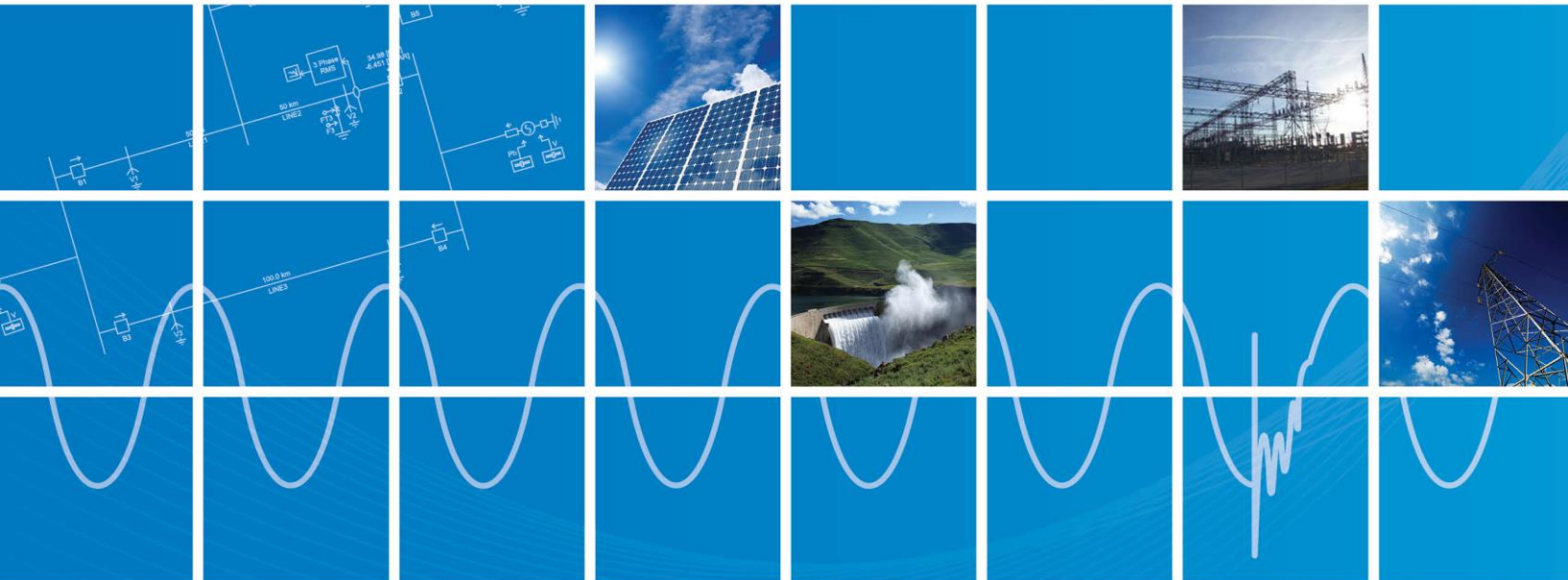# Tutorial – Creating a Simple Circuit

Written for PSCAD™ X4 version 4.5

May 22, 2018

Revision 2

# Contents

# 1. Objectives

The objective of this tutorial is to become familiar with the following:

- Using the PSCAD menus and tools

- Using the Master Library

- Inserting components and wiring

- Entering data

- Running a case

## 2. Creating a Simple Circuit

This section provides instructions for creating and running a simple circuit. This consists of inserting components and wiring, and running the case. Some initial steps are required, including setting the viewing panes and creating a new project.

**2.1    Displaying the Viewing Panes**

There are several viewing panes that will be used throughout this tutorial. Ensure the required viewing panes are displayed as follows:
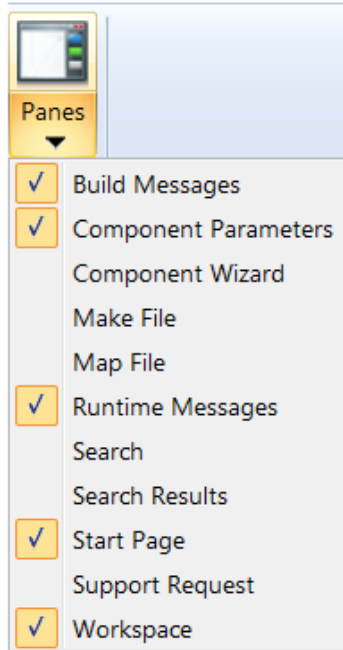
    a.    Left-click on the "View" menu.
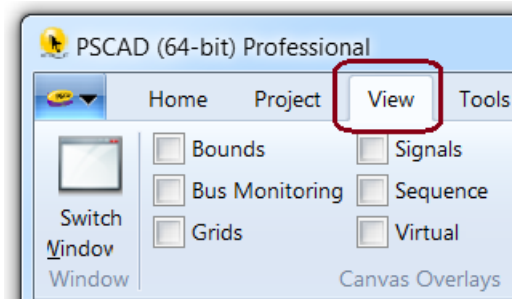


    b.    Left-click on "Panes".

c.    Place a checkmark against the following five panes as shown:
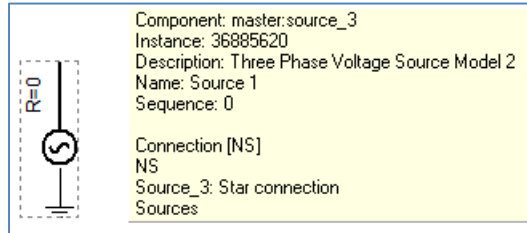


**2.2     Creating a New Project**

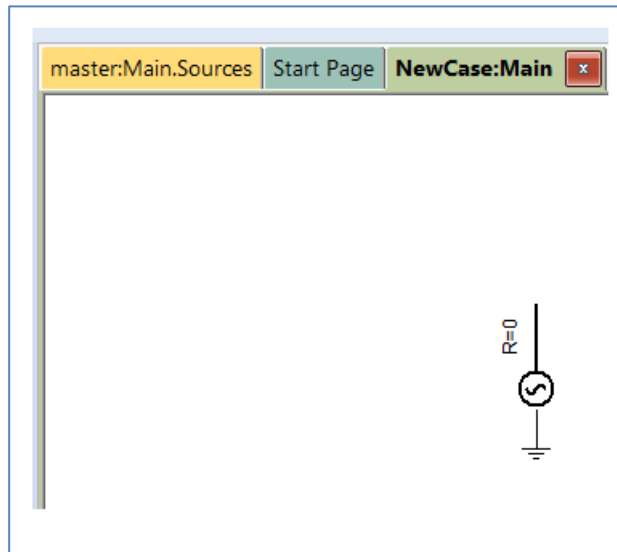Create a new project in accordance with Appendix A. Name the case "NewCase"

## 2.3 Inserting Components

Insert components as follows:

a. Insert a power source into your project as follows:

- Insert the following power source from the Master Library in accordance with Appendix B.



- Your layout should look similar to the following:



**Note**
To move any of the components to a different location on the canvas, use the "drag and drop" method (position the cursor over the component, hold the left mouse button down, move the cursor to the new position, then release the mouse button).

b.  Insert a resistor from the "Components" menu in accordance with Appendix C. Your layout should look similar to the following:
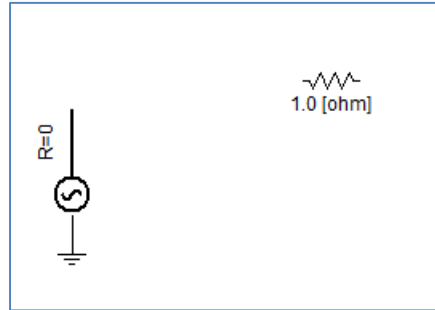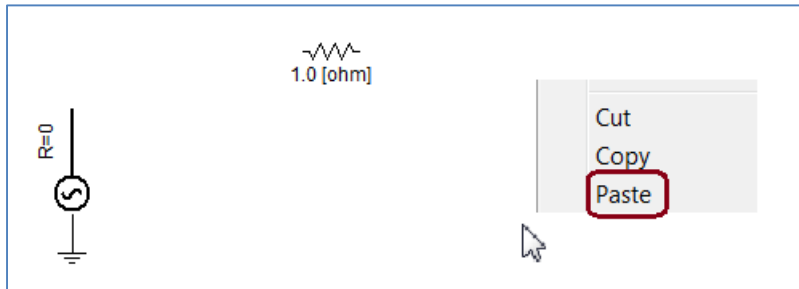


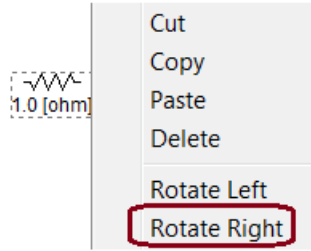c.  Insert and configure a second resistor as follows:

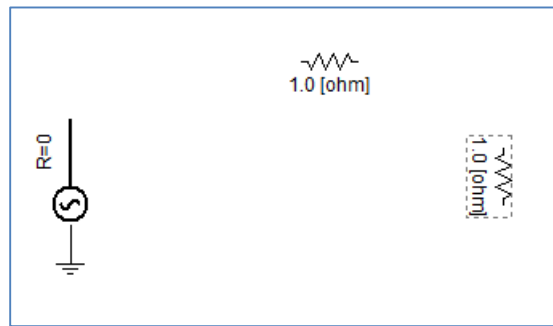- Right-click on the first resistor. In the displayed menu, select "Copy".
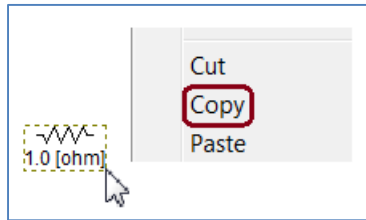


- Position the cursor on the canvas, right-click, then select "Paste". A second resistor will be created and pasted to the canvas.
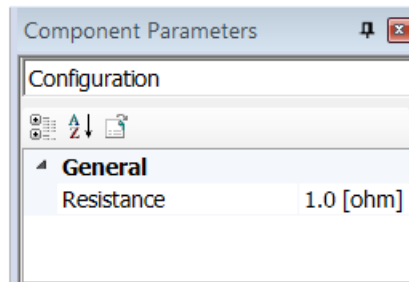
- Right-click on the second resistor, and select "Rotate Right" from the menu.



- The resistor will rotate, and your layout should look similar to the following:



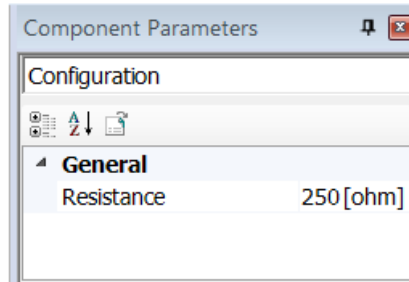- Left-click on the second resistor. The default resistance will display in the "Component Parameters" pane.



**Note**
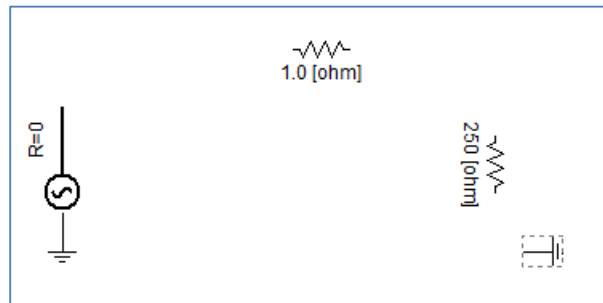If the Component Parameters pane is not displayed, display it in accordance with Step 2.1.

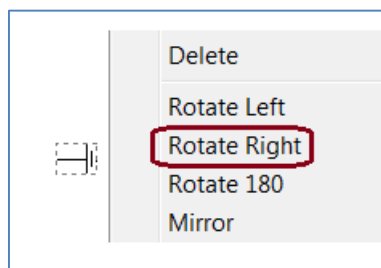- Left-click in the field next to "Resistance", delete "1.0", and keyboard "250".
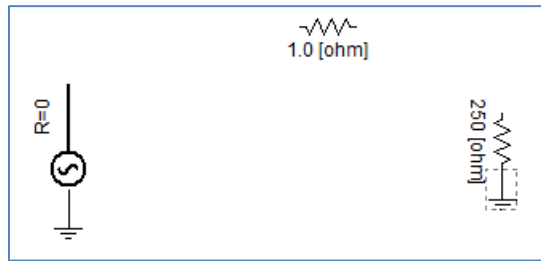


d. Insert a ground as follows:

- Insert the "Ground" from the "Components" tab in accordance with Appendix C. Drop the ground near the second resistor, as shown:
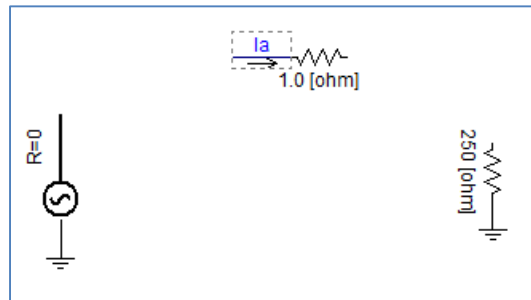


- Right-click on the ground, and select "Rotate Right" from the menu.

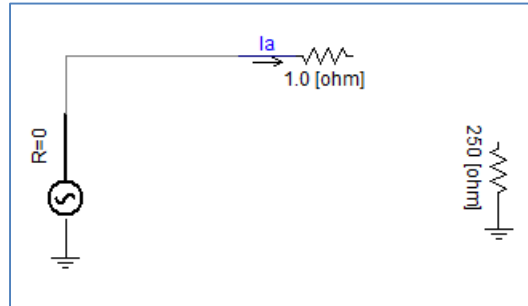- Drag and drop the ground to connect to the second resistor. Your layout should look similar to the following:



e. Insert an "Ammeter" from the "Components" tab in accordance with Appendix C. Drop the ammeter next to the first resistor so that they connect, as shown:
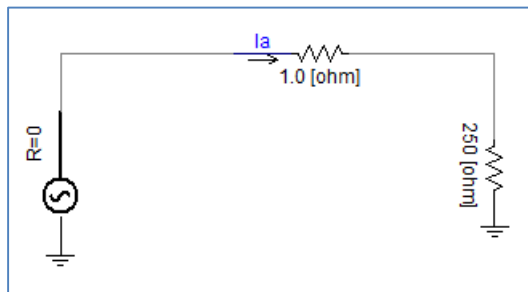
**2.4     Inserting Wiring**

Insert wiring as follows:

a.   Connect the source to the ammeter using "wire mode" in accordance with Appendix D. Your layout should look similar to the following:



b.   Connect the first and second resistors using the wire mode. Your layout should look similar to the following:

**2.5      Inserting an Output Channel and Data Label**

Insert an output channel with data label as follows:

a.   Insert the "Output Channel" from the "Components" tab in accordance with Appendix C. Drop the output channel below the electric circuit. Your layout should look similar to the following:
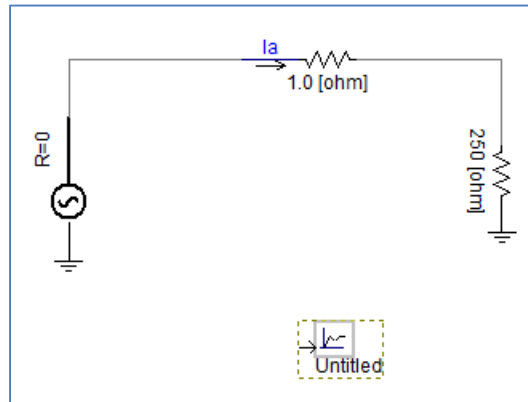


b.   Use the wire mode to connect a short wire to the left of the output channel as shown:
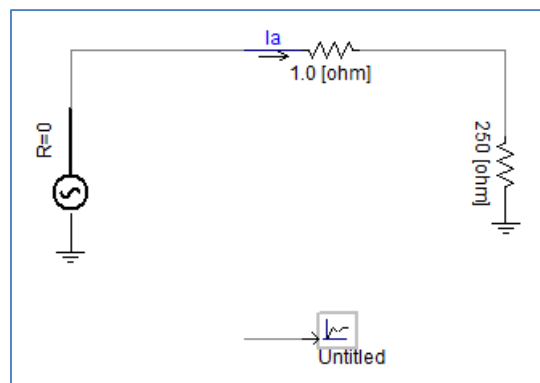
c. Insert a "Data Label" from the "Components" tab in accordance with Appendix C. Drop the data label on the end of the short wire. Your layout should look similar to the following:
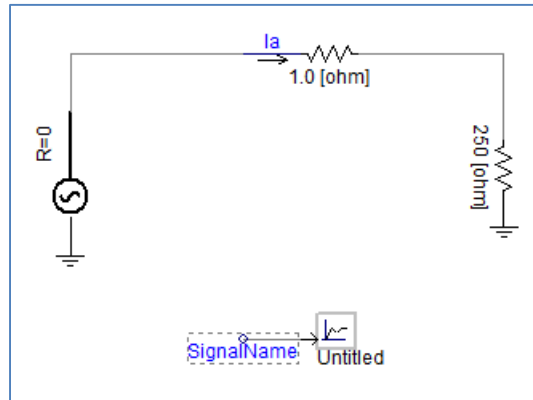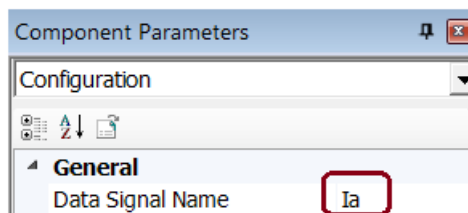


d. With the data label still selected (or left-click to select), in the "Component Parameters" pane, the default name "SignalName" will be displayed.
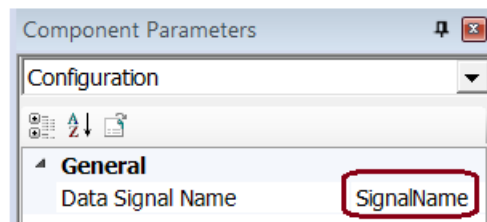


e. Rename the data label from "SignalName" to "Ia".

f.   Your layout should be similar to the following:
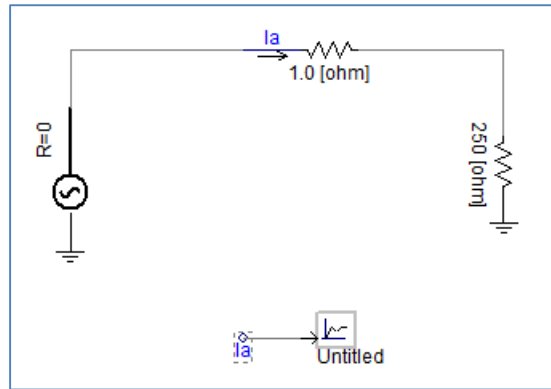


## 2.6    Inserting a Graph

Create a graph to display the results in accordance with Appendix E.

## 2.7    Running a Case

Run a case as follows:

a.   Compile the project by left-clicking on the "Run" button on the "Home" tab.

b.  Once the case has finished running, the messages related to building the project will be listed in the "Build Messages" pane.
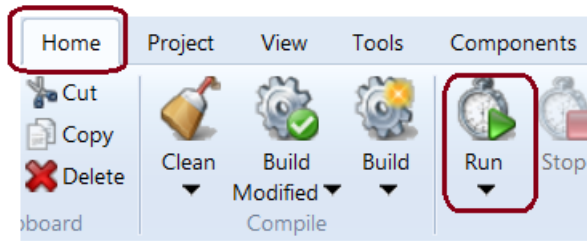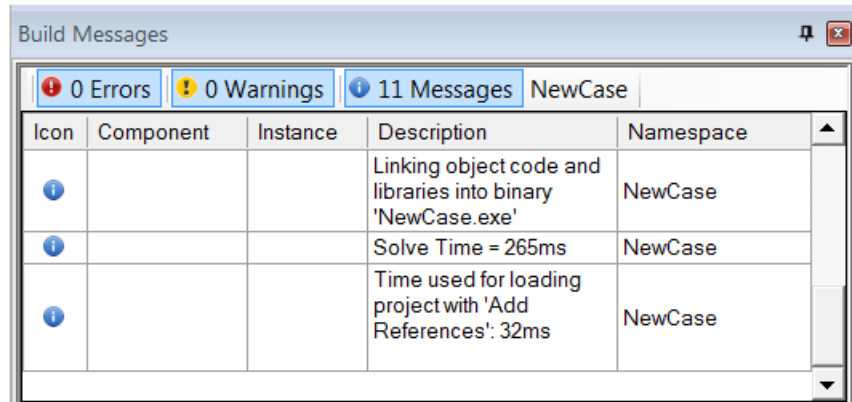


**Note**
If the "Build Messages" pane is not displayed, display it in accordance with Step 2.1.

c.  Review the graph results as follows:

- The results will be displayed in the graph, and should look similar to the following:
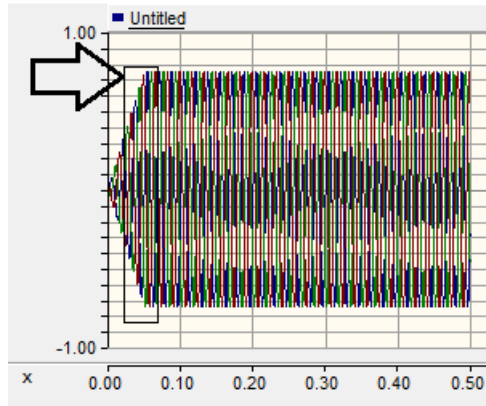
# Appendix A    Creating a New Project

Create a new project as follows:

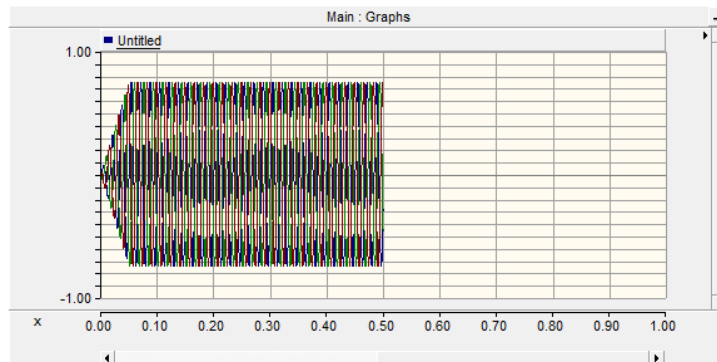a.  Invoke the "New Project" dialog box by using one of the following methods:

- Press Ctrl-n.

- Use the menu as follows:
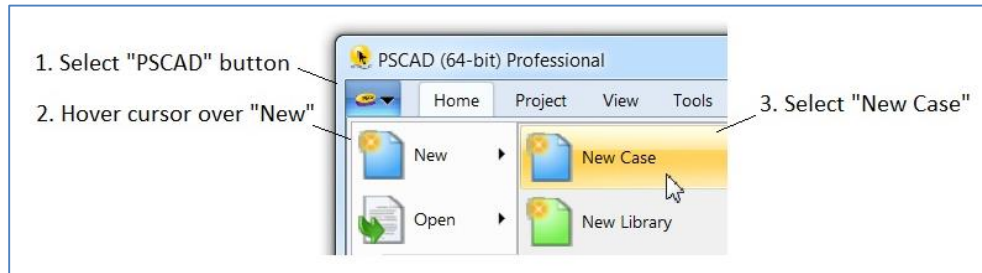


- Select the "New Case" button from the "New" drop menu on the toolbar:

b.  Enter a name in the "New Project" dialog box, then select "Ok".
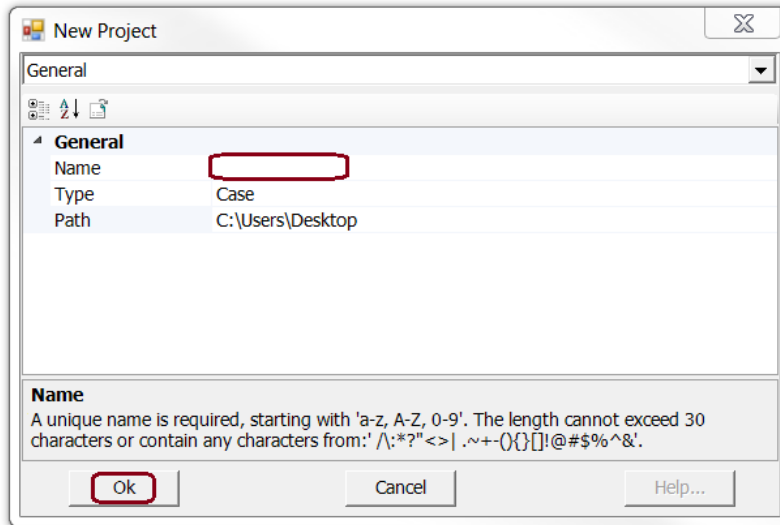
**Note**
Do not use any spaces in the name.

c.  The new case will be listed in the "Workspace" window. For the purpose of this tutorial, this file is named "NewCase" in the following view.
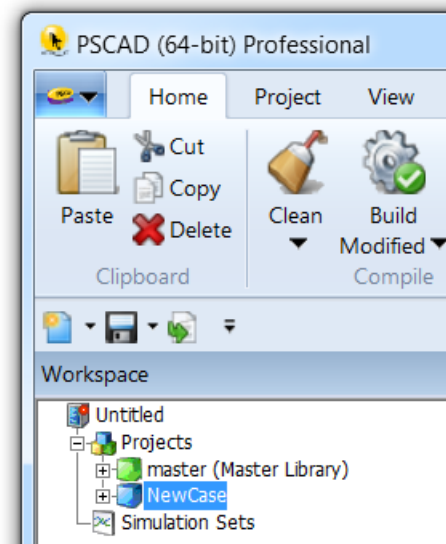
# Appendix B      Inserting Components using the Master Library Page

Insert a Master Library component into your project (named "NewCase" for this instruction) using the Master Library page as follows:

a.   Left-click on "master (Master Library)" in the primary window.
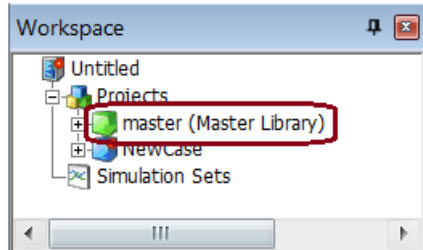


b.   The library will be highlighted in the primary window, "Main" will be highlighted in the secondary window, and the main categories of the library will be displayed on the canvas.
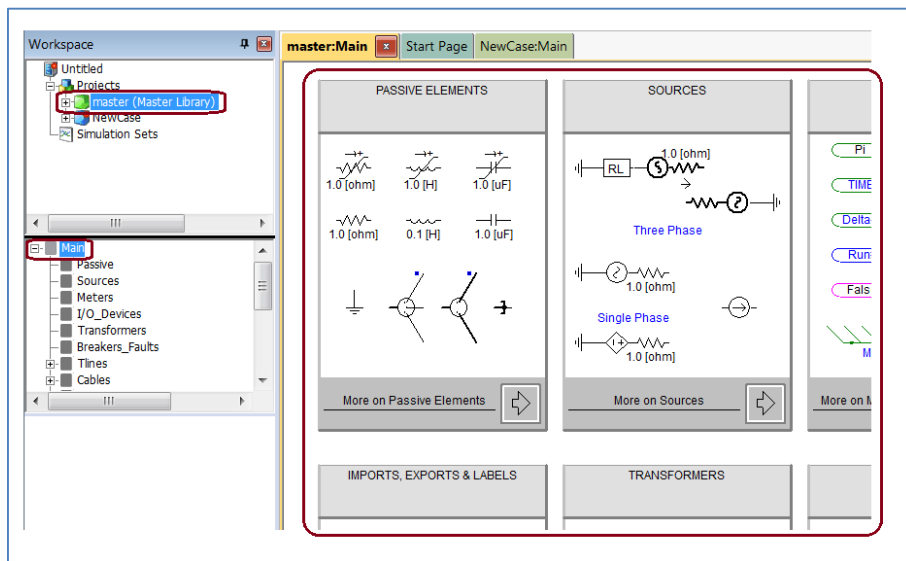
c.  On the canvas, locate the required category, then double left-click on the arrow on the bottom right-hand side (for this illustration, the "Sources" category is being selected).
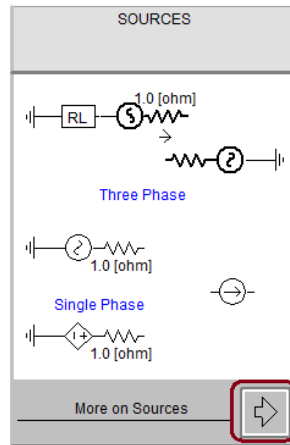


d.  The selected category will be highlighted in the secondary window (in this example, "Sources"), and all available components within this category will be displayed on the canvas.
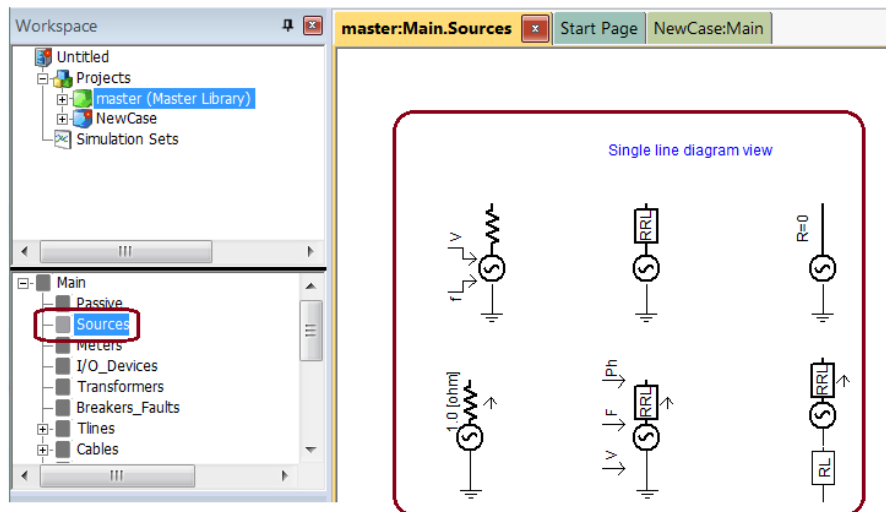
e.  Locate the required component. To determine a component's properties, hover the cursor over the component, and this information will be displayed.



f.  Copy the component (right-click on the component, and from the displayed menu, left-click on "Copy").

g.  Double left-click on "Main" in the secondary window. This illustrates how to re-display the main categories of the master library.

h. Re-display your project (left-click on the project name in the primary window).
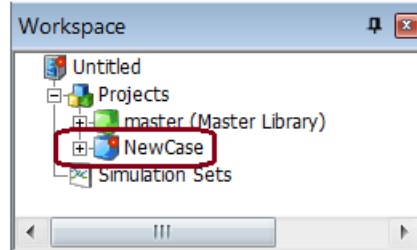


i. Paste the component (place the cursor on the canvas and right-click; in the displayed menu, left-click on "Paste").

j. The component will be copied to the canvas.

## Appendix C    Inserting Components using the Components Tab

Insert a component from the Master Library into your project using the "Components" tab as follows:

a.   Left-click on the "Components" tab.
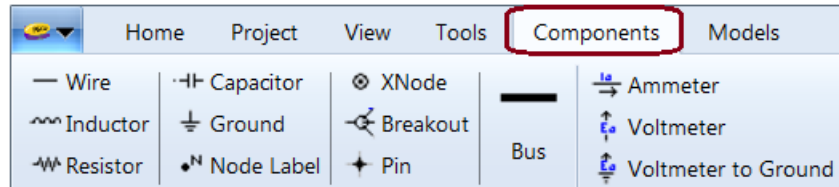


b.   Left-click on the required component.

c.   Move your cursor to the canvas. The component will follow your cursor as it moves over the canvas. Left-click to drop the component onto the canvas.

# Appendix D        Using Wire Mode

Wire mode enables the user to quickly draw interconnecting wires between components. Use wire mode as follows:

a.  To invoke wire mode, click the "Wire Mode" button in the "Home" tab or "Components" tab or press Ctrl + W on your keyboard.

b.  Move the mouse pointer onto the project canvas. The mouse pointer will have turned into a pencil.

c.  Draw a wire as follows:

- Position the cursor on the starting node and left-click. Move the cursor to the line end and right-click to complete the wire.

- Multi-segment wires may be built by left-clicking at different points, then right-clicking at the line end.
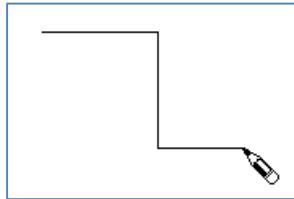
d.  Turn-off the wire mode using one of the following methods:

- Press the "Esc" key.

- Press Ctrl + W.

- Left-click on the "Wire Mode" button.

# Appendix E        Adding Graphs to a Project

A graph is a special runtime object, which can reside only inside a graph frame. A graph frame is a special runtime object container used for encapsulating overlay or polygraphs, and can be placed anywhere on the schematic canvas. Once a graph frame has been added, you may then proceed to add as many graphs to it as you wish. The graph is then linked to the output channel. Proceed as follows:

a.  Add a graph frame. There are two methods for adding a graph frame, as follows:

- Right-click on a blank portion of the page and select "Add Component" | "Graph Frame". A graph frame will follow your cursor as it moves over the canvas. Left-click to drop the graph frame onto the canvas.

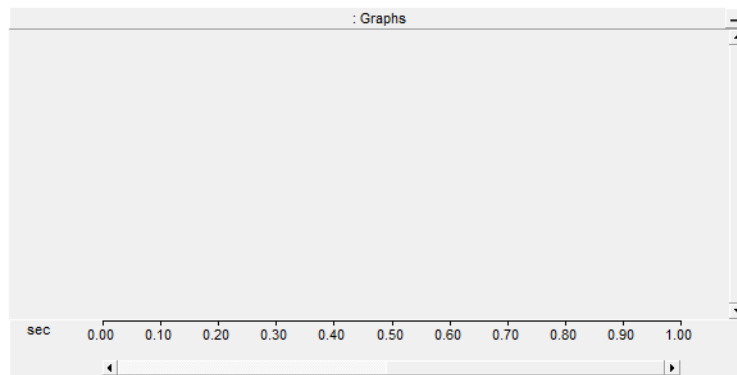- Left-click on the "Graph Pane" button in the "Components" tab of the ribbon control bar. Move your cursor to the canvas. The component will follow your cursor as it moves over the canvas. Left-click to drop the component onto the canvas.

- The graph frame will look similar to the following:

b. Add a graph to a graph frame. There are two methods for adding graphs to a graph frame, as follows:

- Right-click on the frame title bar and select "Add Overlay Graph (Analog)" or "Add Stacked PolyGraph (Analog/Digital)".

- Position your mouse pointer over the graph frame and press the "Insert" key on your keyboard.

- The graph and graph frame assembly will look similar to the following:
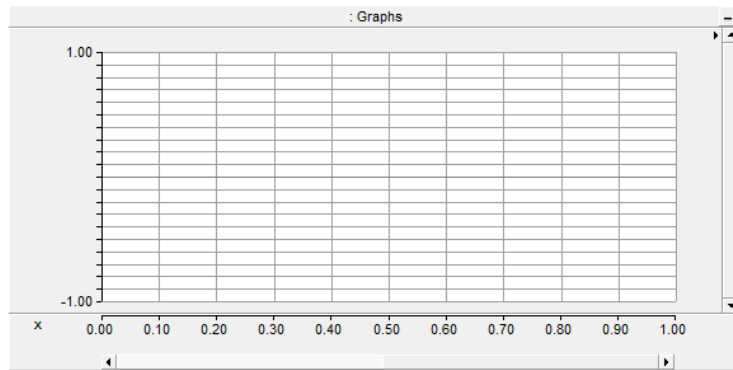


c. Link the graph to the output channel as follows:

- Hold down the Ctrl key, then drag and dropping the output channel to the graph.

- The graph and graph frame assembly will look similar to the following. The output channel's name (in this case, "Untitled") becomes displayed.
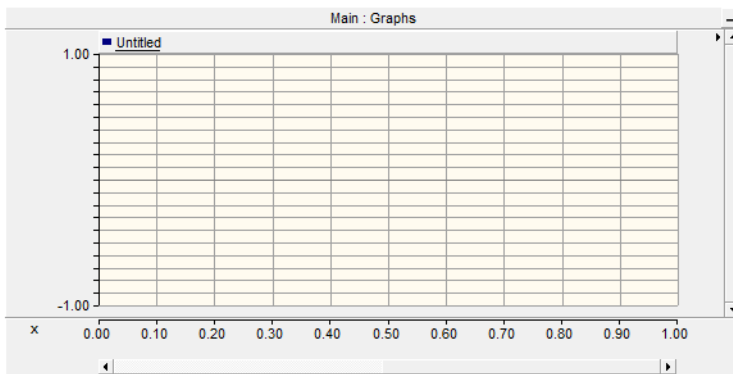
DOCUMENT TRACKING

| Rev. | Description | Date |
|------|-------------|------|
| 0 | First issue | 09/Apr/2013 |
| 1 | Updated Appendix A; New formatting | 10/July/2014 |
| 2 | Update to new Branding Guidelines | 22/May/2018 |
| | | |