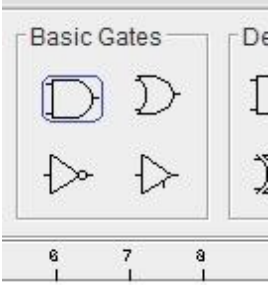
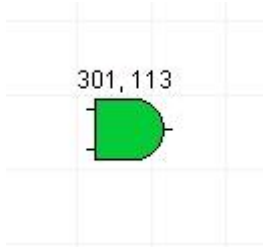
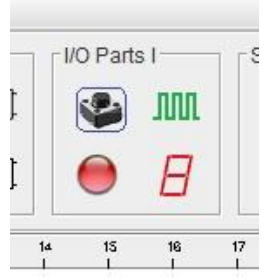
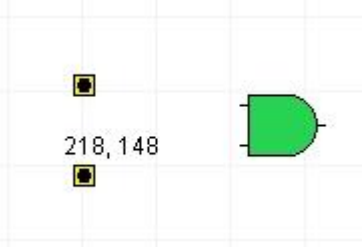
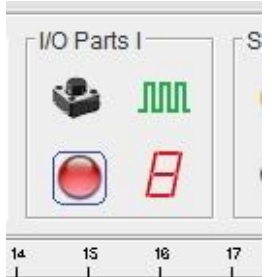
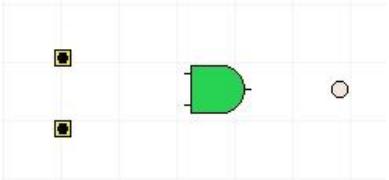
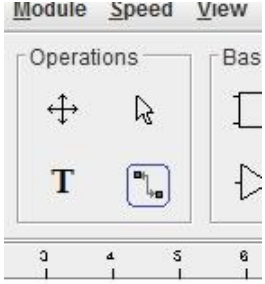
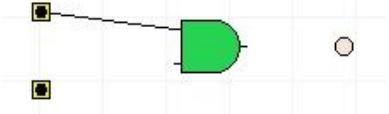
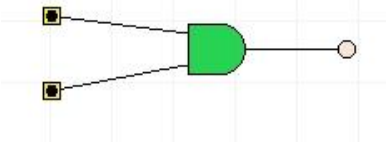


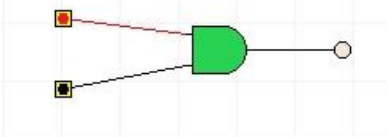
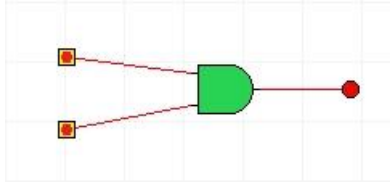

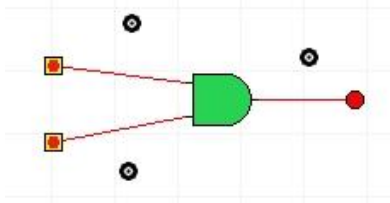
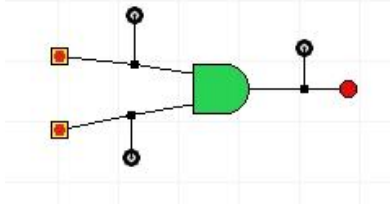
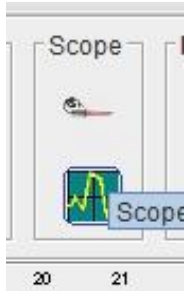
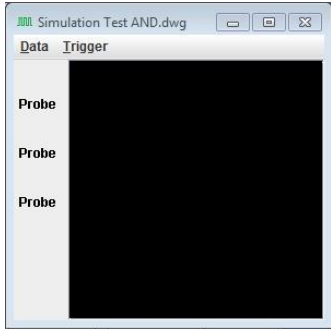


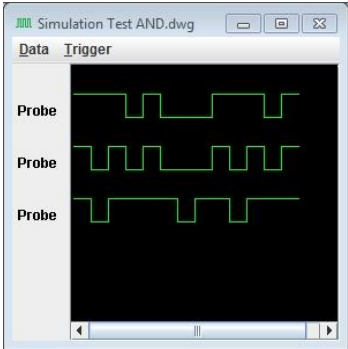
# DLD - Digital Logic Design

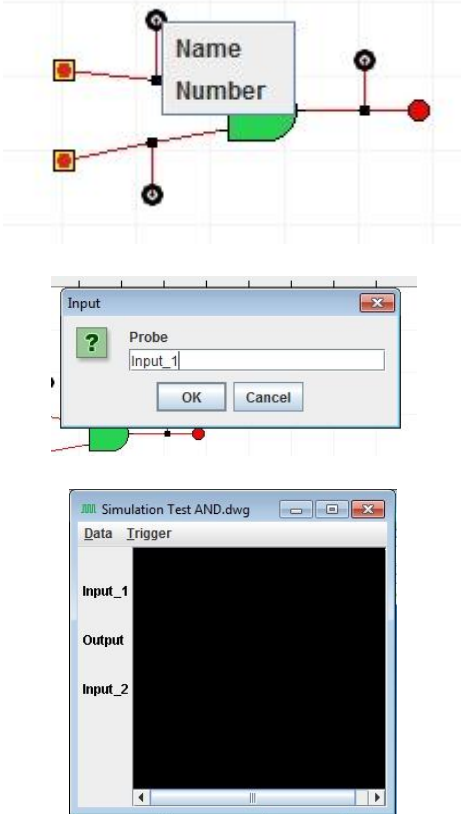
## Quick Tutorial

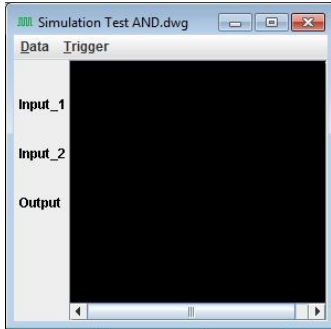
<b>Step 1</b>	Go to Tool Bar and Click <b>AND</b> Gate icon.	
<b>Step 2</b>	Move to the Drawing Area, the cursor will turn into AND gate. The coordinates of the Drawing area will display at the top left corner. Click the mouse where you want to place the gate. A Gate will be placed at the point where you Click the mouse.	
<b>Step 3</b>	Go to the Tool Bar and Click the <b>Button</b> icon in the I/O Parts I Tool Box	
<b>Step 4</b>	Move to the Drawing Area and cursor will turn into Button icon. Place two Button near the AND gate by Clicking the mouse.	
<b>Step 5</b>	Go to Tool Bar and Click the <b>LED</b> icon in the I/O Parts I Tool Box	

<p><b>Step 6</b></p>	<p>Move to the drawing area and place an LED near AND Gate</p>	
<p><b>Step 7</b></p>	<p>Go to the Tool Bar and Click the Track icon in the Operation Tool Box. Move to Drawing area and cursor will change to Track drawing tool. As the Track drawing tool will come near the pin or track where a connection is allowed, it will change its color to GREEN.</p>	
<p><b>Step 8</b></p>	<p>Click any Button with the drawing tool and then Click any one Input pin of the AND gate with the drawing tool. A Track is drawn between the <b>Button</b> and the pin.</p>	
<p><b>Step 9</b></p>	<p>Repeat the Track drawing for other Button and LED as Shown. Remember the Track Drawing tool must be GREEN before you click any pin or button.</p>	
<p><b>Step 10</b></p>	<p>Save the circuit by Clicking the Disk icon in the Tool Bar in File Tool Box and give this file a name in file save dialog.</p>	
<p><b>Running Simulation</b></p>		
<p><b>Step 11</b></p>	<p>Go to the Tool Bar and Click the Run icon in the Simulation tool Box.</p>	
<p><b>Step 12</b></p>	<p>Move to Drawing area. The cursor will change to hand cursor. Click any Button with the cursor and the Button will change its color to RED which means that it now in On or HI state.</p>	

<p><b>Step 13</b></p>	<p>Click the other Button and the LED will also get ON or RED showing AND gate operation <math>1 + 1 = 1</math>. Note that the Tracks will also change their color. RED for HI value and BLACK for LO value.</p>	
<p><b>Using Digital Oscilloscope</b></p>		
<p><b>Step 14</b></p>	<p>Go to Tool Bar and Click the Probe icon in the Scope Tool Box</p>	
<p><b>Step 15</b></p>	<p>Move to drawing area and the Cursor will change its shape to a BLACK circle representing Probe. Click the Probe near each Track and a Black Circle will appear near each track.</p>	
<p><b>Step 16</b></p>	<p>Connect each Probe with the Track as shown</p>	
<p><b>Step 17</b></p>	<p>Go to the Tool Bar and Click the Scope icon in the Scope Menu</p>	
<p><b>Step 18</b></p>	<p>A Scope Window will Open. This Scope will show the name Probe three times on right hand side of this new window representing each Probe or Black Circle in the Circuit Drawing.</p>	

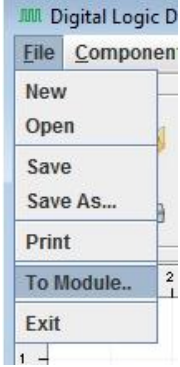
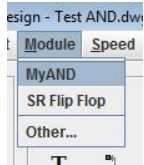
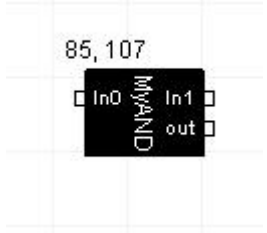
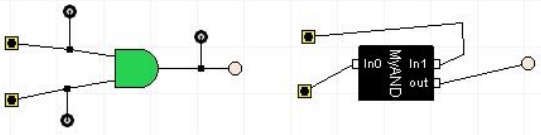
<p><b>Step 19</b></p>	<p>Run the Simulation again and Click the Buttons On and Off. The signal values will start changing with every change in state of Buttons which appeared in the Scope Window as Square wave. You can save this data in a file for later view using Menu in this Scope window Data-&gt;Save</p>	
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<p><b>Step 20</b></p>	<p>It is hard to identify which signals belong to which probe as all probes have same name. To solve this problem and giving unique name to each signal we use context menu of each Probe. Right Click a Probe in Drawing area. A context menu will appear. Click the Name option and the Name entry dialog box will appear. Enter proper name for the Probe in the dialog box. Repeat the process for all the Probes giving them unique name. Run the simulation again and new names will appear against each signal.</p>	
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<p><b>Step 21</b></p>	<p>If the signal names are not arranged in the order as you want, then open the context menu of each Probe and this time select Number option and assign unique Number to each probe according to its position you want in the Scope. The Probe name and Signal will appear in ascending order of Numbers assigned by you.</p>	
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**Making Module or Custom Parts or ICs**

<p><b>Step 22</b></p>	<p>Assign name to Buttons and LED in the drawing and also assign them unique Number using context menu. Give them name In0, In1 and out respectively and number as 1, 2 3 respectively.</p>
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<p><b>Step 23</b></p>	<p>Go to File menu and select the To Module Option. Enter Module name in save Module dialog.</p>	
<p><b>Step 24</b></p>	<p>Open Module menu in the Menu Bar and you will see that your module name appeared. Select it.</p>	
<p><b>Step 25</b></p>	<p>Move to drawing area and a new cursor icon of a Black rectangle shape with your module name will appear. Click on the drawing area just like you click before. A Module will be placed in the Drawing.</p>	
<p><b>Step 26</b></p>	<p>Connect Two buttons and one LED with In0, In1 and out pin respectively as shown in the figure.</p>	
<p><b>Step 27</b></p>	<p>Run the Simulation again and set the Buttons On and Off, you will see that both circuits will behave in the same way. In this way you can convert any circuit into a reusable Module and use in any other circuit. Remember Button and LED will be replaced by Input and Output Pins in the Module. These pins will have same name as given to Button and LED. The Pin position will be decided according to the Number value given to these Buttons and LEDs.</p>	