

Opendiem Training

Exercise 2

Opendiem-TRN-0002

Revision	5.0.0		
Status	Initials	Date	Comment
Released	RAC	11/18/2010	Updated format and content



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Exercise 2 – Introduction to Opendiem Designer, Part I

Introduction

Opendiem Designer is a Windows based application for designing and managing Opendiem projects. Designer is designed to minimize the engineering time / effort necessary to develop an Opendiem solution, while still providing a powerful range of features.

Objective

In this exercise you will use Opendiem Designer to create a new Opendiem project for the Server and produce simple Opendiem objects that change their properties in response to network data. Other, later Exercises will illustrate how to develop web pages that propagate network variables based on user input from within a standard Web Browser.

Creating a New Opendiem Project

In this exercise you will use Opendiem Designer to create a new Opendiem project on your server. You will then connect the Opendiem network driver to an LNS database and use Designer to create a Web page that will allow you to monitor a LON SNVT via a standard Web Browser.

Exercise Instructions

From the Windows Start menu select the **Opendiem** folder and select the **Opendiem Designer** icon to run Designer. You may also have a desktop shortcut icon for Designer



which can be double-clicked to start as well.

Read and then click the **OK** button to accept the 'Tip of the Day' if presented.

You are presented with the Designer welcome screen.



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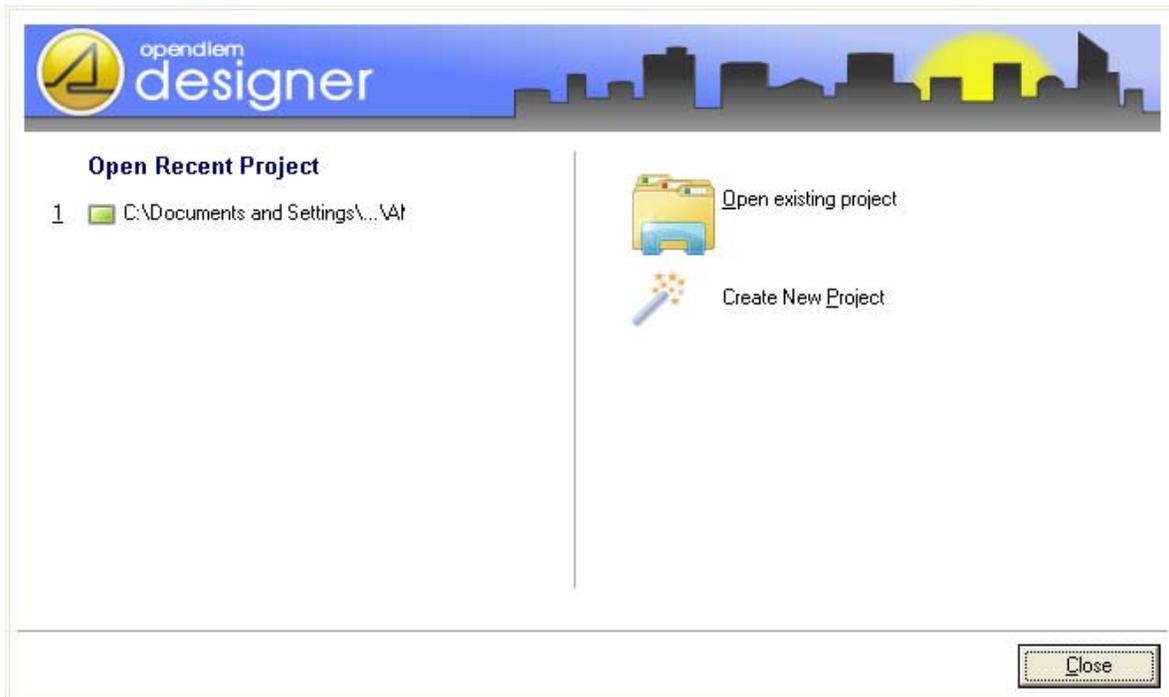
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From the Select Project screen shown above, select **Create New Project**, which will start the 'Opendiem Designer Project Wizard'.



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Opendiem Designer New Project Wizard



1. Click **Next** on the Wizard start screen.



2. Select Standalone or Multi-Server Project (Standalone is most common)

Click **Next**



3. Select the Web Server you wish to use, the recommended option is Microsoft IIS

Click **Next**



3. Select the folder that the Opendiem project files will be stored in and name the project.

Click **Next**



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4. Server Settings. Enter the Project Title and select the services required on the server. For this exercise ensure that all of the services are checked.

Each service may be added or removed later from the Opendiem Engine if required.

Opendiem screen size sets the default client screen size. Enter the desired Height and Width.

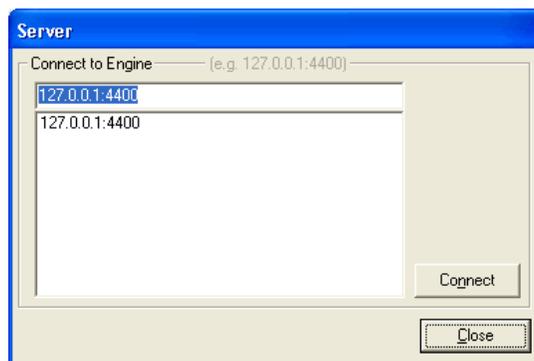
Click **Next**



5. Verify the project location path is correct.

Click **Finish** and the Designer wizard will create your project.

A **Server** dialogue box will appear as shown below, enter the IP address of your Server or LOCALHOST if working locally and click **Connect**





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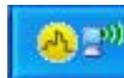
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If security is enabled on the Server the following dialog will be displayed to allow you to connect.



Loading the newly created project into Opendiem Server.

Ensure that Opendiem Engine is running on your server by checking that the Opendiem Engine Icon is visible in the system tray:



If not already running, start the Opendiem Engine. From the Windows Start menu select the **Opendiem** folder and select the **Opendiem Engine** icon.

To display Opendiem Engine, double click on the Opendiem Icon in the system tray or right click and select **Show Opendiem Engine**. The screen below will be displayed.



To load a new project into the Opendiem Engine select **File | Open Opendiem Project...** Browse to your project created with Designer (name.oproject) and select **Open**.

An Opendiem Engine dialogue will appear indicating that there are users currently logged on (The user is Designer). Select **Yes** and the old project will be closed and replaced by the project just created using Opendiem Designer.



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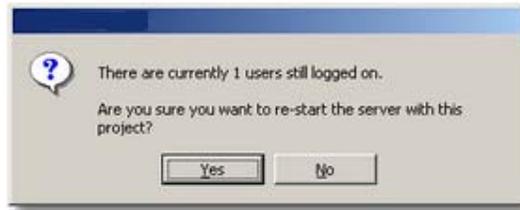


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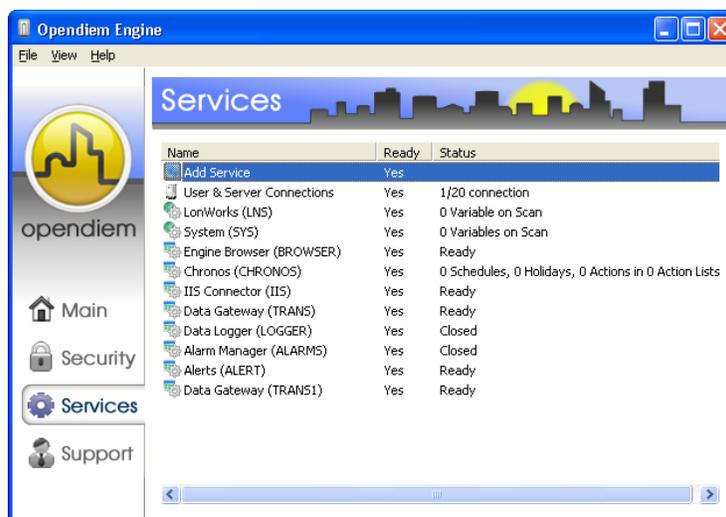
A progress bar will appear until the new project is fully loaded. By selecting **File | System Properties...** details of the currently loaded project can be viewed.

Information shown here includes the system type, the maximum number of concurrent client connections to the server, the location of the project file currently loaded, the GUID, system ID and the Opendiem Port Number. The system ID is for use in multi-Server projects and the Opendiem port number allows the default TCP/IP port of 4400 to be changed if required.

The Opendiem Engine contains four main screens, Main, Security, Services and Support. Each screen is selected by clicking on the appropriate text icon in the left hand panel. These screens will be detailed in later exercises.

On the Main screen in the Project Properties section there is a checkbox that sets the current project to automatically load each time the Opendiem Engine starts.

Click on the **Services** button in the left hand pane and Opendiem Engine will show a screen similar to the one below.





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As this is a newly created project the LNS driver, Alarm Manager and Data Logger are all closed. Before we can use this project we must first connect the LNS Driver to an LNS database.

Configuring the LNS driver.

This section provides a step-by-step guide to connecting the Opendiem Server to a LONWorks LNS database. Opendiem Server must have a valid connection to an LNS database before any LON network variables or messages can be monitored or controlled.

Double click on **LonWorks (LNS)** to select the LNS service and follow the instructions below to open a database. Note that the database must first be created using Echelon LONMaker[®] for Windows[®] or an equivalent LNS tool. Consult the Echelon LONMaker[®] for Windows[®] manual for further details.



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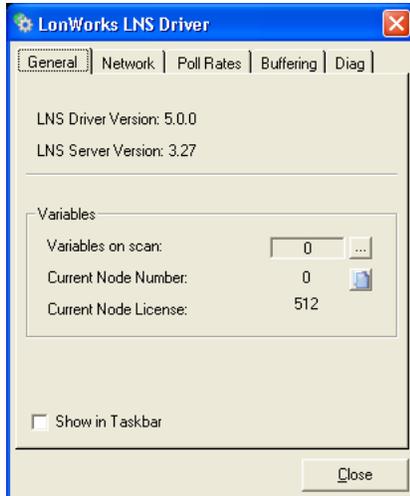


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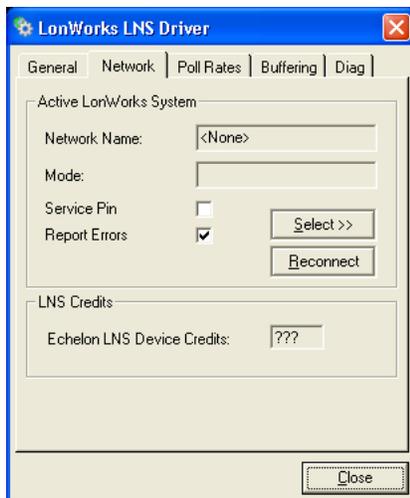
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1. Click on the **Network** tab on the LonWorks LNS Wizard start screen.

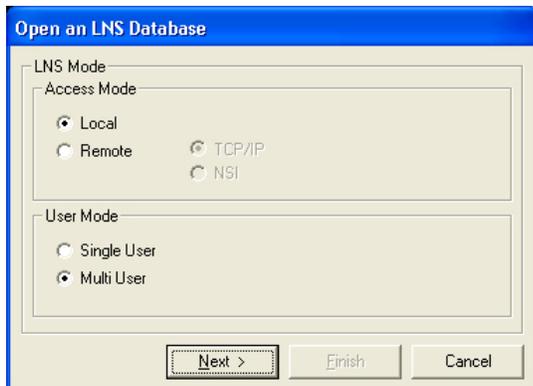
The General tab shows the service version number, the version of LNS on this system and the number of variables that the LNS driver service has on the Opendiem Scan List. The Opendiem Scan list is dynamic based on which variables need to be monitored based on client connections and data requirements from other services e.g. the Data Logger Service.



2. Click on **Select>>**.

The Network tab details the LNS database name, the LNS connection mode e.g. Local / Remote. It also shows the LNS Device Credits available.

The Report errors checkbox allows the LNS driver to notify Opendiem when data errors occur on the LON network, errors are displayed in the browser as ??? instead of the last data value.



3. Connections can be made to a local LNS database, or to a remote LNS database via TCP/IP. For this exercise select a local database and click **Next >**



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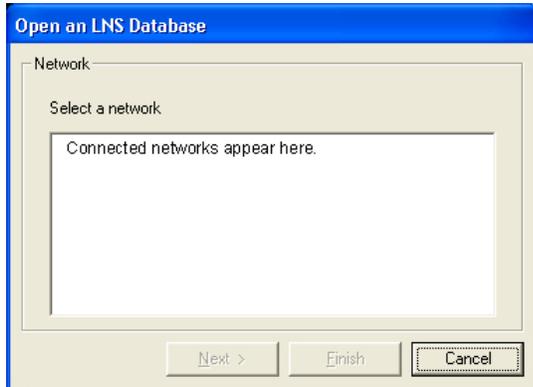


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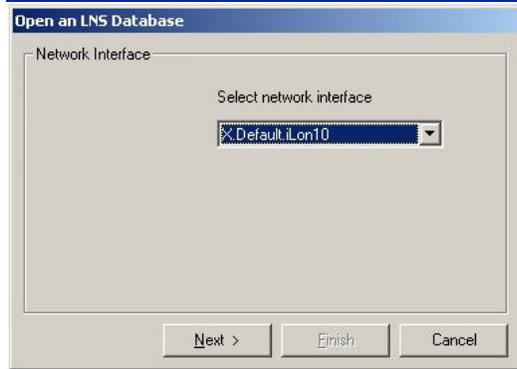


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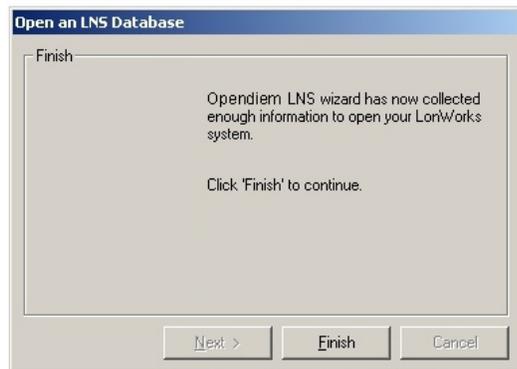
4. A list of all LNS databases will appear, select the Training LNS database and click **Next >**



5. Select the required LON interface from the drop down list and click **Next >**



6. If LON Authentication is used select the checkbox and enter the key, otherwise click **Next >**



7. The LNS wizard now has all of the information required to connect to the LNS database and open the LON network.

Click **Finish**.



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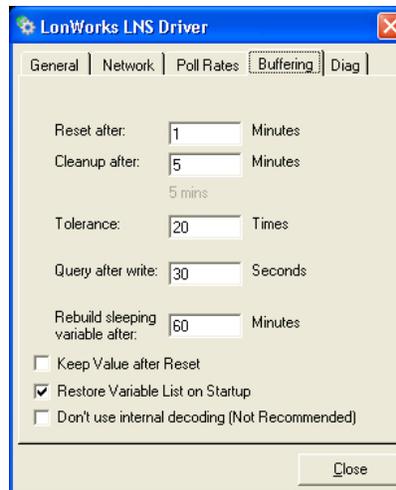


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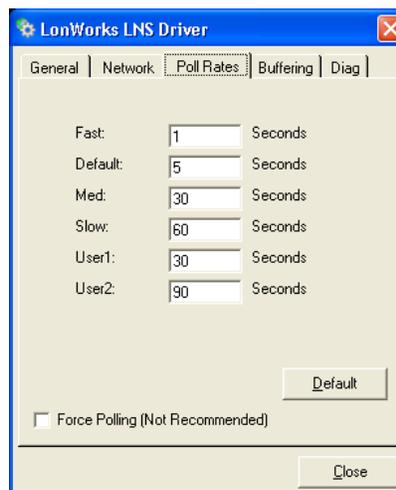
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The LNS database is now open and the LNS driver can send & receive LON variables.

Before moving on we will take a brief look at the other two tabs on the LNS driver service. Click on the **Buffering** tab, this shows advanced LNS network settings these will be covered in more detail later.



Now click on the **Poll Rates** tab, this lists the poll rates that can be used for variables on this driver. There are three pre-defined poll rates and three user defined poll rates. The 'Default' poll rate is the rate selected when no other modifier overrides it and is configurable; the initial value is 2seconds which is suitable for most applications. When a variable is not 'bound' to the LNS network interface it is polled at the rate specified by the poll rate modifier option of the tag name. The principle is the same for most other Opendiem drivers.





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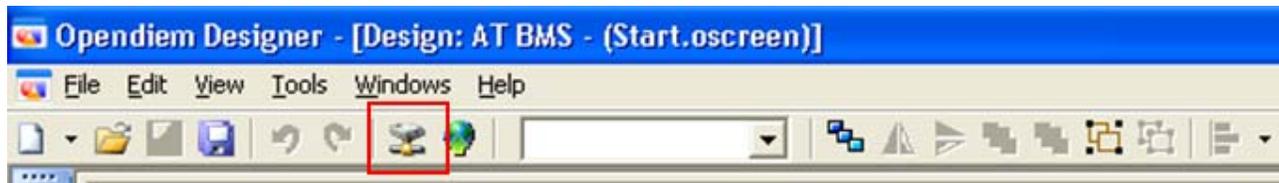
Using a Web Server.

Opendiem Server uses Microsoft IIS as a web server. In order for users to connect to the Opendiem Server using a web browser Microsoft IIS Server which is part of the Windows Professional Operating System, must be installed on the Server. This can be checked by going to the Administrative Tools folder in Windows Control Panel and checking that Internet Information Services Manager is listed. This should already be installed for a Server but for a PC it can be installed by using the Windows OS set up disk. The client service IIS Interface must also be running on the Opendiem Server as this is what communicates between Opendiem and the Microsoft IIS Server (see training Addendum-IIS for instructions on how to install IIS).

Connecting Opendiem Designer to the new Opendiem Server project.

To continue with this exercise we will return to Opendiem Designer. Hide the Opendiem Engine by clicking on the close button in the top right of the Opendiem Engine Window. This close button hides the Opendiem Engine but does not terminate it and the Opendiem Icon will still be visible in the system tray.

At this stage, Designer is still connected to the original Server project.



To connect Designer to the Training project from the Server, click on the Connect to Server icon as shown above. From the Server dialogue select Connect and Designer will connect to the Server and open the Project Explorer.



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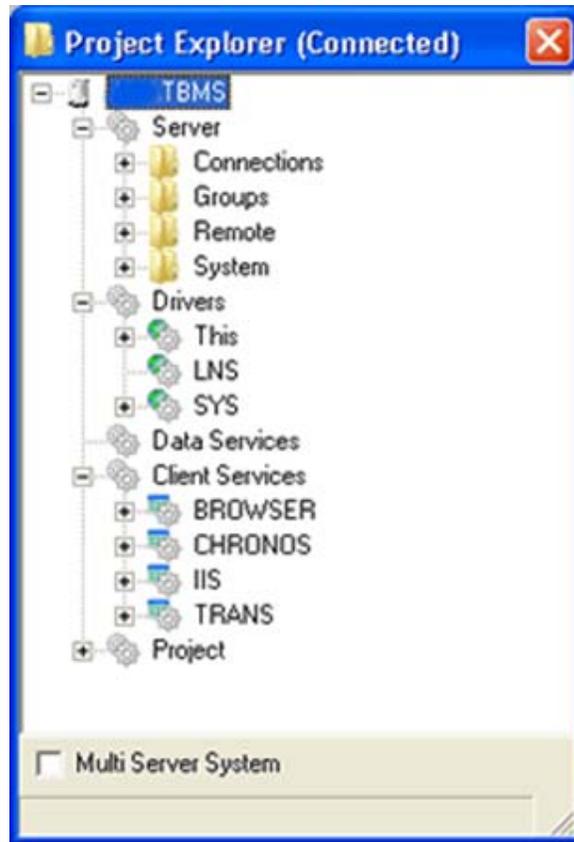


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Refresh the Project Explorer tree view by right clicking on the project tree and selecting **Refresh** from the pop-up menu as shown, alternatively select **F5** to refresh.

The Project Explorer is a tree view of the complete project including Users, Drivers, Data Services, Client Services and Project Web screens. Arrange your windows within Designer to give easy access to the screens and the Project Explorer as shown below:



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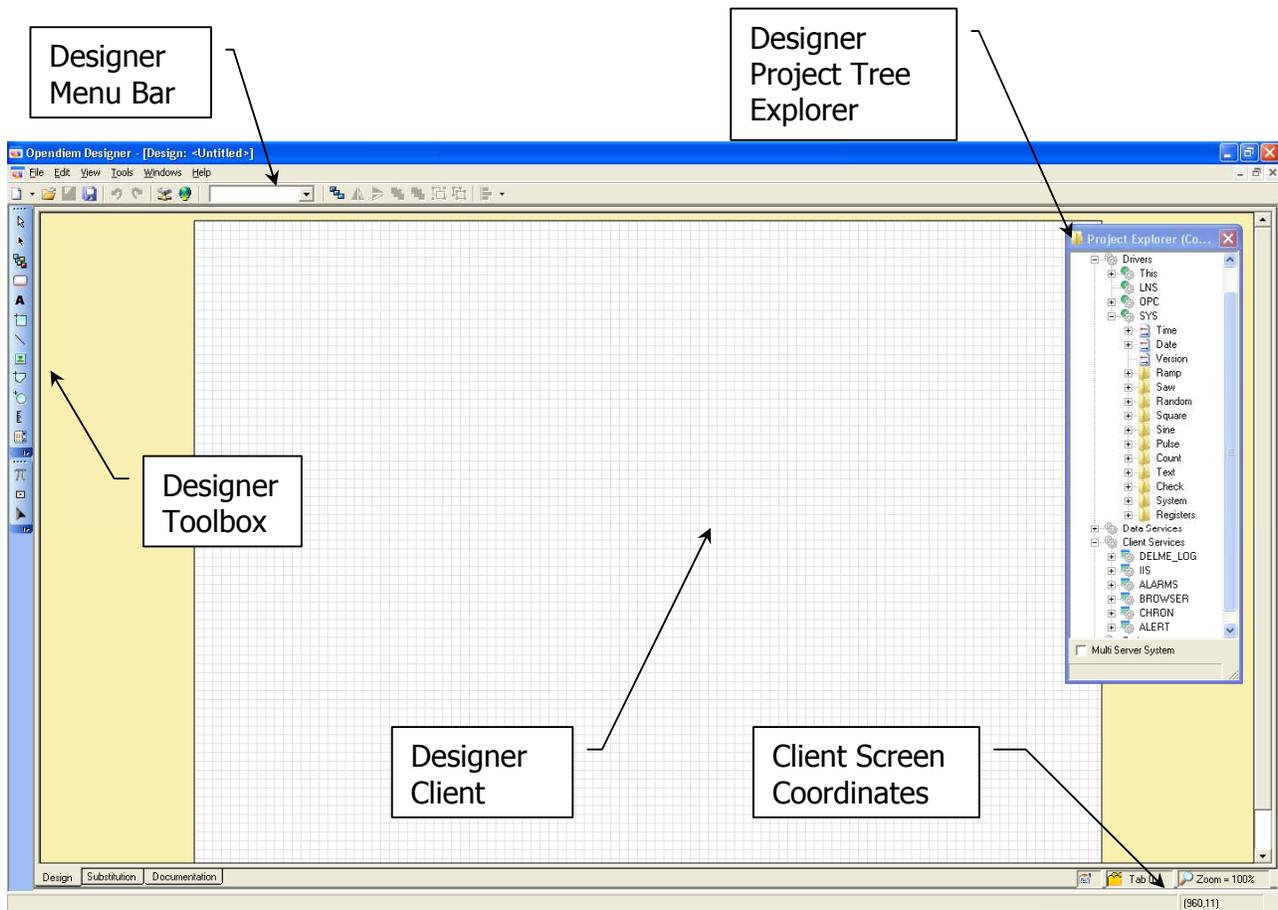


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From the Project Explorer expand the Designer Project Tree Explorer by clicking the plus sign (+) next to the driver or service name. The Project Explorer view for a node separates the Configuration Properties from the Network Variables to logically group the variables.



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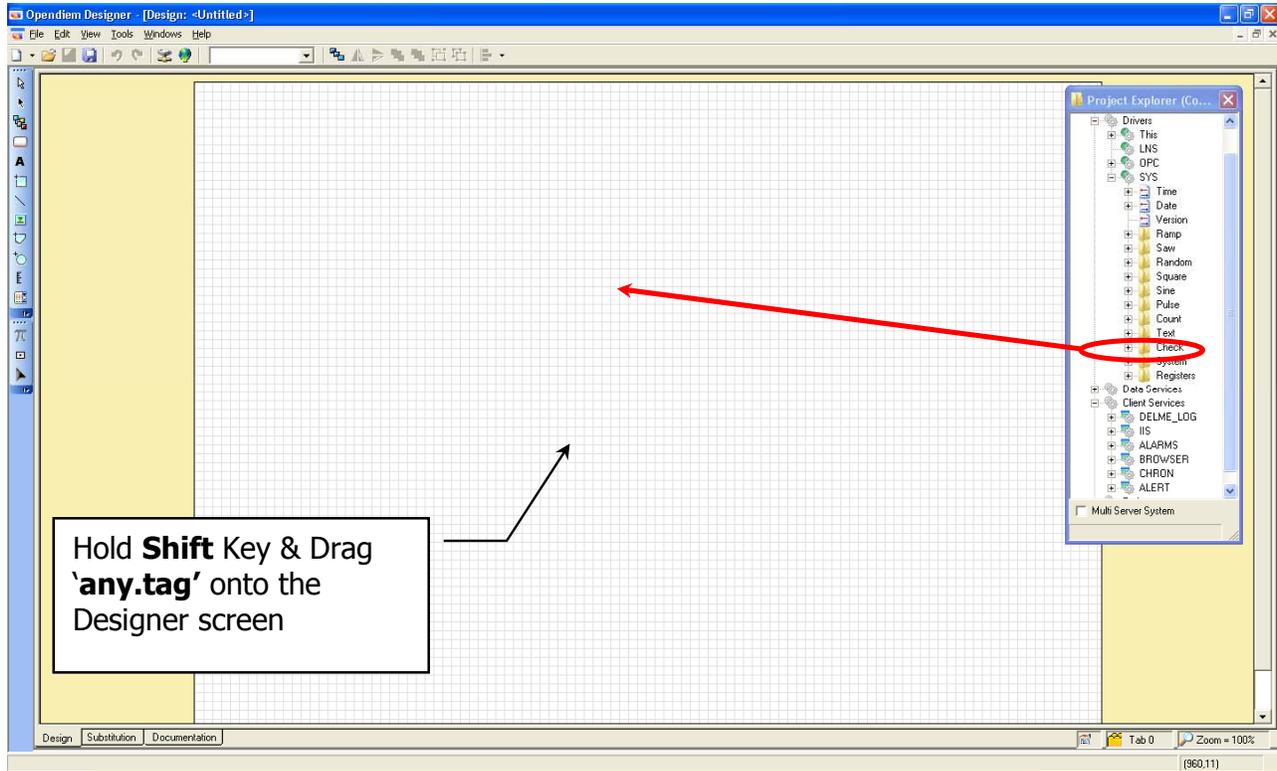


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Hold down the **Shift** key on the keyboard and drag **'any.tag'** onto the grid area, which is the Web Design Page and a **'%v'** symbol will appear on the design page. This is the placeholder for the tag value that will be shown in the Web Browser.

 **Tip:** If you drag a Network Variable or Controller associated with a *SmartComponent* onto the design page without holding down the **shift** key a pop-up list will appear with *SmartComponent* options. Holding down the **shift** key while dragging the Network variable onto the screen bypasses the *SmartComponent* selection and places a **'%v'** placeholder for the value instead.

Right clicking on any object within the design page and selecting properties from the context menu or F4 shows a properties tabbed dialogue. Each tab displays properties related to a particular function e.g. general, color, visible etc. Only valid operations for the selected object appear, e.g. flood fill is only applicable to a polyshape object and therefore would not appear if a text object were selected.

Note that it is possible to select different objects while the Object Properties window is open and only the relevant options will appear. Below is a table of objects and properties



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Properties Available to Each Object.

	General	Caption	Colors	Flood	Image	Rotate	Custom	Style	Visible	Slider	Alarms
Smart Component	✓						✓		✓	✓	
Button	✓	✓	✓					✓	✓	✓	
Label	✓	✓	✓						✓	✓	
Panel	✓		✓					✓	✓	✓	
Picture	✓				✓				✓	✓	
Poly Shape	✓		✓	✓		✓			✓	✓	
Line	✓		✓			✓			✓	✓	
Circle	✓		✓						✓	✓	
Gauge	✓		✓					✓	✓	✓	
Alarm List Box	✓		✓						✓	✓	✓

Click the right mouse button over the **'%v'** and select **Properties** from the context menu. This will display the properties for the temperature reading and then follow the steps below.

1. Click on the **Caption** tab and in the **Caption** box enter `'Temp = '` in front of the **'%v'**
2. Enter `'%u'` after the **'%v'** as shown below. The `'%u'` instructs Opendiem to display the units for the measurement.
3. In the **Display Format:** drop down list select **0.00**. Other options for a Caption include alignment, style and Display format, which for a standard numeric value sets the number of decimal places to be displayed.
4. In the drop down list next to the Tag select **<Temp>** to instruct Opendiem that this is a temperature reading. Using this parameter will display the value and units as SI units or imperial units based on the individual browser regional settings.

Note that there are options for **<CtoF>** & **<FtoC>** conversions which explicitly convert the reading and units.



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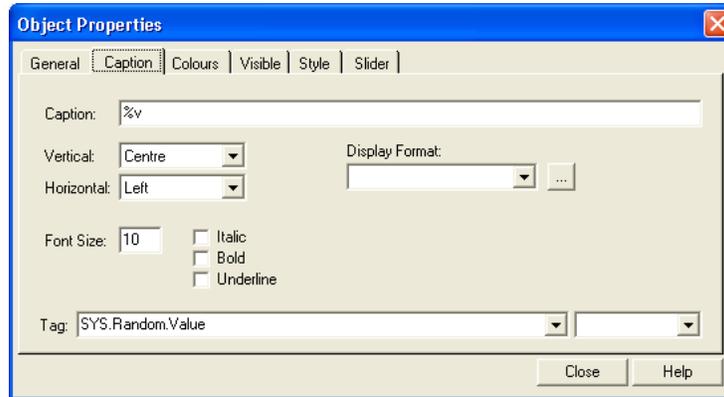


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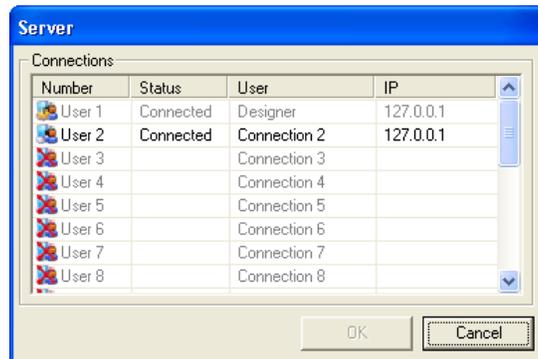
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To quickly view a screen in a web browser Designer has a feature that allows any screen to be sent to any current client browser connection immediately. If you don't have one already, start a Web browser connection to the server. To see how the current screen looks, click on the Upload to Browser icon:



A dialogue similar to the following appears listing the current client connections onto this server. In the example below, User 2 is Opendiem Designer and User 1 is a browser connection. Select a browser connection and click **OK**.



Switch to the browser and you will see the tag value updated in real time within the browser as shown.



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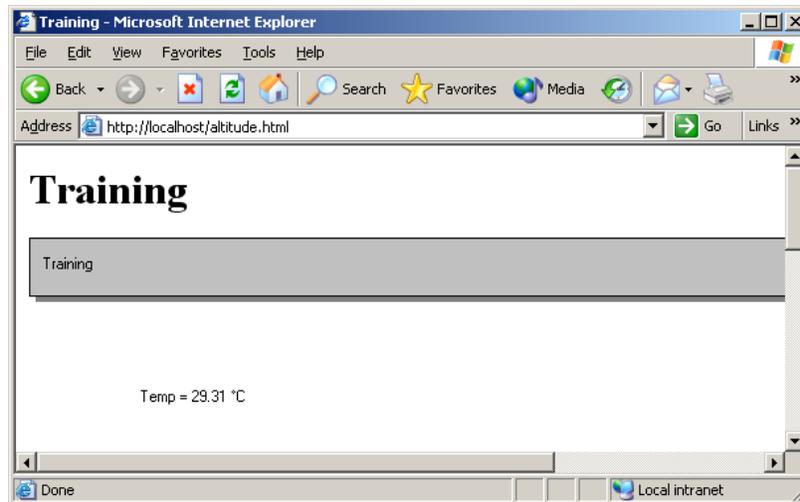


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From within Designer right click on the temperature text, select properties and change the temperature to a Degrees F format by selecting a **<CtoF>** conversion. Send the new screen to your browser and the data will be displayed in Fahrenheit complete with °F units.



The temperature conversion we have just seen is an example of Opendiem's Standard Functions Data Service. These Standard services are functions written to perform specific calculations such as scaling, offsets and conversions. The list of Standard Functions will grow as new functions are added over time. Opendiem also contains a Scripting Service that allows the user to write their own Scripting Functions to perform specific tasks. The Scripting service is however beyond the scope of this exercise.

In the previous example we performed a Degrees C to Degrees F conversion by using the drop down list for convenience. Another way of using the Standard Functions is by adding the Function as a parameter of the Tag, for example to perform a CtoF conversion the following Tag would be used:

```
LNS.SUBSYSTEM 1.FCX.NVOROOMTEMP%STD.CtoF
```

Another Standard Function is Offset. To offset a temperature value by say 5 the following tag value would be used:

```
LNS.SUBSYSTEM 1.FCX.NVOROOMTEMP%STD.offset(-5)
```

Each of the Standard Functions is listed in the Project Explorer under Data Services, STD. Experiment with other Standard Functions and view their effect in the browser.



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A subtle difference exists between using the drop down list conversions and using the STD service. If the drop down list is used then the conversion takes place in the Opendiem Java[®] Client and the conversion can take account of the Browsers regional settings. If the STD service is used then the conversion takes place on the Opendiem Server and therefore applies to all client connections.

Further information on Tags

A tag is a variable reference that is entered on a property page and is in the following format:

```
[SERVER:]DRIVER.variable.field[%Qualifier]
```

SERVER is an optional server specifier used on multiple server systems to inform the system where to obtain the variable.

DRIVER is the driver id that is installed on a server. For example, if a LonWorks driver was added to the server with the name LNS then the driver id would be LNS.

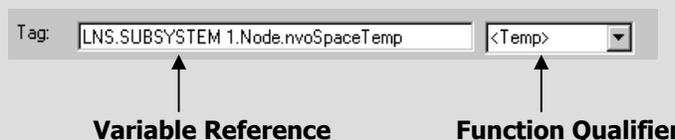
Variable.field is the variable name as defined by the driver.

For example, LNS.Subsystem1.node.nvoSpaceTemp where LNS is the driver.

Qualifier is an optional specifier, which is one of the STD functions. When one of the STD functions is added to a variable reference, this function will be executed in relation to the variable.

Variable and function references can be dragged from the project browser and dropped into the tag box and qualifier box respectively, and the reference will be automatically entered.

The function qualifier in this example converts the variable value to local temperature units.





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To conclude this Exercise, close Opendiem Designer by selecting **File | Exit** from the main menu. If there are unsaved changes in your project you will be prompted to save them when you exit.

End of Exercise 2

In this exercise a new Opendiem Project was created using Opendiem Designer and the LNS driver wizard was used to connect to an LNS database. Using Opendiem Designer the LNS database was viewed from the Project Explorer and a Live data tag variable was displayed within a standard web browser. As an introduction to Opendiem's Standard Functions Data Services such as temperature and scale were performed and their effects validated in the browser.



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Notes:

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