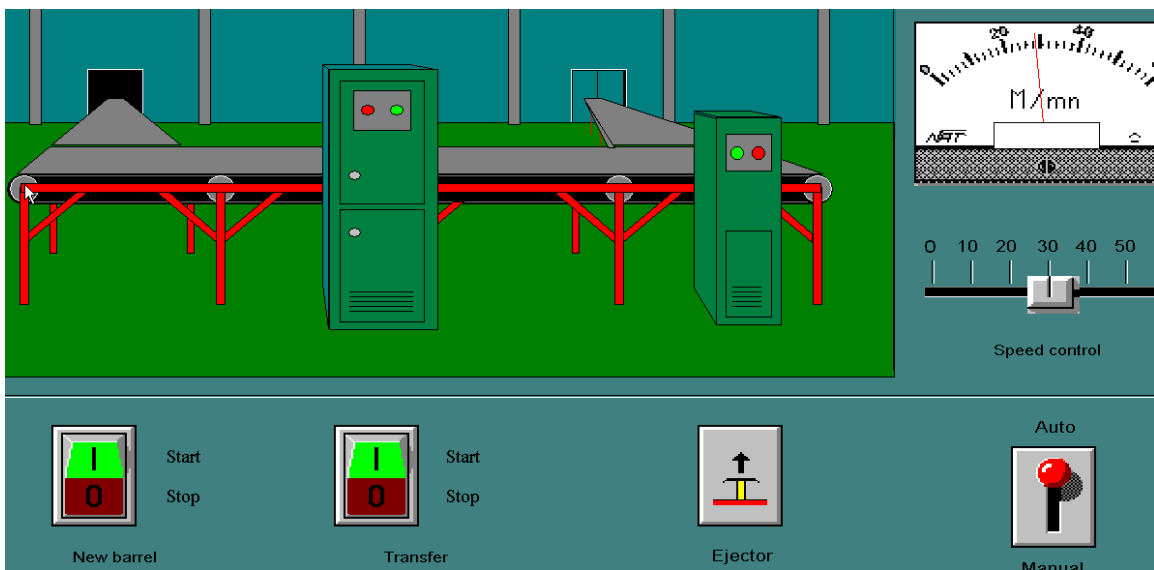# Module 8

# PLC220 Lab Exercise 22

# InTouch HMI, Using Simulate

# Using Simulate

## Lesson Objective

By the end of this session, students should be able to:

1.   Use the Wonderware Simulate Utility for Application Testing

2.   Practice DDE set-ups with simulation software.

3.   Working with Bitmap Graphics

## **Lesson Requirements**:

Computer with Wonderware InTouch, Software

   Required File
      Tank_Picture.jpg

# Introduction:

This lesson will work with the InTouch Simulate simulation utility that can be used to test Wonderware screens.

The utility can be used to test screen objects and can be used to understand DDE communications with the use of I/O tags. The utility is a DDE server, which acts as a PLC

# DDE Review:

DDE – Dynamic Data Exchange – a communication protocol used to exchange information between two applications, i.e. Wonderware InTouch and Simulate.

DDE requires three (3) pieces of information to establish a link.

1. Application – name of the application providing data (i.e. server)

2. Topic – name of a topic within an Application that contains the data.

3. Item – the specific data to access.

# Simulate:

The Simulate utility comes with Wonderware.
By default it is located in the xx:\Program Files\Common Files\ArchestrA directory on a computer with Wonderware install.

Note: xx is the Drive where the InTouch application is installed.
     For Windows 7 location – xx:\Program Files (x86)\Common Files\ArchestraA

Run the utility by clicking on the Simulate.exe file.
A shortcut can be put on the computers desktop to run the utility.



Figure 1-A. Shortcut to Simulate.

Run the Simulate utility. The Main screen opens

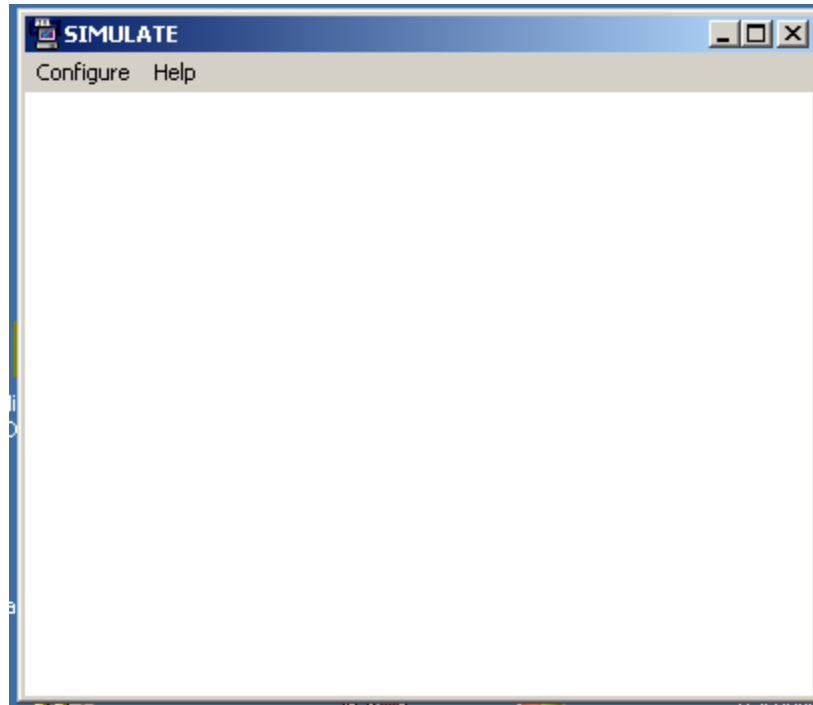

Figure 2-A. The Simulate utility.

The Configure selection configures 1. Topics
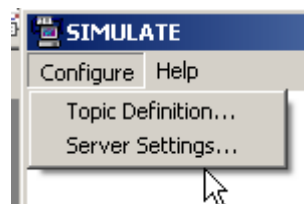                                   2. Server Settings



Figure 3-A. Configure a topic.

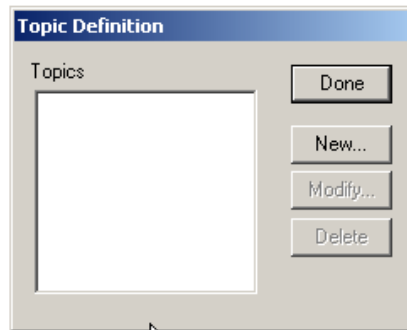To configure a Topic- Select Topic Definition

Figure 4-A. Click New for a new topic.
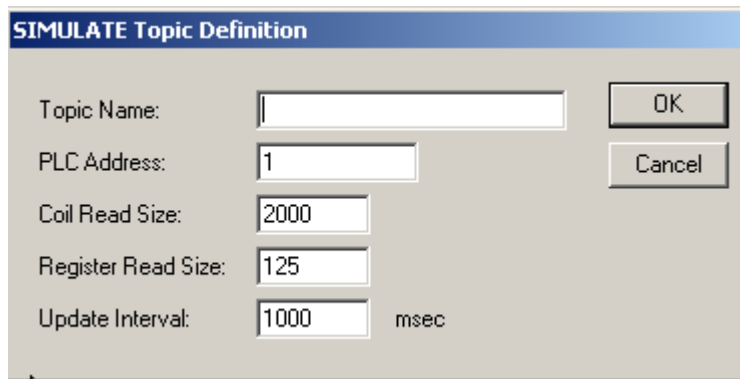
Choose the New button.


Figure 5-A The Parameters for a new topic.

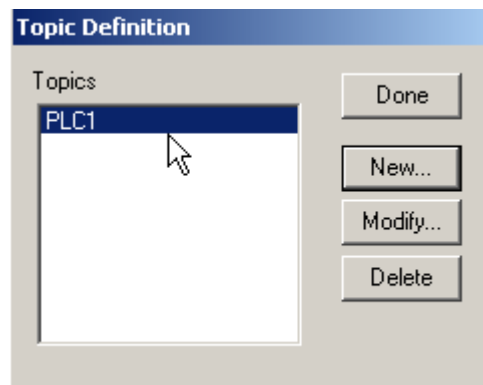To define a topic, enter a name in Topic Name box. Click the OK button.


Figure 6-A. A new topic that is created.

The Topic Definition will list the entered topic name.

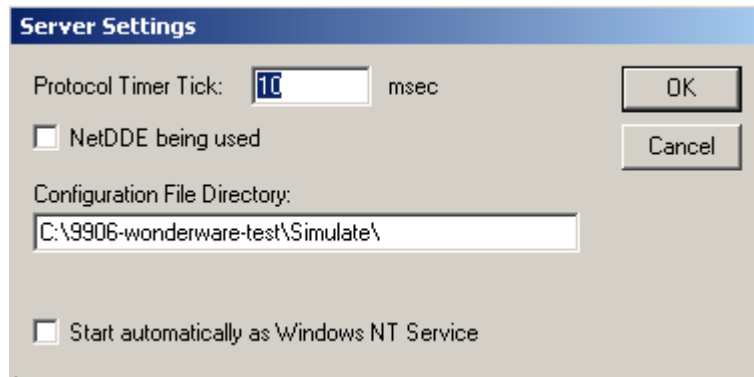The Server Setting allow configuration of application speed.

Figure 7-A. The server settings.

The smaller the number in Protocol Timer Tick box, the faster the application will run. The application name for the Simulate utility is Simulate.
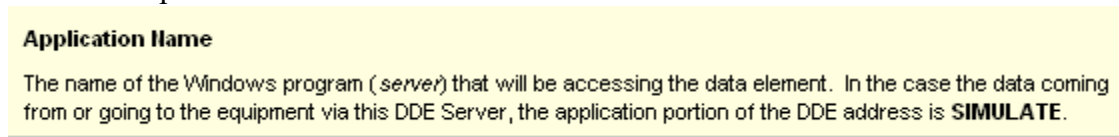
From the Help File:

**Application Name**

The name of the Windows program (*server*) that will be accessing the data element. In the case the data coming from or going to the equipment via this DDE Server, the application portion of the DDE address is **SIMULATE**.

Figure 8-A. Info from the help file.

The Help File also contains Item information for the Simulate utility.

| Item Name | Tag Type | Description |
| --- | --- | --- |
| V1 | Discrete | Milk Valve - **Simulate.exe** forces V1 on when Start = 1 and tank level < 800 and forces V1 off when tank level = 800 or Start = 0. |
| V2 | Discrete | Syrup Valve - **Simulate.exe** forces V2 on when Start = 1 and tank level = 800 and forces V2 off when tank level < 800 or Start = 0. |
| V3 | Discrete | Outlet Valve - **Simulate.exe** forces V3 on when tank level = 1000 and off at all other times. |
| A1 | Discrete | Agitator - **Simulate.exe** forces A1 on when Start bit is equal to 1 and off when tank level = 1000 or Start is equal to 0. |
| START | Discrete | Process Start - When START = 1 **Simulate.exe** forces V1 to increment Tank Level and begins simulating process. |
| L1 | Integer | Tank Level - **Simulate.exe** alternately increments then decrements L1 from 0 to 1000 when START=1.L1 is set to zero when START=0. |

Figure 9-A. Help info for the Simulate utility.

The three pieces of DDE information for the Simulate Utility are:

Application – Simulate

Topic – defined by user
Item – See Figure 9-A

Create a new InTouch application - Simulator

Using the Simulate utility set-up a sample InTouch application that will:

1.  Turn-On an indicator when a Start Switch is ON.
2.  Monitor value of START Tag
3.  Have an analog value – L1 - increment/decrement when a Start Switch is ON.
4.  Monitor Discrete Items – V1, V2, V3, A1
5.  Label Objects on application window using Item Names

Hint: You will need to define a Topic in the Simulate application.-See pages 4-5.
  Use In-Touch to create a Wonderware application.
  Wonderware will communicate with Simulate with DDE.
Create a window called - Simulate
Use Switch -> Rocker Switch Wizard for Start Object
Use Number Field to monitor Start value
Use Light -> Light Panel to monitor status of Start Tag
Use Light -> Light Panel for A1, V1, V2, V3 Objects
Use rectangle -> Vertical Fill to monitor L1
Use Number Field to monitor L1

Create InTouch Tags Names based on Simulator Items
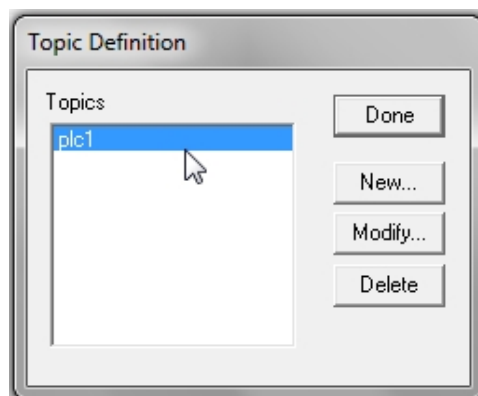
Configure Topic in Simulate

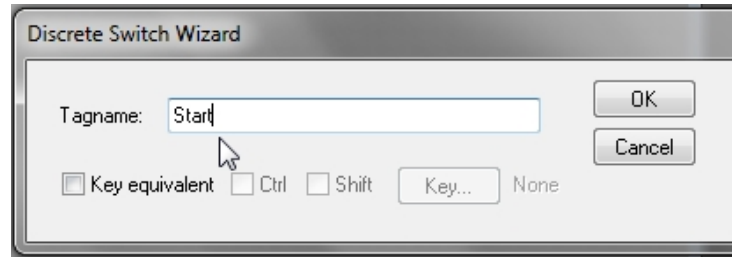

Figure 10-A
Configure Topic

Define Start I/O Tag

Figure 11-A
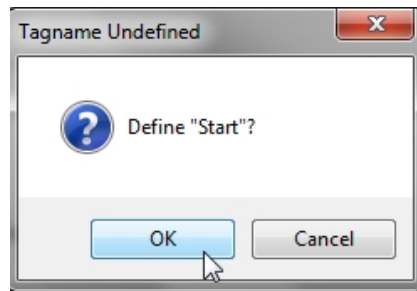Start Tag – Rocker Switch



Figure 11-A
Define Start Tag

All tags for Simulator application will be I/O tags
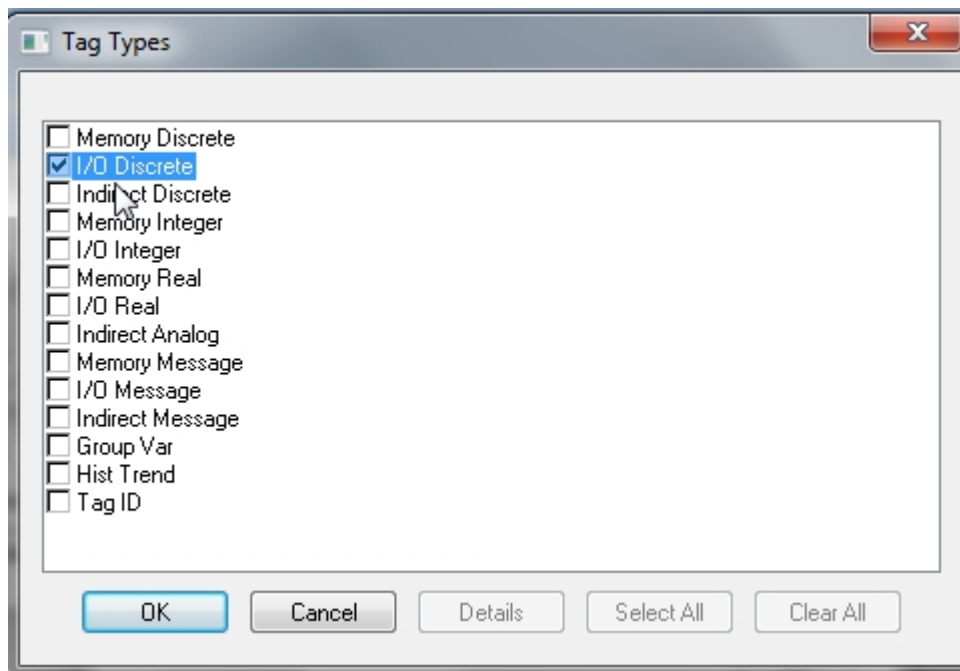Note: L1 will be I/O Integer, all others I/O Discrete



Figure 12-A
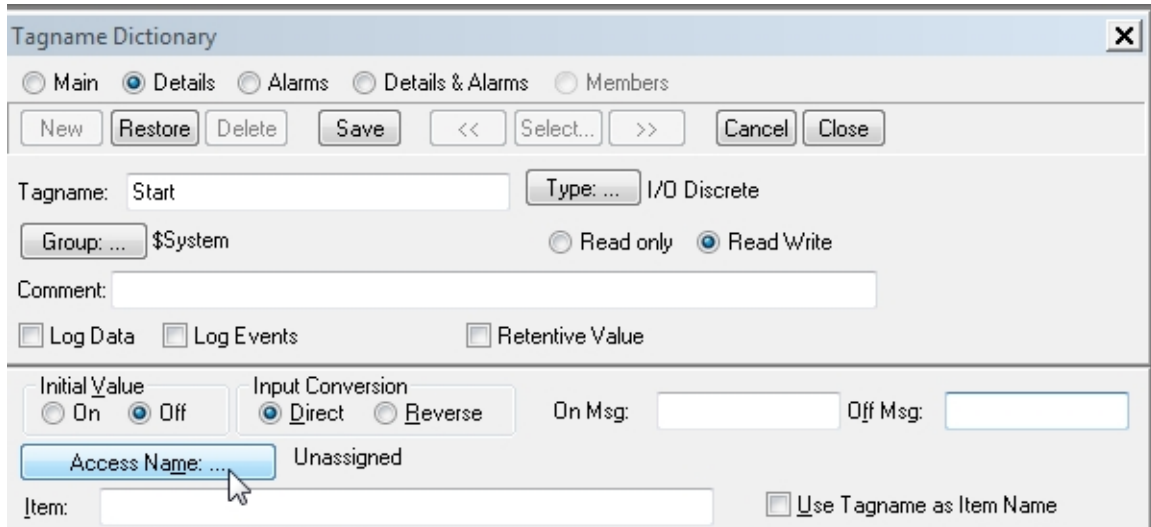I/O Tags

Start tag I/O Discrete



Figure 13-A
I/O Tags

Click Access Name button

Note: I/O tags require Access Name
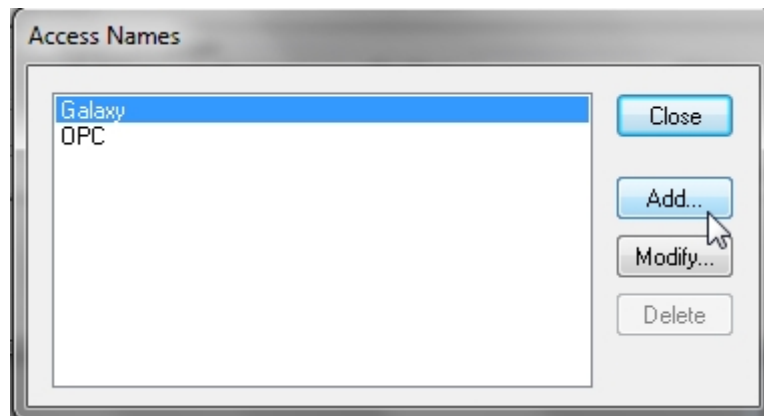
On Access Names window – Click Add button



Figure 14-A
Add Button-Access Name

Complete the Add Access Name window as follows:

Access: User Defined  - the example uses the name Sim
Application Name: Based Server being accessed – see Figure 8-A
Topic Name; User Defined – based on Topic assigned to Simulate – see pages 4-5.

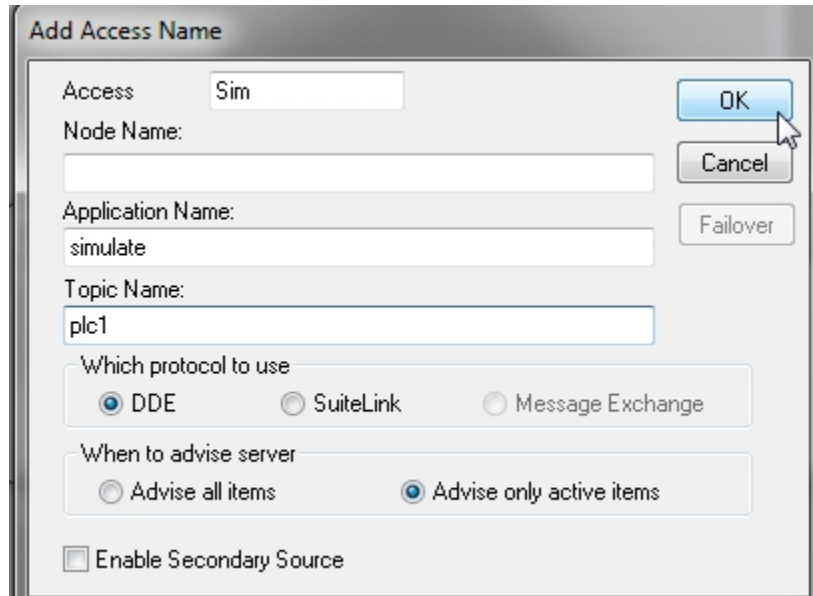DDE Protocol
Advise only active items


Figure 15-A
Access Name window

Note:  A single Wonderware InTouch application can have multiple Accesses
        A single external device, i.e. PLC can have multiple Accesses assigned
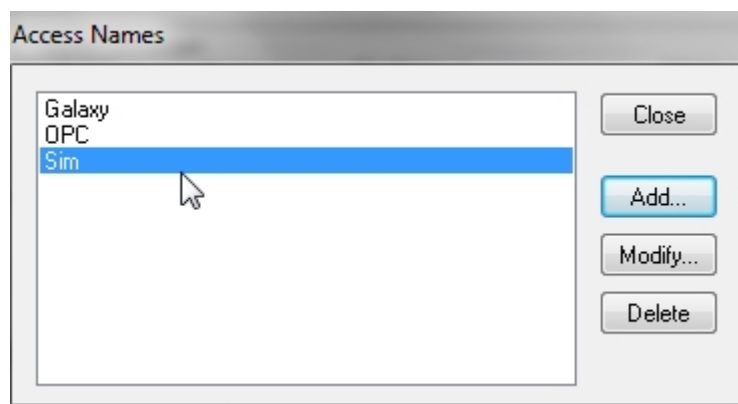
Sim now in Access Names list


Figure 16-A
Access Name window

Click Close button to return to Tagname Dictionary window.
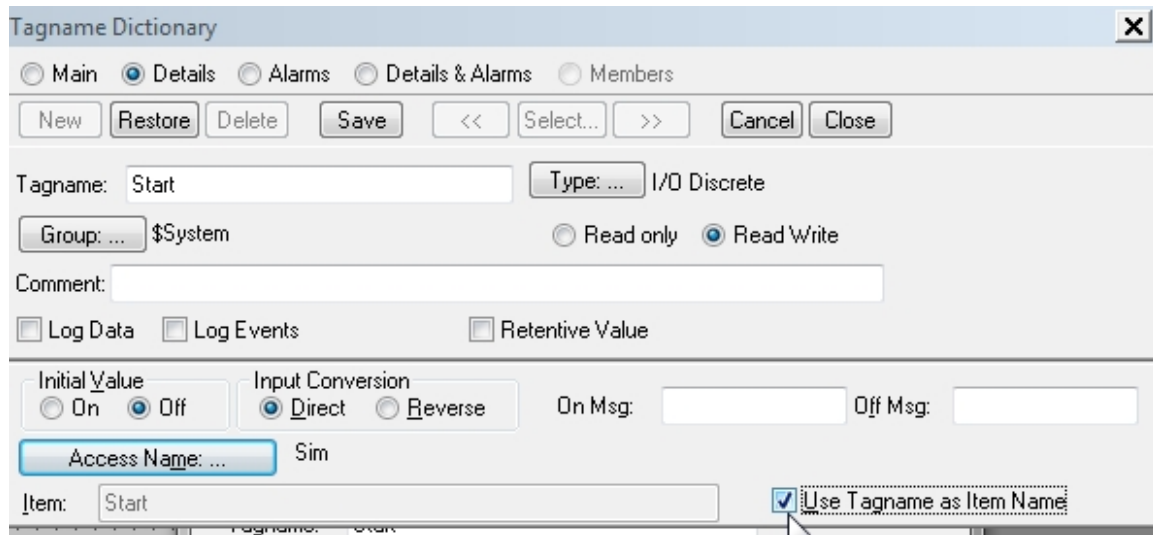
Figure 17-A
Tagname Dictionary Window for I/O Tags

Note: Sim to the right of Access Name button – Access being used by this tag
        A single Wonderware InTouch application can have multiple Accesses

Note: For this Simulate application, all Simulate Items use the same name as
        Wonderware InTouch tags.

        If this is the case, check Check Box to left of Use Tagname as Item Name or
        type the tagname in Item Entry Box.



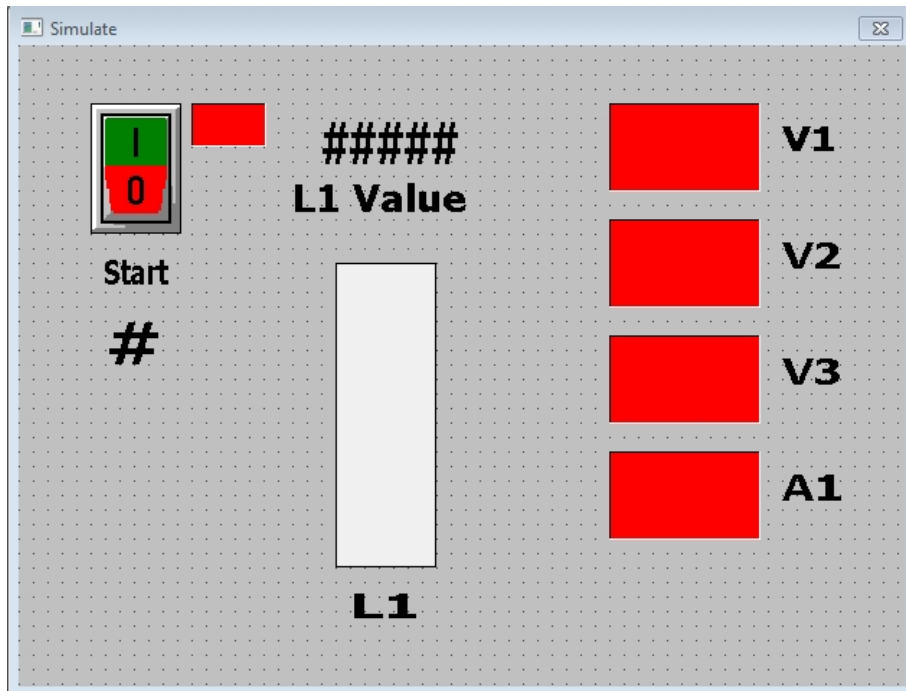        Finished Simulate window will look similar to Figure 18-A

Figure 18-A
Simulate Application Window

Verify the operation of the Simulate Window
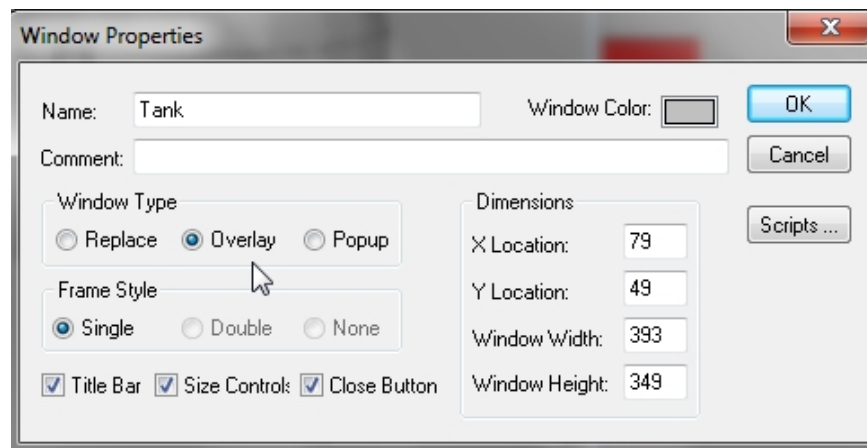
Create a second window called Tank



Figure 19-A
Simulate Application Window

Configure Window Type as Overlay

Add a Bitmap object to the Tank window
Bitmap icon located on Draw Object Toolbar.


Figure 20-A
Bitmap Icon - Draw Object Toolbar

Use Bitmap icon to position a square on the Tank window – Container for Graphic.
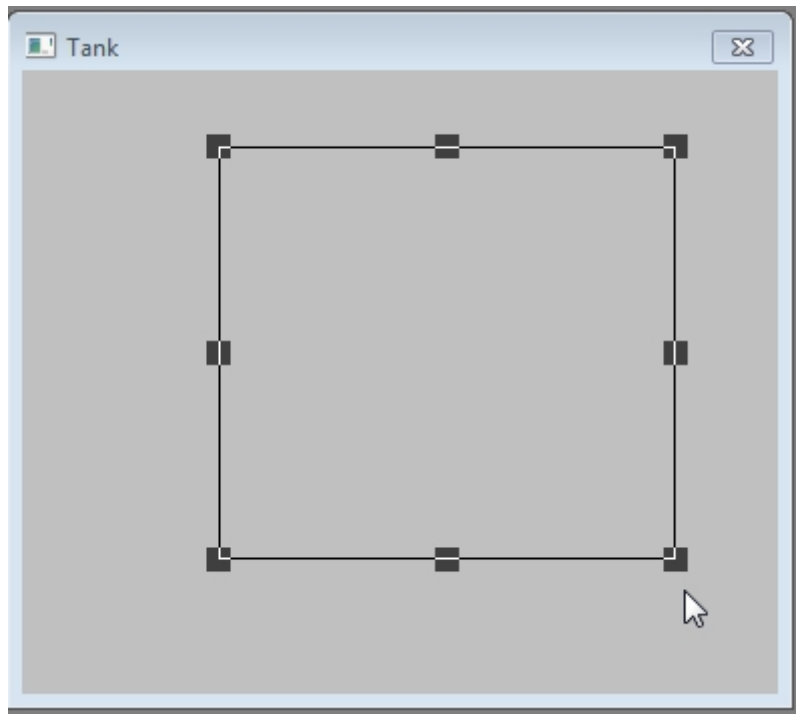

Figure 21-A
Bitmap Container

Note: Although the object is referred to as a Bitmap – other type of graphics besides
 *.bmp files can also be used including:

- *.jpg
- *.jpeg
- *.pcx
- *.tga

Right click on the graphic container.

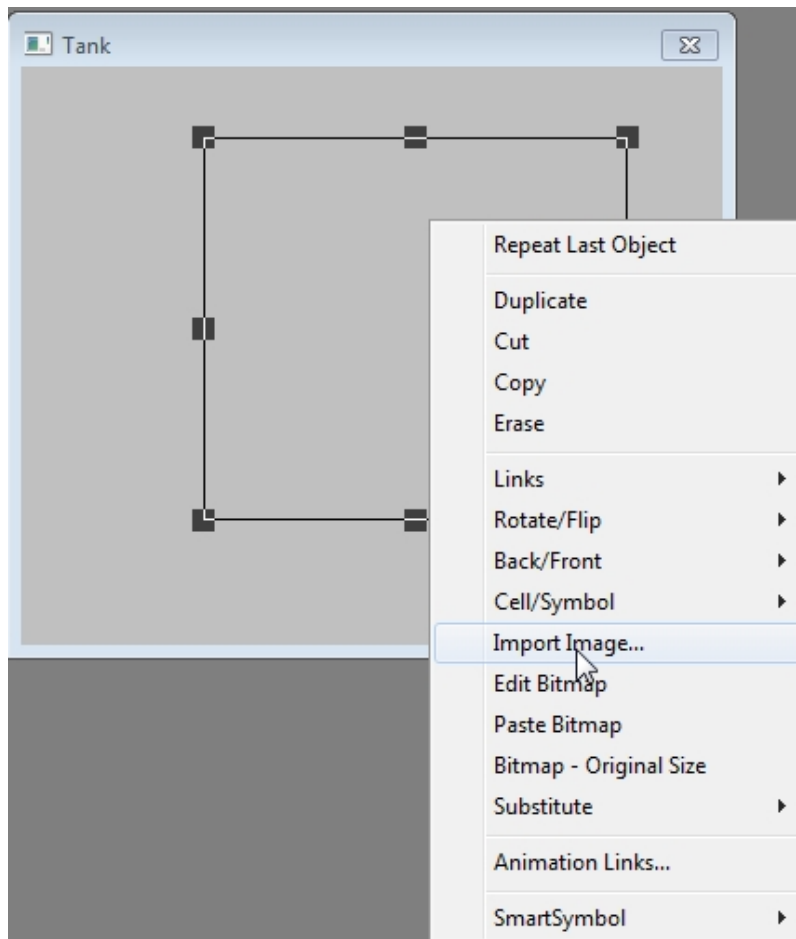Select Import Image from the context menu.

See Figure 22-A



Figure 22-A
Import Image

Use the Tank_Picture.jpg file included in Module 8 – Highlight the file –Choose Open
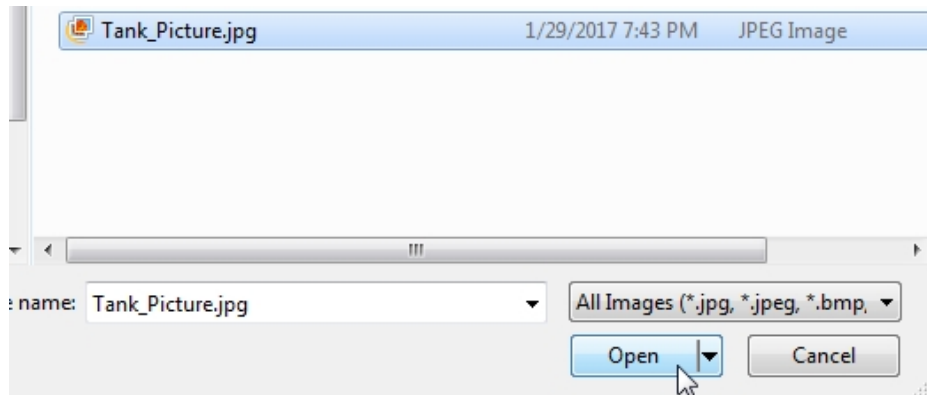
Figure 22-A
Open Graphic File

The Graphic file is import to the application window.
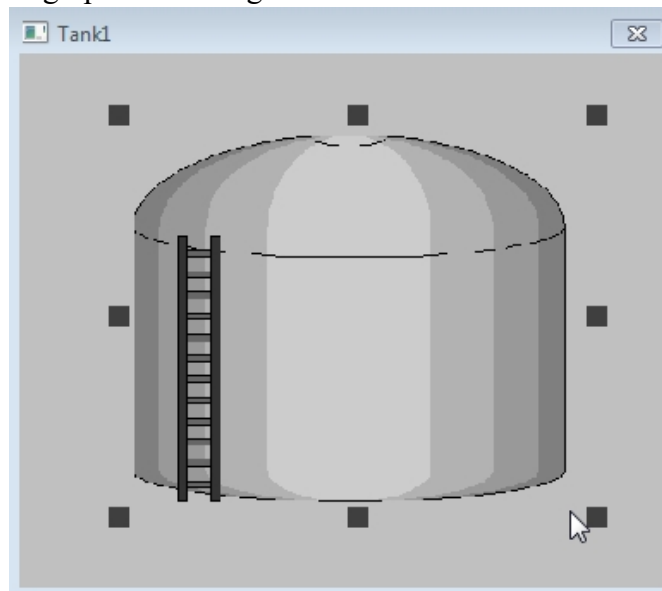Use handles to resize graphic - See Figure 23-A



Figure 23-A
Graphic File Imported

Double click tank graphic or right clock on the tank graphic and select Animation Link form the context menu to open the Animation Links window for the Object type: Bitmap
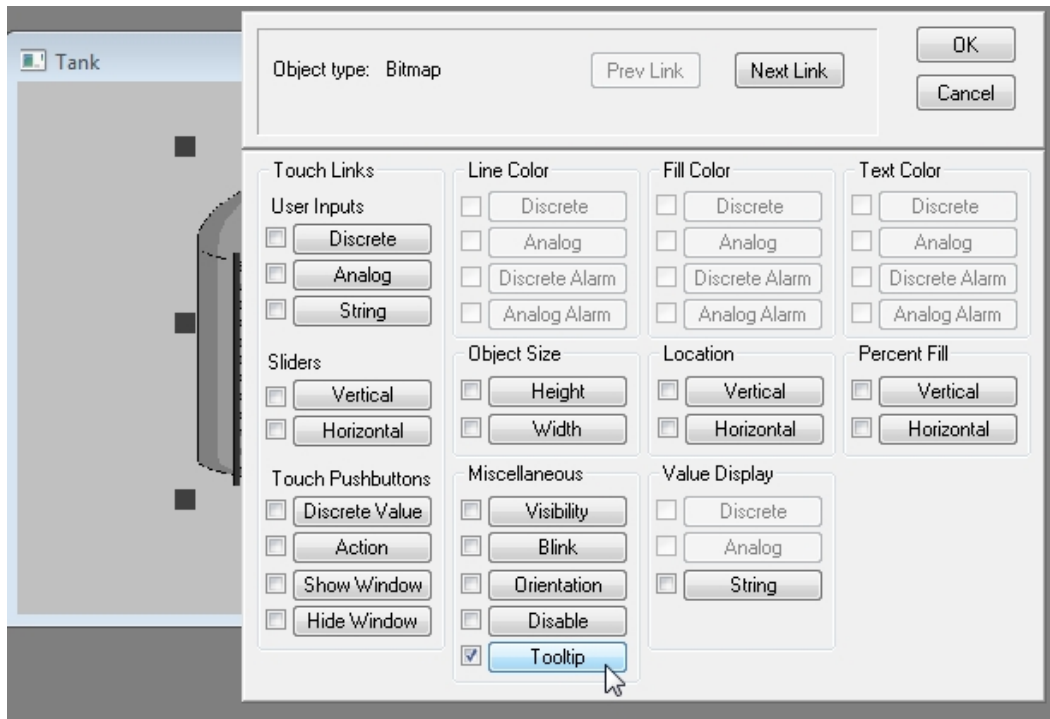
Figure 23-A
Animation Links Window – Object Type Bitmap

In the Miscellaneous region of the Animation Links window – check the Tooltip Check Box.
On the Object Tooltip -> String Tagname
Select Static text:  Radio Button
Type –Tank Picture in the Entry Box


Figure 24-A
Object Tooltip -> String Tagname

Click the upper OK button.

Add window navigation buttons to the two application window to change widows in Runtime
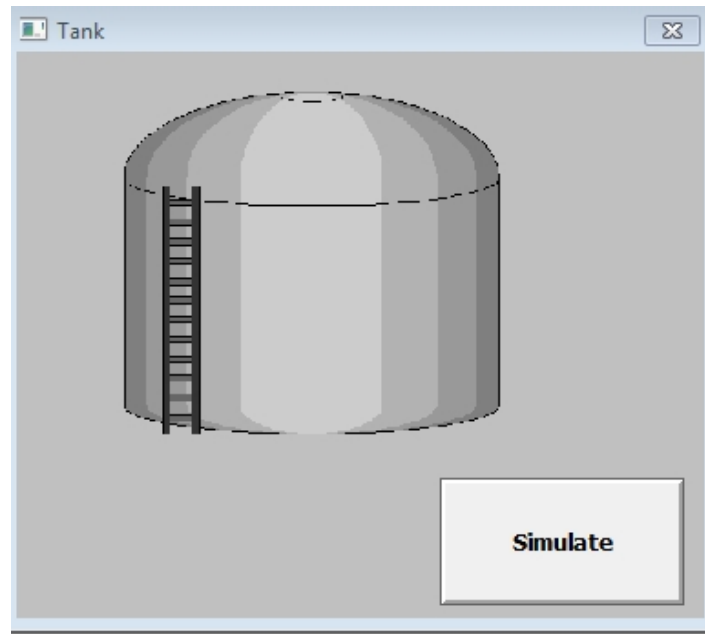
Finished windows will look similar to:
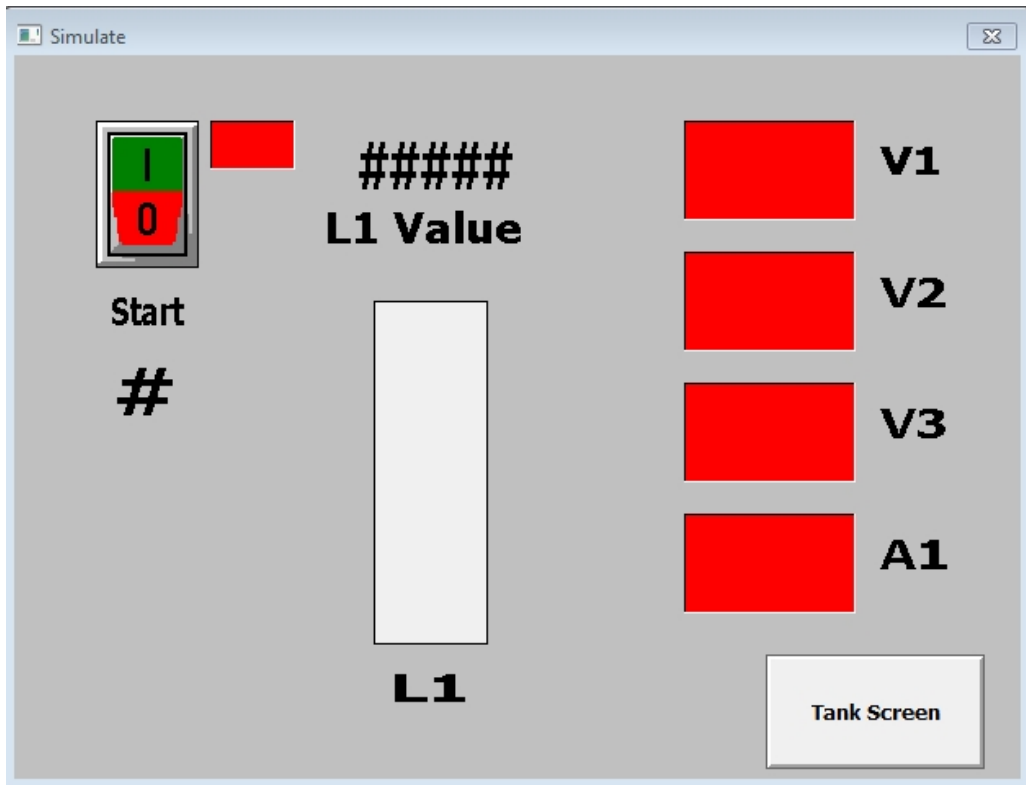


Figure 25-A
Finished Tank Window

Figure 26-A
Finished Simulate Window

Test the application
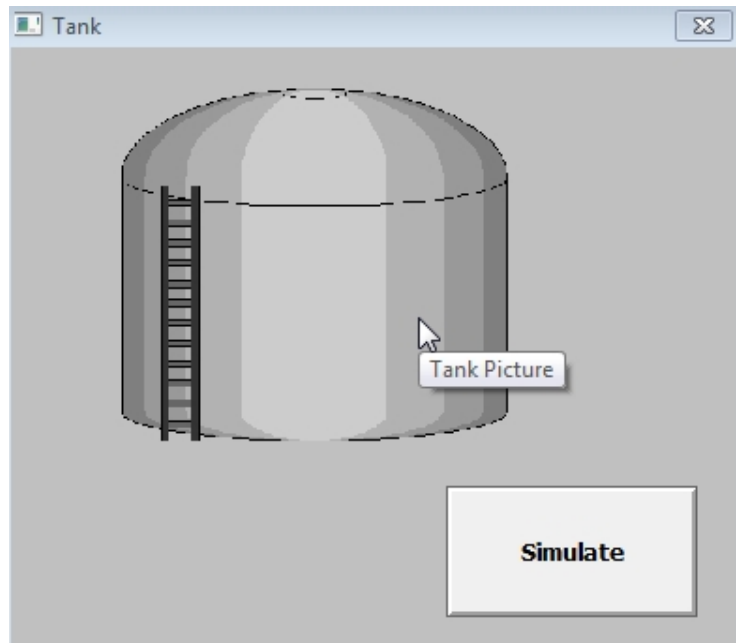Go to Runtime –WindowViewer

Figure 27-A
WindowViewer Tank Window

On Tank window -  place mouse on Tank graphic – Tooltip will appear
See Figure 27-A

From Tank window
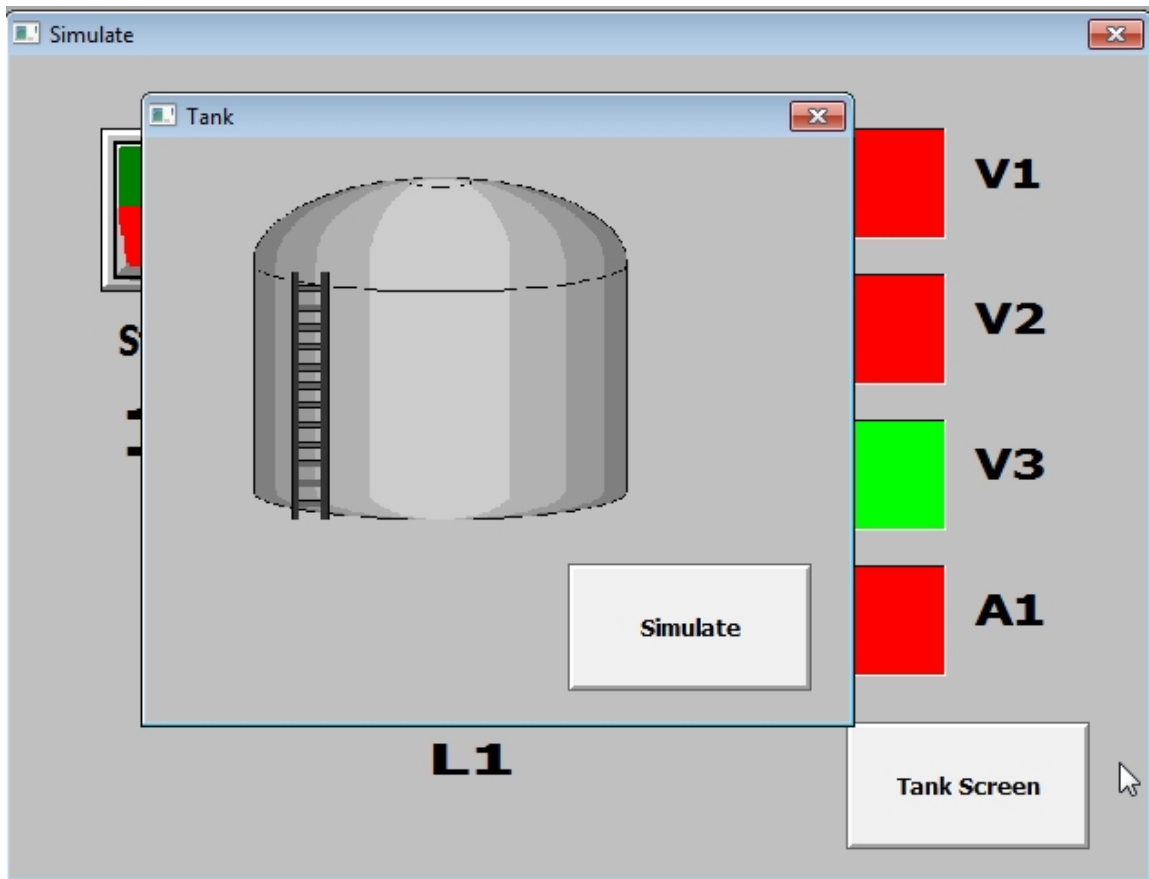Open Simulate window – Does Tank window close?_____

Explain:_____

Figure 28-A
WindowViewer Tank / Simulate Windows

From Simulate window
Open Tank window – Does simulate window close?_____

Explain:_____


Return to WindowMaker – Save All Windows – Exit WindowMaker


## Review Questions

1.    T    F       Bitmap Graphic cannot be assigned Animation Links .

2.    Items in the Wonderware Simulate application include:

     a)    Start

b)  PLC1

c)  Simulate

d)  L1

3.  The Application name for the Simulate application is:

a)  User defined

b)  PLC1

c)  Simulate

d)  B and C.

4.  T     F     The Access and Topic must be the same on Wonderware Access
                 Name screen.

5.  Wonderware InTouch requires which type of tags to work with Simulate

a)  Memory Discrete

b)  Memory Analog.

c)  I/O Discrete

d)  I/O Integer

e)  Memory Message

6.  T     F     The Topic name when using Simulate must be PLC1

7.  T     F     Overlay windows close other application windows

8.  T     F     Replace windows close other application windows

9.  T     F     All Accesses  to the same device must be the same

10.    A DDE link consists of which components :

    a)    Application .

    b)    Topic

    c)    Item

    d)    All the above.

## Review Questions Answers

1) F

2) a, d

3) c

4) F

5) c, d

6) F

7) F

8) T

9) F

10) d