Using LED Wizard 7:

A Detailed Workflow Guide

www.aries-graphics.com

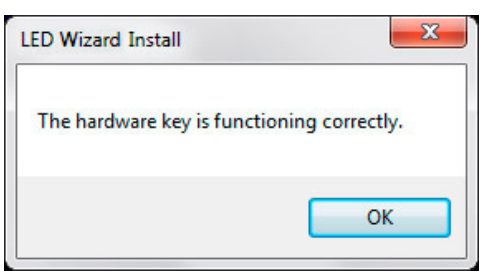
Table of Contents

Installation and Setup

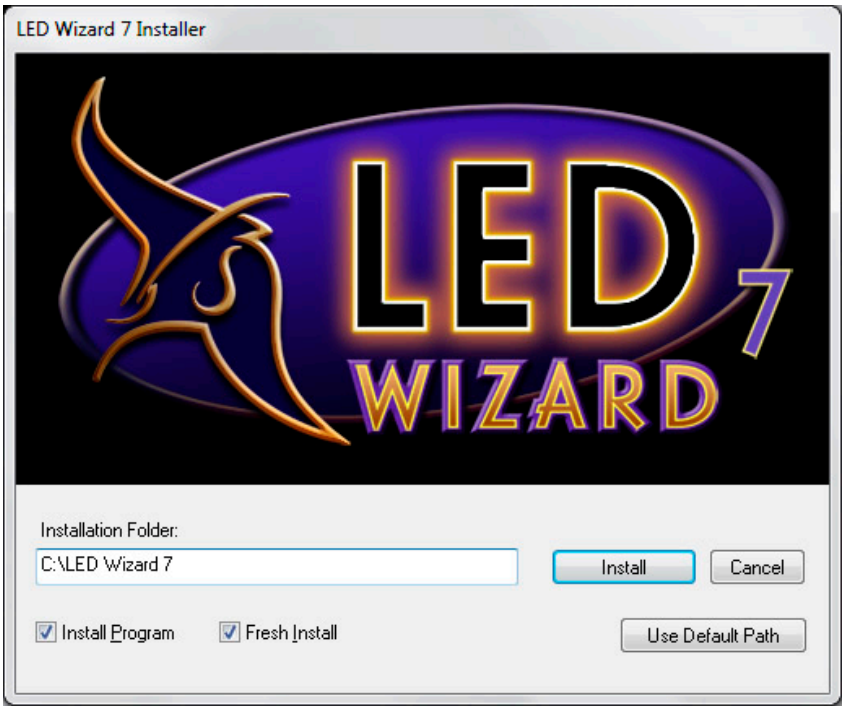
If you are installing from an LED Wizard 7 disk, put the disk in your CD/DVD drive on your computer.

Depending on your operating system, security software, and other variables, you may be asked if you want to continue. Click Yes or Continue. Your system may automatically run the "setup.exe" file, in which case this setup screen will appear. If this does not happen, then you must run the "setup.exe" file on the CD to install the program.

If this is your initial installation of LED Wizard, and you do not also have a current version of Sign Wizard and/or Neon Wizard installed on your system with a USB Key, then you must install the Key Driver. First place the USB Key in an available USB port on your computer, and then click on **Install/Check Key** and follow the directions. If you aren't sure whether you have a current key driver, click on this button to Check. If the driver is current, you'll get this message; otherwise go through the installation process.



You can also **Browse this CD** if you are looking for something particular on the disk, but otherwise you need to click on **Install LED Wizard 7**. This will launch the LED Wizard 7 Installer.

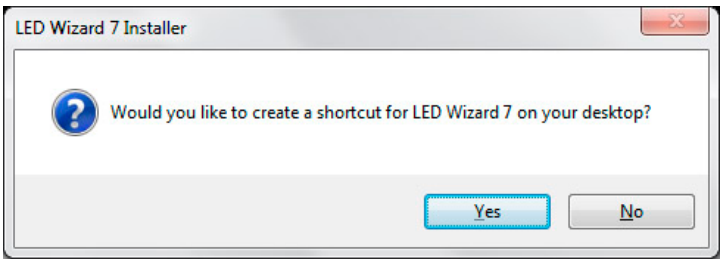


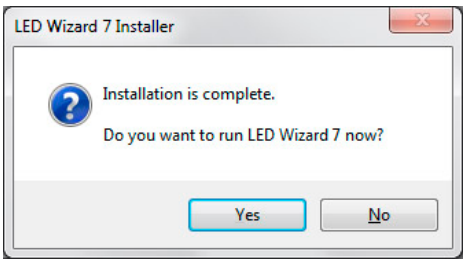
If you are installing from a downloaded file from the Aries Graphics web site, the exact procedure will depend on your operating system, browser, and security software. You may be asked if you trust the company and if you want to continue, so click Yes or Continue to these questions. The downloaded file will be single ".exe" file, and these types of files are sometimes flagged as "suspicious" by some browsers when downloaded from the internet. When you run this file, you will be presented with this LED Wizard 7 Installer. From here on, the installation from a disk and from a download are the same.

For your initial installation, this is what the Installer will look like. You can change the Installation Folder to another location on your computer just by typing in the path of the location you prefer. The "default path" is **C:\LED Wizard 7**. The buttons **Install Program** and **Fresh Install** will automatically be checked. Click on **Install** to continue.

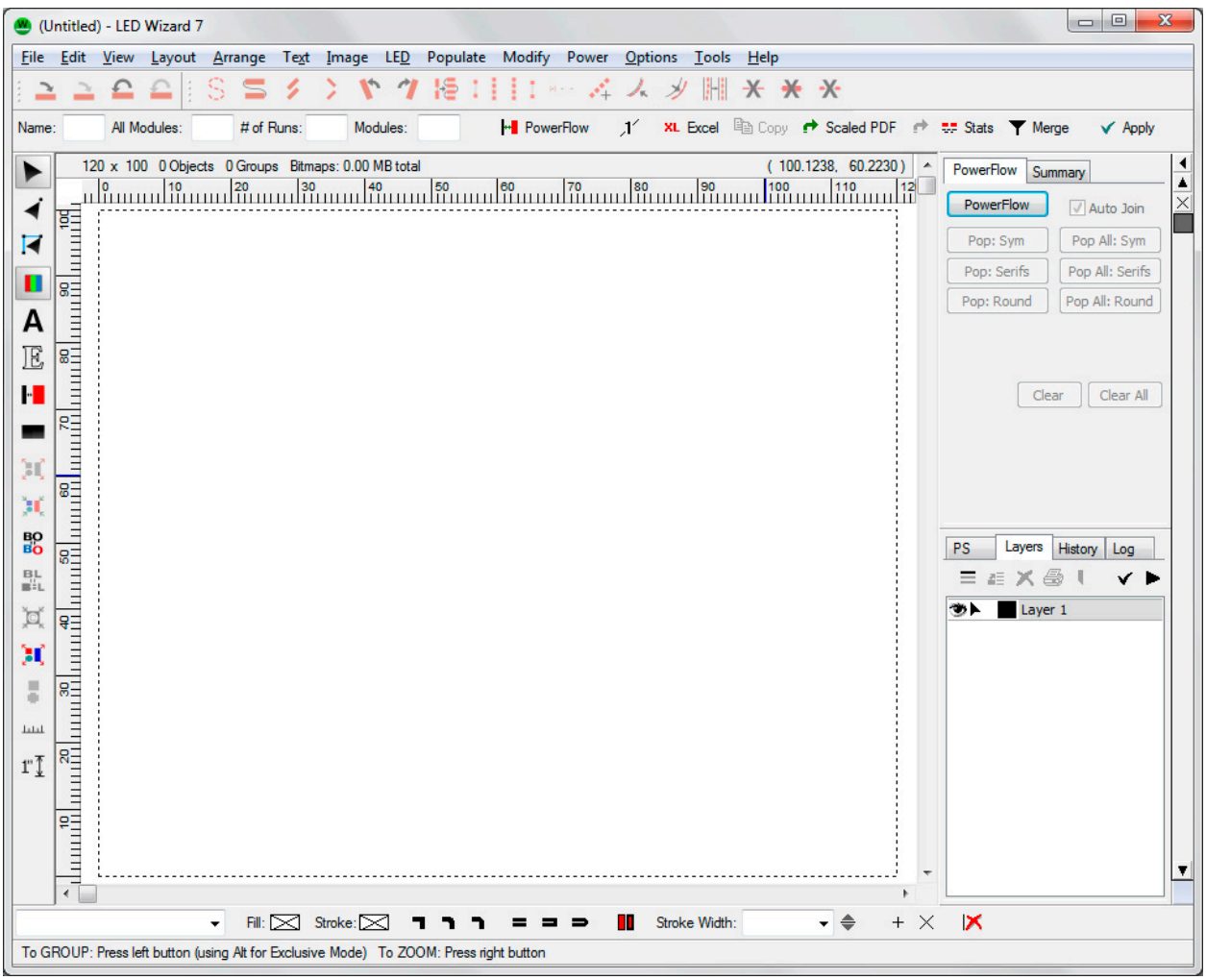
If you are installing an Update, meaning that you already have a prior version of LED Wizard 7 installed on your computer, then the **Fresh Install** button will be Unchecked. If you want to install the update over your current installation, then keep the Installation Folder the same as your current folder. If you want to install the update into a new directory, then type in the new address before clicking on Install. Note that you cannot install into Program Files in Vista or later because LED Wizard modifies data files in its program folder, which is no longer permitted.

You will be asked if you want to put a shortcut icon on your desktop for LED Wizard 7, and the default answer is Yes. At the end of the installation, you will be asked if you want to run LED Wizard 7 now. Click on Yes and the program will launch.





This is how the screen will look when you first run LED Wizard 7 after installing:



We'll do a quick overview of the main sections of the program. The first thing to notice is the **Workspace**, which is outlined with a dotted line. This area can be resized by clicking and dragging on one of those dotted lines. Try to keep your designs within the workspace, although they can extend beyond. Along the left of the screen is the **Toolbox** of icons, which can be customized to your liking. If you don't know what an icon does, hover the mouse over it and a "**Tool Tip**" will appear. On the right side of the screens, we have the various **Tabs**, including PowerFlow and Summary at the top, and then PS (Power Supplies), Layers, History, and Log. You can switch which tab is visible by clicking on the name at the top.

At the very top of the screen, we have the drop-down **menus**, of which there are three new ones in this release: **Populate**, **Modify**, and **Power**. Some of these menu items have sub-menus (indicated with an arrow) with additional options. (We will use the convention "**Menu | Command"** when describing where to find features in the menus.) Below the menus are a new set of **Icons** for PowerFlow editing, which we will talk about later in this document. Below these icons is the standard **LED Property Bar**, which will display information when an LED object is selected. Finally, at the very bottom of the screen is the **Help Bar**, which will display instructions and options depending on what you are doing in the software. It is a very good idea to keep an eye on this Help bar if you are unsure of what to do next!

There are two main operating modes in LED Wizard 7. The first is **Layout Mode**, which uses the **Layout Tool**  , located at the top of the toolbox on the left. In this mode you can **Select** objects, **Move** them, **Scale** them, and **Group** them, among many other tasks. This is the default mode when you start the program. When you click on an object, you will see control points around the outside. This text object is now "selected" and you can perform various actions on it.

You can also make a **Group** by selecting multiple objects. Just draw a box with the left mouse button around all the objects you want to include in the Group. This is important because when you are populating your design, each item that you want to populate must be included in the group.

The first part of this document will deal with the Layout Mode and working with imported files.

The second main operating mode is **PowerFlow**, and much will be said in this document about it. PowerFlow is the comprehensive new tool where you add and edit LED modules and power supplies to create your finished layouts. In order to get into PowerFlow, which we'll introduce in the section on Auto Population, you must have an object or group selected with the Layout Tool. You can move back and forth between the Layout Mode and PowerFlow, and when you finish reading this document, you'll know what you can do in each mode.

There is one global function that we should mention up front, and if you are a previous Sign Wizard or Neon Wizard user, you know all about it, and that's using the **right mouse button** exclusively for **Zooming**. To Zoom In, draw a box around what you want to see closer with the right mouse button. To **Zoom Out**, hold the mouse still and click once with the right mouse button. The right mouse button is only used for this purpose, across all functions and modes.

While this Workflow Guide is detailed about many of the program's functions, it is not an exhaustive guide to everything in the software. Please get into the habit of accessing the documentation in the **Online Help** system, which you can do with the **F1 key,** or by pressing the Help button in dialog windows, or the  icon in many of the property bars.

Importing Files and Data Cleanup

The vast majority of LED layouts created in LED Wizard are initially imported from some other design program. The characteristics and quality of these imported files varies tremendously. We have therefore developed procedures and tools to prepare these files for LED population. It is important to do some analysis on the imported files prior to population, so that you know what, if anything, needs to be done.

File Formats

But before we get to that, here is a table of the more common **File Formats** that you can import into and export from LED Wizard 7.

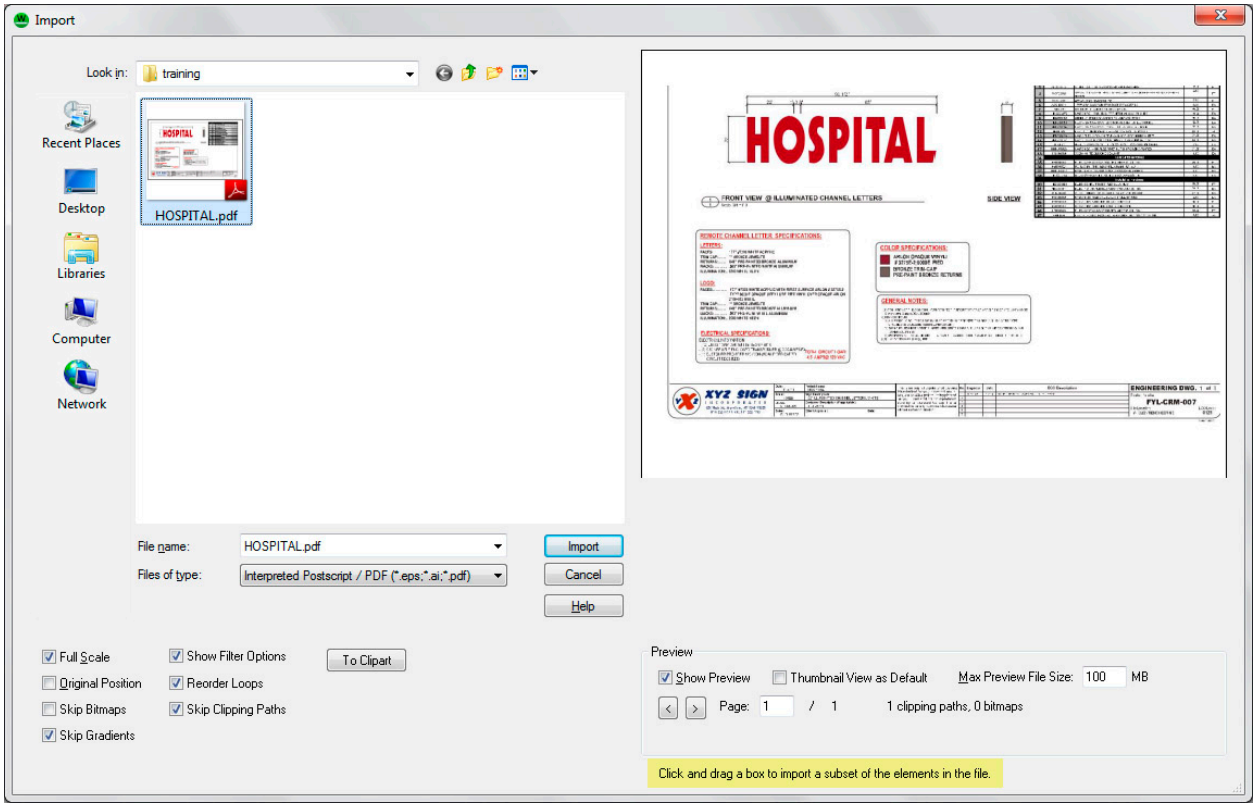
Format	Type	Import	Export	Comments
PDF	Raster +Vector	Yes	Yes	Preferred format for import and export.
EPS	Vector	Yes	Yes	Good format.
AI	Vector	Yes	Yes	Good format.
DXF	Vector	Yes	Yes	Avoid “exploded” data from AutoCAD.
PLT	Vector – HPGL	Yes	Yes	Watch out for large file sizes with chords.
JPG	Raster	Yes	Yes	Common for photographs, web content.
TIFF	Raster	Yes	Yes	Typically the highest quality raster format.
PSD	Raster	Yes		Native Photoshop format.

We realize that many customers do not know or care about the difference between a vector format and a raster format, and all of the subtleties that go with these formats and files. But it is a good idea to educate your customers and tell them exactly what you want…which in most cases is a **PDF** file. A vector file is preferable to a bitmap file. And a photograph is probably the last thing you want…especially shot with a phone, looking up at an existing sign that they want retrofitted.

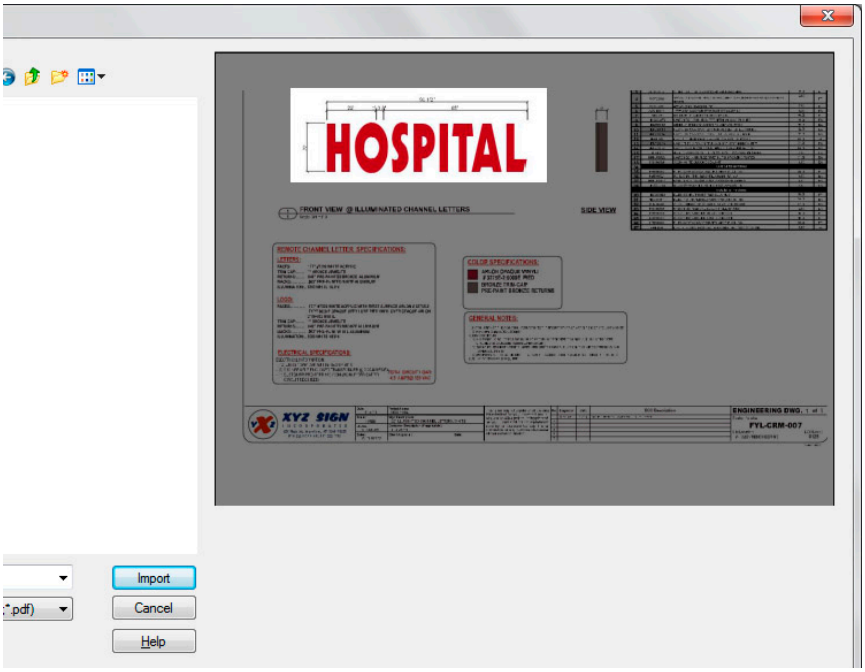
We’ll talk about this in the next sections, but it is worth mentioning here as well: you must always pay attention to the **Scale** of the imported file. Rarely are files scaled to full size, although nearly always they will have dimensions. Needless to say you won’t be able to populate a 3/8” letter with LED modules!

Import Crop

Many of the files that you import into LED Wizard contain information that is not directly relevant to the LED layout, such as a photograph of the building, the sign company logo, an artist's rendition of the building after the new sign is installed, design and installation notes, the names of everyone who ever had anything to do with the design, etc. In fact, all we are really concerned with is the letters (and the scale). So we have developed the new capability to crop just what you need from a file directly in the Import dialog box. This way, you import only what you need, and the rest of the file doesn't clutter up the job.



Here is what the **Import** dialog box looks like. The large preview window lets you see more detail in the file. The highlighted text at the bottom is what we're going to focus on here – click and drag a box to import a subset of the elements in the file. If you mess up dragging the box to the right size, just do it again. Generally, it is a good idea to keep whatever dimensioning info is in the file. Doing that with this "HOSPITAL" file looks like the following:



From this point, you just click on **Import**, and only the highlighted section will be imported. All of the rest of the data will be left behind, and you can just focus on making the LED layout.

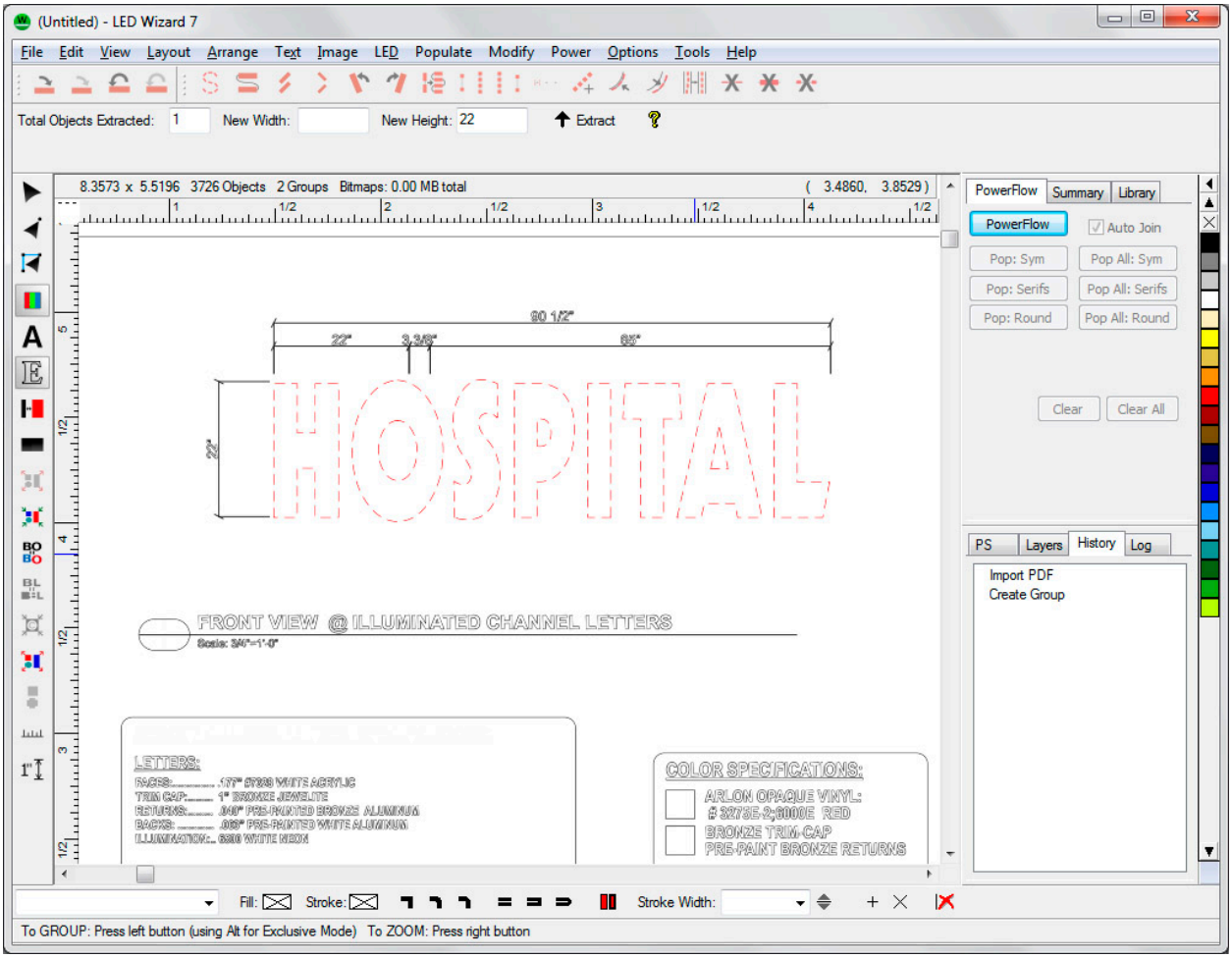
Please note some of the import options, such as **Skip Bitmaps**, **Skip Gradients**, and **Skip Clipping Paths**, which should usually be checked.

Extraction Tool

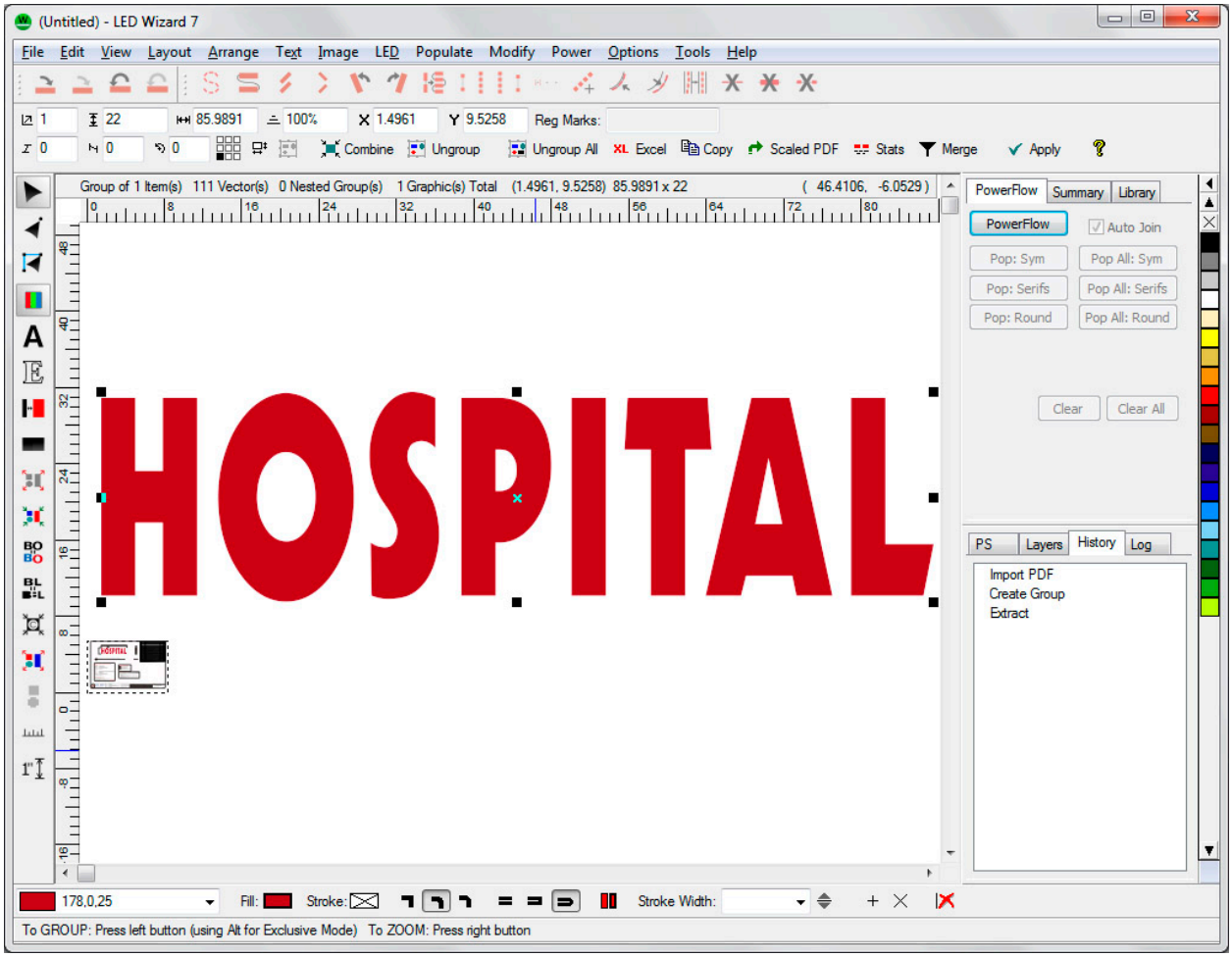
In addition to the Import Crop capability, there is another new way to isolate just the data you need from an imported file. It is called the **Extraction Tool**. It works by allowing you to easily select just the items you want to keep from the file, and then "extracting" them out of the file and into a clean workspace, with an optional scale factor.

So let's look at the same file, and assume that we imported the entire file. The first thing you'll want to do is isolate just the data you want, which is the letters. Go to **LED Menu | Extraction Tool**. Immediately the data will turn into a wireframe mode, with just the vector data showing up. Now when you move the mouse over an object, the vectors will turn into a green dotted line. If you then click on that object, this will select it for extraction and the vectors will turn into a red dotted line.

In the example here, we have selected the HOSPITAL text, which was combined into one object. At the top of the screen, it says: "**Total Objects Extracted: 1"** It also has input fields for **New Width** and **New Height** so that you can directly scale the letters to the correct size all in the same operation. For this example, we entered 22" for the height, according to the dimensions in the file.



Now when we click on **Extract**, the program will copy and resize the selected objects and place them above the original layout.



In this screen shot you can see the original imported design in the lower left and the rescaled letters in the middle of the screen. All you have to do now is delete the original import and resize the layout to fit the new letters (**Layout Menu| Size to Fit**).

There are other ways to select just what you want out of a larger file, including Group by Color (Arrange Menu), Shift+Click on each letter to add them to a group, and simply dragging a box around the items you want. But the Extraction Tool will normally be the best approach.

Data Clean Up

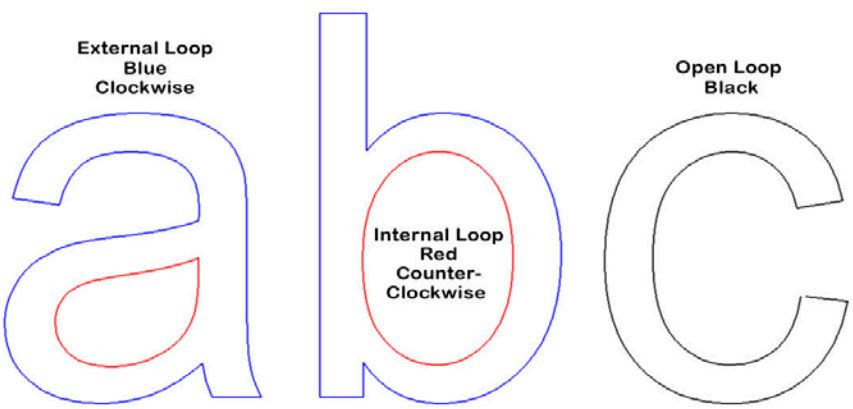
Most often we have no control or perhaps even no idea where a design file comes from. It could come from AutoCAD as a DXF file, from Illustrator as an AI file, from Photoshop as a PDF, or from Corel Draw as an EPS, a TIFF from Paint Shop Pro, or my personal favorite, a JPG from a digital camera or phone

(copyrights belong to their respective owners). Whatever the case, it is our job to create an LED layout from the file.

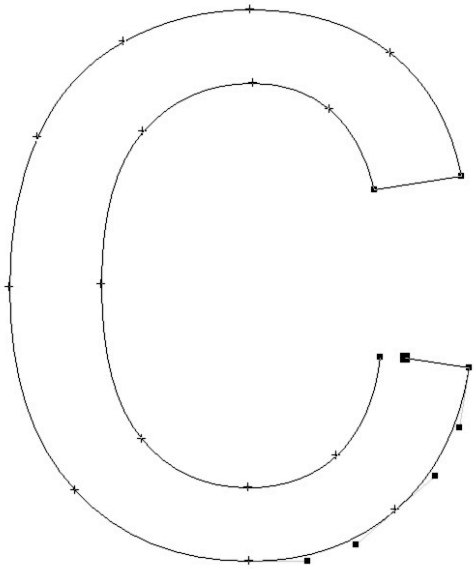
There are a number of data issues that can come along with your imported files. We have already talked about isolating the letters and/or logos in one of these large imported files. Now let's talk about examining the data in the letters. The very first observation that you have to make is *Do I have a vector file or a raster file?* If it isn't obvious by the format, go to the **Color** icon  in the toolbox on the left and click it. If the object disappears, and just a rectangle remains, then it is a raster file. If the vectors turn blue, red, and possibly black, then you have a vector file. Let's continue on the basis that you have a vector file for now. If you have a raster file, please read the online documentation on **Vectorizing**.

Loop Direction, Open and Closed Loops

The colors of the vectors indicate **Loop Direction** and whether or not a loop is **Open** or **Closed**. This is very important, because **an object that you are going to populate with LEDs must have closed loops, and these loops must be in the correct direction**. The outside loop must be **blue**, indicating a clockwise loop direction, and an inside loop must be **red**, indicating a counter-clockwise direction. An open loop is **black**, and must be closed prior to populating with LEDs. So the first thing you want to do when analyzing an imported file is **turn off the colors** and look at the colors of the loops.



If the loops in your design do not follow these rules, select the letters or logo and select **Edit Menu | Reorder Loops**. An alternate approach is to use the **Combine** function on the selection, which is in the **Arrange Menu | Combine**. This will create one object from all the loops that were in the selection, and reorder the loops at the same time.

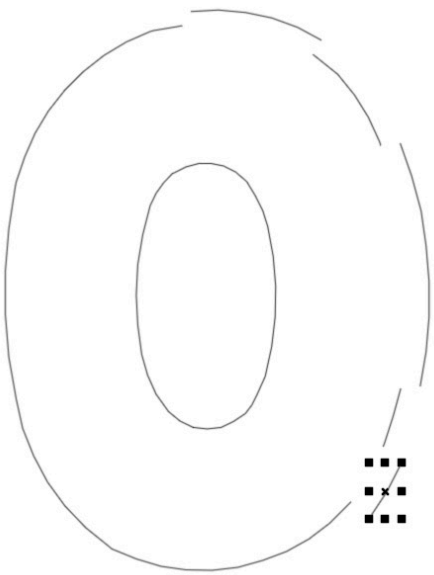


If you notice that a loop is black, then we have to do some additional investigation. We want to see what the individual vectors look like for the object, so click on the **Vector Edit Tool** , which is the second tool on the left below the **Layout Tool** . Here is the "C" from the above example, which is comprised of Bezier curves and a couple lines. You can see where the loop is open. The quick way to close this loop is to select **Arrange Menu | Close All Loops**. This may not work if the gap is too big, so…

An alternate and more precise method is to manually close the loop. While in the Vector Edit Mode, just select the end point of the line where the loop is open, hold down **SHIFT**, and move the point over the end point of the Bezier curve. The program will click, and the two points will snap together. Just release the mouse and the points are now connected.

Exploded Data

There are two other important potential data issues that will be revealed when you switch to the Vector Edit Mode to display the individual points: **Exploded Data** and **Excessive Nodes**. Exploded data usually comes from AutoCAD. This basically means that every vector is separate and not connected to any other vector, even though the end point of one vector will be exactly in the same position as the start point of the next vector. An object with exploded data will show up as a black loop, since none of the vectors are connected, although visually you will not be able to see where the loop is open. You can confirm that you have exploded data just by trying to move an entire letter that is not a Group using the Layout Tool. Instead, you will move just one arc or line.

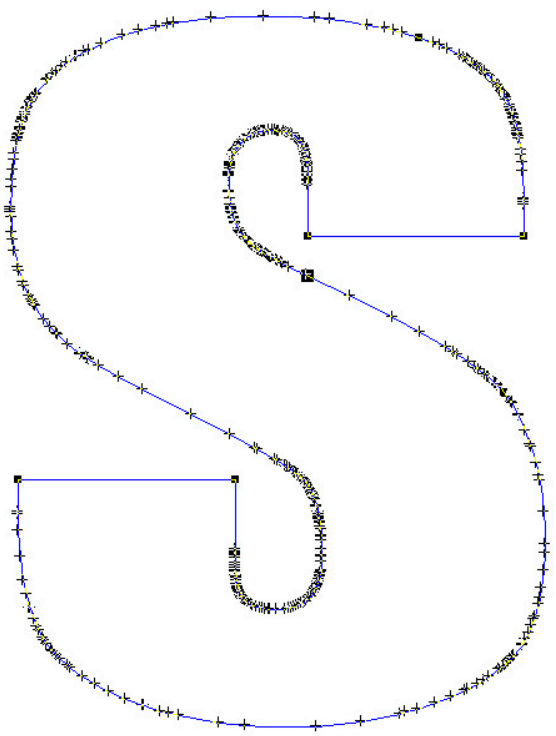


Here is a letter with exploded data. Each vector is its own object.

Fortunately there is a solution to this problem! If you have moved vectors in the manner shown here, **Undo** (Backspace key or Ctrl+Z) until all the vectors have the points perfectly aligned. Make a Group of all the letters you need to fix by drawing a box with the left mouse button while in the Layout Tool. Now select **Edit Menu | Convert Exploded Vector Paths**. Voila! Problem solved. To verify, outer loops should now be blue and inner loops red, with the colors turned off. Note that if you select this command without an object selected, it will check the entire layout for the exploded data.

Excessive Nodes

The other data problem that you can expose by going into the Vector Edit Mode is that of **Excessive Nodes**. Most letters can be reasonably defined in **25-50** vectors. So if you have a letter that has, say, **1000** vectors or more, we would consider this to be excessive and would want to clean it up. Data of this magnitude is only going to slow down the software and increase the chances of a data-related problem, such as coincident points, vectors doubling back, open loops, etc.

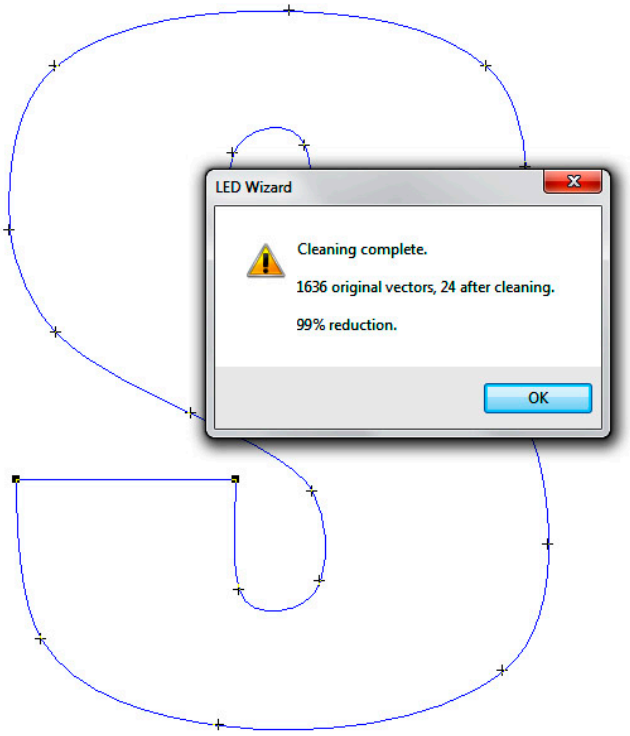


Here is an example letter with excessive points. In fact, there are so many points here (1636 total) that it is difficult to show in an image. While letters with many nodes can be processed, we highly recommend using the fewest number of nodes to describe the letter.

To solve this data problem, use the function **LED Menu | Recreate with Bezier Curves**. There are actually three options here – **Tight**, **Medium**, and **Loose**. Tight will maintain the most fidelity to the original path and will result in the fewest number of points deleted, whereas Loose will allow for more deviation from the path and will result in the largest number of points deleted.

It is important to note here that the exterior path of the letter used in creating an LED layout does not have to be perfect. Some deviation from the original path is acceptable, as we are using it only to position LED modules, not for routing the letter backs.

The results of the function are a reduction from 1636 vectors to just 24 vectors, a 99% reduction. Your mileage may vary, depending on a variety of factors, but the end result here is what you'd expect with clean data.



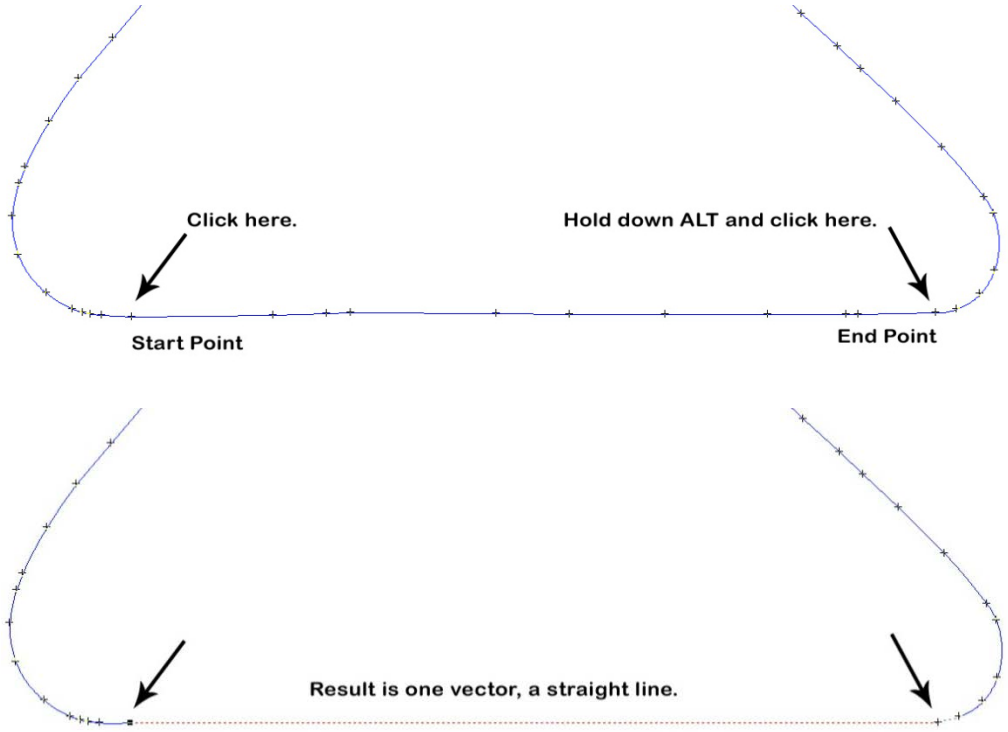
ALT Smoothing

There is one more data reduction technique that we should mention, one that is useful on a specific section of a letter where you want to get rid of some points. We call it **ALT Smoothing**, and it lets you selectively go around a letter and remove points.

The process is as follows: select the letter you want to work on and get into the Vector Edit Mode  . Click on a point that you want to have as the starting point for a new line or arc. Now move the mouse to a point that you want to have as the end point, hold down the ALT key, and click on that point. All of the points between the start point and end point will be deleted, leaving you one line or arc in their place.

It is important in this process that you do not remove too many points so as to dramatically alter the path. You should select a range of points that can be approximated with an arc or line (this is arc based, not Bezier curve based).

Here's a simple example of making a straight line. This will remove 10 vectors and straighten this section. If you work around a letter, you do not have to reselect a new start point every time. The end point from the previous operation will become the start point for the next one.



You may encounter situations where the software seems to have a problem with a particular letter, such as the auto-population was poor. You can use this technique to clean up just that letter, or a section of that letter, if you see a data problem such as excessive vectors or a vector doubling back on itself.

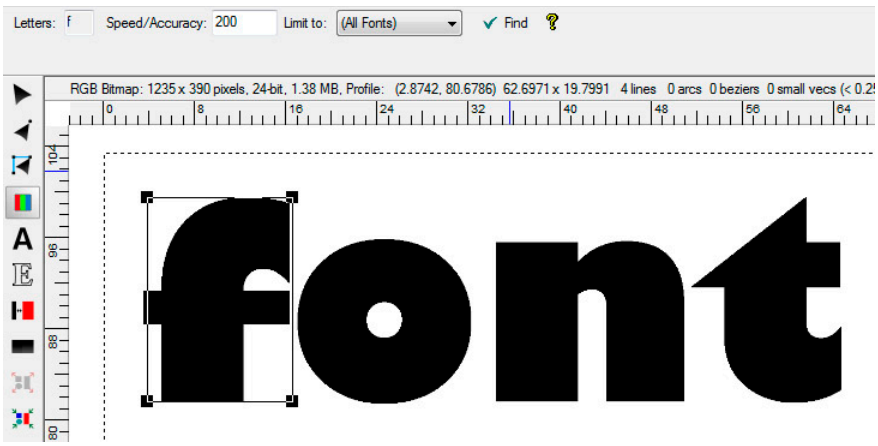
Once again, we provide these kinds of tools because we cannot dictate the kinds of files that are brought into the program. We do have some automated processes that will run on all files, including one that will handle **Coincident Loops**. Coincident loops are two or more loops that are identically shaped and in exactly the same location. These are now automatically detected and the duplicate loop(s) removed when using PowerFlow, but if there are cases where a letter does not populate, the way to check for coincident loops is to move an object and see if there is another one underneath. And do it again to see if there is more than one coincident loop. This often occurs in some files that have strokes and/or outlines, color blends, overlays, etc.

In summary, while your first inclination is going to be to just jump right in with Auto Populate, we highly recommend that you do some quick analysis of imported files to ensure good data integrity. If you do find any of the situations described here, now you know how to handle them!

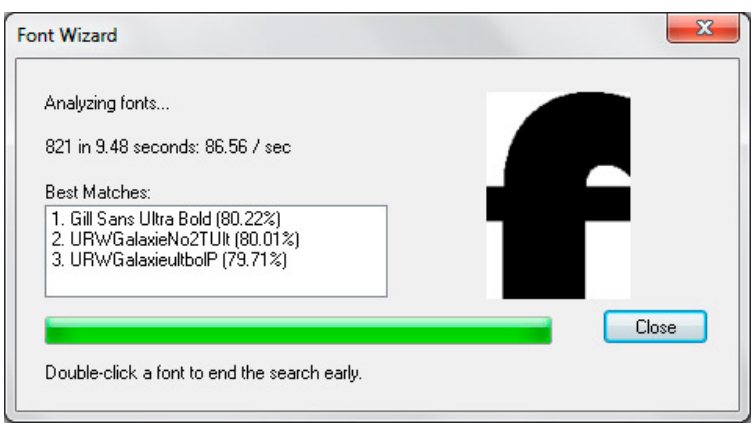
Font Wizard and Font Matching

One final note on the topics of importing files and cleaning up data is to think about matching a font in an imported file with a TrueType font that is on your system. In many cases, this is a good option, especially if you can easily identify the font and/or the quality of the imported data is poor. LED Wizard carries over the industry-leading text editing abilities from Sign Wizard that enable you to quickly use text control points to match up a system font to imported letters.

Font Wizard is a function that matches a given letter from a **bitmap** file to all the fonts installed on your system and suggests the "best match" font for that letter. You then have the option to type in the text with that font. To use this feature, select the bitmap that contains the letter that you want to match, and then select **Text Menu | Font Wizard**.



Here we have the bitmap text "font." There will be a crop cursor, and you want to draw a box around the letter that you want the system to analyze, in this case the "f". Type in "f" on the keyboard and that letter will be entered in the **Letters** box at the top left. Now cick on **Find** and the system will match this to all of your fonts!



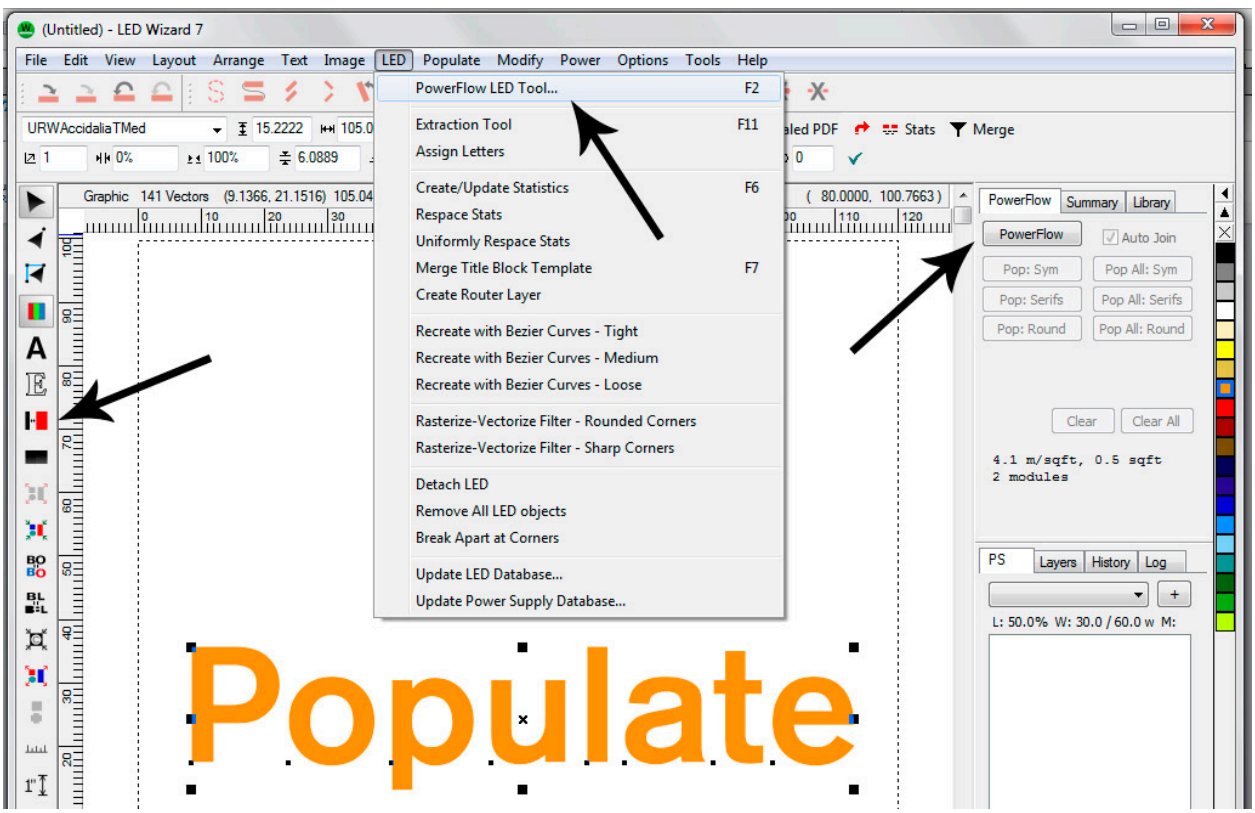
In this case it correctly found "Gill Sans Ultra Bold" as the font. Click on that font and then click on Close. The letter "f" will now be positioned right over the bitmap, at the correct size. From here you can just enter the text with this TrueType font, and not worry about any raster-to-vector conversion (Vectorizing). Obviously if you do not have the correct font (or a very close match), this will not work, although the feature will always suggest a "best match."

Auto Populate

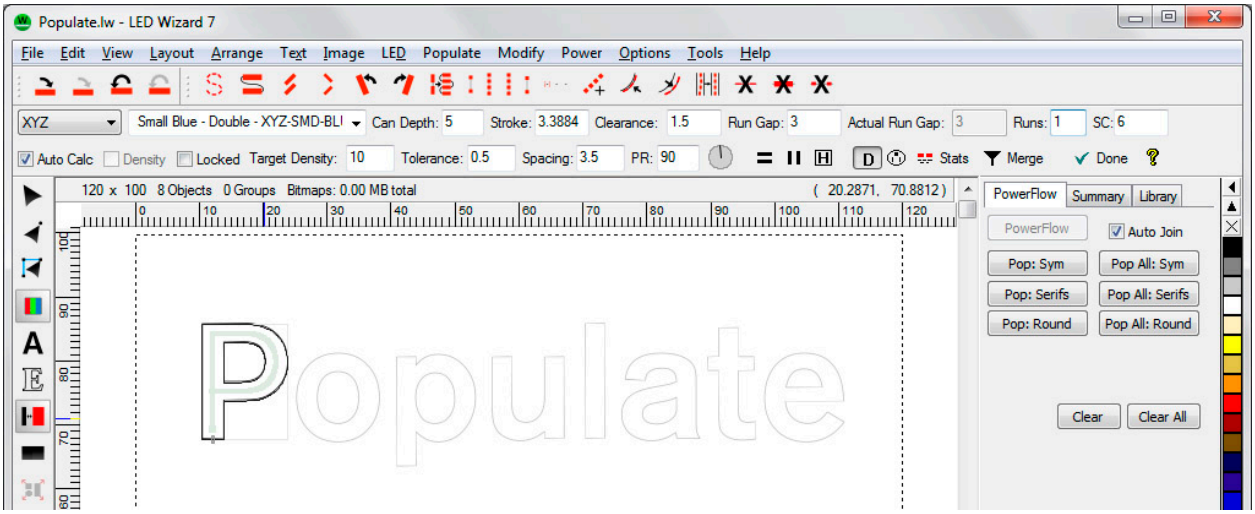
Now that we have our data ready to be populated, it is time to talk about **Auto Populate**. If you are an existing LED Wizard user, then you'll notice that the terminology here has changed – **Auto LED Layout has evolved to be several Auto Populate options**. It is not just a new name, but is really based on a new core technology that is driving the layout of the LED modules. This new core technology is called **PowerFlow**.

PowerFlow generates a "guide path" based on the shape of the letters, but unlike the previous version, you can easily deviate from the guide path if the design requires it. There is no penalty from going on or off the guide path, or for the order in which you edit the modules. This approach is considerably more flexible and more productive, as we'll discuss in this section and the next.

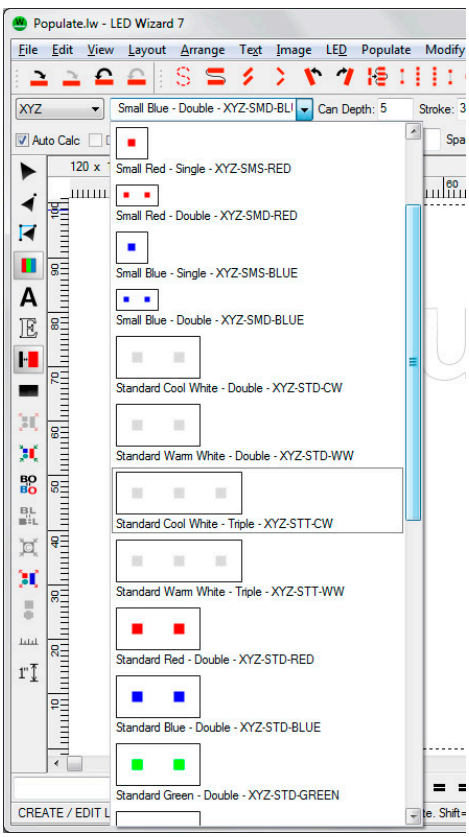
So to launch Auto Populate, you first have to get into PowerFlow, which you can do in one of four ways: click on the PowerFlow button in the PowerFlow tab on the right of the screen, press the **F2** key, select **LED Menu | PowerFlow LED Tool**, or click on the PowerFlow icon in the toolbar on the left of the screen. All of these options require that you first select the object that you want to populate.

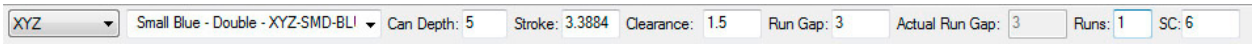


When you launch PowerFlow, the first things you'll notice are that one or more guide paths are created inside the first letter, and that the property bar changes. We are going to spend some time talking about the new property bar, because this is where you choose all the settings for your population.



Let's go through the main items here in the new toolbar. Keep in mind that each item has a **Tool Tip**, which is a little text window that pops up if you hover over the item for a second or so. From left to right, the first button, which says "XYZ," is where you choose your LED supplier. This is a simple drop-down list. Then the next box to the right lets you choose the individual LED module that you want to use for the selected letters. This list now shows previews of the actual modules, and you can create custom drawings for all of your modules (there is a separate document that explains this process). Now you don't have to memorize obscure part numbers for your modules!





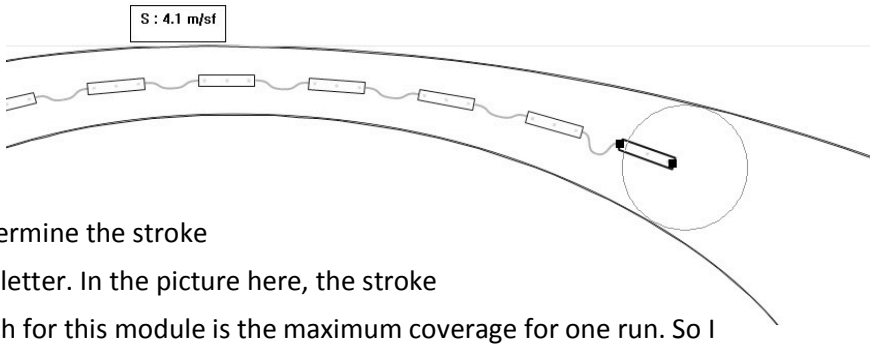
Continuing across the top to the right, we have **Can Depth**, which is a new input. LED Suppliers now have the ability to create **Density Guidelines**, which include can depth. Therefore, when you have a population for a job with a shallow can depth, it will populate with more density, according to the supplier's recommendations. So it is important that you enter a Can Depth to take advantage of this capability.

Next is **Stroke**, which is a calculation of the widest stroke of the letter. Stroke and Can Depth together will determine the number of runs. New to this version is the ability to override the auto calculation and enter your own stroke width, if you feel that the calculated number is not ideal for the population. If you do enter a new stroke width, and if that is a material difference, then the number or runs will adjust automatically according to the density guidelines for that module.

Clearance is the next value, and that is simply the distance away from the edge of the letter that you want the modules positioned for a double layout and up. This number is not relevant for a single run layout, since that run will be centered in the stroke. Clearance values typically range from one inch for a tight double population or mini module, to 1.5 or 2 inches for a normal double or triple run with a typical module, to higher values for larger/brighter modules. LED Suppliers also enter default values for Clearance when they define density guidelines for their modules.

Run Gap is the optimal distance between runs in a multiple run layout. This value is typically double the Clearance, but this is only a rule of thumb. This number could be larger or smaller in an actual layout depending on the shape of the stroke and other values entered. In fact, the next box to the right is called **Actual Run Gap**, which at times can be slightly different from the entered Run Gap in order to provide even spacing, especially in the case of sign cabinets.

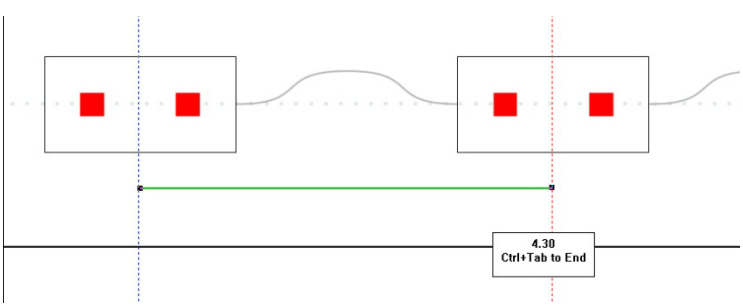
Runs is the number of runs (or rows) per stroke in a letter. This will be automatically calculated from the other inputs and from the density guidelines for the module you have selected. You can override the number of runs if you wish to make a change to the default. One run will center in the stroke, two runs will be offset from the edge of the letter by the Edge Gap value, three runs will have one in the center of the stroke and two offset from the letter, and so on for larger numbers of runs.



The last item on the top right is **SC**, which stands for **Stroke Circle**. This is a very useful circle cursor that you can display instead of the normal cursor to help you determine the stroke width of a certain section of a letter. In the picture here, the stroke circle is set for six inches, which for this module is the maximum coverage for one run. So I know when this circle is smaller than the stroke that I need to start thinking about rotating or adding a second run. This can be very helpful in situations when you have a variable stroke letter and/or when your density requirement is very specific. The Stroke Circle cursor can be toggled on and off by selecting **Options Menu | PowerFlow | Show Stroke Circle**.

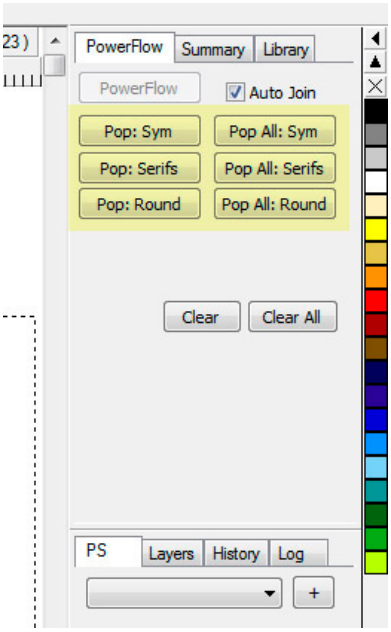
This covers the majority of the items in the toolbar that are important for making an Auto Population. There are just two more that we want to draw your attention to: **Auto Calc** and **Spacing**. Auto Calc is a check box on the second row way on the left, below the LED supplier list. In order for the density guidelines to apply to your population, you need to make sure that option is checked. The default is that it is checked, so there should not be anything that you have to do. If for some reason you do not want to use the density guidelines in a particular situation, uncheck it. Or if you find that the Run Gap and/or Runs values are being reset to values other than what you entered manually, uncheck it.

Spacing is a value that determines the linear density of the modules. This value has changed from the previous version, so please read this to understand how it works now. The number here now refers to the actual distance from the center of one module to the center of the next module along the wire. Previously this was a percentage, where 100% was the normal spacing, and for example, 80% was more dense. Now the value is in inches (or mm), which is a more intuitive way to measure the spacing. Note that this value is approximate due to the curvature of the path and the requirement that modules be properly positioned at the end of the strokes.



Here the Spacing is 4.30” from center to center. 4.50” is the max for this module. If you enter 4.00” for the Spacing value, that would increase the linear density.

OK, now that we have an understanding of the values used in Auto Population, it is time to actually populate these letters. The **PowerFlow Tab**, shown here, has six main buttons, highlighted in yellow. The three on the left are used for one letter or object at a time, and the three on the right are used for an entire line of text or selection.

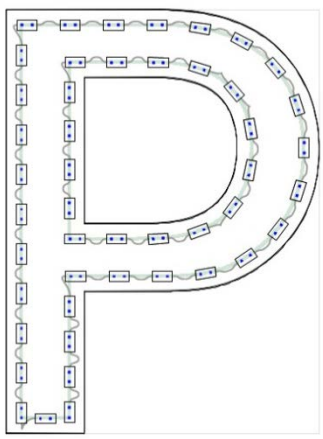


Pop: Sym, which stands for "Populate: Symmetrical", and **Pop All: Sym**, which is "Populate All: Symmetrical", is the most common auto population routine that you'll use, and should be the generic "default." This population approach prioritizes symmetry and looks at letters on a stroke by stroke basis.

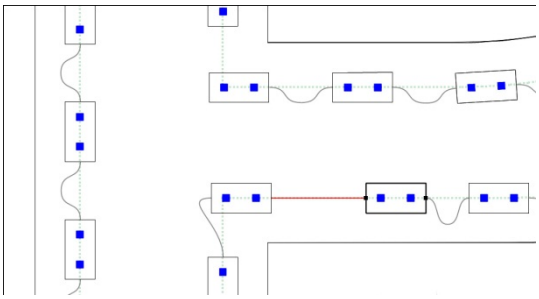
Pop: Serifs and **Pop All: Serifs** is the population routine that identifies square serifs as part of the population. Because serifs can be tricky to populate and connect with the rest of the letter, this routine will populate the serifs as a separate step. We'll look at examples below.

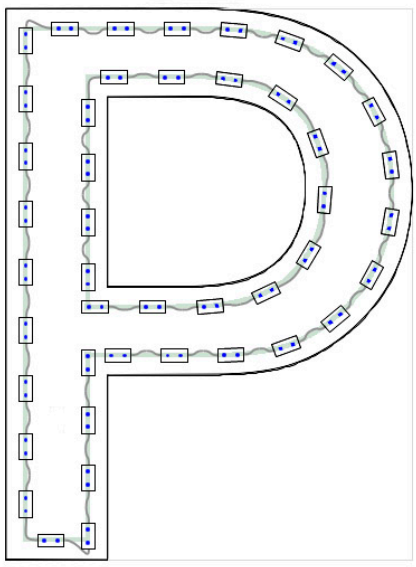
Pop: Round and **Pop All: Round** use a linear population approach, where the modules will be sequentially placed along the guide path without regard to symmetry. This is the preferred population routine for rounded letters and scripts that have few sharp corners.

When you first get into PowerFlow, the guide paths will automatically be created in the first letter, according to the density guidelines for that module, shown on the left. This is a kind of a "preview" for where the modules will be placed, which is a nice improvement over Auto LED Layout. If you do not like how this guide path looks, you can change one or more of the values in the property bar that we discussed above, such as Clearance or Runs, and the guide path will adjust. This letter "P" is 42" tall and has a stroke width of about 8 inches. We are going to use the XYZ Standard Blue Double module to populate with a double run. For this example, we are using **Pop: Sym**, and we get the result on the right.

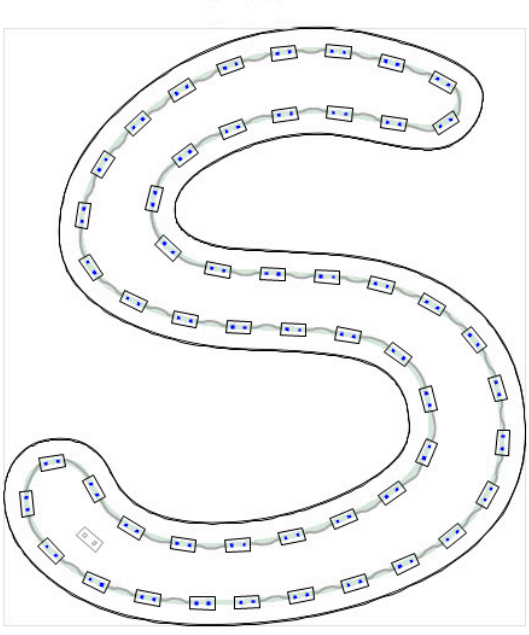


One quick note before we continue: in addition to the realistic module drawings, there are also realistic wire drawings. These wires will indicate if your modules are too far apart by switching to red. Here we have moved a module to the right, creating a section that doesn't reach, and so the wire has turned red. This provides a very quick way to see if any modules need adjusting due to wire spacing.

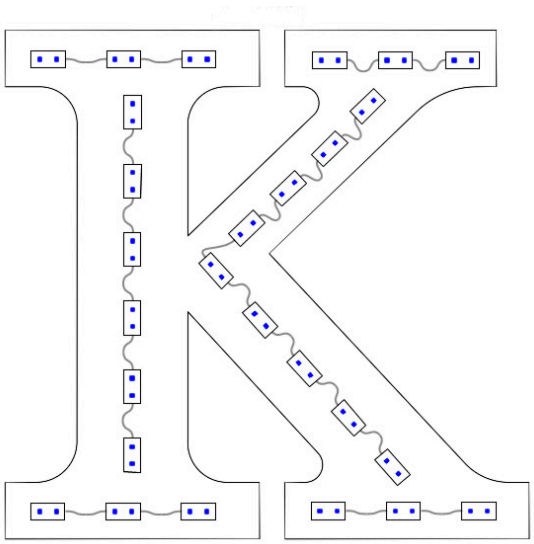




If we populate the same letter using **Pop: Round**, you can see the difference in these two approaches. This population will not prioritize placing modules in corners like Pop: Sym does, as you can see at the bottom and at the upper left of the internal section. This difference may be subtle, but potentially important on these kinds of block characters.



Pop:Round would be best on a letter like this "S", which has rounded ends, where the linear flow of the path is not interrupted by sharp corners. Round mode is designed to use the fewest possible number of modules, whereas symmetrical mode will add extra modules in order to create symmetry.

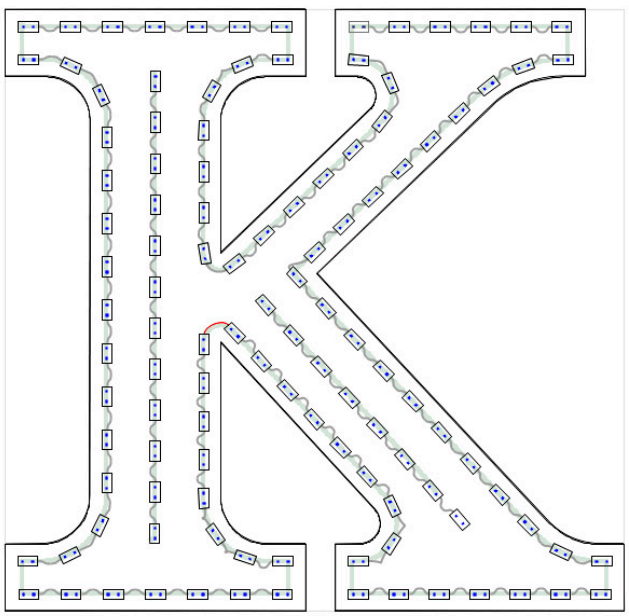


Pop: Serifs would obviously be used on letters that contain serifs. This “K” is a 30” tall letter with strong serifs. The Pop: Serifs routine will place a single module run in exactly the center of the top and bottom horizontal serifs. This is a significant improvement in the population for these kinds of letters from the standard Pop: Sym.

You’ll also note here that the serif modules are not connected to the modules in the main runs. Typically these kinds of serifs require some kind of wire splicing, so that decision is left up to you or the installer.

Pop: Serifs will not work on rounded serifs.

If the letter is large enough for a double run to fit inside the serifs, then just use Pop:Sym because the Pop:Serifs is designed for a single run in the serifs. In this example “K”, which is 60” and the same font as the single population above, a double run is used and it does a good job of populating the serifs.



If you are not sure which population option to use in a certain case, you can simply try one, Clear it, and try a different one. The buttons **Clear** and **Clear All** will remove the modules but not change the settings, allowing you to try a different auto population option.

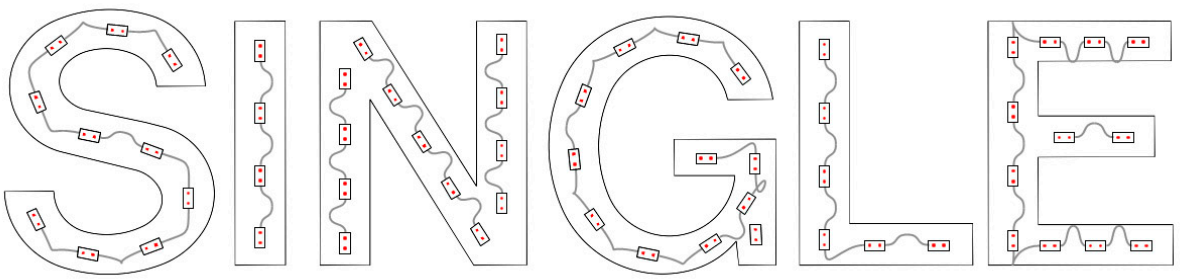
Clear All will clear all the populations for the letters you originally had selected when starting PowerFlow – for example, a group of letters on a single line, or a single text object that was then broken down into letters by PowerFlow.

There is a table of suggested population options later in the document.

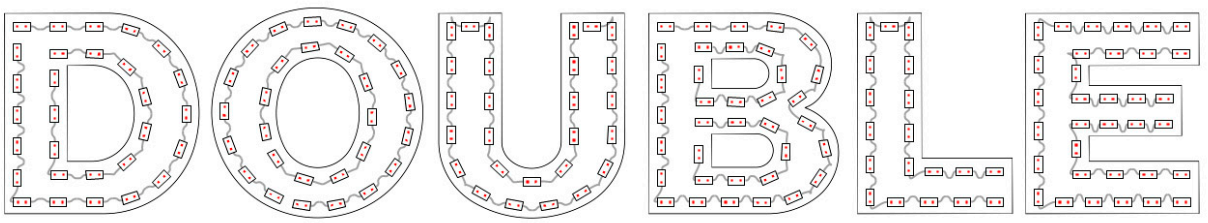
When you choose one of the **Pop: All** options, all of the letters will populate with the settings that you used in the first letter. This is typically the case for most populations. However, you may have a case where the first letter is different, such as larger than the other letters, then you may have to adjust the settings. You determine how a line of text populates by how you **Group** or **Combine** it prior to population. If you want the entire line of text to populate with the same settings, you can make one Group of all the letters or Combine all the letters into one object. If you want to populate the first letter separately from the rest of the letters, just leave the first letter out of the Group.

Example Populations

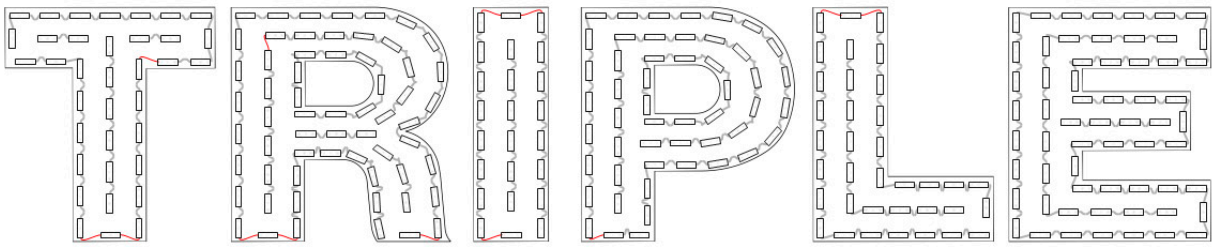
Now that we have the basics of Auto Population and the various options available to you, let's look at some more detailed examples. In the next section we'll talk about making edits to the populations, but for now here are some examples, along with the settings used, so that you can get a feel for how things work.



Single run, 12" Helvetica Regular, 2.5" stroke width, Pop All: Sym
XYZ Small Red Double module

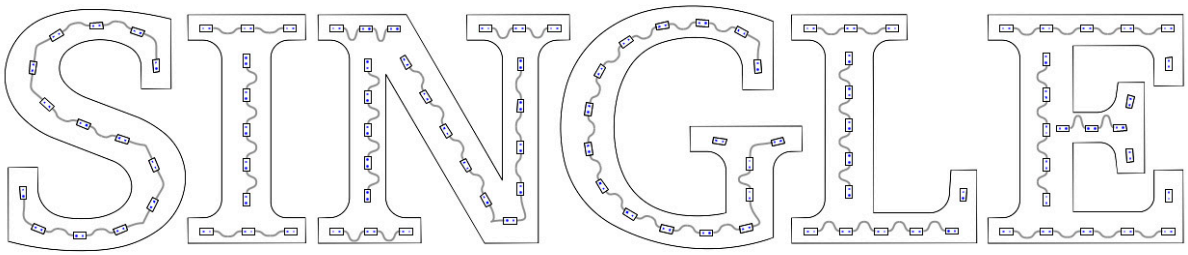


Double run, 24" Helvetica Bold, 7.25" stroke width, 1.5" Clearance, Pop All: Sym
XYZ Standard Red Double module



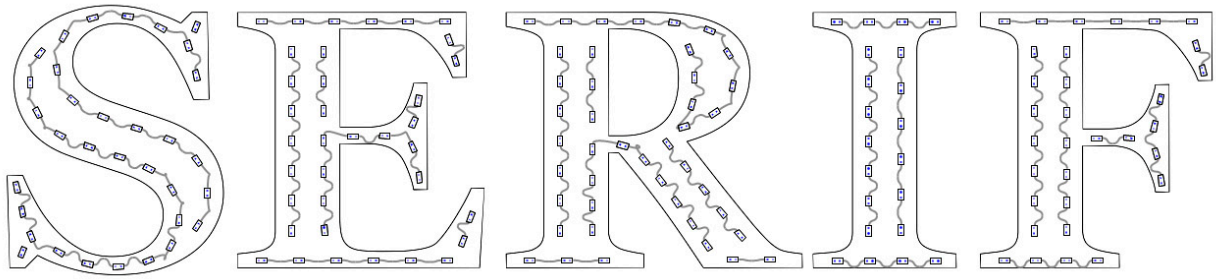
Triple Run, 48” Helvetica Bold, 15” stroke width. 1.5” clearance, Pop All :Sym

XYZ Large Cool White Triple module



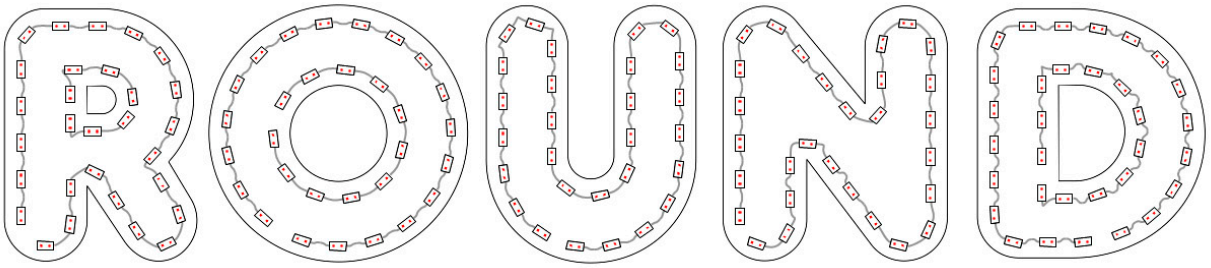
Single Run, 18” Egyptian Bold, 4” stroke width, Pop All: Serifs

XYZ Small Blue Double module



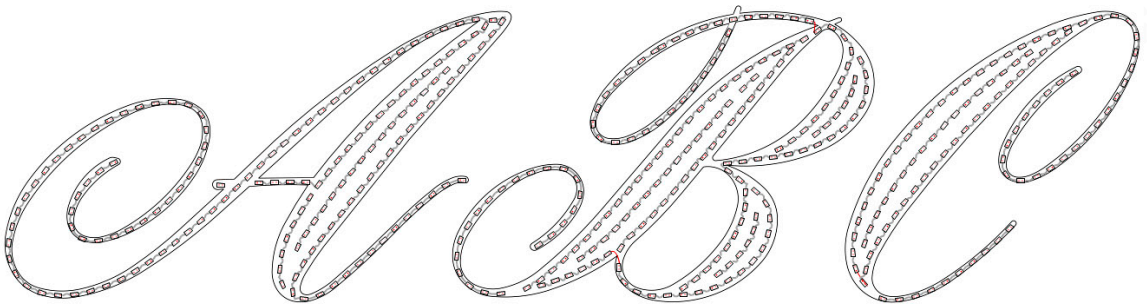
Single/Double Run, Vani Bold 24”, 6” stroke with, Pop All: Serifs

XYZ Small Blue Double module

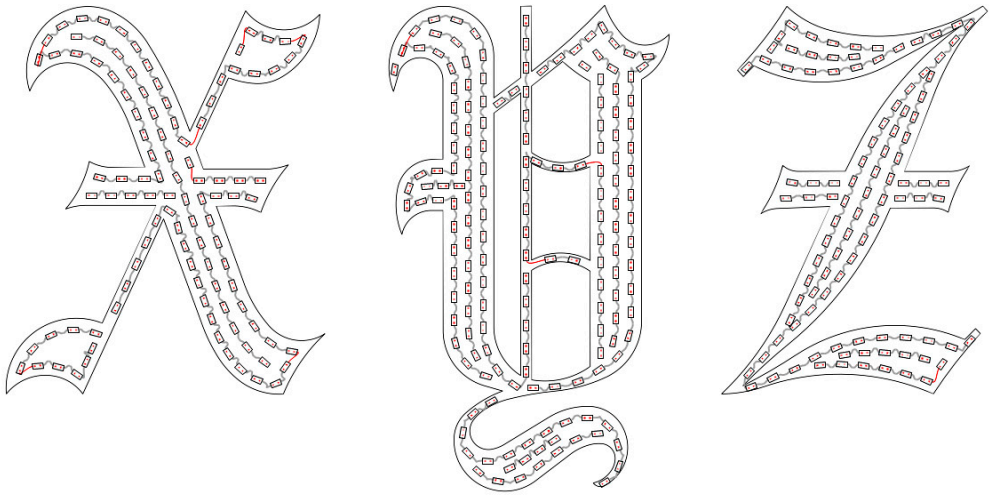


Double Run, Hot Dog 30”, 10” stroke width, 2” clearance, Pop All: Round
XYZ Standard Red Double module

Another major improvement in **LED Wizard 7** is the ability for Auto Populate to handle letters with a variable stroke width. These populations may go from one run in thin sections to three or more runs in the thick sections. Here are a couple of examples:



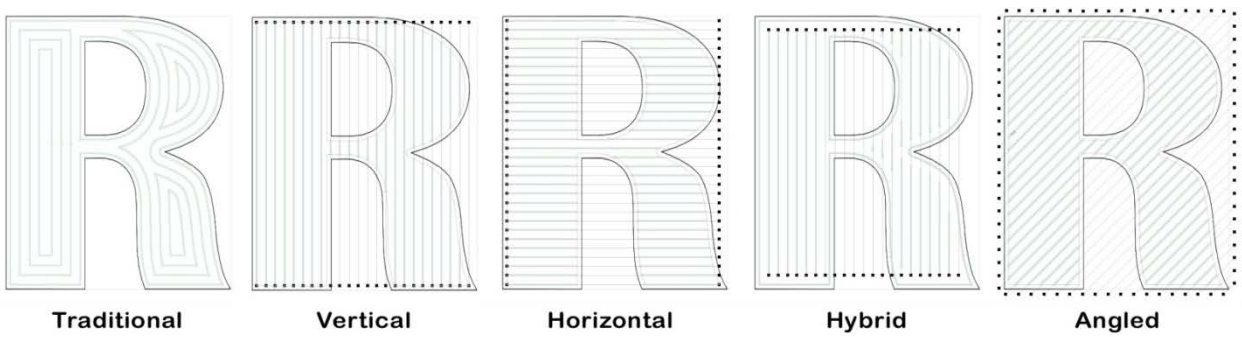
Single/Triple, Zircon 72”, 13” stroke width, 2” Clearance, Pop All: Sym



Single/Triple, Old English 72”, 10” stroke width, 2” Clearance, Pop All: Sym

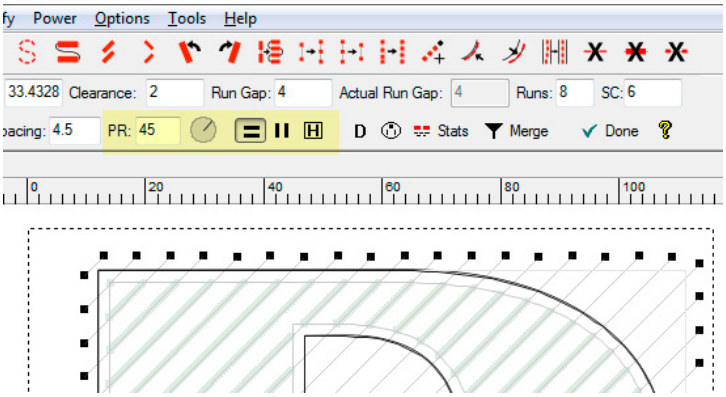
Parallel and Hybrid Populations

The next topic for this section on Auto Populate is going to be large letters, as in 8 foot, 12 foot, 15 foot letters. For something of this size, it can make more sense to lay out modules in a parallel fashion, instead of multiple inlines that trace the outside shape of the letters. LED Wizard 7 has several options for this type of Parallel Layout.



This is a 10' letter using Brittanic Bold. The population parameters are the same for all the populations – 2" Clearance, 4" Run Gap. These images just show the PowerFlow guide paths for comparison. The first population is the **Traditional** inline approach, which traces the outline of the letter in consecutive runs. The second is a **Vertical** population, which works well since this letter has large vertical strokes. The third is a **Horizontal** population, which is probably not ideal since it results in a higher number of shorter runs. The fourth population is called **Hybrid** because it contains one inlined run and then parallel vertical runs. This gives you a clean edge and then fills in the rest of the letter evenly. The last population is **Angled**, which may not offer any value in this example, but if the letter was italicized by 15 degrees, you could match that angle numerically and they layout would be very clean.

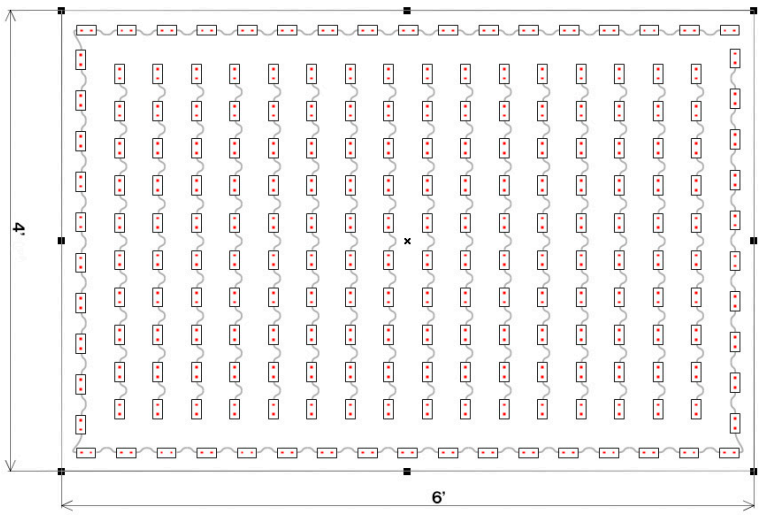
To create layouts like these, after you enter PowerFlow but before you use one of the Auto Populate functions, select either the Horizontal, Vertical, or Angled options, as highlighted here. To then create a Hybrid layout, which adds a single inline, click on the Hybrid icon. Once your preview is what you want, click on **Pop: Sym** to put in the modules.



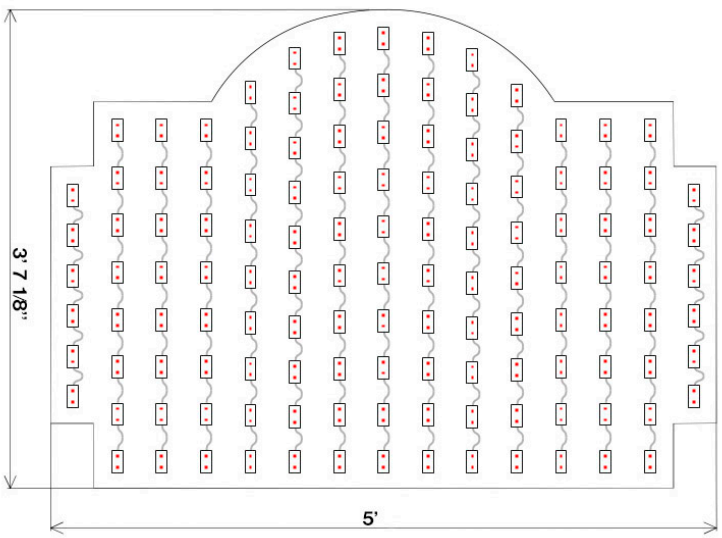
Sign Cabinets

Sign Cabinets, or Light Boxes, are typically rectangular shapes, and so can be very evenly populated with the tools we just discussed. If you recall the discussion about **Actual Run Gap**, this slight adjustment in the entered **Run Gap** is how we can perfectly populate a sign cabinet with no odd sections in the middle.

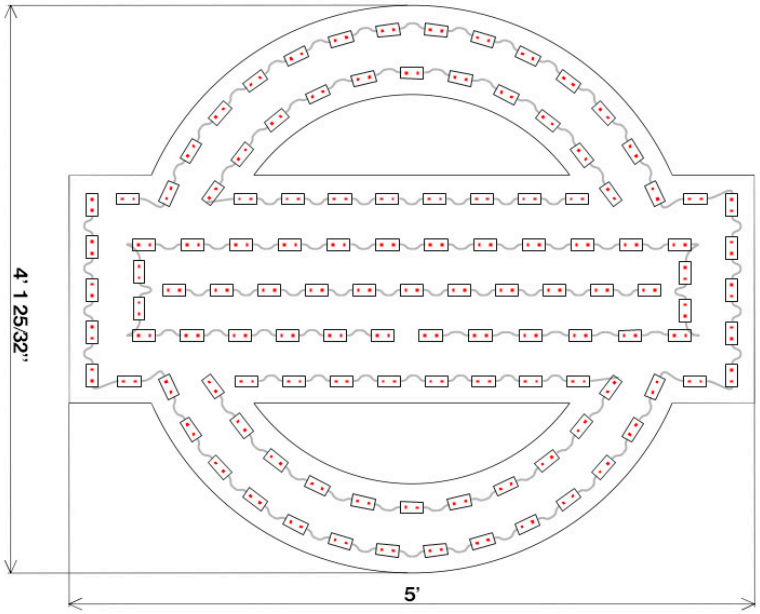
The options for sign cabinets are actually similar to those of very large letters – traditional inlines, parallel layouts, hybrid layouts, and angled layouts. For a cabinet, you use the same steps, which are to select the cabinet using the Layout Tool, start PowerFlow, select the population approach that you want, and then click on Pop: Sym.



This is a 4’ by 6’ cabinet with a Hybrid population, 2” Edge Gap, and 4” Run Gap.



Here’s a cabinet that has an irregular shape, but the vertical population is even. The linear density is slightly adjusted so that the Clearance value is enforced.



And here's a sign cabinet that looks like London's Tube logo. This is actually the result of a normal Pop: Sym operation, with some auto adjustment of the Run Gap to get even spacing in the middle.

Auto Population Summary Table

Here is a summary of the Auto Population options. This is a generalized table of guidelines and should not be regarded as law, since there are many variables, such as stroke width, module density, and sign face material that go into choosing the proper population.

Letter Style	Letter Size	Layout	Comments	Auto Population Option
Block/Sans Serif	Small	Single run	Thin strokes, good with mini modules.	Pop: Sym or Semi-Automatic*
Block/Sans Serif	Medium	Double run or Single/Double	24" block font is probably the most common layout.	Pop: Sym
Block/Sans Serif	Large	Triple or Quad run	Wide variety in settings; depends on stroke/module.	Pop: Sym
Block/Sans Serif	Extra Large	Parallel, Hybrid	Parallel layouts are cleanest for most letters this size.	Pop: Sym
Variable Stroke	Medium	Single/Double or Single/Triple	Pop: Sym does the best job here; consider rotation.	Pop: Sym
Variable Stroke	Large	Double/Triple , Double/ Quad, Triple/Quad	Auto Run Gap helps to even out population.	Pop: Sym

Square Serif	Small/Medium	Single or Double run	Must have single run in serifs to use Pop: Serifs.	Pop: Serifs
Square Serif	Medium/Large	Double or Triple run	Double run or more in serifs.	Pop: Sym
Square Serif	Extra Large	Quad or Parallel	Parallel may not be the obvious choice with serifs.	Pop: Sym or Parallel
Round Serif	Small/Medium	Single, Double, Triple	Pop:Serifs doesn't work with rounded serifs.	Pop: Sym or Semi-Automatic
Round Serif	Large or Extra Large	Triple, Quad or Parallel Layout	When rounded serifs are big, Pop: Round may be best.	Pop:Sym orPop:Round
Rounded	Small	Single run	Rounded font probably doesn't matter at small size.	Pop: Sym or Semi-Automatic
Rounded	Medium/Large	Double or Triple	Ideal for Pop:Round.	Pop: Round
Script (non-welded)	Small	Single	Can be tricky with stroke variation.	Pop: Sym or Semi-Automatic
Script (non-welded)	Medium, Large	Varies	Large font variation makes it difficult to generalize.	Pop:Sym or Pop: Round
Welded Script	Small	Single run	Semi-Automatic lets you determine routing of runs .	Semi-Automatic
Welded Script	Medium, Large	Varies	Large font variation makes it difficult to generalize.	Pop:Sym, Pop: Round, Semi-Auto

Small ~ 12-18", Medium 24-48", Large 48-72", Extra Large 72"+

*Semi-Automatic populations are covered in the next section below.

Remember that these are just guidelines, but this table can be useful in learning when to use which Auto Population option and what kind of layout to expect for certain fonts and sizes.

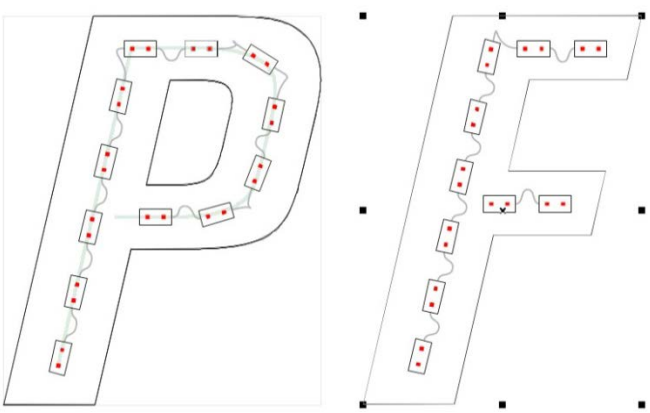
PowerFlow Editing Tools

LED Wizard 7 has a rich set of tools for editing the modules to fine tune the auto populations. The majority of these tools are in the new **Modify Menu**, and they are aimed at boosting layout productivity. **PowerFlow** enables a new way to edit modules, which is not based on editing the centerline path. The guide paths that are created when you first launch PowerFlow are kind of like magnets for the modules, but it is very easy to deviate from these paths. And when you need to make changes to the position of more than one module, you can now simply make a selection of modules and perform an action on the entire selection. This is where a lot of the increased productivity comes from – making edits on selections of modules, perhaps even all the modules for an entire letter in one operation.

Along with these new editing tools come many new functions and shortcut keys. At the end of the discussion of these new functions, there will be a cheat sheet with shortcut keys and icons that you can use as a reference.

We are going to divide the discussion of editing modules into three sections: **Semi-Automatic Populations**, **Individual Module Edits**, and **Selection Module Edits**. Many commands will work on both a single module and a selection, but others will only work on one or the other.

As a quick reminder, PowerFlow is one of the two main operating modes in LED Wizard 7. The Layout Mode is the other. When you are in PowerFlow, you will see the guide path previews and you will not see control points. In the Layout Mode, you will see control points around the selected object or group, but you will not see the guide path previews.

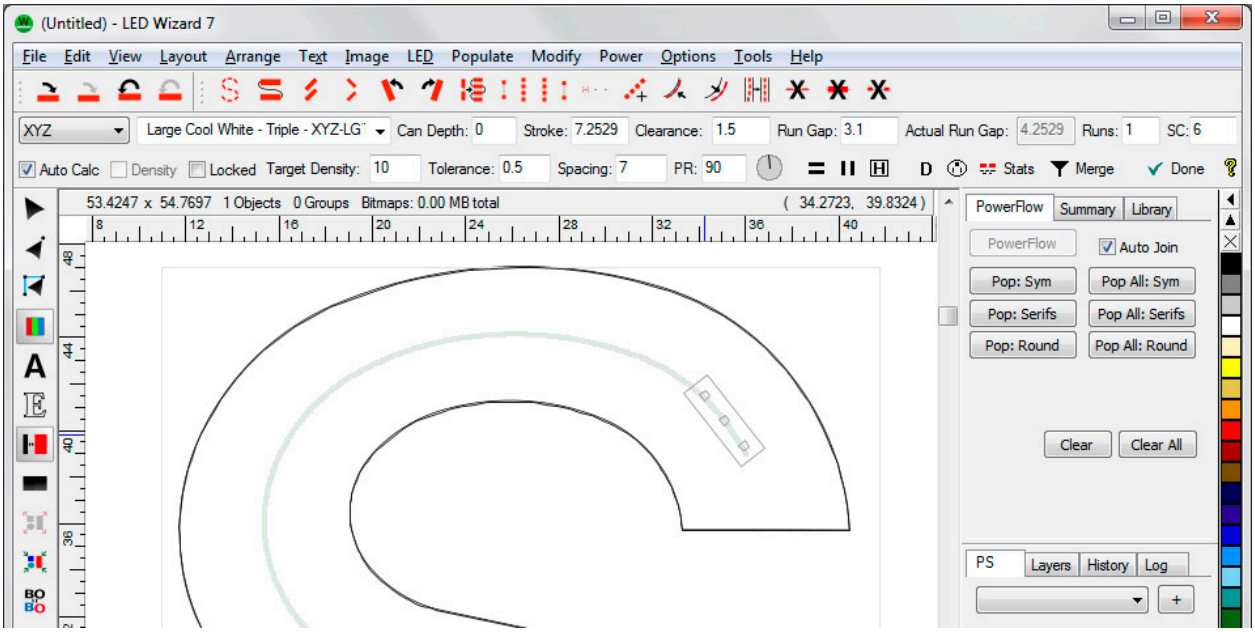


PowerFlow Mode Layout Mode

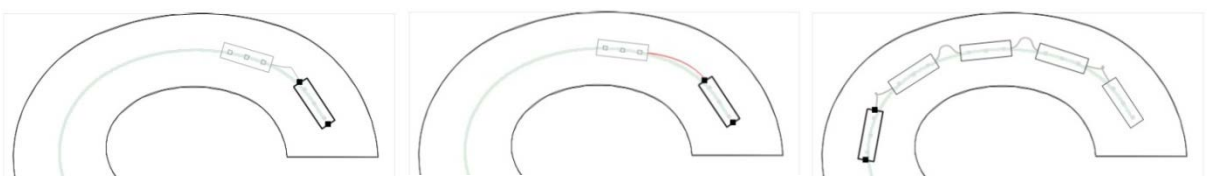
It is important to know what mode you're in at any given time and what functions are available in each mode. If a certain feature isn't available and you can't figure out why, it may be because you're in the wrong mode. Also remember that you must start with something selected in Layout Mode when you launch PowerFlow.

Semi-Automatic Populations

Before we discuss editing individual modules, we want to cover a semi-automatic way to lay out modules in PowerFlow. When you have a letter or line of text selected and then you go into PowerFlow, the guide paths will automatically display. If you then move the mouse over the guide paths, you'll see that there is a "preview" module that slides along the path.



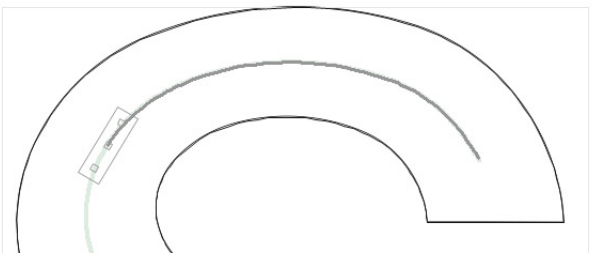
Here is the Preview Module, attached to the guide path and also the position of the mouse. If I now click the mouse, then a real module will be placed at this position. If I continue to move the mouse along the path, I can add another module in this same fashion. If I move the module preview too far for the wire to reach, it will turn red, so I know that I need to reposition that module closer to the previous one.

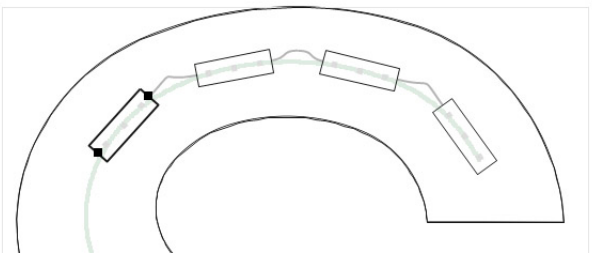


For exact placement of modules along the path, you can add them one by one using this technique. This is particularly useful on very small letters, where maybe only 3 or 4 modules would cover the cap height. You can visually tell exactly where the modules should go, and in just a few clicks, you can precisely populate a whole letter.

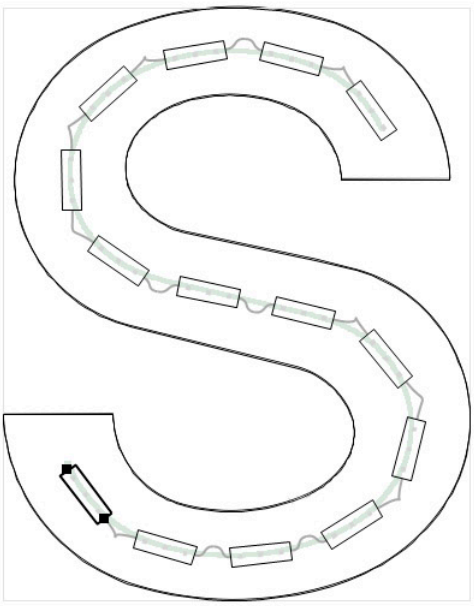
There is a more automatic routine, however, using this same concept but with the ability to place multiple modules at once along the guide path. The approach here is that you **click and drag** a run along the guide path, and when you release the mouse button, the run will be populated according to the spacing for that module.

So if we start from the same end position on this "S" from the above example, and click and drag along the guide path, the program will create a darker line to indicate that you are dragging a new run (left image), and when you release the mouse, it will put in the modules (right image).



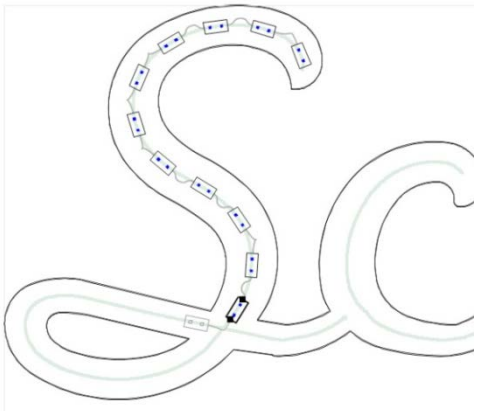


With this click and drag option, you do not have to be very accurate with the mouse. The run will be created smoothly along the path. Now in the situation where you have part of the letter done this way, as with the right image, you can continue with another click and drag, or just move the mouse and click once to add a single module. Again, if you go too far, the wire will turn red. So for this simple letter "S," you can cover the whole letter in one click and drag operation.

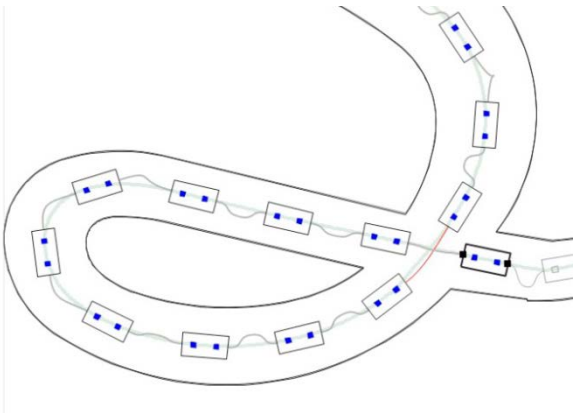


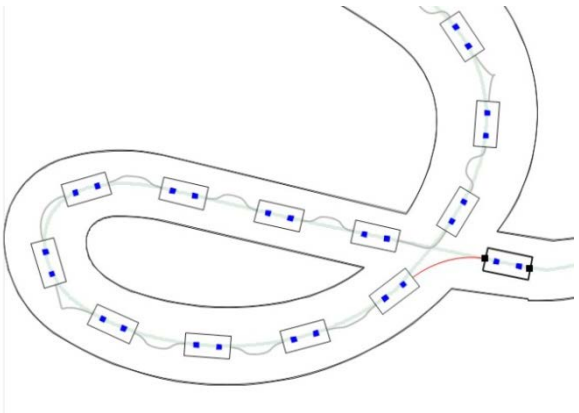
A good situation in which to use this technique is for a connected script font. These kinds of letters represent a challenge for any automated routine because there are frequent crossing strokes, and many different ways in which it can be populated. Therefore, a semi-automatic approach like this, one that lets you make the key decisions about how to route the runs, is optimal.

Here is an example of what we're talking about. This is the font Freehand Script, with the text "Script" that has been welded to create one object.

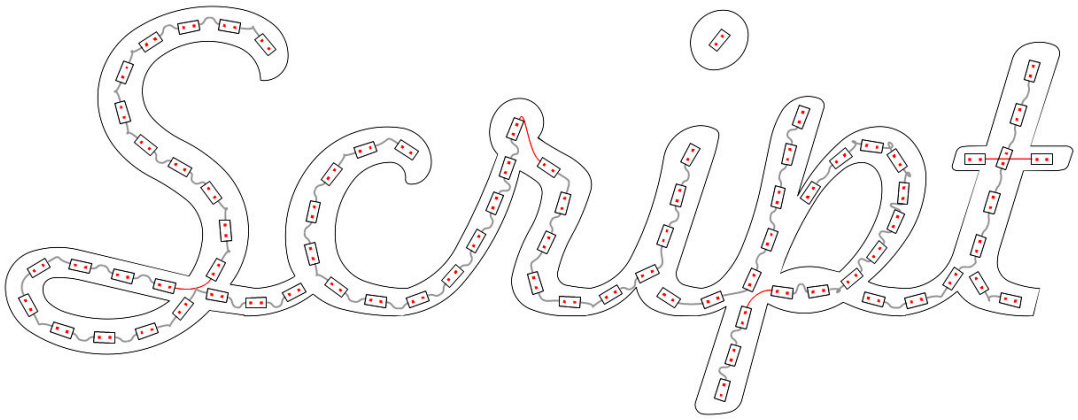


The logical place to start on these letters is at the top of the "S." As you come down to the first crossing stroke, you have a decision to make: do you continue down and then come back around, crossing over to go to the "c," or do you go to the left and then come around the bottom without crossing? In this first image, we did a click and drag to this intersection point and then stopped.

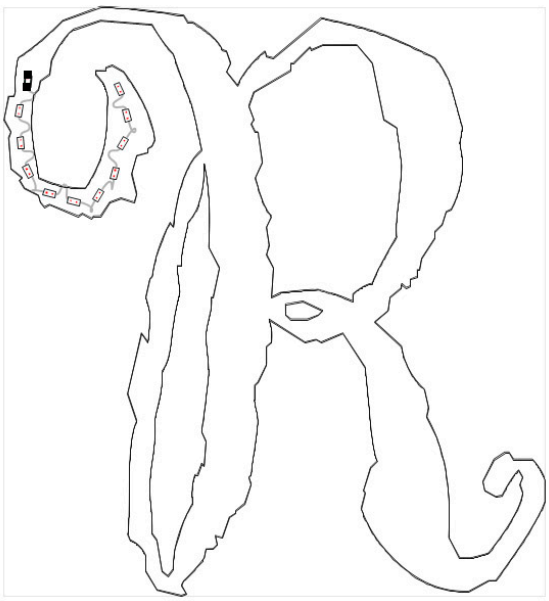




This may not be an enormous decision in this population, but there are several similar decisions that you have to make, and these will have implications for wiring. The click and drag method within PowerFlow gives you complete control, and there are definitely situations where this is valuable.



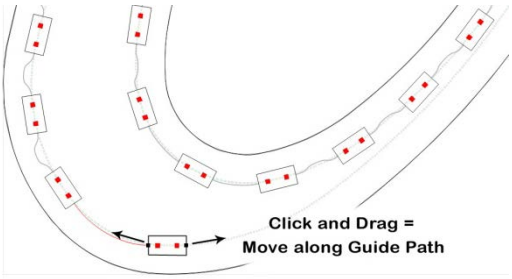
One final note on using these semi-automatic tools: if you have a population that requires a single centerline, and due to the nature of the letter or the data, the centerline guide path is inaccurate, you may elect to **set the Runs value to 0 (zero)**. This will remove the guide path entirely, but you can still populate the letter(s) using the techniques in this section. In fact, the default module position will be centered in the stroke, so it is practical to efficiently populate this way.



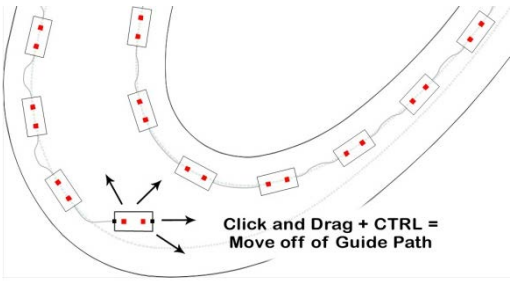
For example, here is the letter “R” for the font “Gigi.” It is unlikely that a clean centerline will be generated for this character, so by setting the Runs to 0, we can do a semi-auto population with better control. Making the Runs 0 removes the “snapping” characteristic of the module to the guide path, so in the case of an inaccurate guide path, this would be the approach to use. The software will still try to find the center path, but that can be over-ridden by using CTRL+Drag.

Individual Modules

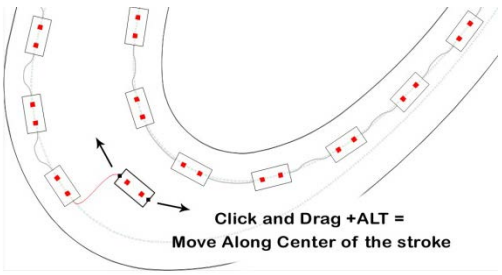
Editing the position and angle of individual modules is easy and straightforward in PowerFlow. To **Move** a module, click and drag it. When you are at the new position, release the mouse button. That's it. Moving a module this way will slide the module along the guide path. Remember that a red wire means that it won't reach from that position without a splice.



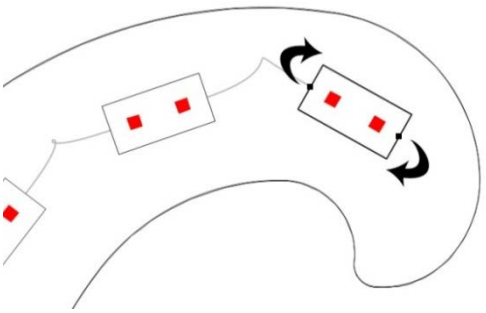
If, however, you want to move the module **off** the guide path, then you hold the **CTRL** key when you click and drag. This will enable you to move the module to any position, and it will maintain the same angle. You can also use the **Nudge** function to move a module off the path. Nudge is simply a tiny movement up, down, right, or left using the arrow keys on the keyboard. Hold down CTRL and then one of the arrows to nudge a module.



To move a module to and along the **center** of a stroke, hold down **ALT** as you click and drag. Note: If you have 1 entered for Runs in PowerFlow, then the guide path will be in the center of the stroke automatically, so it would not be necessary to use ALT in this case. The software automatically performs auto centering when it can.



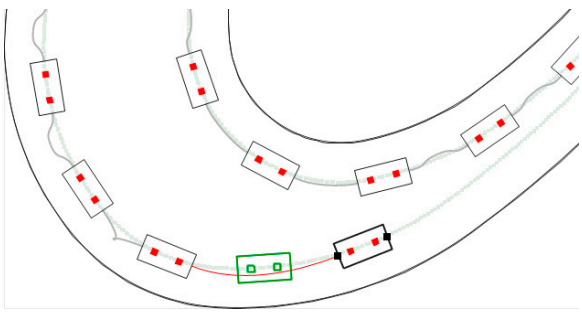
To **Rotate** the module, you can do so at either end, in either direction. Just click and drag on the small square at either end of the module. If you are moving a module along the path or along the center of the stroke (ALT), then the angle of the module will adjust to match the angle of the stroke. You can also **Flip** the module, which is a 180 degree rotation in one shot, using the **F** shortcut key. Sometimes a module needs to be flipped so that the wires reach.

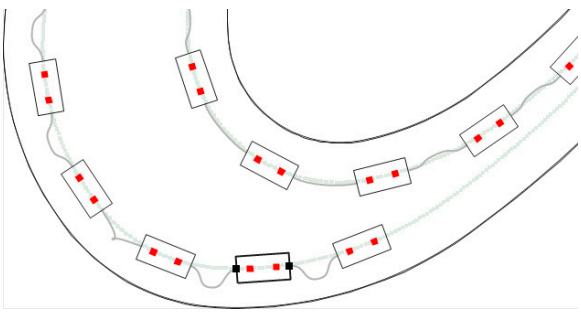


To **Delete** a module, select it by clicking on it and either press the Delete key or the keyboard shortcut, **D**. If the module you deleted was part of a longer run of modules, the next module in the run will now be selected. So if you want to delete several modules, you can do so sequentially in this manner using Delete or D.

To **Insert** a module, there are three main ways to do it one module at a time:

1. If you are at the end of the current run, then simply moving the mouse along the guide path and clicking to add (as discussed above) will be the easiest approach.
2. If you are not at the end of the current run and want to add a module, position the mouse where you want the new module and press **I** for Insert.
3. If you are not at the end of the current run, and have a section with a red wire, then when you move the mouse over that red wire, a green preview module will appear. To add that module in that position, just click the left mouse button. This is really faster and more practical than option 2 for inserting, since you would most often insert when a wire isn't reaching.





Here is a summary of the **Individual Module Editing** options:

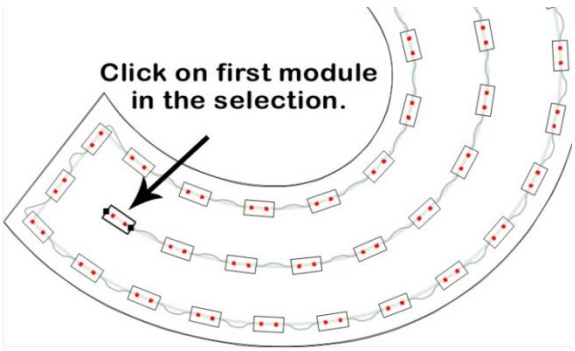
Function	Description	Icon	Shortcut Key
Move a Module Along Guide Path	Click and drag	Mouse operation*	
Move a Module off the Guide Path	Click and drag while holding CTRL.	Mouse operation	
Move a Module to/along the center of the stroke	Click and drag while holding ALT.	Mouse operation	
Nudge	Tiny module movement up, down, right, or left. SHIFT uses larger increments of mvmt.		CTRL+arrows, SHIFT+arrows
Rotate a Module (Free Rotate)	Click and drag on rotation handles.	Mouse operation	
Rotate Clockwise	Incremental rotation of a single module.		CTRL+C
Rotate Counter-Clockwise	Incremental rotation of a single module		CTRL+X
Flip	Rotates a module 180 degrees.		F
Insert	Insert a single module.	Mouse operation	I
Delete	Delete a single module.		D or Delete

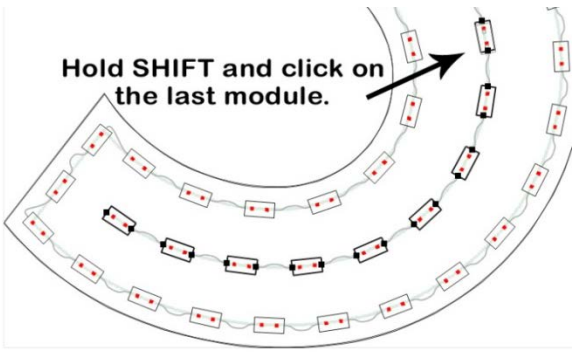
*Mouse Operation means that the position of the mouse is required to use the feature; therefore an icon is not practical to the use of that feature.

Selections of Modules

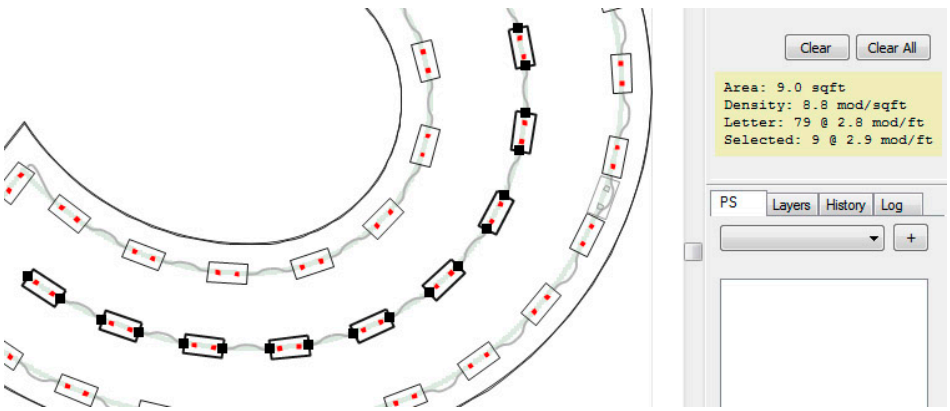
One of the biggest productivity breakthroughs of LED Wizard 7 is the ability to make selections of multiple modules and then perform actions on those selections. While the individual module editing tools are good, adjusting the position and rotation of individual modules is just not productive on a large scale job.

To make a selection of modules, get into PowerFlow, and first click on the module that you want to be at one end of the selection. Now hold down SHIFT and move the mouse to the position of the module you want to be at the other end of the selection and click. This **SHIFT+click** approach to making selections is a graphics software standard and should therefore be intuitive.





Now you have made a selection of these 9 modules. If you want to know how many modules you've selected, and perhaps more importantly, the linear density of these modules, look at the data at the bottom of the PowerFlow tab, highlighted in yellow. This info includes the **Area** of the entire letter, the Area **Density**, as measured in modules per square foot for the letter, the number of modules and linear density for the whole **Letter**, and the number of modules and linear density for the **Selected** modules.



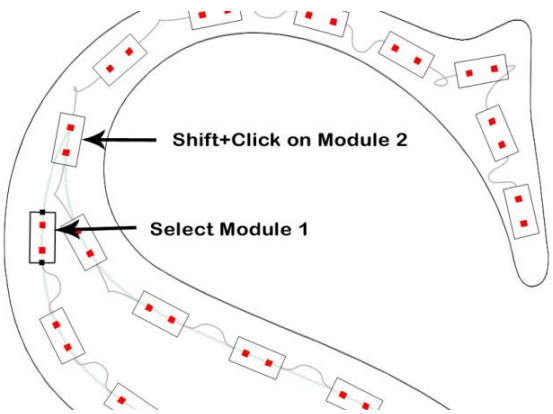
Connecting and Breaking Runs

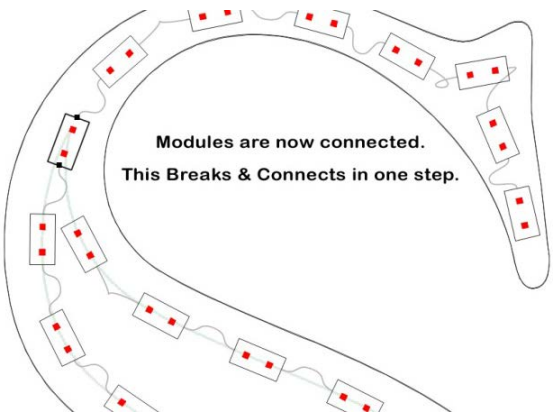
As you edit a population and think about how you want the wiring to be done, inevitably there are cases where you want to route the modules in a certain way, which leads to the necessity of breaking runs and connecting runs. There are different schools of thought about the necessity of showing very accurate wiring in a layout (particularly if it is an estimate), and if you are of the school that feels this is important, here are the instructions for doing so.

To **Break** a run, select a module and use the shortcut key **O.** You may also select **Modify Menu | Break Run**. Sometimes you'll notice that the module didn't break on the side you were expecting. To ensure that the module breaks on the correct side, move the mouse over the rotation control point on the side where you want to break the run and then use the shortcut key **O**.

To **Connect** a run to another run, assuming that both modules that are going to be connected are in fact open on one end, select one module by clicking on it, hold down SHIFT, and at the same time, click on the other module. If you want to connect two runs together, but one of the runs is not open, you can still "cut in" and connect them anyway. As part of this operation, the run that is not open will be broken and then connected in one step. First select the open run, then SHIFT to connect to the other run.

Let's suppose that we have an "S" from the font Goudy Old Style Bold. We want to re-route the run at the top where it splits to two runs to the outside stroke.



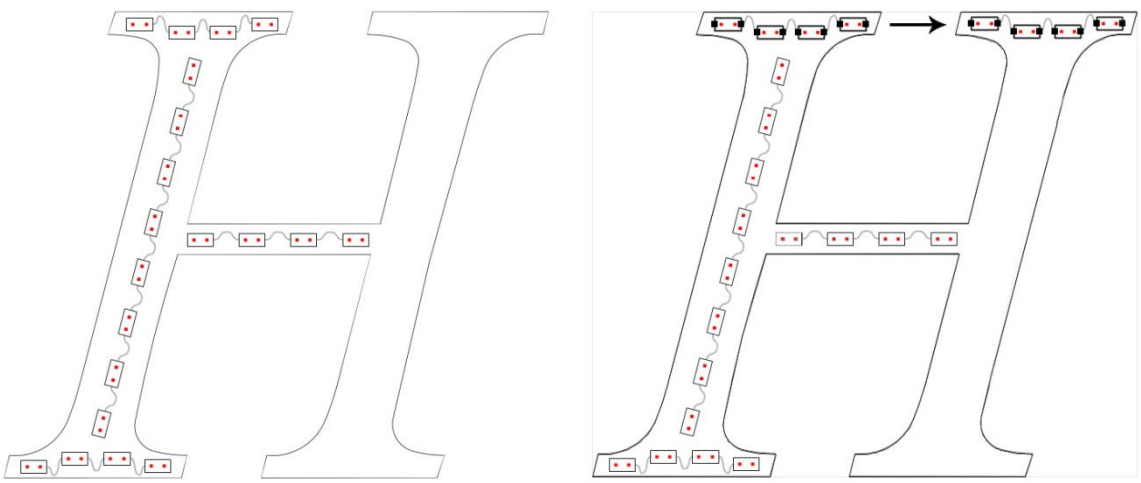


When you have a selection of modules, you can perform many of the same commands as you can on a single module, such as **Delete** and **Move.** There are also special options for **Rotate** that we'll talk about below.

Select All and Copying Modules

There are two quick ways to select modules that don't require the steps above, which are **Select All Modules in Run** and **Select All Modules in Letter**. These descriptions are pretty self-explanatory. To Select All Modules in Run (shortcut key **CTRL+A)**, you must have at least one module selected in that run so that the software knows which run you want to select. And to Select All Modules in Letter, shortcut key **SHIFT+A**, you must have at least one module selected in that letter.

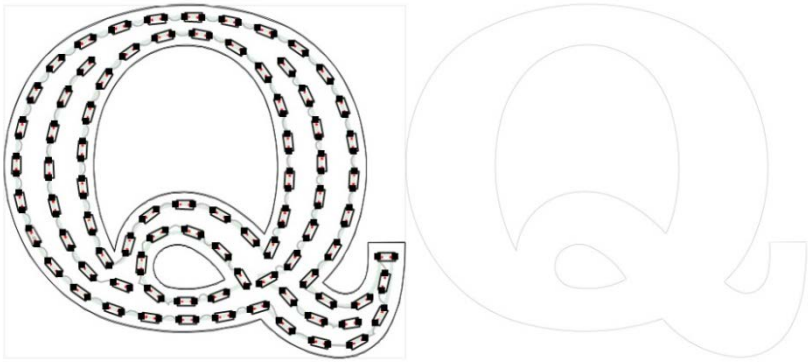
Once you have a selection, whether it is just a few modules, an entire run, or an entire letter, you can **Copy** that selection and **Move** it or **Paste** it somewhere else. The simplest way to copy a selection and move it to a different location is to use **CTRL+Drag** on the selection. This is different from using CTRL to move a single module off the guide path; **CTRL+Drag** has a different meaning when you have a selection of modules. To **Copy**, you first make a selection, then hold down CTRL and drag a new copy of the selection.



In this example, the left side of the "H" was edited to have clean serifs, so instead of doing this again on the right, we can just copy over these runs. Fast and easy!

To take this idea one step further, we can copy an entire letter to the same letter somewhere else in the job. So if you spent a couple minutes on a tricky letter, you don't want to have to duplicate the effort when that letter shows up again. All you have to do is select **CTRL+A** when the populated letter is selected in PowerFlow, and then click on the duplicate, unpopulated letter and press **SHIFT+V**. Just make sure that the new letter has no existing modules.

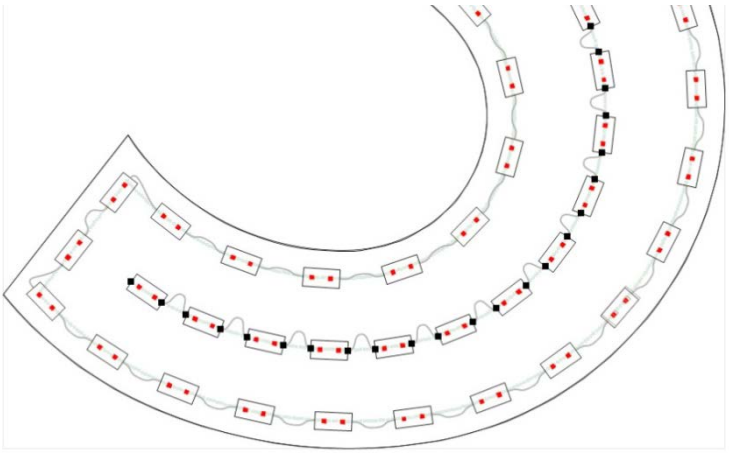
Despite the fact that there is probably no word in the English language that has two Q's together, in this example, all the modules have been selected in the first Q. So all you have to do at this point is select the second Q while in PowerFlow and use the shortcut key **SHIFT+V** to paste the modules in.



Increase and Decrease Density

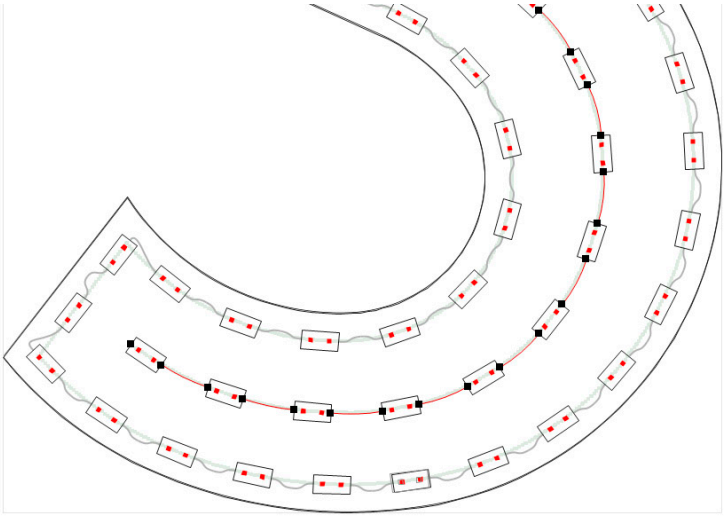
Adding and subtracting modules to/from a selection is easy. The first thing we'll do is make a selection of the entire center run, and then increase and decrease the density of the run. The initial selection has 24 modules at a linear density of 2.8 modules per foot. To add modules to the selection (and have the modules automatically re-space themselves), use **Modify Menu | Density | Increase Density**. This can be more conveniently accessed with the icon  or the **W** key on the keyboard. Each time you click the icon or hit W, one more module will be added.

Now the center run has 30 modules (not all shown here) at 3.5 modules per foot. When you add modules this way to increase the density, the two end modules will be "locked" and the new modules will be inserted between them and re-spaced automatically.



The new modules will be added along the guide path and correctly angled to match the path.

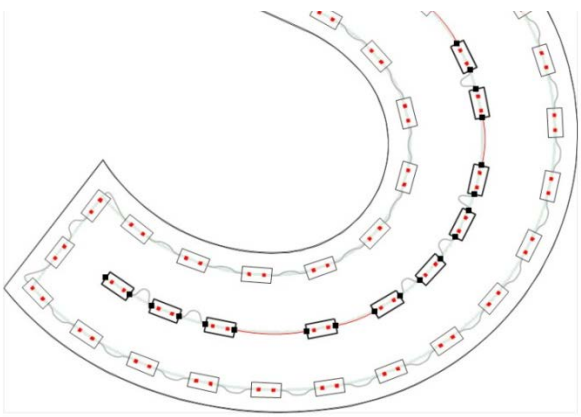
To decrease the linear density, use the icon or **R** on the keyboard. This will remove one module at a time and automatically respace the remaining modules. If you remove too many modules, then you will start to see red wires, and you'll know that you've gone too far, as in this graphic.

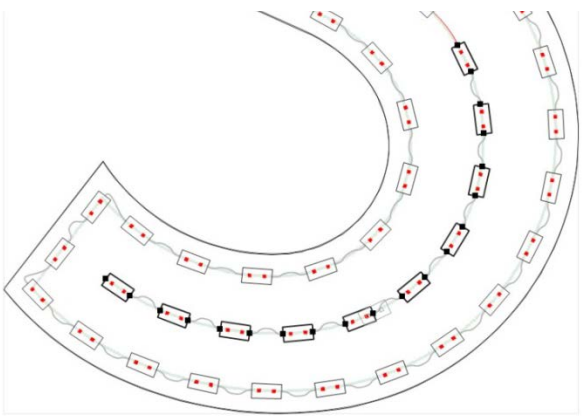


You will use Increase and Decrease density of selections very frequently, so it is a good idea to learn the shortcut keys for these.

Re-spacing

Right in between W and R on the keyboard is E, and as you might guess, **E** is used to **Re-space** a selection (without adding or subtracting any modules). You may want to re-space a selection after doing any manual repositioning of modules or to clean up an auto population for a tricky section. Let's say on this "S" that we started out with the run looking like the left image. The Re-space command, or shortcut key **E**, or this icon will instantly convert it to the image on the right.

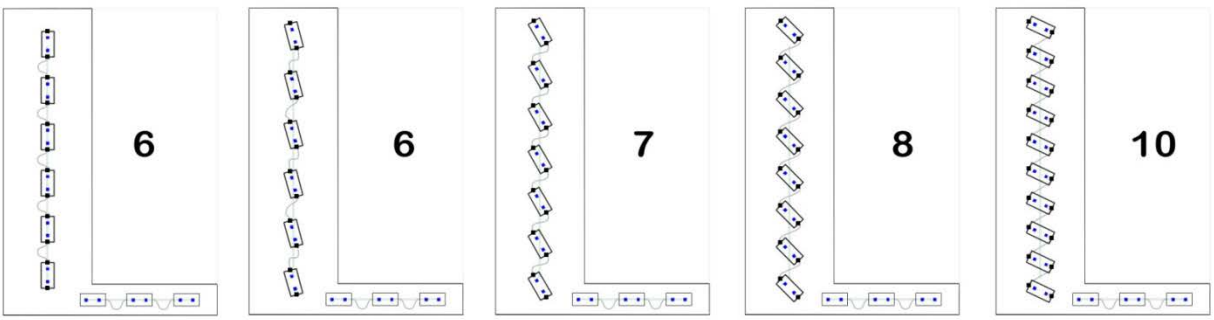




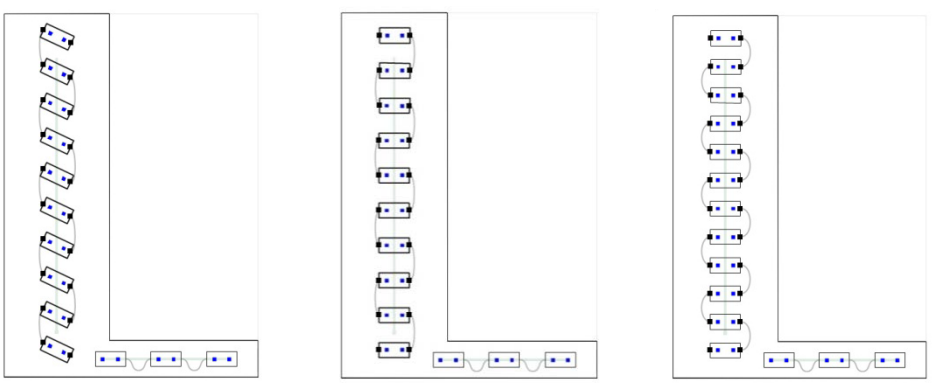
Rotation

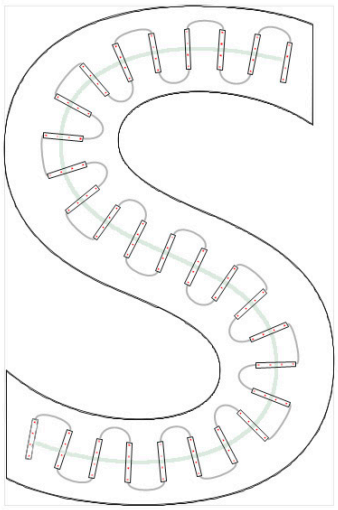
Now let's say that you want to **Rotate** the modules in the center path to give more even light coverage and a little more density on this letter. For modules that have two or more lights, rotation can be a great way to lay them out in situations where you are between one and two runs, or where you just want a little more light density.

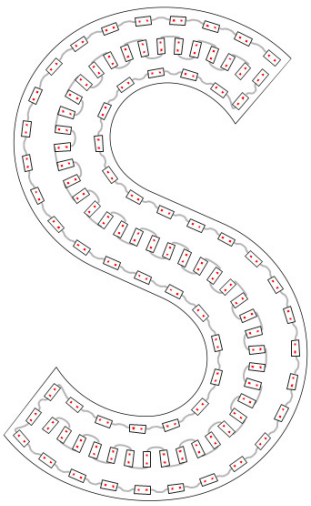
As you recall from above, **CTRL+X** and **CTRL+C** will rotate a module, or in this case, a selection of modules. The first thing you notice when rotating a selection of modules is that the wires start to get stretched. After only a little bit of rotation, you need to start adding modules. Fortunately, this feature will automatically add the modules and respace them to maintain "reachability" of all modules! Here is a series of examples, using CTRL+X or  for Counter-Clockwise Rotation. The number indicates how many modules are in the run.



When you get to the kind of rotation and density in the last "L", you start thinking about alternating the wiring so that you don't have to stretch too far. **Modify Menu | Rotate | Alternate Rotations**, shortcut key **U,** will alternate the wiring. And if you want the rotation to go all the way perpendicular to the path, then you select **Perpendicular Alternate Rotated**, or  , or the shortcut **CTRL+U**. As you would expect, when you have a selection of the modules in the middle graphic, you can increase or decrease the density to modify the selection. In the third graphic, we have added two more modules using Increase Density, shortcut key **W**.

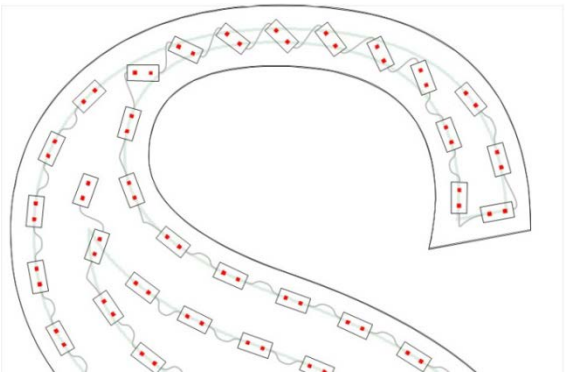






Perpendicular Alternate Rotated is a great feature that you can do in one step from a linear centerline. Keep in mind that the density commonly doubles in these cases from a linear layout, although it does depend on the module and the wire length.

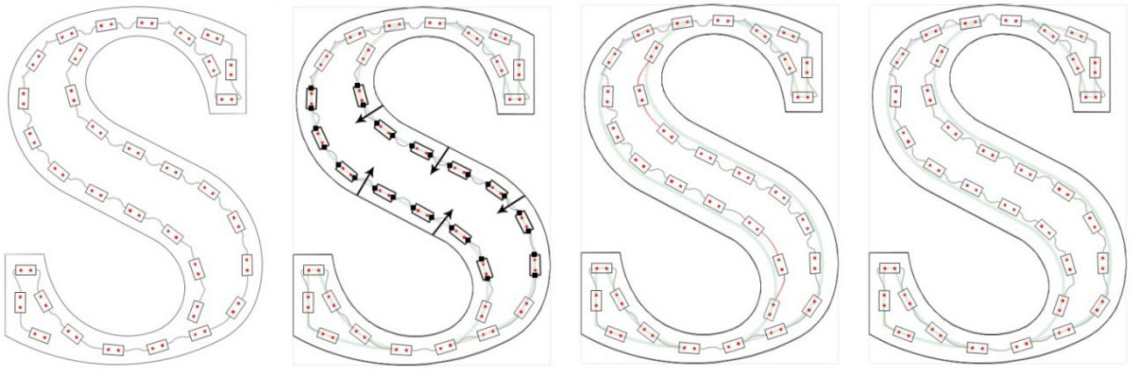
In these cases above we are showing entire runs using this rotation, but in practice you can use this, or various degrees of rotation, for certain sections of letters, especially variable stroke width letters, where you are transitioning between thick and thin sections. Here we have a thick/thin stroke where rotation is used to transition.



Shift In and Shift Out

The next feature we'll look at for selections is **Shift In** and **Shift Out**. Going back to variable stroke letters, there are some cases where you want the Clearance value to vary with the stroke of the letter. In the thinner sections, you may want a tighter clearance, and in the thicker sections, a larger clearance. **Shift In** and **Shift Out** will allow you to make a selection and incrementally move it in towards the edge of the letter or out away from the edge of the letter.

Here in this "S" you can see that there is going to be a dark area in the middle of the letter, but you don't really want to put a third run in. And since it's a double run, rotation is probably not a good option. What you really want to do is move the modules away from the edge and towards the middle of the letter in that open area. The procedure is to make a selection of the modules you want to shift, then use either the icon  or the keystroke, which is **CTRL + >**.

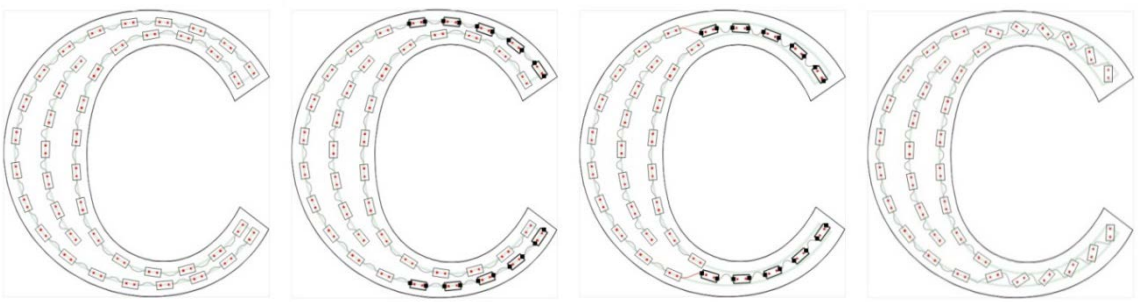


You can see the progression here in these four images. First is the original. Second shows what we want to do. Third is the initial result, but you can see that now we've created some red wires. This is due to the fact that the modules are moved away from the edge at a perpendicular from the outside angle. The result is that some modules get closer together and some get further apart. So the fourth image has the shifted sections re-spaced.

Centering

There are many cases where you want a run to be centered in the stroke. And as we saw above, this could be in a triple run layout as well. In the section on editing individual modules, we talked about using **ALT+Drag** to place modules on the centerline. When dealing with selections, the approach is a little different, but consistent with how we are working with other selections. To **Center** a selection, use the icon  or the **SHIFT+C** shortcut key.

Perhaps one of the most useful tools for centering a run is what we call **Center with Clearing**. This is used when you have two runs that are really too close together, and you'd prefer to just have one centered run. Maybe you would consider rotating the one run if the section is really on the border of one and two runs. The procedure is to select the modules that you want to center, and then use the shortcut key **CTRL+SHIFT+C**.

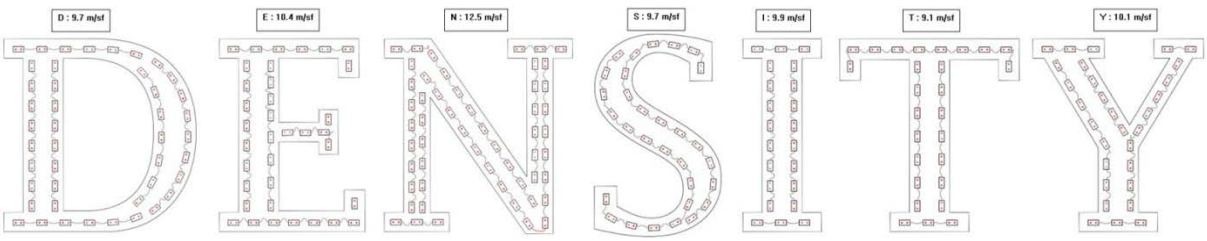


Density, Target Density, and Density Segments

One of the primary goals of making LED layouts is to populate in a very even, consistent manner, so that the resulting sign does not have hot spots or dark spots. This is not an exact science, as there are many variables, some of which are outside the scope of this software. But we do provide you with **Density** information that lets you know data such as **modules per linear foot** for a selection and a whole letter, and **modules per square foot** for a selected area and a whole letter. This data is valuable on both an absolute basis (How many modules per square foot are in this letter?) and on a comparative basis (Do all the letters have consistent densities?)

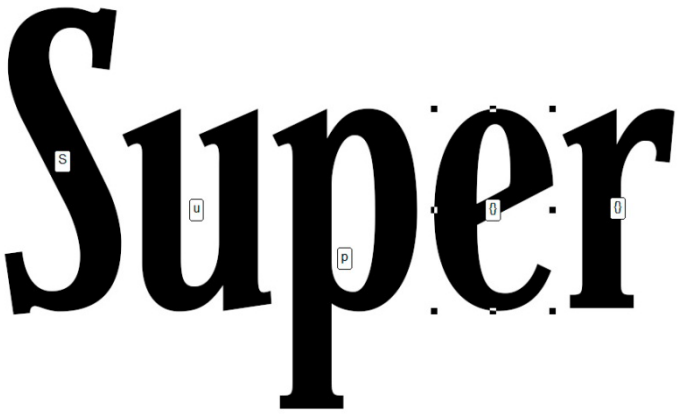
Let's review something we covered previously, which is the display of density information in the **PowerFlow Tab** on the right of the screen. Here at the bottom we see **Area**, which gives the area inside of the letter in square feet, **Density**, which shows the area density, measured in modules per square foot, **Letter**, which is the number of modules in the letter and the linear density of the modules, measured in modules per foot, and finally **Selected**, which shows this same info as **Letter**, but just for the selected modules (if applicable). All of this information is always on display when you have the PowerFlow tab visible.

You can also display the modules per square foot of each letter in a small box above each letter by checking **Show Letters and Density** in the **Options Menu**. This information is shown like this:

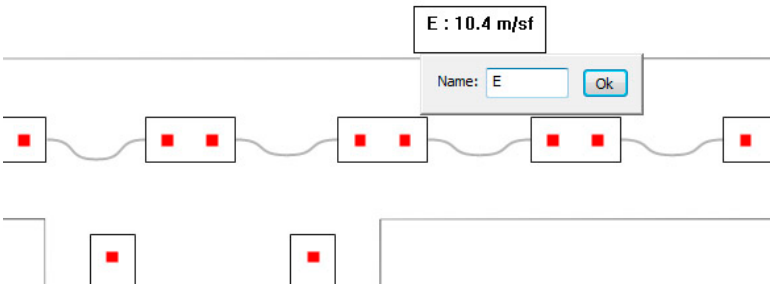


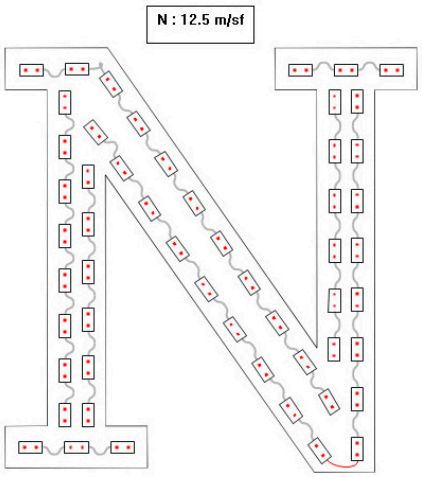
If you import your text, as opposed to using the LED Wizard Text Tool, then you'll either have to use the **LED Menu | Assign Letters** tool before going into PowerFlow to identify the letters, or identify them after you have populated them with LED modules.

To use **Assign Letters**, while in the Layout Tool, just Group the letters and then choose this function. You will then be able to enter each letter sequentially. Here we have already typed in S, u, and p, and now "e" is selected. Once we type e, then r, just click back on the Layout Tool to finish. The identifying letters will disappear, but they will be saved and used with the Stats.

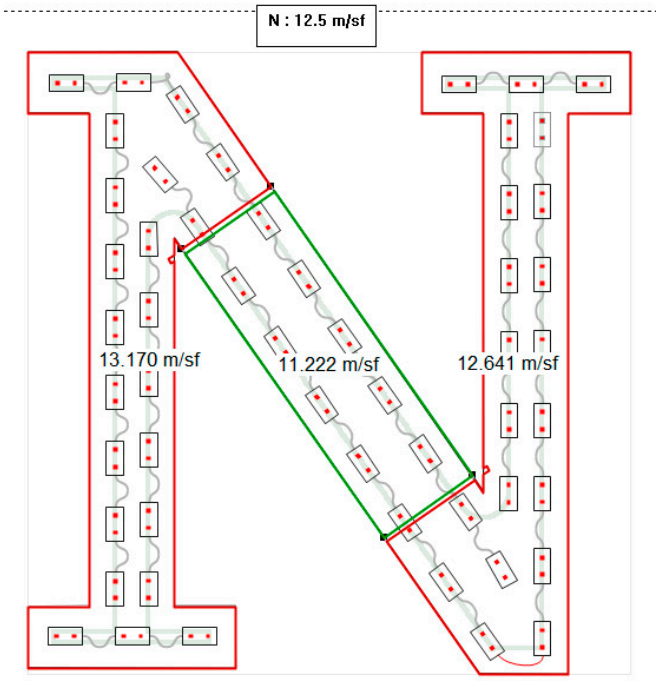


The other way to identify the letters is to edit the little boxes above the letters in PowerFlow, after you have populated the letters. To do this, just click on the box and an input field will pop up, allowing you to type in the letter(s). This is actually more flexible than Assign Letters because you can type anything here, such as multiple letters. Just press OK when you're finished.

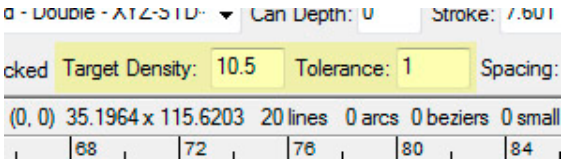




In addition to these density readings per letter, LED Wizard 7 can get even more granular in its analysis of density by letting you define **Density Segments**. These are basically sections of a letter that you define with simple segments that splice a letter. For example, going back to the "DENSITY" text above, you'll notice that the "N" has the highest density of all the letters at 12.5 modules per square foot. You can see this visually too. It looks like that the center stroke has about the right density, but both vertical strokes are too dense. To test this observation, we are going to add Density Segments to the middle stroke. To do this, position the mouse where you want the segment splice and press shortcut key **L**. Be sure the mouse position is **inside** the letter! The splice will be perpendicular to the letter edge.



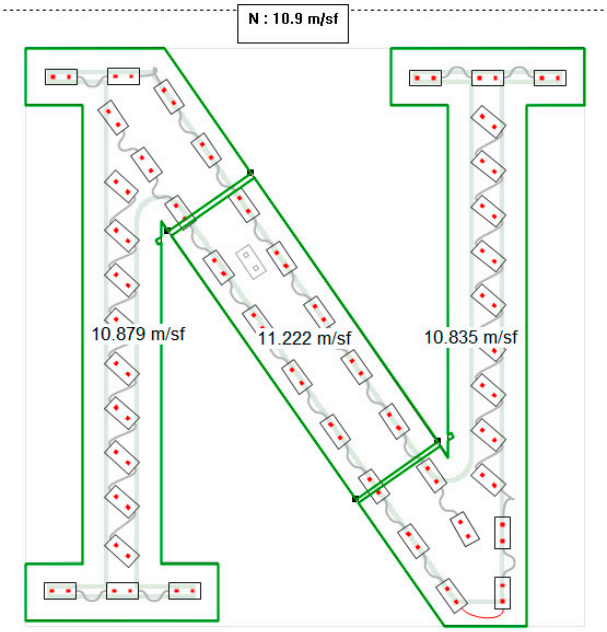
This splits the letter into three segments, each with its own density reading, and introduces this color coding of each segment. The color of a segment provides a quick way for you to determine whether the segment is under-populated, over-populated, or just right, according to the **Target Density** and **Tolerance** values that you have entered here.



In this case, we have the Target Density at 10.5, with a Tolerance of 1. So a density value of 9.5 to 11.5 will show up as **green**, any value above 11.5 will be **red**, and any value below 9.5 will be **blue**.

You can set the Target Density ahead of time if you know it, or you can simply read the values from the other letters and come up with an average or what looks right. Then it becomes a question of consistency across all of the letters – maybe some need a couple more modules and some need to lose a couple modules. For this "N", one way to get the segments more consistent is to switch to one rotated row in the vertical strokes. All green is good.

Density Segments can be moved and deleted as well. To move one of the segments, just click and drag on the one of the points at the end of the splice. To delete a segment, just position the mouse over the slice and press **L** again.



One word of caution with reading densities: they are typically more dense and more variable on smaller letters. Sometimes adding or subtracting just one or two modules on a small letter will make the density swing from “underpopulated” to “overpopulated.” Larger letters tend to be more consistent since you have a larger area and a larger number of modules to work with. How you use this data is up to you, but it is here for you as another way to ensure consistent populations.

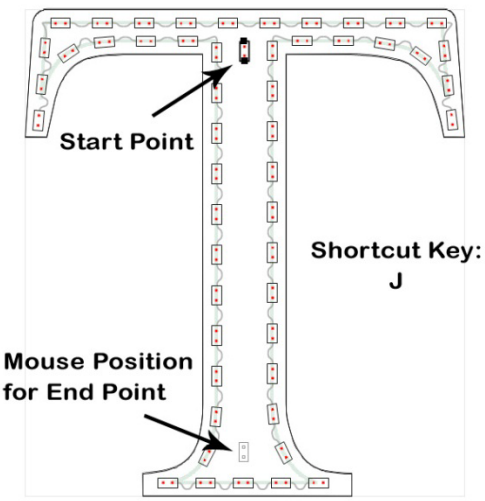
Additional Tools

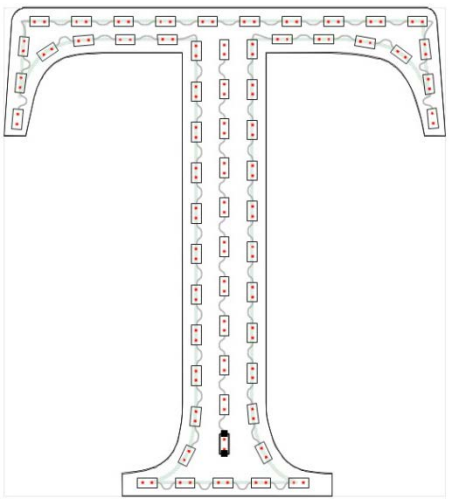
There are several additional tools available for working with selections, and here is a quick summary of a few more. As you work with the software, you can look deeper in the documentation to explore more options.

Convert To Line – this function takes a selection and converts it to a straight line. The shortcut key is “]”.

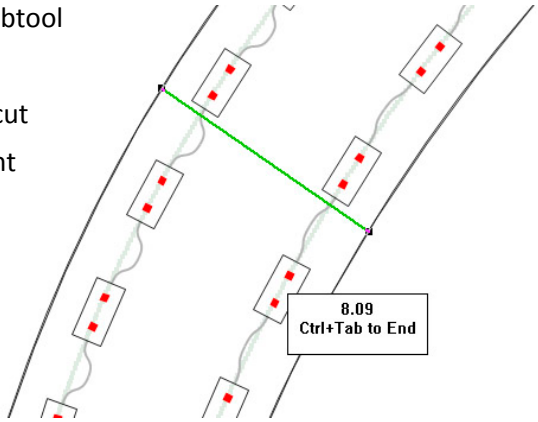
Append Module – this function will add a new module to the end of a run, either in a straight line if the run is straight, or along the guide path if the run is a curve. This module will be positioned with spacing that is consistent with the original run. The icon is  and the shortcut key for Append is **G**. This can really be thought of as an alternative to click and drag for adding several modules at once or module by module adding, as discussed at the beginning of this section.

Fill to Cursor – this function will fill in modules in a straight line between a selected module and the position of the cursor. The procedure is to select a module that will be one end of the new line, move the cursor to the point that will become the other end, and then press the shortcut key **J**. There cannot be an icon for this function because the position of the mouse determines the end point of the line.



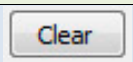
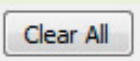


Measure Tool – PowerFlow has its own special Measure Subtool that you can use very quickly to measure the width of the stroke, height of a letter, etc. To invoke this tool, the shortcut key is **CTRL+TAB**. Then position the mouse on the start point for the measurement, click and drag a line to the end point for the measurement, and the distance will be shown right there in a little box. To leave this subtool and return to PowerFlow, hit CTRL+TAB again.



PowerFlow Selections Summary

Function	Description	Icon	Shortcut key
Uniform Spacing	Standardizes the spacing between all modules in a selection.		E
Increase Density	Adds one module to the selection and automatically applies Uniform Spacing.		W
Decrease Density	Removes one module from the selection & automatically applies Uniform Spacing.		R
Center	Centers the selection in the stroke.		Shift+C
Center with Clearing	Centers the selected run and deletes other modules in close vicinity.		Ctrl+Shift+C
Shift In	Nudges the selection in towards the edge of the letter.		Ctrl+<
Shift out	Nudges the selection out from the edge of the letter.		Ctrl+>
Rotate Alternating Perpendicular	Rotates each module to be perpendicular to the guide path & alternates the wiring.		Ctrl+U
Append Module	Adds another module to the end of the selected run with consistent spacing, either in a straight line or along the guide.		G

Select Run	Selects all the modules in the current run.		CTRL+A
Select Entire Letter	Selects all the modules in the entire letter.		SHIFT+A
Paste Entire Letter	Pastes a Selected Letter into the same (but unpopulated) letter elsewhere in the layout.		SHIFT+V
Fill to Cursor	Adds one or more modules in a straight line from a selected module to the position of the mouse.	Mouse operation	J
Break Run	Will remove the wire connection between two modules.		O
Move opening	If a run is open at just one point, then this command will close that point and open the run at the position of the cursor.		M
Convert to Line	Converts a selection to a straight line.		[
Delete Current Run	Deletes the current run, even if only one module is selected from that run.		CTRL+D
Delete All Modules in Letter	Deletes all the modules in the current letter. You can also use this Clear button in the PowerFlow Tab.		CTRL+DEL
Delete All Modules in All Letters	Deletes all the modules from all the letters in a group or Combined object. You can also use the Clear All button in the PowerFlow Tab. To delete all modules from the entire layout, use **LED Menu | Remove All LED Objects**.		Shift+Ctrl+Del
Measure Tool	Enables a quick measurement within PowerFlow.		Ctrl+Tab
Add/Delete Density Segment	Inserts or deletes a splice inside a letter to create or remove density segments.	Mouse operation.	L

Note: This table does not also list items that were included above in the Individual Modules section, such as Rotate CW/CCW and Nudge.

This is not an exhaustive list, but does show the most common PowerFlow editing functions.

Mouse Operations

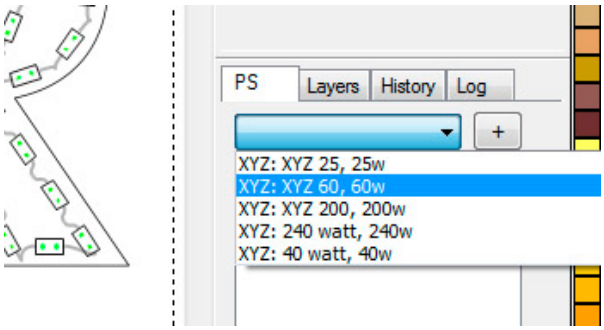
Some PowerFlow functions require the mouse to be in a particular position, and therefore you cannot go to a menu or click on an icon. These functions therefore require a mouse operation (click, click and drag, etc) and/or a shortcut keystroke (CTRL+Drag, SHIFT+Click).

Function	Description	Mouse Operation	Shortcut Key
Move Along Path	Move a module or selection along the guide path.	Click and drag on the module or selection.	
Move Off Path	Move a module or selection OFF the guide path.	Click and drag while holding down CTRL	
Ctrl Drag to Copy	Make a copy of a selection	Ctrl + Click and Drag selection	
Create Selection	Make a selection of multiple modules	Shift + Click	
Force Center of Stroke	Add modules in the center of the stroke	Alt + Drag	
Insert Single Module	Insert a module between two others.	Click when module turns green	I
Fill To Cursor	Adds one or more modules in a straight line from a selected module to the mouse position.	Position the mouse where you want the new run to end and press J.	J
Insert/Delete Density Segment	Adds or removes a density segment splice.	Position the mouse over the point of the splice and press L.	L

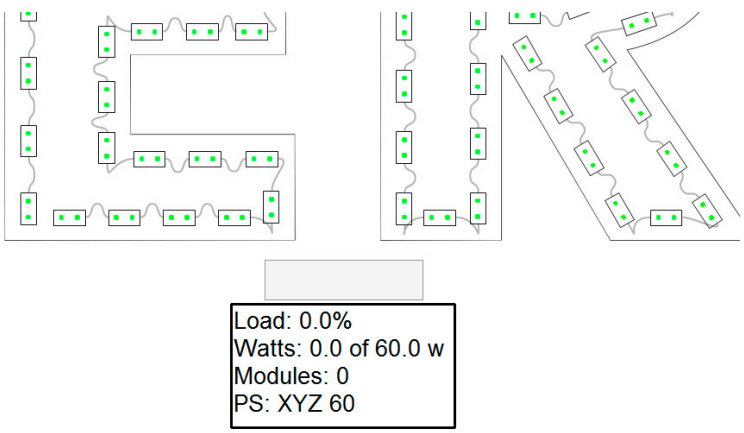
Adding Power Supplies

Once you have your letters populated and edited to your satisfaction, it is time to add **Power Supplies** to the layout. The main goal with these features is to provide an easy way to add and load power supplies so that the layout is complete, whether it is for an estimate or as a production file.

With LED Wizard 7, LED suppliers have added their power supplies to our system. Only the power supplies for the supplier whose modules you have used will be available in the Power Supply Tab, shown here.



To see the list of available power supplies, click the down arrow, which is just to the left of the "+" sign. Here we have the list of names of our fictitious XYZ LED supplier, such as "XYZ 60" for the 60 watt power supply. If we select that power supply from the list, then we just click on the "+" sign to bring it into the layout. The power supply will be represented by a red dotted line rectangular preview, and will be attached to the position of the mouse. So just move this preview power supply to the position you want and click the mouse.



Here is the power supply that we have placed in the layout beneath the "E" and "R." The actual power supply dimension is the rectangle on top. The larger rectangle just houses the data: **Load**, as a percentage of the total, **Watts**, as a number of the total wattage, **Modules** wired to that power supply, and **PS**, the name of the power supply.

Now before we continue to the process for loading this power supply, we should mention that in some cases, such as a simple Estimate or a basic "One Power Supply" job, it may be good enough to just bring in the power supply or power supplies and place them in the layout. No loading or wiring or positioning.

When we get to the **Stats** section below, you'll see that all power supplies in the layout will be listed with the Stats, whether or not you go through the steps to load them.

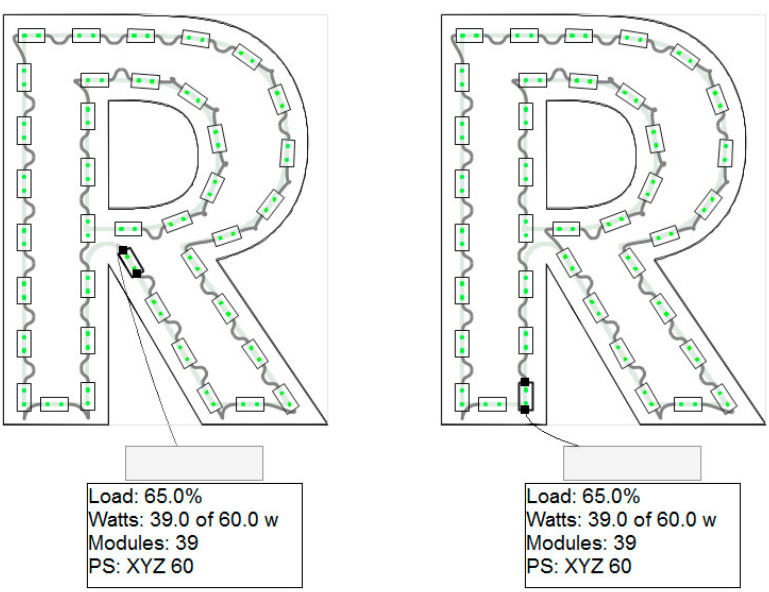
But a word of caution here: it is not always practical or feasible to use logic such as "I have 200 modules, each power supply drives 50 modules, so therefore I need four power supplies." Maybe the manufacturer suggests running them at a lower load percentage, maybe you have five letters and it makes more sense to keep one power supply per letter, maybe the layout dictates how the power supplies need to be positioned, maybe it would make sense to mix two or more different power supplies for the layout, etc.

Loading Power Supplies

There are two main ways to load power supplies:

1. Run by run and/or letter by letter – most common approach, small and medium letters.
2. Rectangular selections – large letters, multiple power supplies per letter.

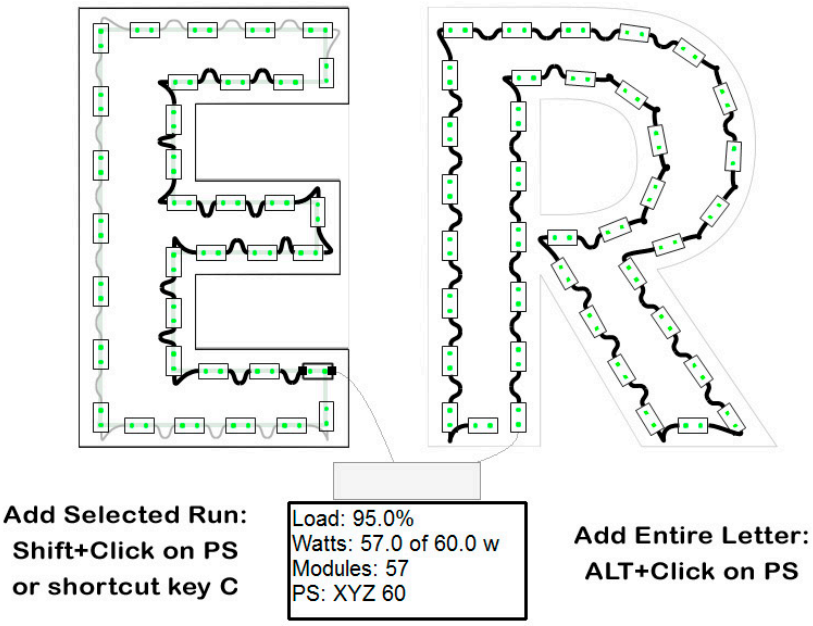
Let's first talk about the first option, adding letters and runs to a power supply, because that is what you'll do most often. To add an entire letter to a power supply, make sure you're in PowerFlow and select that letter or select one module in the letter, hold down **ALT**, and click on the power supply. Here's what that will look like with a double run "R" with 39 modules on a 60 watt power supply.



You'll notice that the wires now have a heavier stroke, and that indicates that the modules are connected to a power supply. You can think of it as the wires are now "live." There is also a connecting wire from the end of this run to the power supply.

In certain situations, you may want to use **Move Opening** to move the opening from one location on the run to another to be closer to the position of the power supply. For example, on this "R" you could move the opening from the middle of the letter to the bottom.

Now the box with the data gives us some relevant information: this power supply is 65% loaded, with 39 watts out of 60, and 39 modules (one watt per).



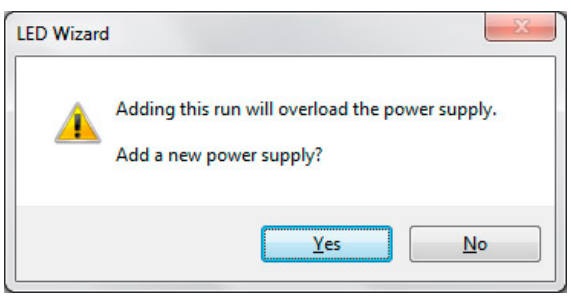
In this case the letter is populated by just one run, but if you have a letter that is populated with more than one run, such as this "E," then you can add one run at a time. To do this, select a module in the run (it is not necessary to select the entire run), and **Shift+Click** on the power supply or use the shortcut key **C**.

Now the power supply is 95% loaded. When a power supply is loaded beyond 95% of the maximum safe operation, the power supply will be drawn with red text.

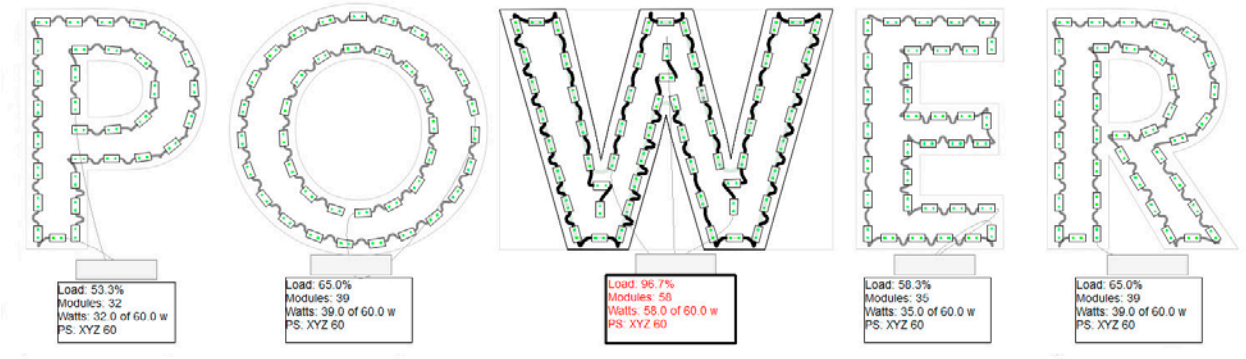
But there is a built-in mechanism to handle this if you are trying to add another run to a power supply that is near capacity.

Clicking yes here will bring in a new power supply into the layout and load it with the selected run.

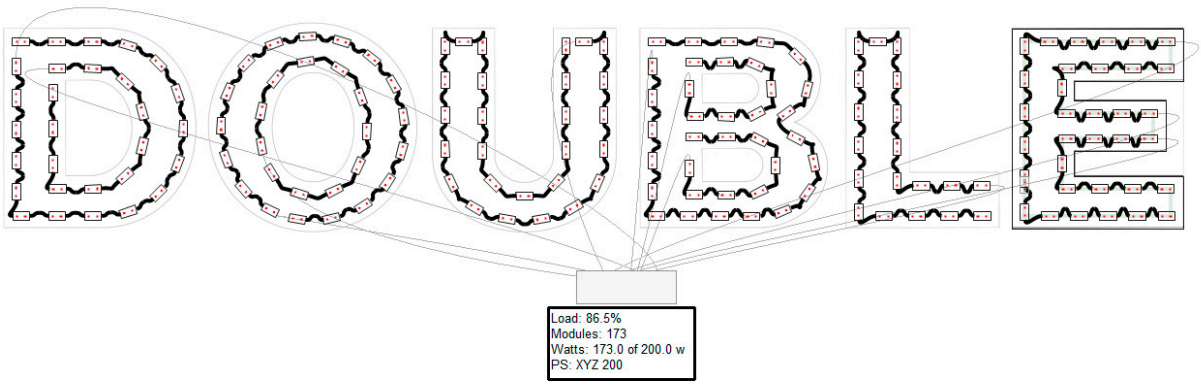
You can, however, overload a power supply by adding an entire letter that has too many modules.



Here is the whole layout, one power supply per letter.



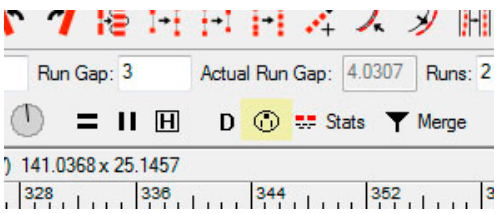
Here's another example, one 200 watt power supply for the whole job.



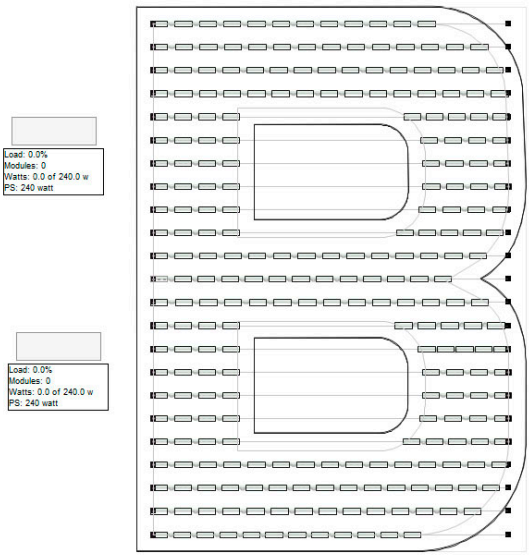
If you find the wires distracting, you can turn them off in **Options | Show Power Supply Wires**.

Now let's talk about the second way to load power supplies, which is targeted towards larger letters and multiple power supplies per letter. This method uses a special **Power Supply Mode**, which enables you to make selections of modules just by drawing a box.

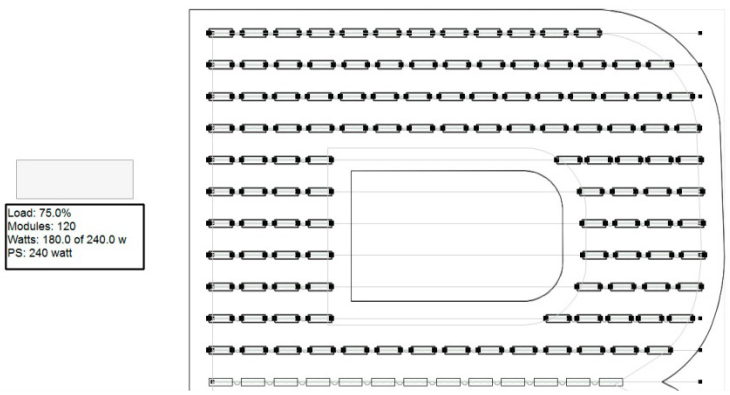
To get into the Power Supply Mode, click on this icon in the toolbar. While in this mode, when you draw a box with the left mouse button, it will select modules.



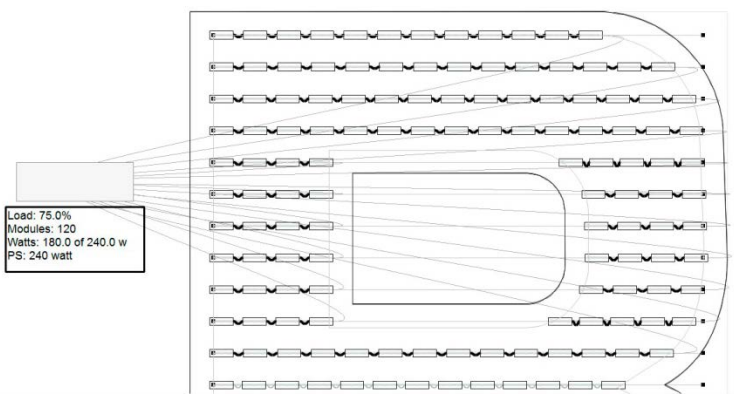
Here is a large “B,” populated with horizontal parallel runs. This letter has 254 modules and needs 381 watts. We can drive these modules comfortably with two 240 watt power supplies, one for the top section and one for the bottom section. So while in the Power Supply Mode, the procedure to add a power supply to the layout is the same: select the 240 watt unit, click on the “+” sign, and move it into position in the layout. And we’ll add the second one as well.



The top power supply is first, so we’ll click on it to select it.

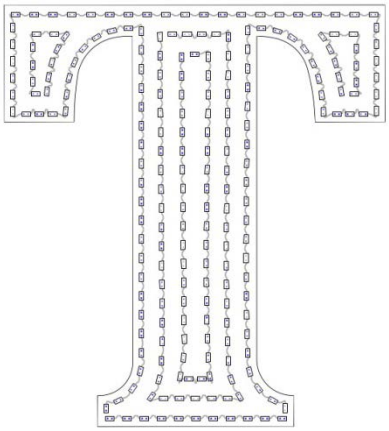


Now all you have to do is draw a box around the modules you want for the first power supply, and they will be selected, as shown here. The power supply data box will show a preview of the load for your reference, but the modules are not actually attached to that power supply yet. To do to that, go to **Power | Add Selection Rectangle Modules to Power Supply**, or use the shortcut key **B**.



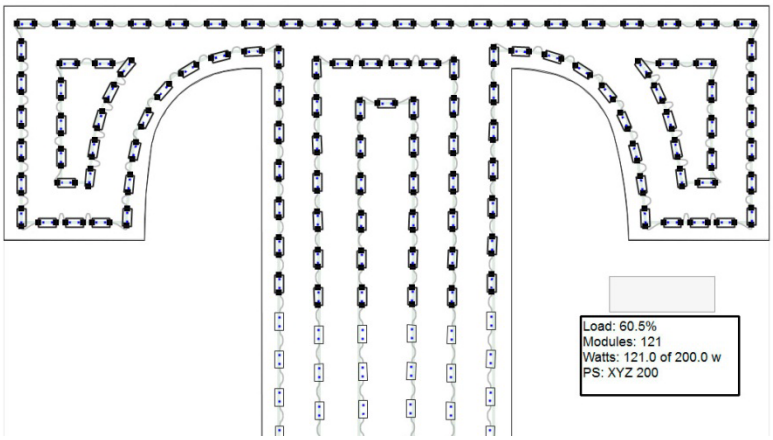
The modules are now wired to the power supply. Note how the wires are now thick, which means that they are “live.” Above the modules are just selected. We can do the same thing with the other power supply. You can see that in this case, this is a much faster method.

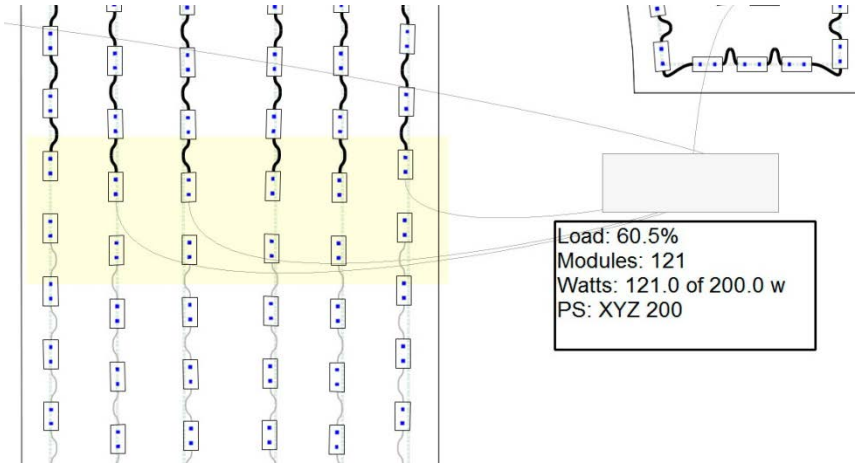
But in some ways this is a simplistic case since all the runs are parallel, so let's now look at a situation where you have to break runs to create a cohesive selection of modules.



Here is a large "T" that we want to populate using two power supplies, one at the top and one at the bottom. Since this layout has runs that span the entire height of the letter, if we want to do our power supplies this way, we'll have to break several runs. Luckily the Power Supply Mode can do this for us!

Hold down CTRL as you draw the box to select the modules, and this will enable you to make selections that are subsets of an entire run. Again, once you have made this selection, then use the shortcut key **B** to add them to the selected power supply.





You can see in the close up image that the runs have been broken at that spot. Now you just do the same for the bottom section, and your power supplies will be loaded. You can position the power supplies anywhere you want to in the layout.

Power Supply Summary Table

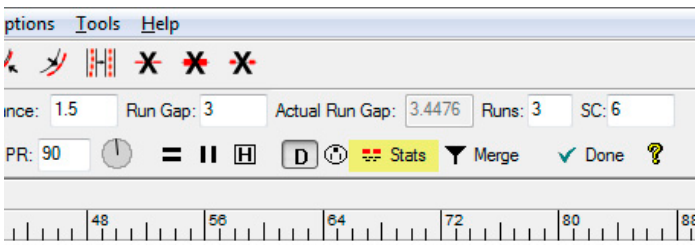
Function	Description	Icon	Shortcut Key
Add Power Supply	Insert a new power supply into the layout.	 (in PS Tab)	Shift+P
Remove Power Supply	Removes the selected power supply from the layout.		Ctrl+Shift+P
Connect Current Letter to Power Supply	Adds all the modules from the current letter to the selected power supply in one step.		Alt+Click on power supply
Remove Current Letter from Power Supply	Removes all the modules from the current letter from the power supply.		Ctrl+Shift+Click on power supply
Connect Run to Power Supply	Connects the current run to the selected power supply.		C or Shift+Click on power supply
Remove Run from Power Supply	Removes the current run from the power supply.		X or Ctrl+Click on power supply
Get into Power Supply Mode	Switches to Power Supply Mode so that dragging a box selects modules for loading.		
Make Rectangular Module Selection	In Power Supply Mode, make a selection of modules by drawing a box around them with the left mouse button.		Drag a box around modules
Add Selection Rectangle Modules to Power Supply	In Power Supply Mode, adds the selection of modules to the selected power supply.		B

Stats, Title Block Integration, and Exporting

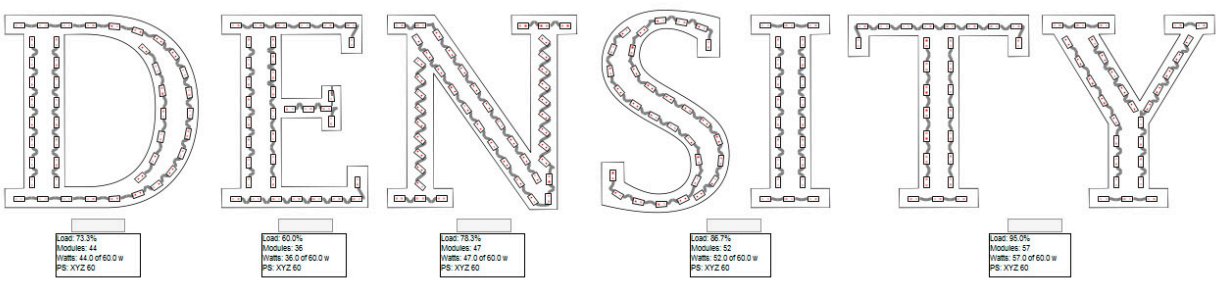
We're almost finished. The final steps to complete your LED layout are to add the **Stats**, or Summary Data, below the letters, integrate with your **Title Block**, and **Export** the final file. These last steps are important because it gives you a chance to customize what the final layout looks like, although these features are largely automated.

Creating Stats

To create the Stats for the job, click on the **Stats** icon shown here.



Here is what the DENSITY example looks like with Power Supplies and Stats.

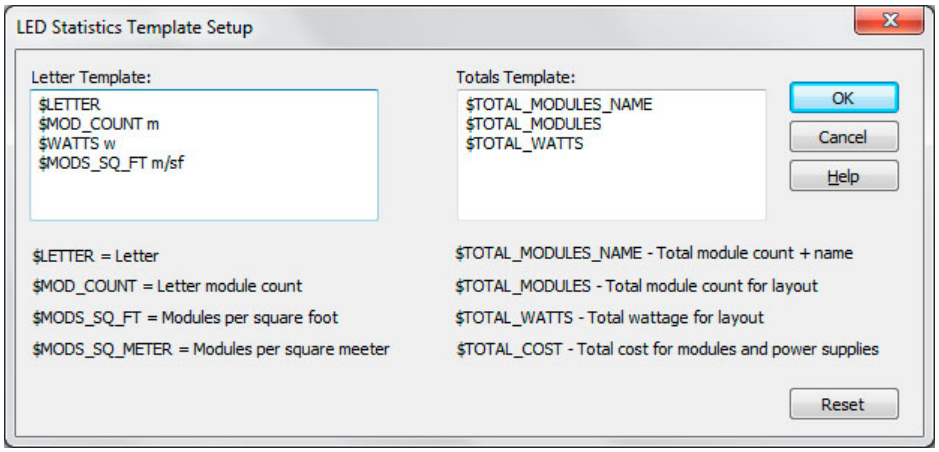


D	E	N	S	I	T	Y
44 m	36 m	47 m	30 m	22 m	27 m	30 m
44.0 w	36.0 w	47.0 w	30.0 w	22.0 w	27.0 w	30.0 w
9.7 m/sf	10.4 m/sf	10.9 m/sf	9.7 m/sf	9.9 m/sf	9.1 m/sf	10.1 m/sf

236 Modules: XYZ - Standard Red - Double - XYZ-STD-RED
236.0 Watts
5 Power Supplies: XYZ - XYZ 60

To dissect this a little bit, we have four distinct items here: 1) the populated letters, 2) the loaded power supplies, 3) the stats for each letter, and 4) the summary stats for the whole job. Numbers 3 and 4 are generated automatically with the **Stats** command, but you do have the ability to edit the size, position, and text of this data.

So the first way we'll look at to customize this data is the actual code we use to generate the stats for each letter and the whole job. To do this, we go to **Options Menu | Statistics Template Setup**, which brings up this dialog box:



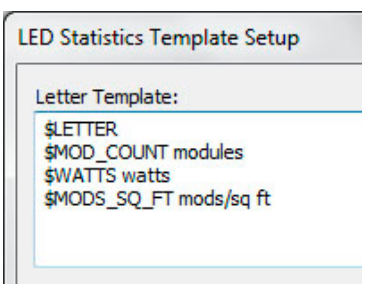
This is going to get a bit technical, so if you are fine with how the Stats are displayed, then feel free to skip this section.

The box on the top left defines how the individual letter stats are displayed and the box on the upper right defines how the totals for the whole job are displayed.

The items in all CAPS that start with $, such as $LETTER, are values in the software that we can report here in the stats. The keys to each item are displayed under the boxes, such as $LETTER = Letter. This little example here shows how this data is displayed – the Letter is "D".

D
44 m
44.0 w
9.7 m/sf

The next item, $MOD_COUNT is the module count for the letter, in this example, 44. This is where you can customize how this is displayed. The "m" is what is displayed after the value, and you can change this. If you type in "modules" instead of just "m" then the stats would say "44 modules". Similarly, if you wrote "watts" instead of just "w" after $WATTS, then the stats would read "44.0 watts". Finally, you could change "m/sf" to read "mods/sq ft" and it would read "9.7 mods/sq ft".



=

D
44 modules
44.0 watts
9.7 mods/sq ft

The argument for brevity in these stats per letter is that you simply end up with a lot of extra information if you put too much text here. Each of these stat objects need to fit underneath the letter. As you use the software, you'll be able to come to a good balance between providing the information and keeping the layout clean.

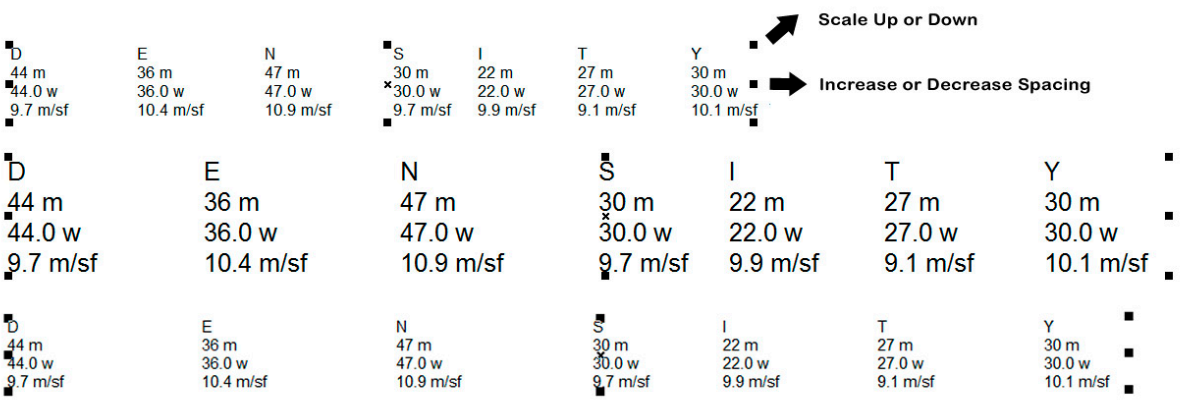
The "Totals Template" has the same basic idea, although the default for this is completely "generated" stats – the total number of modules and the name of the module(s), the total number of watts, and the number and name of the power supplies. If you have multiple modules in the layout, as well as multiple power supplies, then those will be broken out separately.

283 Modules: XYZ - Standard Blue - Double - XYZ-STD-BLUE
310 Modules: XYZ - Standard Green - Double - XYZ-STD-GREEN
593 Total Modules
593.0 Watts
3 Power Supplies: XYZ - XYZ 25
2 Power Supplies: XYZ - XYZ 60

If you want to further customize either set of stats, you can always do so by selecting the stats object **while in the Layout Mode**, and pressing shortcut key **T** for **Change Text**.

The other capability that you have with the stats is to rescale, respace, and reposition them in the layout. They will be generated in a default position below the letters, but you can always move them to better suit the layout. Again, these changes need to be made in the Layout Mode.

Going back to our DENSITY example, if you make a Group of all the letter stat objects, then you have three quick and easy adjustments that you can make: Move, Scale, and Respace.



Here at the top we show the original stats in a Group. The top right control point will **Scale** the stats up or down. In the second line, we have scaled up. The middle right control point will increase the **Spacing** between each stat item, which is what we've done in the bottom example.

One final note on the Stats command – you can update it at any time by clicking on the Stats icon again. If you want the stats to auto-update, click on **Auto Update Power Stats** and **Auto Update LED Stats** in the **Options Menu**.

Excel Integration

LED Wizard 7 also has the ability to export the summary data to an Excel spreadsheet. To set this up, select **Options Menu | Excel | LED Excel Link Setup**.

This will bring up the LED Excel Link dialog box, which lets you customize how the data comes into Excel, including setting up a template file. The details of this are beyond the scope of this document, but if you plan to use this feature, please read the online documentation for instructions.

The default settings in this dialog box will create this basic data.

Sheet 2 will contain an image of the layout for reference. To bring your data into Excel, go to **Options | Excel | Update Excel**.

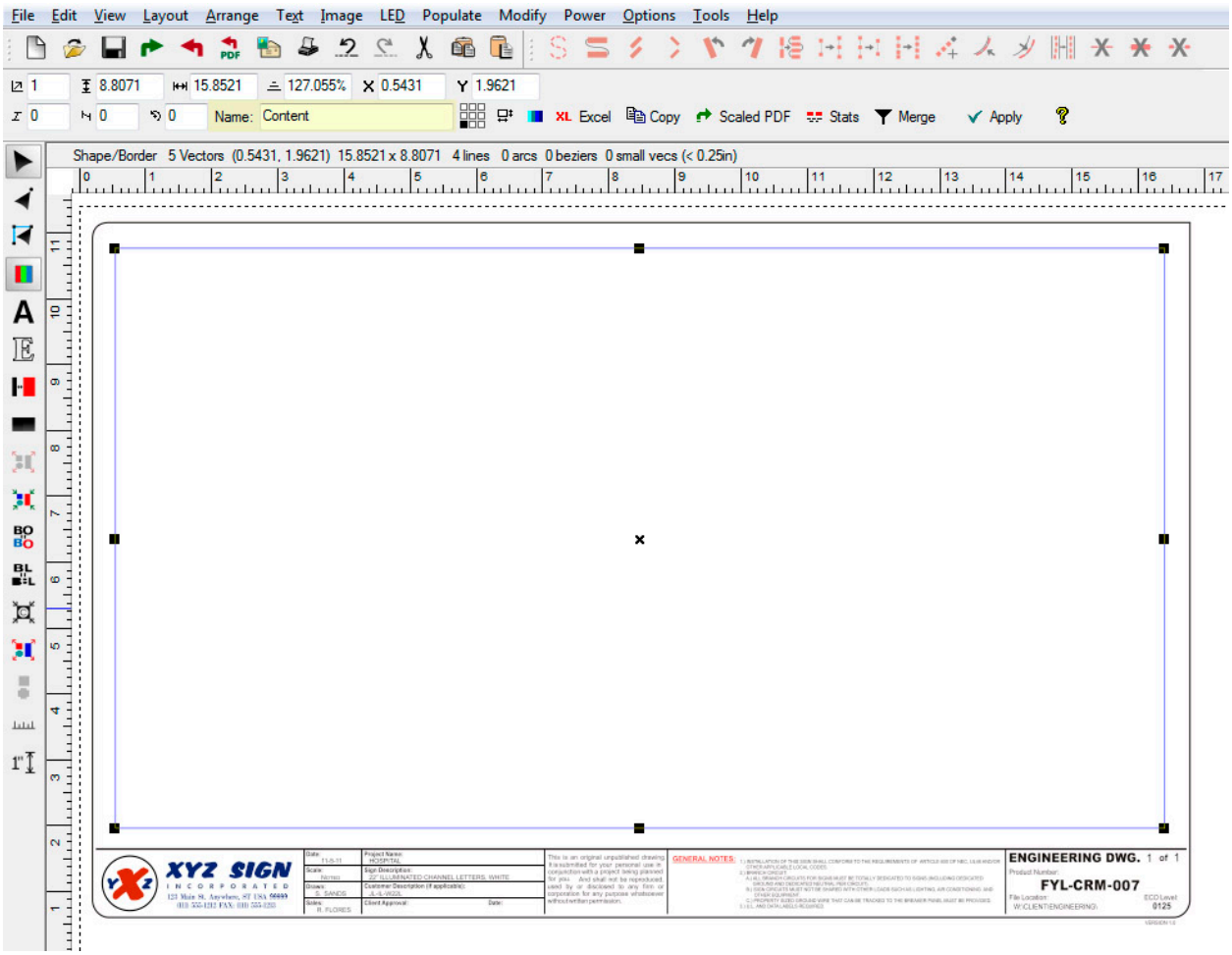
LED Wizard Template

Run	Brand	LED Module	Letter	Modules / Run	Modules / Letter	Watts / Run	Watts / Letter	Area	Density
								sq in or cm	area / modules
1	XYZ	Standard Red - Double		7		7			
2	XYZ	Standard Red - Double		8		8			
3	XYZ	Standard Red - Double		8		8			
4	XYZ	Standard Red - Double	D	21	44	21	44	652.47	14.828811
5	XYZ	Standard Red - Double		4		4			
6	XYZ	Standard Red - Double		8		8			
7	XYZ	Standard Red - Double		7		7			
8	XYZ	Standard Red - Double		8		8			
9	XYZ	Standard Red - Double		8		8			
10	XYZ	Standard Red - Double	E	1	36	1	36	499.2	13.86665
11	XYZ	Standard Red - Double		21		21			
12	XYZ	Standard Red - Double		3		3			
13	XYZ	Standard Red - Double		3		3			
14	XYZ	Standard Red - Double		9		9			
15	XYZ	Standard Red - Double	N	11	47	11	47	623.02	13.255798
16	XYZ	Standard Red - Double		15		15			
17	XYZ	Standard Red - Double	S	15	30	15	30	444.1	14.803482
18	XYZ	Standard Red - Double		3		3			

Title Block Integration

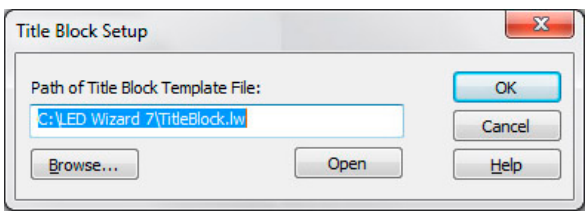
If you do not use Excel to create your final Estimate, Work Order, or Bill of Materials, then perhaps you have a **Title Block Template** where the job information is stored. Maybe you create this template and populate it in another design program. Now we can merge your finished LED layout with your title block to create a very professional finished document, all in LED Wizard 7, and export it to a common file format.

The first step is to open or import our title block file and format it to be the title block template in LED Wizard. Here is a sample title block for XYZ Sign Inc. The large open space is where we want the layout file to be inserted. All we have to do to set this up is create a rectangle outline in this space and name it "Content" in the **Name** field shown here, highlighted in yellow.



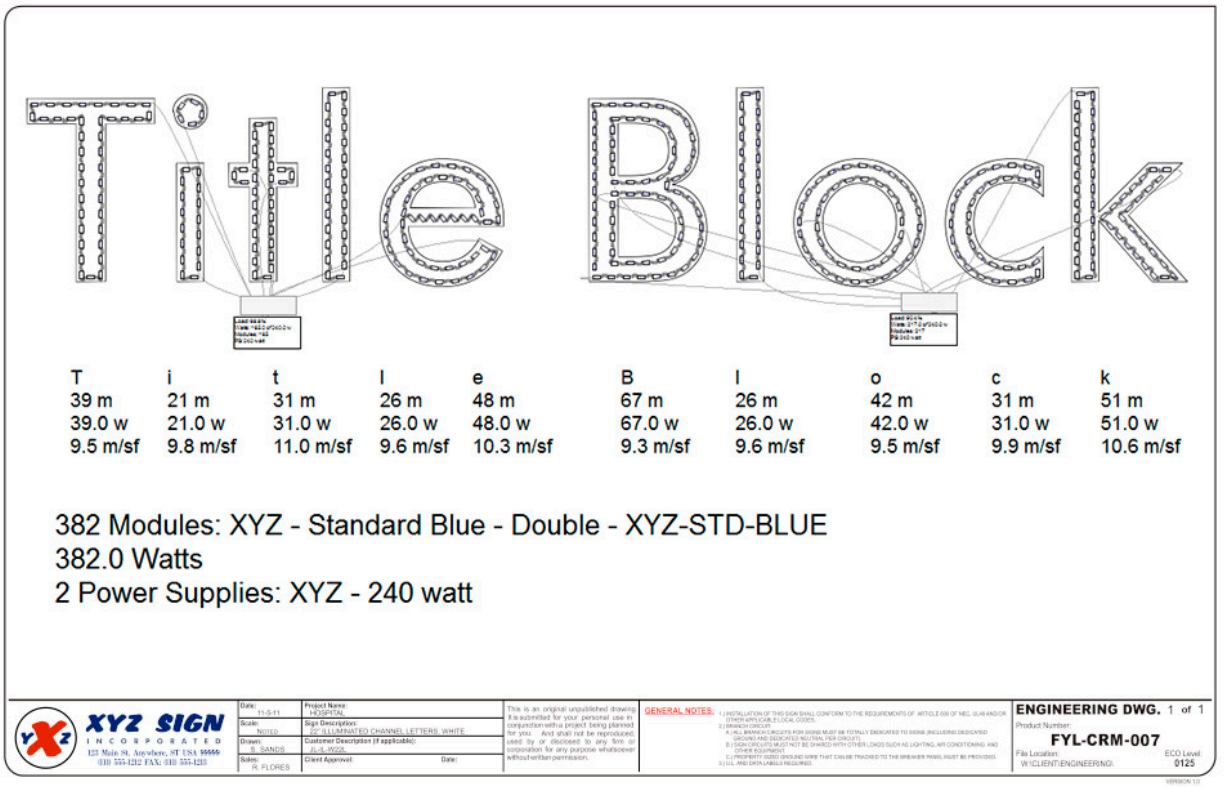
Once we've done this, we just have to save this file (remember where you saved it for the next step). It can have any name, but the default file name is "TitleBlock.lw".

The next step is to select **Options | Title Block Setup** to get this dialog box. Enter the path of the title block template file, or click Browse to locate the file, and press OK.



Now we have this "Title Block" job that we've finished and we want to merge it with the new title block template file that we just made. There is an icon on the main PowerFlow toolbar 

, or you can use the function key **F7**, or you can select **LED | Merge Title Block Template**.



The choice of whether to use the **Excel Integration** or the **Title Block Merge** is going to depend on your workflow. The Excel Integration allows you to put data into certain cells and automatically make calculations. The Title Block Merge is more "static," but if all the key data is in the layout itself, then this will suffice. If you have a workflow where the final steps are in another design software, then you may simply Export the finished design, which is what we'll talk about here in the last section.

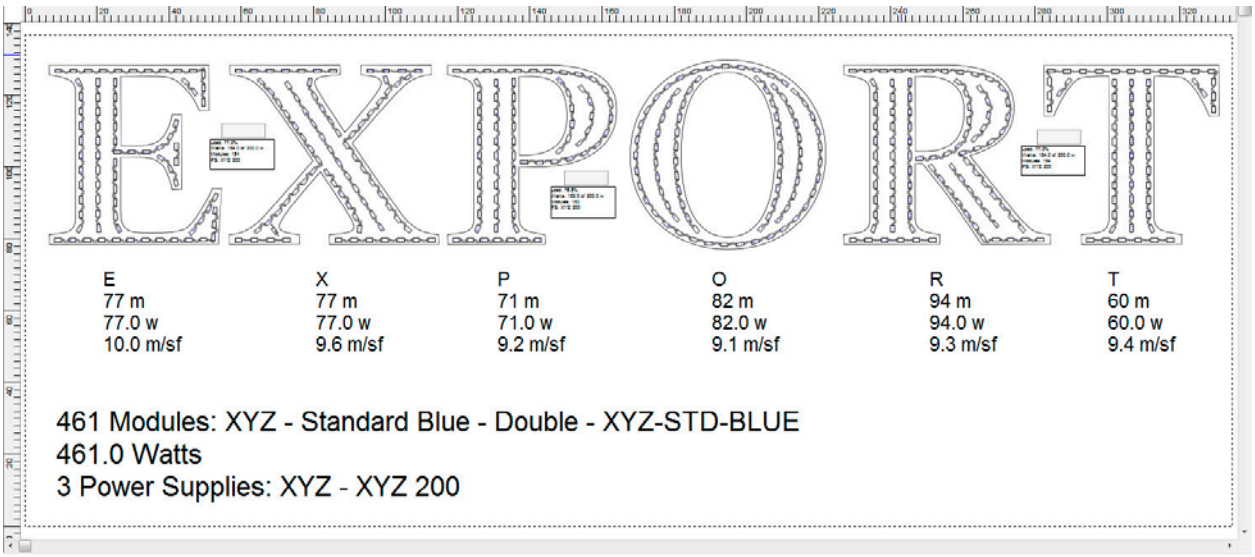
Exporting

Now your layout is completely finished and you are ready to save and export the file. Saving the file and exporting the file are two different things. You should always, always save your files in the native LED Wizard 7 file format, which has the extension ".lw". (This replaces and enhances the old ".lyt" format of previous versions, which will not maintain the necessary information to resume PowerFlow editing.) Do not work on a file and only Export it to your chosen file format without first saving it as an .lw file. The reason is simple – you need the native file to do any meaningful editing, such as PowerFlow. This does not mean that an exported file loses all ability to be edited, but an exported file by definition is not in the native format of the original application.

So after you have saved your file in the native .lw format, then it is time to export it to your favorite format. At the beginning of this document we talked about the various file formats that LED Wizard 7 supports for import and export. And once again we'll make the pitch for **PDF** as the best format for both import and export. That being said, **EPS**, **AI** and **DXF** are also standard vector formats that will work fine.

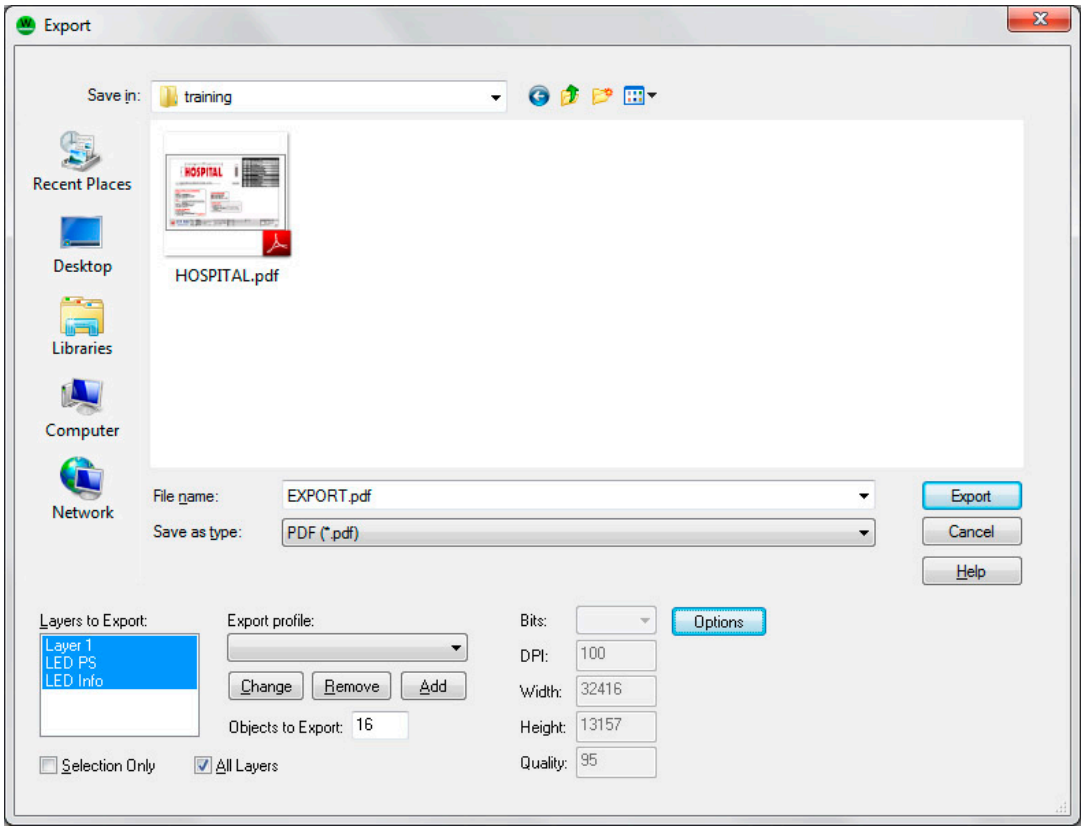
One word of caution when exporting: **be sure to keep the entire design inside of the overall layout size**, as represented by the dotted line around the workspace. Sometimes you may need to adjust the size of the layout, which you can do on any side just by clicking and dragging on the dotted line. If when you export, your design is "cut off" unexpectedly, this is most likely the cause.

Here is a layout that fills the workspace, and you can see the dotted line around the outside.



When you export, you have to take special care about what is and what is not selected. If everything is selected in the layout, either by drawing a box around all of the items or by **Select All**, shortcut key **A**, then everything will be exported. If nothing is selected, then everything will be exported. But if something is selected, then only that item will be exported.

In the **Export** dialog box, you do have the ability to manage the layers that are exported, but in general you will be exporting all layers. Therefore, it is good to get in the habit of Selecting All prior to exporting.



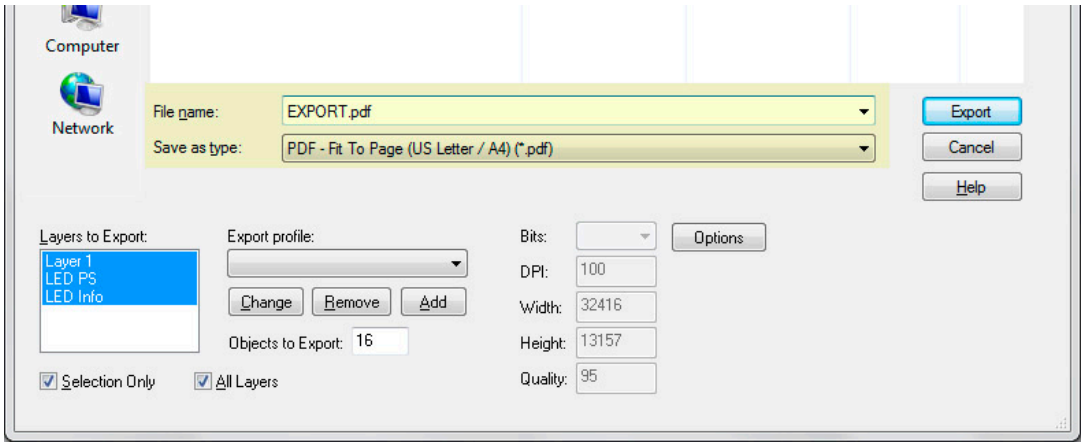
The **Layers to Export** box in the lower left corner shows all the layers in the layout. Here in this example, there are three and they are all selected (highlighted in blue).

If you are exporting to a bitmap format, such as TIFF or JPG, you can set the export size and quality where it says Bits, DPI, etc.

Finally, you can set up **Export Profiles**, which are simply presets of certain layers to export.

There is one special export option that you'll likely use most frequently, and that is **Export Scaled PDF** Scaled PDF.

This automatically scales the entire file to a US Letter or A4 page size. The regular PDF export, and all other formats for that matter, will be full scale.

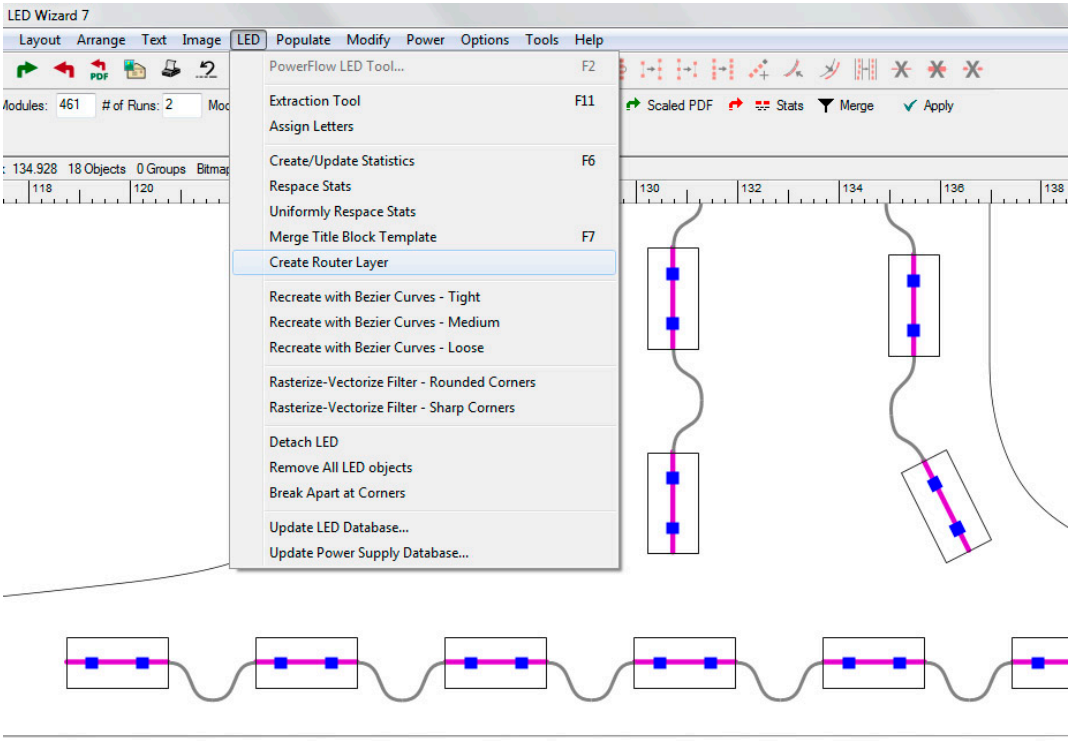


Export Module Markings

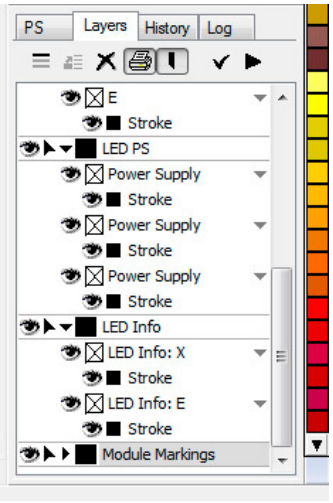
This is a new export option that provides another level of accuracy to ensure that your layouts are followed at the step of actually placing the LED modules inside the channel letters. You can imagine that there would be some loss of faithfulness to the drawing in the scenario of working from an 8 ½ by 11 piece of paper to populate a 5' letter.

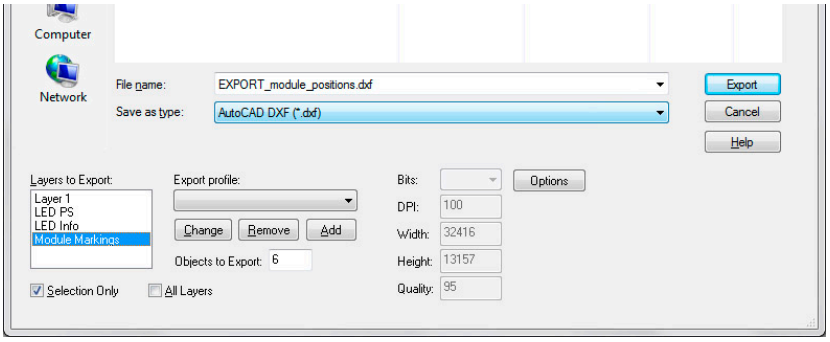
There are two steps to this process – creating the layer and then exporting the layer. The menu command **LED Menu | Create Router Layer** will create a new layer that has a simple line that spans the length of each module. The concept here is that these lines, called **Module Markings**, would be drawn directly on the letter backs with a pen on the router. Then the letters would be routed out in a second step.

The actual data that we're talking about is the purple lines, in the image on the next page, which are positioned in the middle of the module and precisely the same length.



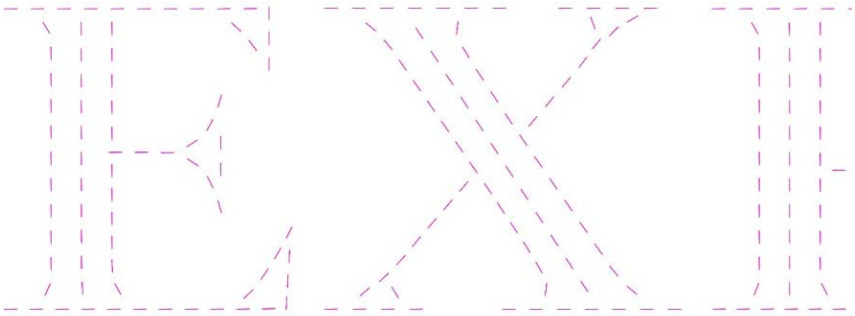
After you have created the data, you will have a new layer called **Module Markings**, as seen here in the **Layers Tab**. Then when you **Export**, you'll see this layer in the list of **Layers to Export**.





This layer is unique in the sense that when you export this layer, it is probably the only layer that you want to export. So in the above example, only that layer is selected, as shown by that layer being highlighted and the checkbox **Selection Only**. We have also given it a unique name: "EXPORT_module_positions.dxf". Don't make the mistake here of choosing the Scaled PDF Export function because you need this layer to be full scale.

The actual file created will look like this, just straight lines where the modules should be positioned. Now there's no ambiguity about the precise position of the modules on the actual letters!



Summary

LED Wizard 7 has been designed with the tools to enable you to create LED layouts quickly and accurately. We have strived to provide a good balance between automated tools and manual control. If you have read this document from start to finish, then you are well on your way to becoming more productive on your estimates and jobs.

If you have additional questions beyond what is covered here and in the online documentation, please contact your dealer, LED supplier, or Aries Graphics directly for additional support.