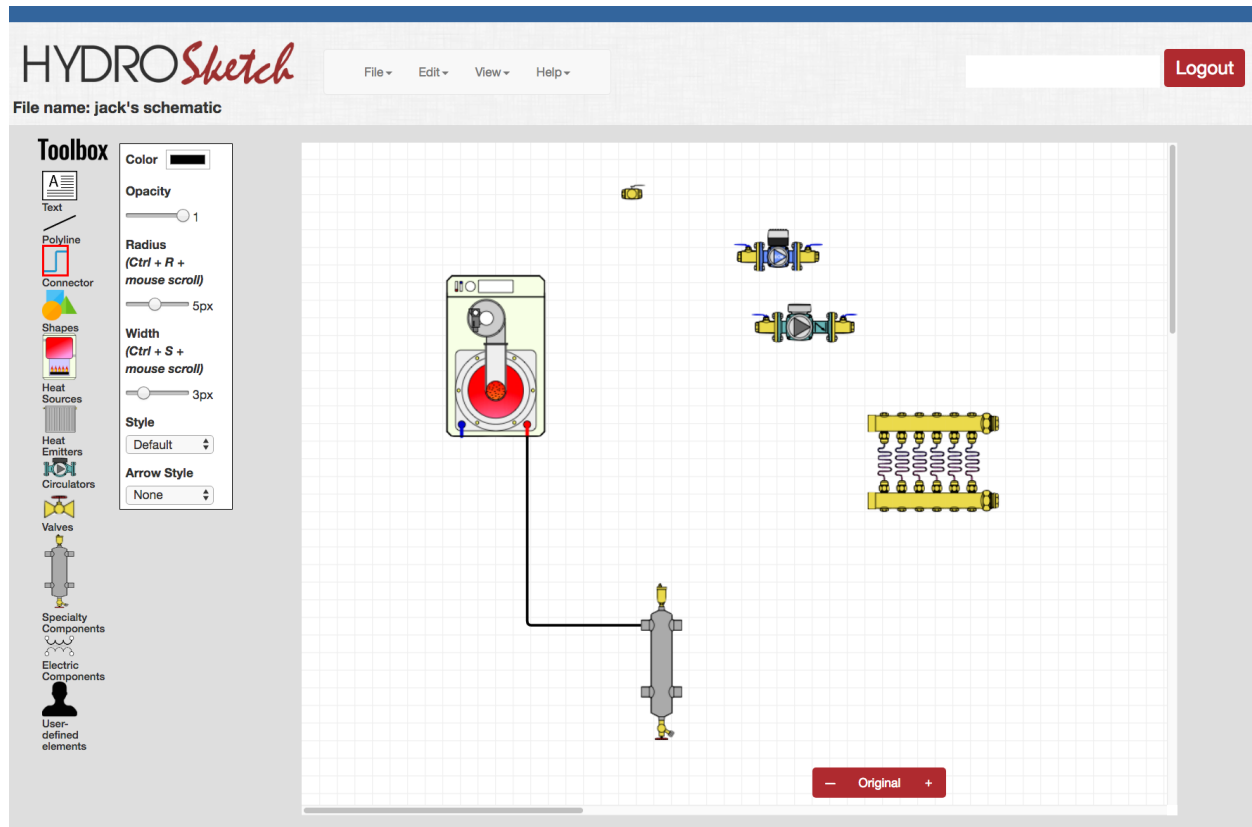
Connectors are "smart." Unlike simple line segments in a CAD system, connectors can automatically reshape themselves as you move one or more of the symbols they connect to.

Try it. Just drag the hydraulic separator symbol around the screen with your mouse and watch what happens. The connector automatically adapts its shape and direction as you drag either symbol it connects to around the canvas.

Editing connectors:

If you take a close look at the connector you will see that a small curve called a "fillet" has been created where the vertical and horizontal segments of the connector come together. You can think of this an an elbow in the piping. It makes the piping schematic appear more realistic.

You can easily change the radius of this fillet. Just click on the connector to select it. When selected you will see small blue circles at the ends of the connector. Now, move the horizontal "slider" control under the word Radius in the pop up menu to the left of the canvas and watch what happens. The default radius of fillets can be reduced down to a square intersection (set the slider to 1), or left anywhere in between. You can also

change the radius of fillets by simultaneously holding down the "Control" (Ctrl) and "R" keys on you keyboard, and then rotating the scroll wheel on your mouse.

While you have that connector selected try out the other editing functions in the pop up menu.

For example, click on the color box at the top and then select a different color for the line. You will see a color selector pop-up window appear elsewhere on your screen. *This color selector window is created by the browser you are using, so it may change depending on the browser and version you are using*. You can change the color of the connector to any color that's available in your browser's color selection window. Just click on the color you want in the color selection window and the connector changes to that color.

Try changing the width, the pattern, and the opacity of the connector. Just use your mouse to drag the slider controls in the pop up window left or right and watch what happens to the connector.

You can also add different types of arrowheads to one or both ends of the connector. The default is no arrowhead.

Set the color of this first connector to red.

Draw another connector from the lower left port of the boiler to the lower left side port of the hydraulic separator.

You will see this connector created with the same color and width as set for the previous connector. However, you can always change the color, width, pattern, and opacity of any connector at any time.

Change the color of the second connector to blue as shown in figure 4-7. Then try moving the hydraulic separator symbol around the canvas. Notice that *both* connectors automatically adjust as the symbol is moved.

Figure 4-7:
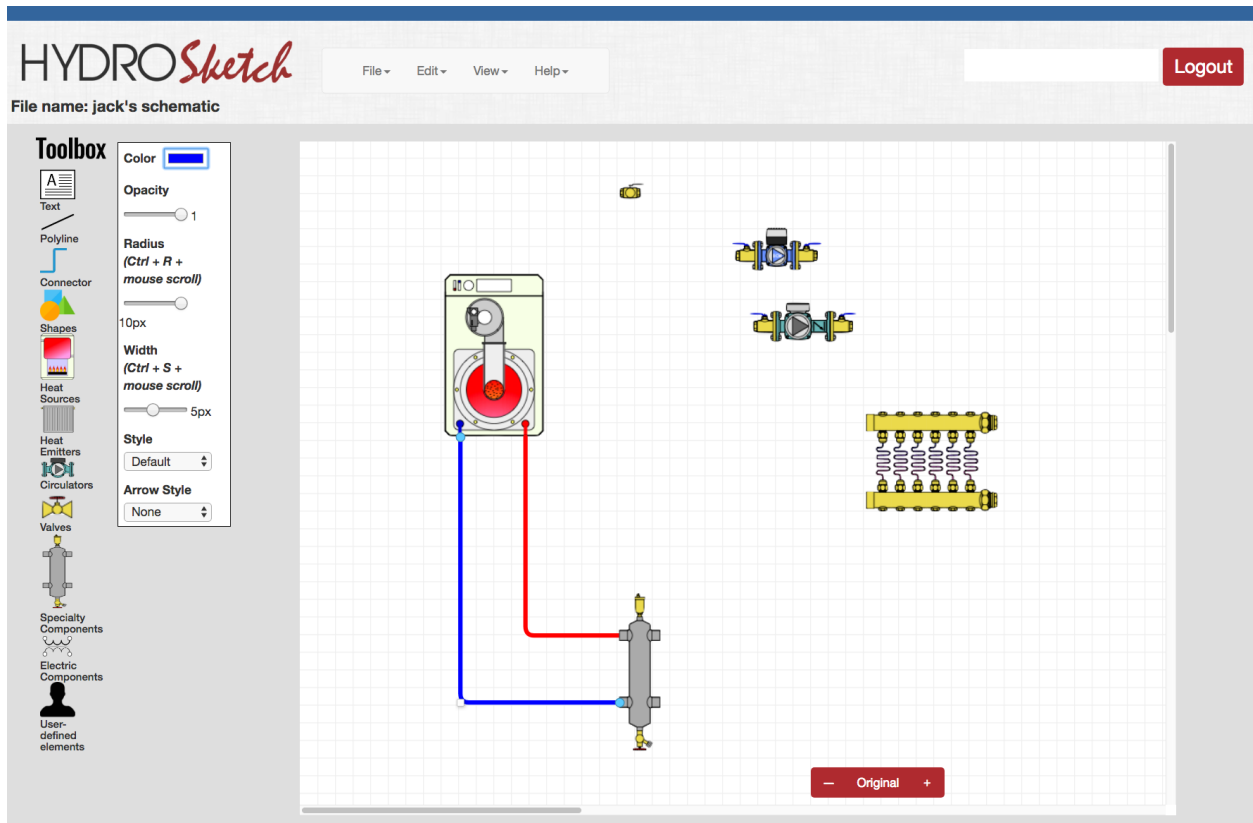
Next let's put a circulator between the boiler and hydraulic separator.

Using the right button on your mouse, right click on the green circulator symbol that was previously dragged onto the canvas. You will see a pop up list of "edits" that you can make to that symbol.

Click on "rotate 90º CCW." The circulator symbol will rotate counterclockwise by 90º so that it's ready to go into a vertical line.

Drag the circulator symbol *over* the blue connector as shown in figure 4-8.

Figure 4-8:
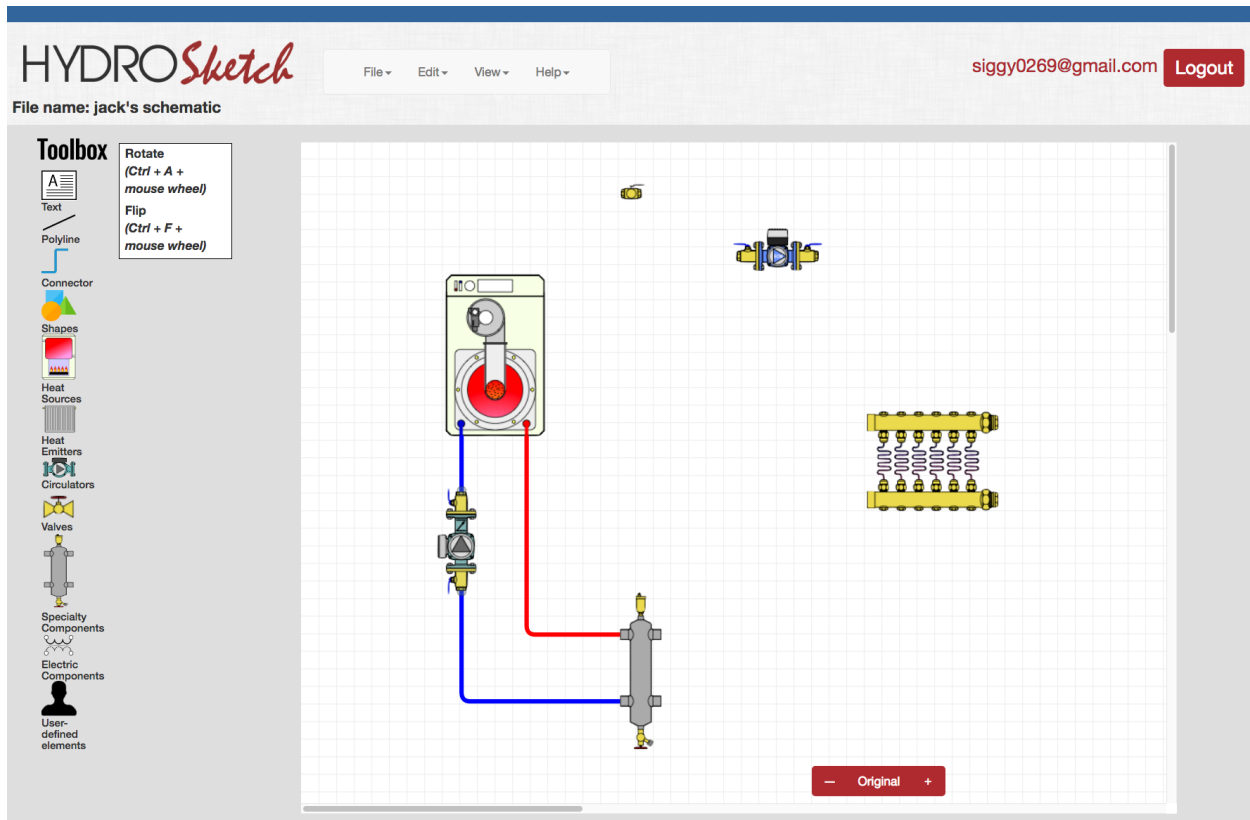
The circulator symbol looks "OK" sitting on top of the blue connector, and from a purely graphics standpoint it is OK. _However, this circulator is not attached to the blue connector._ It's just laying on top of it. If the boiler or the hydraulic separator is moved, the circulator symbol will not stay on the connector, as shown in figure 4-9.

Figure 4-9:
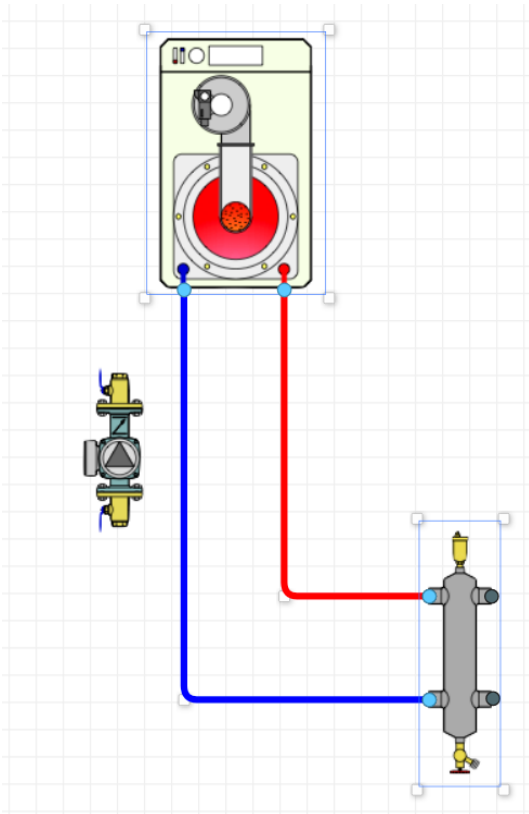
If you want the circulator to be attached to the connector you can delete the original blue connector and then create two new connectors; one from the boiler to the circulator outlet port, and the other from the circulator inlet port to the hydraulic separator.

To delete a connector just *right* click on it and select "delete" at the bottom of the pop-up list. You can also delete a connector by left clicking on it and then pressing the delete key on your keyboard.

Alternatively, you could drag the end of the blue connector that's attached to the boiler, and attach it to the lower port on the circulator. Then, draw another connector from the lower port of the circulator to the lower left port of the hydraulic separator.

After doing this you can drag the circulator symbol and the two new (attached) connectors will move with it.

You may notice that one or both of new connectors appear as shown in figure 4-10.

Figure 4-10:
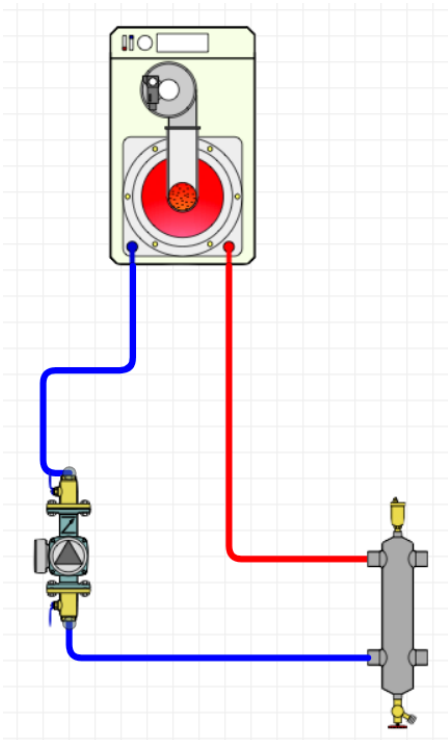
Notice that the upper connector on the circulator is not leaving the circulator symbol in the correct direction. This can be easily changed.

Just *right click directly on the small gray circle* representing the port at the top of the circulator. This opens a pop up selection box with choices such as "Direction top","Direction Right", etc., as seen in figure 4-11. Just click on the direction you want the connector to come out of the upper circulator port. In this case that would be "Direction Top." The upper connector adjusts to the correct direction as it leaves the circulator.

Figure 4-11:
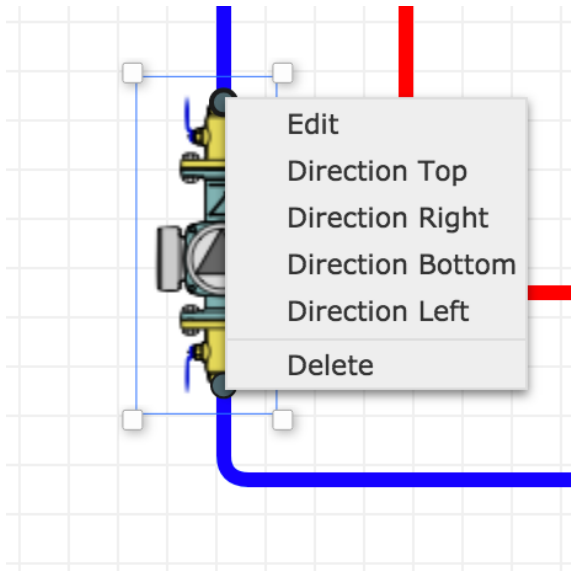
Now that the connectors are leaving the circulator in the correct directions, drag the circulator symbol to the desired location.

Let's complete the simple schematic by connecting the manifold station and another circulator.

Drag a manifold station from the symbol pallet for the Heat Emitters toolbox onto the canvas.

Then, right click on it to open an edit menu and click on "flip horizontal." This does just what the name implies, it flips the symbol 180º around a vertical axis. The ports on the symbol rotate with it.

Next, move the blue circulator symbol down into the space between the hydraulic separator and the manifold station as shown in figure 4-12.

Figure 4-12:
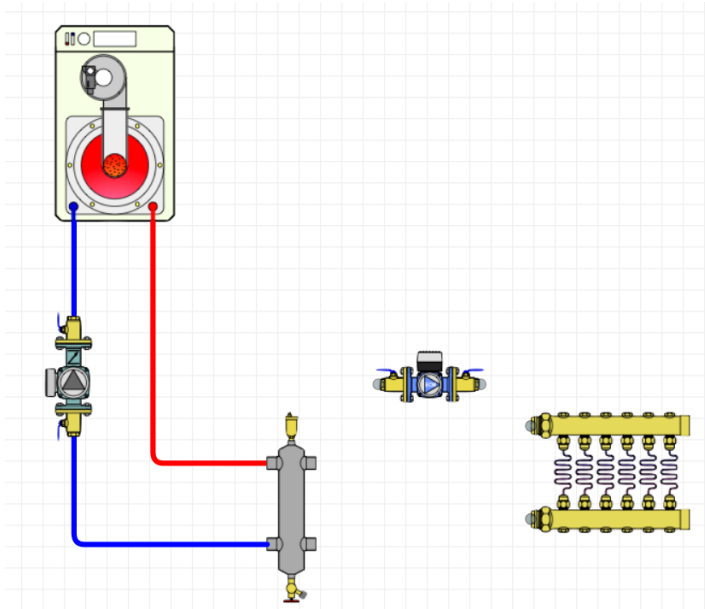
Draw three new connectors; one from the upper right port of the hydraulic separator to the inlet port of the circulator, another from the outlet port of the circulator to the upper port of the manifold station, and the third from the lower port of the manifold station back to the lower right port of the hydraulic separator. Your drawing should look similar, but perhaps not identical to figure 4-13.

Figure 4-13:
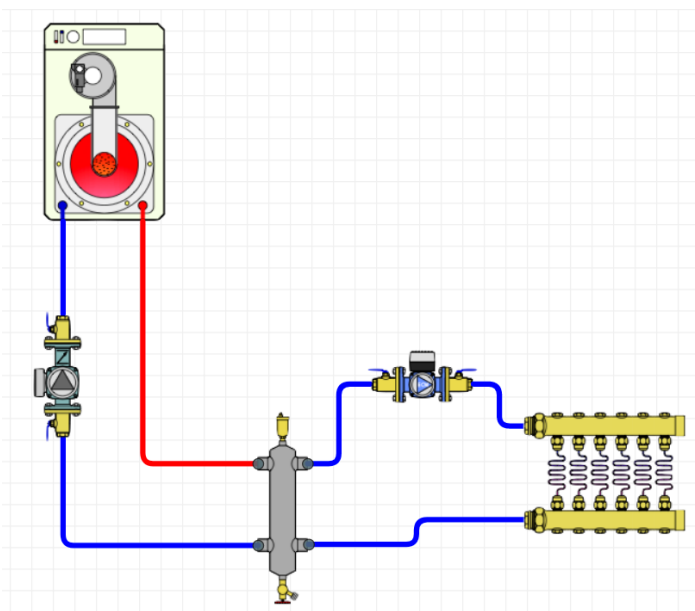
If the connectors don't leave the symbols in the correct direction right click on the pots where the direction needs to change, and select the desired direction for the connector leaving that port.

You can now drag the circulator and manifold station to "clean up' some of the unnecessary changes in direction of the connectors.

You can then change the color of the upper two connectors to red by clicking on them one at a time and then clicking on the color bar at the top of the attribute window. If the color shown in the color bar is not red, find the color selector window for your browser and click on red.

Your drawing might look similar to figure 4-14:

Figure 4-14:
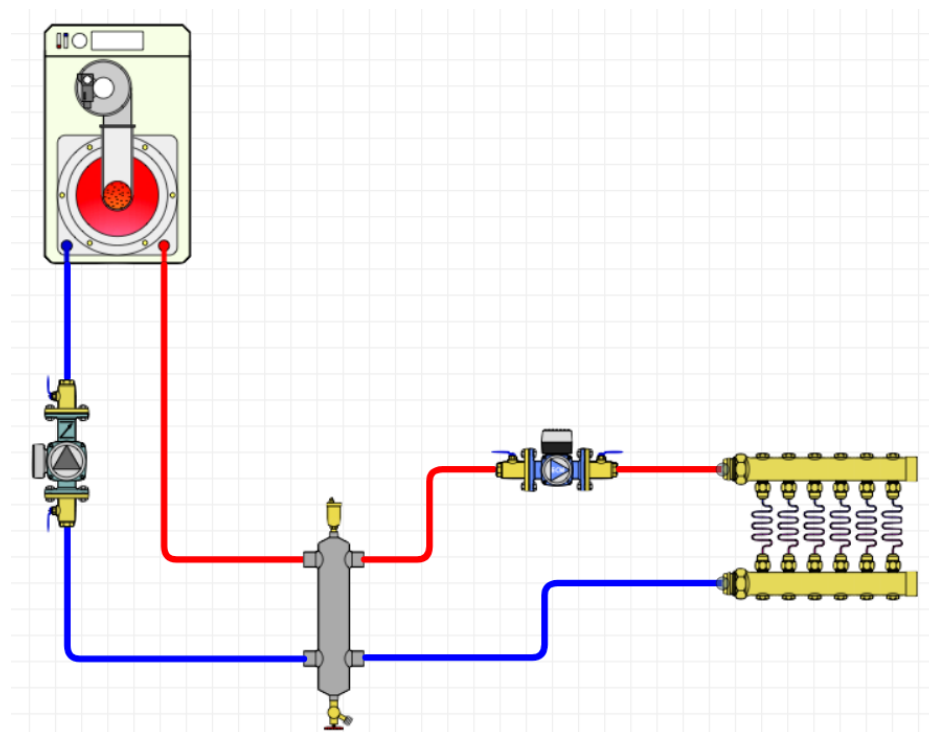
Other things to try:

Zooming:

You can zoom in or out of the drawing by clicking on the + or - symbols at the lower right of the canvas. Clicking "original" restores the view to its original size. If the "-" sign in this box changes to a faded red, you have reached the limits of zooming out. You can zoom back in by clicking the "+" or clicking "Original." You can also zoom in or out by clicking on the "View" menu above the canvas, and then clicking on "zoom in," "zoom out," or "zoom original."

Scrolling:

Use the vertical and horizontal scroll bars along the right side and lower side of the canvas to navigate around the canvas. These are especially helpful when you are zoomed into one area of the drawing. *HydroSketch does not currently support scrolling using mouse wheels.*

Moving the schematic on the canvas:

If you want to move the entire schematic, just draw a selection rectangle around it with the mouse cursor. This selects everything inside the rectangle. Place the mouse cursor over one of the selected objects and drag the cursor across the canvas. The entire schematic moves as a single entity.

Deleting:

To delete an object from the canvas just *right* click on it, and choose "delete" in the pop up menu. You can also delete an object by selecting it and pressing the delete key on your keyboard.

Grouping & Ungrouping:

Select two or more objects on the canvas by holding down the shift key and clicking on each object. You will see a small frame with square dots at its corners around each of the objects that have been selected. If you don't see this blue rectangle the object is not selected.

Right click on one of the selected objects to see the pop up shown in figure 4-16.

Figure 4-16:
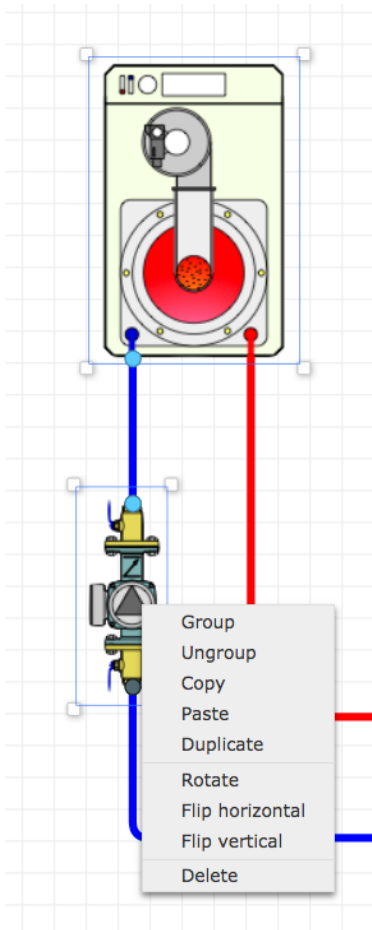
Select "Group." This joins all the selected objects as if they were glued together.

You can also select "Group" under the Edit menu above the canvas.

A previously created group can also be "ungrouped" back to the individual objects by right clicking on the group and selecting "ungroup" from the pop up menu, or by selecting "Ungroup" under the Edit menu.

Nudging:

When a symbol is selected it's possible to move that symbol in one pixel increments using the up arrow, down arrow, right arrow, and left arrow keys on your keyboard. This is especially helpful for making location adjustments on small components that have multiple ports (such as tees). If the component has connectors attached to it they will automatically readjust possible as the symbol is nudged.
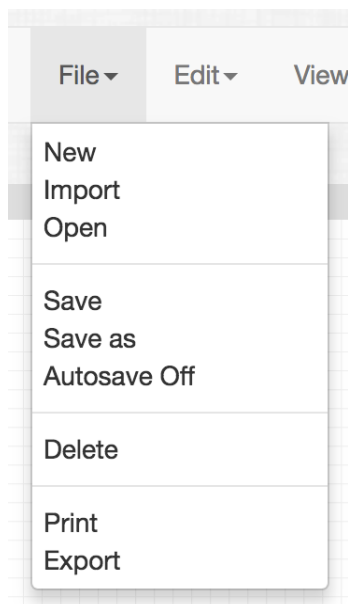
5. Pull-down menus

There are several pull down menus shown above the canvas area. They will each be described in this section.

File Menu:

The File menu opens as shown in figure 5-1.

Figure 5-1:

New:

Select "New" when you want to begin a new drawing. If you have an existing drawing open you will see a prompt (shown in figure 5-2) asking if you want to save the current version of that drawing. Clicking Save to save the current version of the drawing. Click "Don't Save" to move on without saving. Click "Cancel" to return to the currently open drawing.

Figure 5-2:
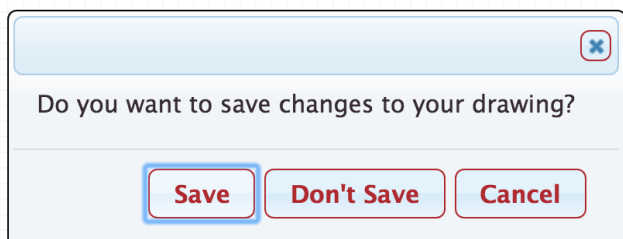
After clicking either "Save" or "Don't Save" you will be directed to another screen (see figure 5-3) where you create a new drawing and give it a name. The new drawing name will appear in a listing along with previously created drawings.

Figure 5-3:
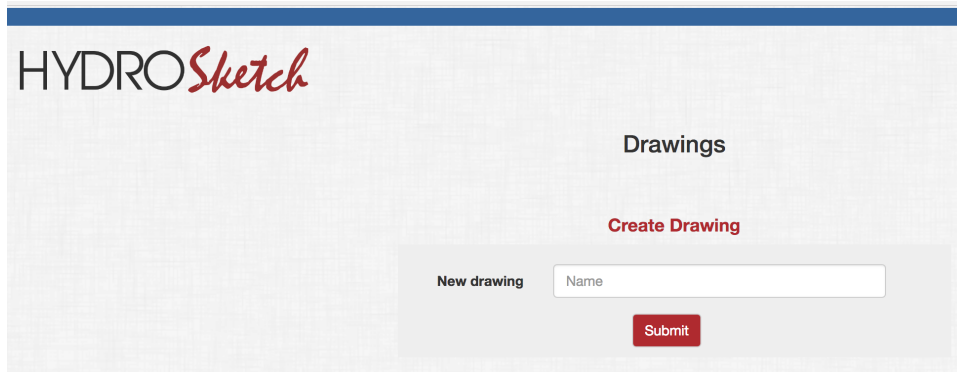
Once you've entered a drawing name, click the "Submit" button. This opens the main drawing screen with a blank canvas. The name you entered will appear as the file name just below the HydroSketch logo at the upper left of the screen.

Import:

The import command is for bringing a previously saved HydroSketch file into the program from a storage device connected to your computer. An example would be a file created by another HydroSketch user, and sent to you as an e-mail attachment.

Selecting import initiates the file selection process on your computer. Use this file selection process to locate the file you want to import among the various storage devices connected to your computer. Only files previous created by and exported by HydroSketch, and as such having the **.hs** extension can be imported.

Open:

This command allows you to open a HydroSketch file that the user had previously created. Selecting "open" displays a listing of HydroSketch drawing files that have been previously created. Just click on the name of the file you want to open, and the previously created drawing will appear on the canvas.
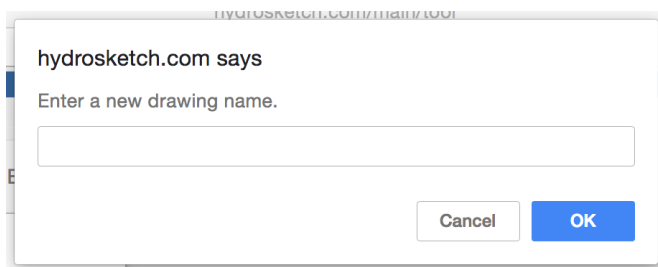
Save:

The save command saves the current status of the drawing to a secure server. The file name has already been selected and appears in the upper left corner of the screen, just under the HydroSketch logo.

Save as:

The "Save as" command allows you to store the current status of the drawing using a file name that's different from the original file name. When you select "save as" you will see a pop-up box asking for a new file name (see figure 5-4).

Figure 5-4:

Enter a new name for the drawing and then select OK to save it. The file is then stored off-site on a secure server.

Autosave Off:

By default, HydroSketch automatically stores a drawing file with its given file name *every 2 minutes* as it is being worked on. However, this feature can be turned off by the user. If turned off it can be turned back on by selecting "Autosave On" under the file menu.

Delete:

This selection is for removing an **entire drawing file** (not to be confused with deleting an object on the canvas).

Selecting "delete" opens a pop-up box asking if you really want to delete the current *drawing* file. Clicking on "yes" will delete the file. Once deleted the file can no longer be recovered. Selecting "cancel" leaves the current file as is. User's can also delete files by clicking on the small trash can icon found at the right of each file name in the listing of current drawing files.

Print:

Selecting print will display the print setup screen shown in figure 5-5:

Figure 5-5:
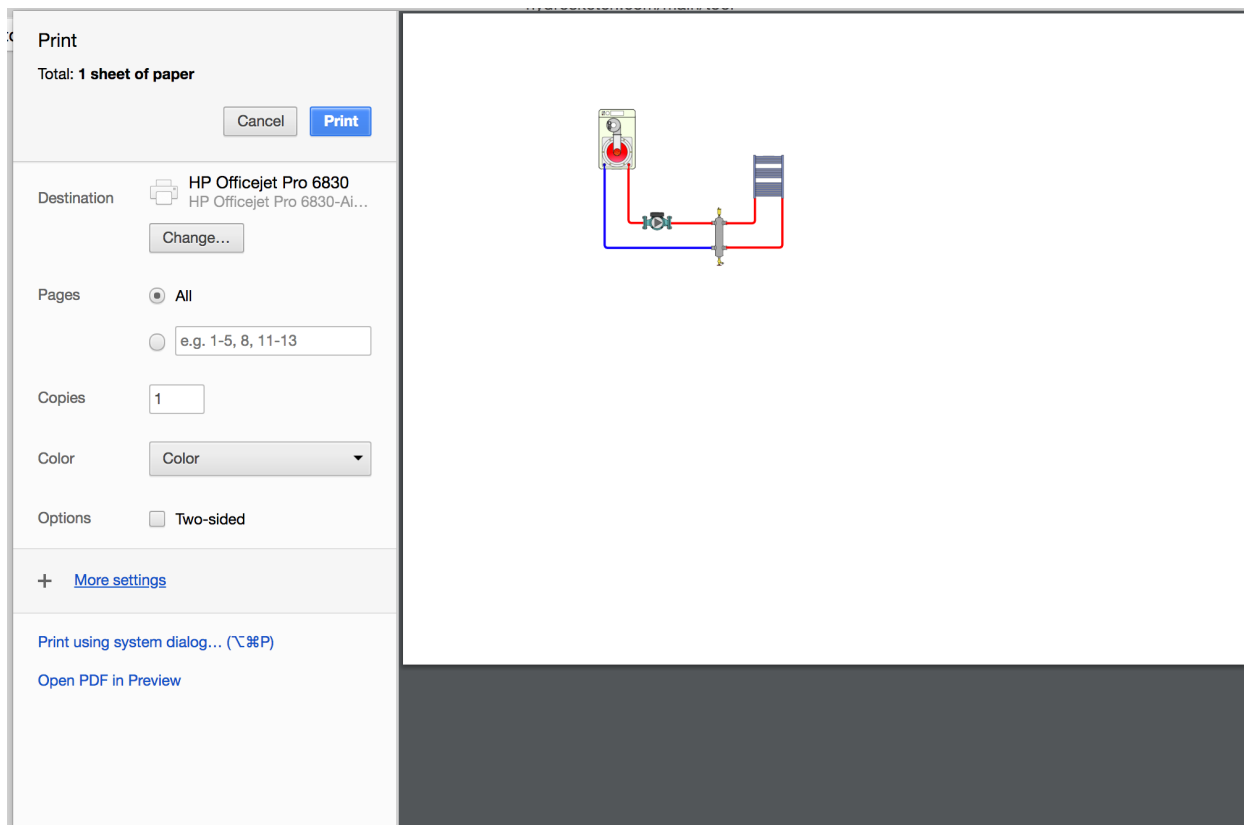
This screen is created by your browser. It allows you to select the printer to which the drawing will be printed. It also allows options such a the number of copies and the choice of color or black & white printing.

Clicking on "more settings" displays additional choices such as paper size, margins, and scale. The default paper size is "letter."

The print previous window appears at the right of these settings. It shows approximately what the printed image will be, based on the currently-set zoom level and the shape of the currently-selected paper size.

Select "Cancel" if you decide not to print the drawing when the print previous window is displayed.

Export:

This selection creates a file for the current drawing *on the user's computer* and displays an icon for that file ending with **.hs** ,which identifies it as a HydroSketch file.

The icon for this exported file can then be attached to an e-mail, or saved on any storage device. It provides an easy way to save a drawing file on the user's computer (versus on a secure off-site server). It also provides a simple way to exchange HydroSketch files with other users.

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Edit Menu:

The Edit menu appears in one of two ways depending on what object(s) are selected on the canvas. Both appearances are shown in figure 5-6. Functions that are not "valid" for the currently selected objects on the canvas are not shown on the Edit menu.

Figure 5-6:
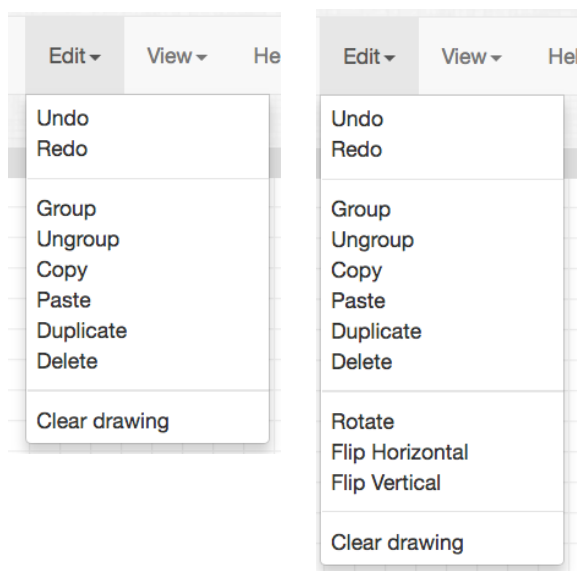
The functions listed in the Edit menu are used extensively in creating and making changes to drawings. These functions can also be selected using keyboard short cuts, which can be found at the "quick reference" selection under the Help menu.

Undo:

This editing function will undo the last change made to the drawing. This is very helpful when the user decides that the last change to the drawing is NOT wanted. If selected

multiple times it will continue to undo the previous changes to the drawing in the reverse order in which they were made.

Redo:

Redo as the opposite of Undo. If selected it will redo the change to the drawing that was just undone by the "Undo" selection.

Group:

This editing function is the equivalent of digital glue. It allows you to select multiple objects on the canvas and bond them together as a single entity. This is very helpful when an assembly of multiple objects, all positioned as desired, is used multiple times on the same drawing.

It is also possible to have groups within groups. An object that was formed by grouping other objects can then be grouped with a different object on the canvas.

To use this editing function hold down the shift key and click on multiple objects on the canvas to select them. This is called 'shift clicking.' Then select "group" under the Edit menu. The selected objects are effectively bonded together and surrounded by a single rectangle frame.

The group can be moved, duplicated, or rotated as if its a single object.

Ungroup:

This function does exactly as its name implies, it "ungroups" objects that have been previously grouped together. Multiple ungroups are possible to ungroup nested groups

Copy:

This function copies the selected object(s) to the clipboard. Objects copied to the clipboard they can be pasted back to the canvas, which, in effect, creates a duplicate copy.

Paste:

Selecting "paste" puts a copy of what was last copied to the clipboard onto the canvas.

Duplicate:

This function makes a duplicate of the selected object and places it on the canvas with a slight offset from the original.

Delete:

This selection deletes the currently selected object(s).

Rotate:

This selection rotates the selected object by 90º counterclockwise. It can be used repeatedly. Each time it is selected the object rotates another 90º counterclockwise.

Flip horizontal:

This selection flips the image 180º around an (imaginary) vertical axis. It's a convenient way to change the direction of components such as circulators. When an object is flipped any connectors attached to it are deleted. They can be redrawn. *Grouped objects cannot be flipped horizontally.*

Flip vertical:

This selection flips the image 180º around an (imaginary) horizontal axis. It's a convenient way to change the direction of components such as circulators. When an object is flipped any connectors attached to it are deleted. They can be redrawn. They can be redrawn. *Grouped objects cannot be flipped vertically.*

Clear drawing:

This selection is used when the user wants to clear ALL objects and text from the canvas. When "Clear drawing" is selected the user is prompted with the pop-up shown in figure 5-7.

Figure 5-7:
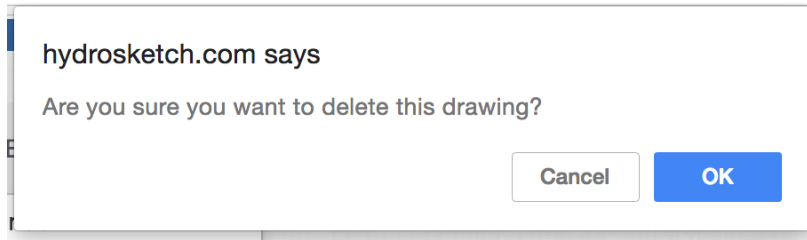
Clicking "OK" will remove all objects and text from the canvas. *Once the canvas has been cleared it cannot be restored using the Undo command.*

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View Menu:

The View menu opens as shown in figure 5-8.

Figure 5-8:
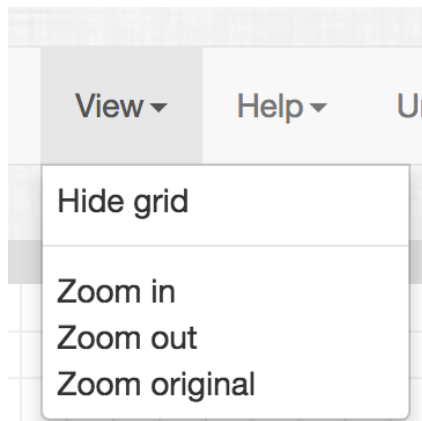
Hide grid:

This selection lets the user show or remove the light grid created on the canvas. When on, the grid can visually assist with horizontal and vertical alignment of objects on the canvas.

Zoom in:

This selection zooms in on the canvas, and is useful when working on highly detailed areas of a drawing.

Zooming in can also be done by clicking on the "+" sign seen in the red area at the bottom right of the canvas.

Zoom out:

This selection zooms out on the canvas, and is useful when working on large schematics. Zooming out allows the user to see the extents of a schematic that, at normal viewing size, would not all fit on the canvas. It reduces or eliminates the need to use the horizontal and vertical scroll bars found at the right side and bottom of the canvas. Zooming out can also be done by clicking on the "-" sign seen in the red area at the bottom right of the canvas.

When the limits of the zoom out capability are reached, the "-" sign in the red area at the bottom right of the screen changes to a faded red. Click on "original" to restore the default view size.
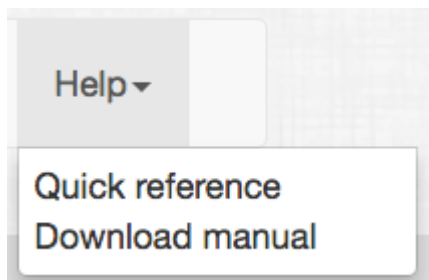
Zoom original:

This selection returns the view of the canvas area to its normal (default) size.

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Help Menu:

The Edit menu opens as shown in figure 5-10.

Figure 5-10:

Selecting "Quick reference" opens a *separate window* with a listing of many HydroSketch functions, and a listing of key combinations that can be used execute those functions.

For example, to flip an object vertically, hold down the Ctrl and F keys simultaneously, and rotate the scroll wheel on you mouse upward (e.g. "mouse up").

To change the width of a connector, click on it to select it, then hold down the Ctrl and S keys simultaneously and scroll the mouse wheel up (to increase connector width), or down (to decrease connector width).

Key combinations take some time to learn, but can speed the drawing and editing process once they are familiar.

The"Quick reference" can remain open while you are working on a HydroSketch drawing. This is especially helpful while learning to use key combinations

The "Quick reference" window can be closed at any time by clicking the close window icon displayed at the top of the browser window. It can also be minimized.

Selecting "Download manual" under the Help menu will download a copy of this user manual to your computer as a PDF file. That file will be placed at the location which you direct it to on your computer's file access system. To access that PDF file you will need to locate it on your computer and then use any PDF reader program such as Adobe Acrobat Reader, or Preview on the Mac OS X operating system.

6. Toolboxes

This section discusses details on several of the toolboxes seen at the far left side of the HydroSketch screen.

Text:

To add text to a drawing, _drag the text toolbox onto the canvas_. You will see a small text box as seen in figure 6-1.

Figure 6-1:

Just begin typing the text you want. The text box will automatically expand as you continue entering text as shown in figure 6-2.
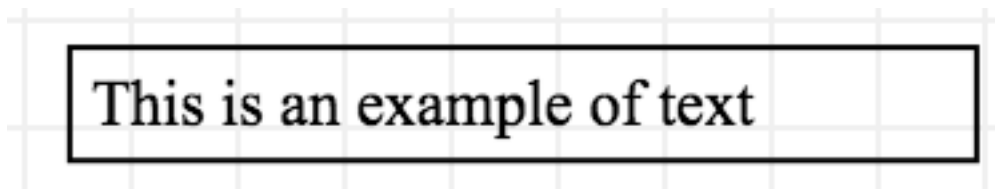
Figure 6-2:

This is an example of text
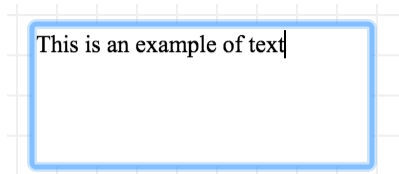
When you've entered the text you want, just click elsewhere on the canvas.

You may see a border around the text as shown in figure 6-3.

Figure 6-3:

This is an example of text

The width of the lines that form this border can be changed by using the controls in the attributes box at the left of the canvas. Use the slider control to make the border wider, narrower, or *move the slider to "0" to remove the border.*

You can change the default font (Arial) to other fonts by clicking on the "Font Family" attribute, and then clicking on one of the displayed font names.

The size of the text can be adjusted up or down using the Font Size attribute. Font sizes range from 8 to 100 points.

The color of the selected text can be changed. Select the text by double clicking on it, and then dragging across it. Then, click the "Font Color" attribute. This will bring up the color selector window for your browser. Click on the color you want the text to be within this color selector window and the text will immediately change to that color. Note: *Once you've changed the color of the text, that color will remain active if you continue to add more text to the drawing. You can always go back and change the color of any text using the Font color attribute.*

The default angle of the text is 0º. This displays the text in the normal orientation. You can change the angle of the text using the slider controller. The angles to which the text can be set are increments of 90º. We recommend that the text angle be set to 0 prior to editing the text.

The "Opacity" slider within the attributes window can be used to change the opacity of the selected text. Lowering the opacity will make the text appear more transparent. Setting the opacity to 0 makes the text total transparent. Setting the opacity to 1 makes the text totally opaque. If text with reduced opacity is placed over other objects, it is possible to see some of the underlying object through the text.

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Polyline:

The polyline tool provides wide flexibility in how the user can add lines to the drawing.

Note: The polyline tool should not be confused with the connectors tool.

The polyline tool allows you to create a simple straight line segment, or a more complex assembly of line segments, each having different lengths and angles.

To draw a simple line segment click on the polyline icon in the toolbox column. You will see a red frame around the polyline icon indicating that it is selected.

Next, move the mouse cursor to the location on the canvas where you want the line segment to begin. DOUBLE CLICK the left mouse button at this location. You will see the beginning of the line segment at the tip of the mouse cursor. Drag the mouse cursor in any direction and a line segment will follow. This action is called "rubber banding."

Move the mouse cursor to the location where you want the line segment to end and DOUBLE CLICK. This terminates the line segment.

The polyline tool will remain active until you click on the polyline icon under the toolbox to make it inactive, or click to use another tool.   This allows you to quickly draw multiple line segments without having to reselect the polyline tool for each segment.

It's also possible to draw polylines that have multiple line segments (hence the name "polyline.") Do this by starting the polyline with a DOUBLE CLICK, then move the mouse cursor to the location of the first vertex (e.g., the first change in direction point) and SINGLE left click. The second segment of the line will be created as you move the mouse away from this first vertex. You can continue to create multiple attached line segments by SINGLE left clicking at each desired vertex. When you want to end the polyline just DOUBLE CLICK.

The attributes window for polylines, shown in figure 6-4, allows you to change the width, color, and opacity of any polyline, much the same as with connectors.
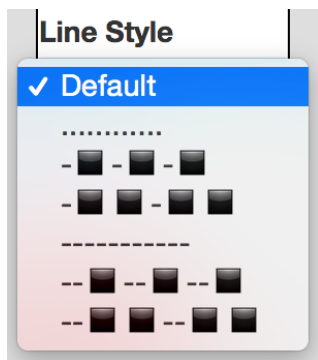
Figure 6-4:
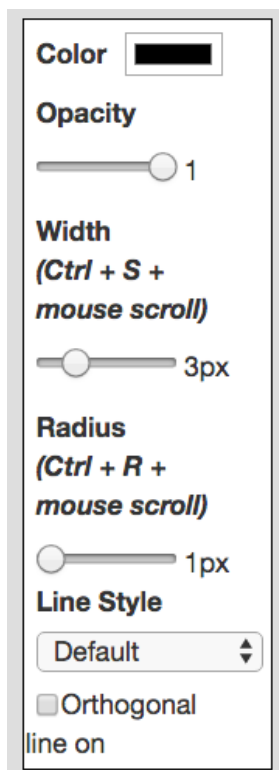
Fillets (e.g., rounded corners) of various radii to be automatically generated at vertices between line segments. Just use the slider bar in the polyline attributes window. If a radius other than zero is set prior to drawing the polyline the radii will appear as it is drawn. If radii are to be added to an existing polyline, select that polyline by clicking on it, and then use the radius slider to add the radii to all vertices in that polyline.

The style of the line can also be changed using the Line Style selector in the polyline attributes window. The default line style (solid) can be changed to multiple types of dashed lines as shown in figure 6-5.
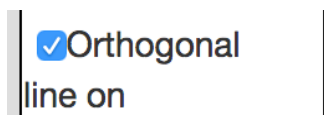
Figure 6-5:

Orthogonal line on:

If the check box next to "orthogonal line on" is checked in the polyline attributes window, as shown in Figure 6-6, the segments of the polyline will be restricted to horizontal and vertical directions.
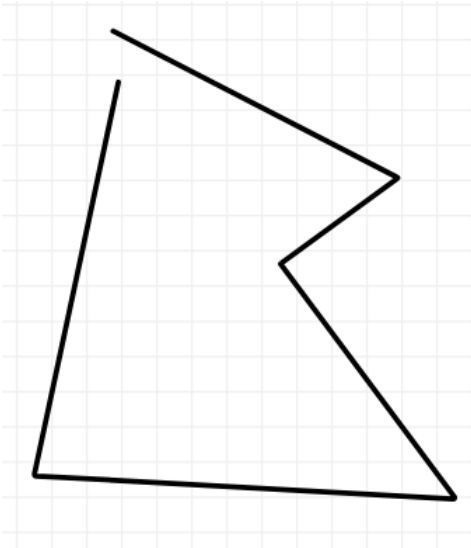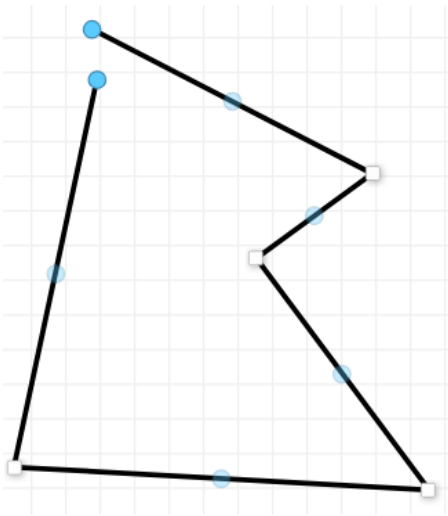
Figure 6-6:

Each line segment will snap to either vertical or horizontal directions (whichever is closer) when there's a SINGLE left click to create that segment.
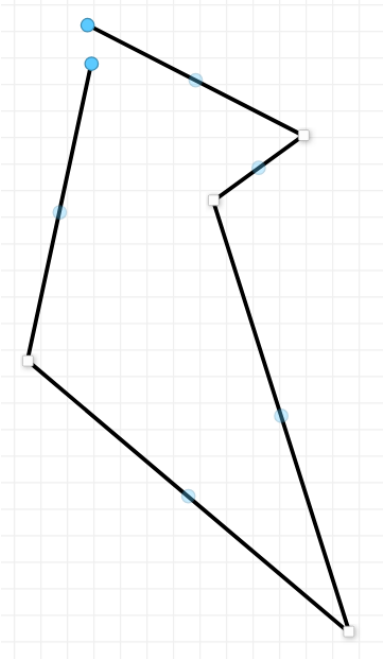
Editing polylines:

Figure 6-6 shows a randomly created multi-segment polyline.

Figure 6-6:

Left click anywhere on the polyline to select it. You will see darker blue circles at the beginning and end of the polyline. You will also see light blue circles at the center of each segment, and small white squares at each vertex, as shown in figure 6-7.

Figure 6-7:

You can 'grab' any of the white square handles and drag it to a different position. The attached line segments will automatically follow this move, as shown in figure 6-8.

Figure 6-8:

You can also move the starting or ending points of the polyline by dragging the market blue circles, as shown in figure 6-9.

Figure 6-9:
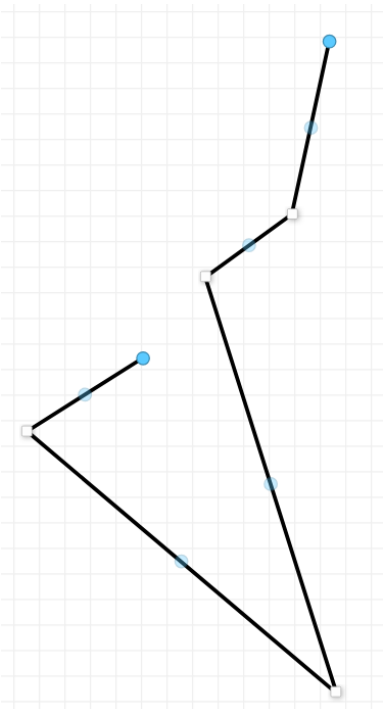
If you click on any of the light blue circles that appear on each segment, that segment will be divided in half, and a new square handle will be placed at the mid-point. You can then drag that new square handle to create a new vertex in the polyline, as shown in figure 6-10.

Figure 6-10:
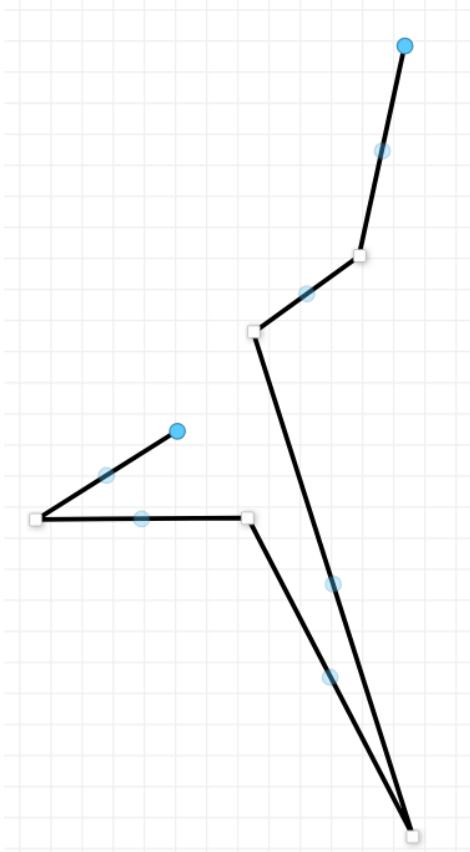
Polylines are a very versatile tool. We encourage you to "experiment" with creating polylines. Try changing color, width, opacity, fillets at vertices, orthogonal constraints, and adding new segments.

One use of polylines is creating "leaders" that point to some detail on the drawing and "lead" the viewer back to a word or line of text describing what is being pointed to. You can make a leader line using only the polyline tool. An example is shown in figure 6-11.

Figure 6-11:

Start at the text end, DOUBLE click to start the polyline, then SINGLE click where you want the vertex (change in direction). SINGLE click where you want the point of the arrow. SINGLE click where you want one side of the barb. SINGLE click back on the tip of the arrow. Finally, DOUBLE click at the other end of the barb.

You can also make a leader by combining a polyline with one of the arrowheads found in the "Shapes" palette. Draw the polyline. Move one of the arrowheads from the "Shapes" tool palette over the end of the polyline. Finally, group the polyline and arrowhead. An example is shown in figure 6-12.

Figure 6-12:
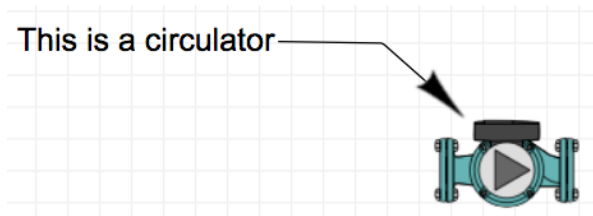
Shapes:

Clicking on the "shapes" toolbox opens selection palette containing several "primitive" shapes such as circles, rectangles, and triangles. Arrowheads pointing in several fixed directions are also shown in the shape palette.

Any of these shapes can be dragged onto the canvas and then modified.

The size of the shape can be increased or decreased by clicking on the shape to select it, then using the mouse to drag inward or outward from any of the small selection handles (e.g, small white squares) that appear around the shape. Figure 6-13 shows and example of these handles.

Figure 6-13:
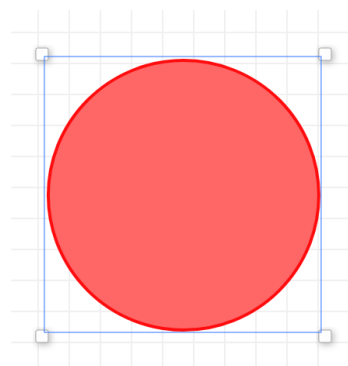
When the shape is selected, and the cursor is placed over one of the small selection handles, a small arrow appears over the selection handle indicating a direction to drag that handle to increase the size of the object. *Although this small arrow points outward, indicating the drag direction for increasing the size of the shape, the handle can also be dragged inward to decrease the size.*

Shape symbols have a variety of potential uses.

An individual shape symbol such as a rectangle with a specific color, size, border, etc. could be used to represent a component that's not in one of the other toolboxes. *Note however that there are no ports on shapes. Therefore they cannot latch to connectors like other pre-defined piping and electrical symbols.* Shape symbols can be placed "on top" of connectors or polylines, as can other component symbols. Visually this is fine, however, any symbol placed "on top" of a connector or polyline will not move with that connector.

Multiple shapes can be combined and "grouped" to create a unique new symbol.

Custom graphics:

This tool has multiple uses that allow additional symbols, imported images, and complete schematic templates to be added to HydroSketch drawings.

The upper section is labeled "**Admin images.**" It allows the HydroSketch development team to add new symbols and template drawings to HydroSketch. Users can choose to import any image files listed in this area. However, *users cannot add or delete files listed under "Admin image files."*

Users are encouraged to periodically check the "Admin images" list for new additions to HydroSketch. These additions are immediately available to all HydroSketch users as soon as they are uploaded by the development team.

The middle section is labeled "**User-defined images**." It lists graphic files that have been *created* or *imported* by the user.

Creating a user-defined image:

To *create* a user-defined image from objects on the HydroSketch canvas follow these steps:

1. Arrange the objects as desired and then group them using the "group" selection under the Edit menu.

2. *Right click* anywhere inside the group, but not on the objects themselves.

3. Click the 'Save as' option.

4. Enter a name for the image file.

The image file name will then appear under "**User-defined images**" in the pop up window for the Custom graphics tool.

Importing an image:

HydroSketch can import images that are in either JPEG or PNG file formats.

To import an image follow these steps:

1. Be sure the file you want to import is not too large. We recommend that the maximum image size is 2 inches in either vertical or horizontal direction, and that its resolution not exceed 200 DPI (dots per inch). Large image files, such as from digital cameras, can be reduced to smaller sizes using pixel editing software such as Photoshop, Pixelmator, or other similar software.

2. Click on the Custom graphics tool to select it. You will then see a pop-up window, a portion of which is shown in figure 6-12.

Figure 6-12:

3. At the bottom of this pop-up window, under "**Import an image**" you will see a button labeled "choose File." Click it to go to the file access system on your computer.

4. Navigate through your computer's file system to the image file you want to import (it needs to be a JPEG or PNG file). Select it, and click the "open" button. This adds the file name to the list under "Imported images", along with a small trash can icon to the right of the file name.

Placing an imported image on the canvas:

To place an image from either "**User-defined images**" or **Admin images**" onto the HydroSketch canvas, first click on the "Custom graphics" icon at the bottom of the toolbox. A red frame will appear around the tool icon indicating that it's selected. This also opens a pop-up window, a portion of which is shown in figure 6-8.

*To bring any image that's on the list of imported images onto the canvas **click on the file name.***

Depending on the size of the image file, there may be a momentary delay between when you click on the file name and when the image appears on the canvas.

Once the image is on the canvas click on it. This creates a temporary editing frame around it, along with small square 'handles' at the four corners. You can drag any of these handles inward or outward with the mouse cursor to change the size of the imported image while maintaining its horizontal and vertical proportions. You can also drag the image around the canvas as you would with other objects.

Imported images cannot be duplicated, copied, or pasted. They also cannot be flipped vertically or horizontally.

Imported images can be grouped along with other objects.

Deleting an imported image:

To delete an imported image file click on the trash can icon to the right of the file name. You will be prompted with a pop-up asking if you're sure you want to delete this image. Click OK to permanently delete the image. Click Cancel to return to the drawing without deleting the image. Remember that you cannot delete image files listed under "**Admin image files.**"

END of user manual