Visio Schematics

This course covers the process of creating point to point schematic drawings. Best practices for drawing layout, wire connections and signal flow management will be addressed. All corresponding installation reports will be demonstrated.

**Course Outline**

*Introduction to Schematic View*
- Schematic Shapes
- Right Click Commands
- Wiring Options

*Schematic Documentation*
- Page Layout Techniques
- Creating a Schematic Drawing
- Wire Management on the Drawing
- Off Page References

*Using Installation Reports*
- Checklists
- Labels

Notes
Introduction to Schematic View

**Schematic Shapes**

The Schematic Page is used to create point to point connection drawings. The schematic shapes are based on the database Inputs & Outputs so the accuracy of the data will directly reflect in the accuracy of your shapes and thus your drawings. The D-Tools schematic drawings are data-driven, and thus all of the connections can be reported on producing installation reports such as wire checklists and wire labels.

*Every IO Connection consists of these three elements: Terminal – Signal - Label*

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**Standard Schematic Shape**

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**Horizontal Schematic Shape**

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**Notes**
Right Click Options

The schematic shapes have various right click options available to change the functionality of the shapes.

- **Show Connected Terminals** – Displays only the Connected Terminals on the schematic block
- **Show Labels** - Allows you to show/hide the Labels on the Schematic block
- **Show Signals** - Allows you to show/hide the Signals on the Schematic block
- **Show Terminals** - Allows you to show/hide the Terminals on the Schematic block
- **Show Terminals Top to Bottom** - Displays the I/O Connections on the block from Top to Bottom
  - This option can be set as default in the global settings for projects, this right click option allows for overriding the default setting.
- **Show Location**: Allows for the location of the product to be shown on the schematic shape. Handy for like items in many rooms (speakers, keypads, etc.)
- **Show Leader Lines**:
- **Show Center Line**: Allows hiding of the center line on schematic shape.

Terminal Options

The Wiring Terminal Options allow you to set preferences for the entire page and all schematic shapes on the page. This option (if checked) hides all unused connections on all schematic blocks. It is highly recommended (basically necessary) to set these options after all shapes have been connected on the page. There is a right click option for shape specific hiding, this one is for all shapes on page.

1. Right Click on Any schematic shape
2. Select Wire Options → Terminal Options
3. Choose to show connected terminals only (or not)

Audit Wire Connections

The audit wire connections command searches all wire connections on all pages (plan and schematic) and identifies if there are any wire conflicts. A wire conflict occurs when the same wire is attached to two different components on either the input or output side of the wire.

View Wire Connections

Selecting this option with a wire shape selected will show you the specific details of the wire’s From/To connections.

Notes
Schematic Documentation

Page Layout Techniques

Using consistent and logical page layout techniques can help your drawings be more effective, clean and easier to interpret. We have found the following methodology works very well in most cases:

1. Far Left (Quadrant 1): Sources
2. Middle Left (Quadrant 2): Switching
3. Middle Right (Quadrant 3): Amplification
4. Far Right (Quadrant 4): Speakers, Keypads, Displays, etc.

Layout your Shapes

Moving and aligning the shapes manually into their respective “quadrants” on the page.

1. Drag the Theater speakers on to the drawing page
2. Place one of the speakers at the top of the page and one of the speakers at the bottom of the page on the right side of the screen.
3. Left click and drag a large selection box from the top to the bottom of the page. (It is important to do this top to bottom)
4. All of the speakers should be selected
5. Using the Align on Center tool (located on the Position tool), we want to align all of the speakers on center with the top speaker.
6. Then you will want to use the Distribute Vertical Spacing tool (located on the Position → Space Shapes toolbar) in order to evenly space all of the speakers along the right side of the page.
7. This is the process you would continue to follow for manual layout of your shapes.

Notes
Creating a Schematic Drawing

The process for creating schematic documentation is fairly straight forward. Drag the schematic blocks onto the page and distribute them based on the layout techniques described earlier. Add wire shapes to the page and make the connections from output device to input device.

**Implementation Tip**

**Note on Wiring:** If an item in the project has been connected on the Plan View page, when that item is dragged on to the Schematic page, the wire attached to it on the Plan view page will also be placed on the Schematic page. This is a very nice feature that helps us keep wire continuity across multiple drawing pages!

**Making Wire Connections**

When making connections on schematic drawings I tend to work left to right across the page systematically, rather than bouncing around to various devices. I also make most of my connections before I start trying to clean up the wire routing and crosses (later in the course we talk more about this).

1. Select the Blu-Ray player on the page, Right Click ↦ Find in Project Explorer.
2. Now that you have found the item, drag the item’s interconnect wire accessories onto the page.
   a. Note how much easier it is when you know which wires are intended for what purpose in your project editor!
3. Connect the wires to the out terminals on the blu-ray.
4. Connect the same wires to the receiver or surround processor.
5. Repeat this process for the remaining sources and speakers.

**Notes**
**Wire Management on the Drawing**

At this point your wires are probably crossing over each other and it does not look like a very pretty picture. There are a few tricks to managing the wire routing on your drawings.

**Move devices on the page to avoid wire crosses**

This is probably the easiest way to manage the wire crosses. For the schematic built in this example you would want to move all of the surround speakers to the top of the page and the LCR speakers toward the bottom (and line them up in the same order as the Output Connections on the Amplifier). Essentially what we are trying to do is move the input devices to line up with the order of the output connections on the output device.

**Shuffle Connections in the IO Studio**

Change the order of the inputs and the outputs on devices to make it so that the wires do not cross over each other. Sometimes this can be the easiest method because you have complete control over the order of the I/O connections. Improvements have been made to the schematic drawing connections in SI 2015 – when you move connections the wires attached to those connections also move.

1. Select the Schematic shape for the product you want to modify.
2. Right Click \rightarrow D-Tools \rightarrow I/O Studio.
3. Move the terminals up or down as appropriate.

Tip: it is easier to accomplish this when the I/O is displaying from “Top to Bottom” because when you move a connection down in the specifications window it also moves down on the drawing page.
Wire Routing

The Finish wire shapes in D-Tools are created as right angle lines; you can manipulate direction changes in right angle, 90 degree increments. The connection points in the middle of two vertices will allow you to shift that section of the line in one direction or another.

Off Page References

The Off-Page Reference shape can be added to a wire connected at one end with the D-Tools shortcut menu. Click D-Tools → Wire → Create Off-Page Reference.

The shortcut menu works if the wire is connected at one end only (the Off-Page Reference shape is connected at the unconnected end of the wire).

Notes
On clicking the "Create Off-Page Reference" shortcut menu you will see the “Create Off-Page Reference” dialog.

The Create Off-Page Reference dialog drops two Off Page Reference (OPR) shapes -
1. The first OPR is dropped on the current page and the OPR is connected to the unconnected end of the selected wire.
2. The second OPR is dropped on the connected page as selected by user in dialog. A wire is also dropped on the connected page and connected to the OPR in reverse. For example if on the source page the wire connection ends at the OPR - then on the connected page the connection will start at the OPR.

Active page - wire ends at OPR

Notes
Connected page - same wire starts from OPR.

The two OPR shapes are hyperlinked to each other. If you mouse over either of the two OPR shapes you can CTRL+Click to jump to the other shape on the connected page.

If you delete any of the 2 OPR shapes the other linked OPR shape will delete.

**Using Installation Reports**

The D-Tools Installation reports provide you with valuable information from your project and drawings. Wire connection schedules and label reports allow you to leverage the work completed in the drawing and remove manual processes for creating these documents. Wire numbers are auto-generated via the Component ID assignments and should be leveraged as much as possible in the field installation.

**Notes**
Filtering Installation Reports

It may be very helpful/necessary to use filtering to get the most beneficial results from installation reports. Without filtering, often times unnecessary information shows up on the reports. Report filtering can be achieved using regular report filters as covered in the Reports course – BUT…

There are some filtering tools only available when the Project Editor is opened from Visio.

1. Navigate to the Reports tab on the Project Editor
2. On the Options section select the filtering option “Current Drawing Page”
3. From the Installation Reports list, select the Wire Connections report. This report can be generated with wire entries grouped by Mfr then Wire Number or just by Wire Number.
4. Select by Wire Number (this sorts the connections by Wire Number)
5. Take notice that only the wires we used on this page are showing up in the report. **Note: Standard filters could also be used to specify criteria for this installation report.**

Wire Connections Report

The Wire Connections report is run for terminated connections made on schematics. The details it provides shows connections from the output device to the input device, wire Mfr-Model and Wire Number and Type.

- **Current Drawing Page**: Runs the report only for the items on the current page you are viewing in Visio
- **Selected Drawing Shapes**: Runs the report for only items selected on the page.
- **Drawing Pages**: Select multiple pages

Notes
**Wire Label Reports**

Wire label reports in D-Tools allow you to print matching wire labels to go with your wire checklists. You have two options with the wire labels in D-Tools, Brother Wire labels or Laser printer labels. The Brother labeling printer has much more robust labeling features than the standard label labels.

**Brother Wire Labels**

1. From installation reports, Select the Brother Wire Label Printer report.
2. This opens the Brother Label report interface which includes its own filtering interface and also allows you to select specific wires to print using Ctrl/Shift + Left Click.

**Laser Printer Wire Labels**

There are three laser label reports you can run. The differences on each of the three are how the wires are grouped. One is by Head End, another is by Location and the other is by Wire Number. If using these it is recommended to use filtering to narrow down the wire labels being printed.

**Wire Connections Exporting - Using Other Wire Labels**

If you are using other wire labeling methods such as an excel template or importing the labels directly onto a USB connected labeler, you can use the Wire Connections Export, which provides you with the ability to export the wire connection data only. When using this you have several choices for filtering which wire connections are exported:

- **Quick Filter Options:**
  - Wires Connected: All, Yes (Connected), No (Not Connected)
  - Drawing Pages: Choose which specific pages to export wire connections from.
- **Column Chooser:** Select which columns of data to export.

**Exercise: Export Wire Connections**

1. Select the Tools Tab
2. On far right side of the toolbar, select Wire Connections tool. Select either ALL or Selected.
3. Make your filters, click Export and save the file.

**Notes**