Go to Exercises | Go To Home

Read This before you start.

This document is an interactiv PDF that will give you the oppertunity to guid yourself trough the document using buttons. **Do Not Use The Scroll Function!!**. The document will give you a basic trainig in how to use the different features in the DeltaV. The doucument is created so that you will get the feeling of being in the program, without having to download it. You should start by reading about the different applications that DeltaV provides before you start on the exercises.

The exercises are listed from 1 to 10. You should start on the first one. In the exercises the commands are shown with a blue rectangle around it.
Some commands include a continue button, when this appears you must press the continue button to proceed. The buttons you are asked to press are shown with red marking around it. **Do Not Press Enywhere else than where you are asked to press,** if you happend to press wrong and dont get to press the button again, click on the white area on the page and try again(this is just a bug).

You will also be asked to write something, then you just click in the red rectangle and start typing what you've been asked to type.
It is also possible to click on the x's that are marked with black rectangles around. This, so you can go back in case you want do it again. Just as you would do in DeltaV.

Information and Exercises are gathered from DeltaV Explorer--> Help--> Books Online. If you want to read more about DeltaV and do some more on the different exercises, you can go to Books online. Books online is where you will find everything you need to know about DeltaV.

Telemark University College
Norway

Next

DeltaV

Basic DeltaV Training

DeltaV System Overview

DeltaV Software Applications

DeltaV Explorer

System Configuration

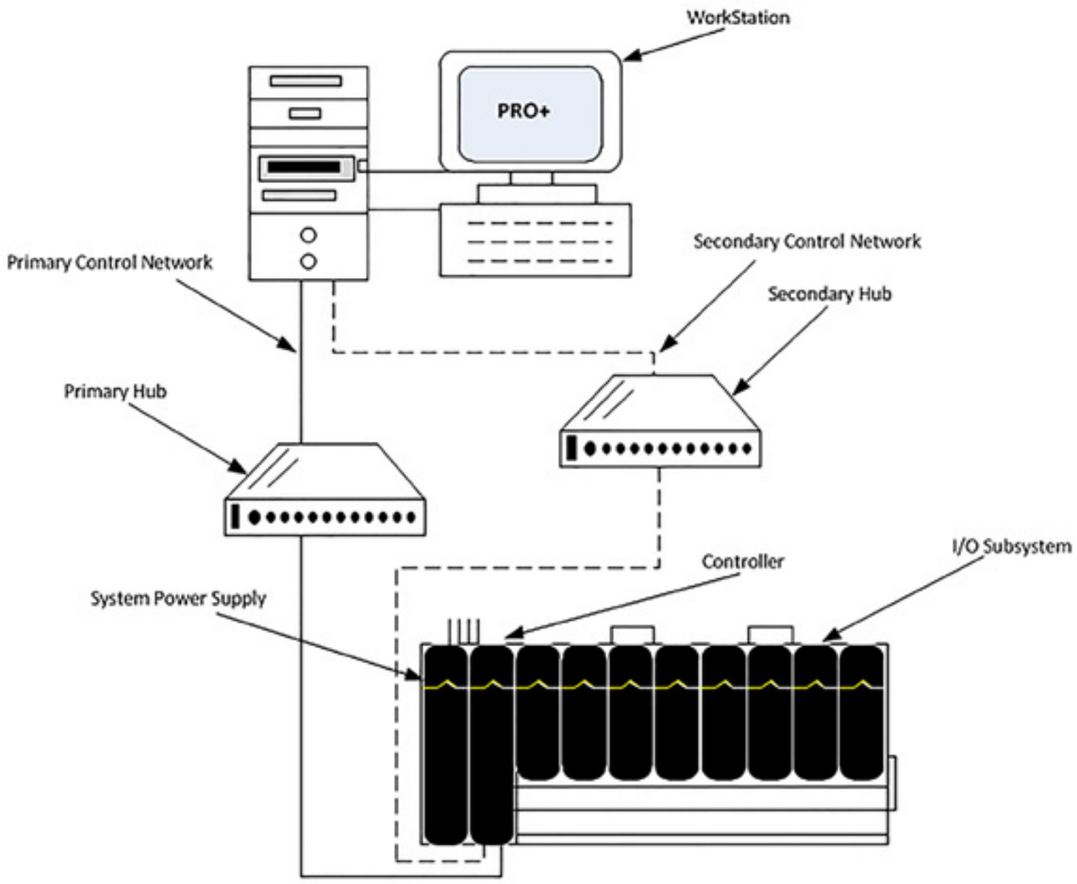
Control Studio

DeltaV Operate

Exercises

Telemark University College
Norway

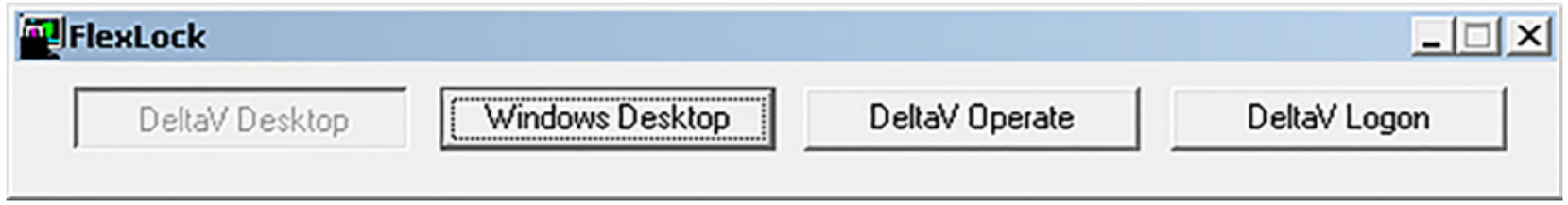
DeltaV System Overview



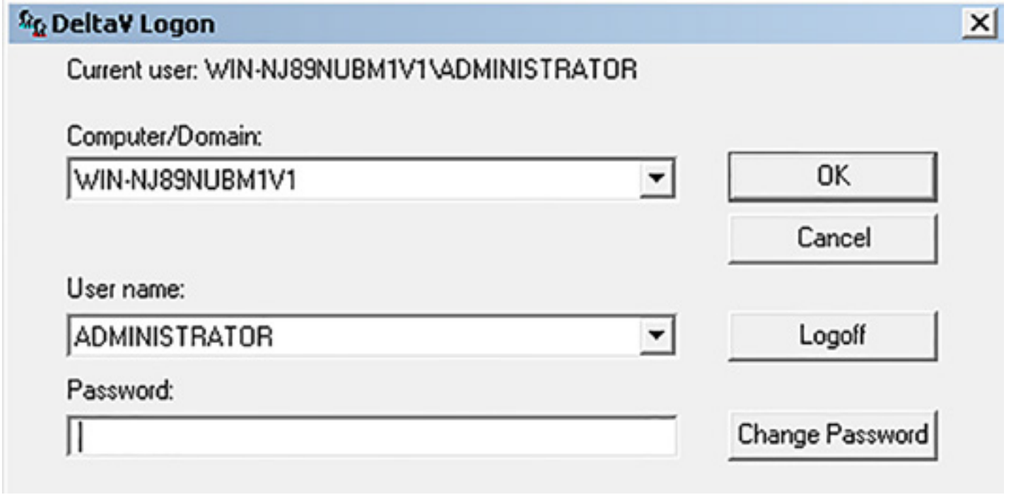
The system hardware consist of the following:

- One or more DeltaV workstations
- A control network(optionally redundant) for communication between system nodes
- Power supplies
- One or more DeltaV controllers(optionally redundant) that perform local control and manage data and communication between the I/O subsystem and the control network
- At least one I/O subsystem per controller that processes information from field devices
- System identifier

DeltaV Software applications



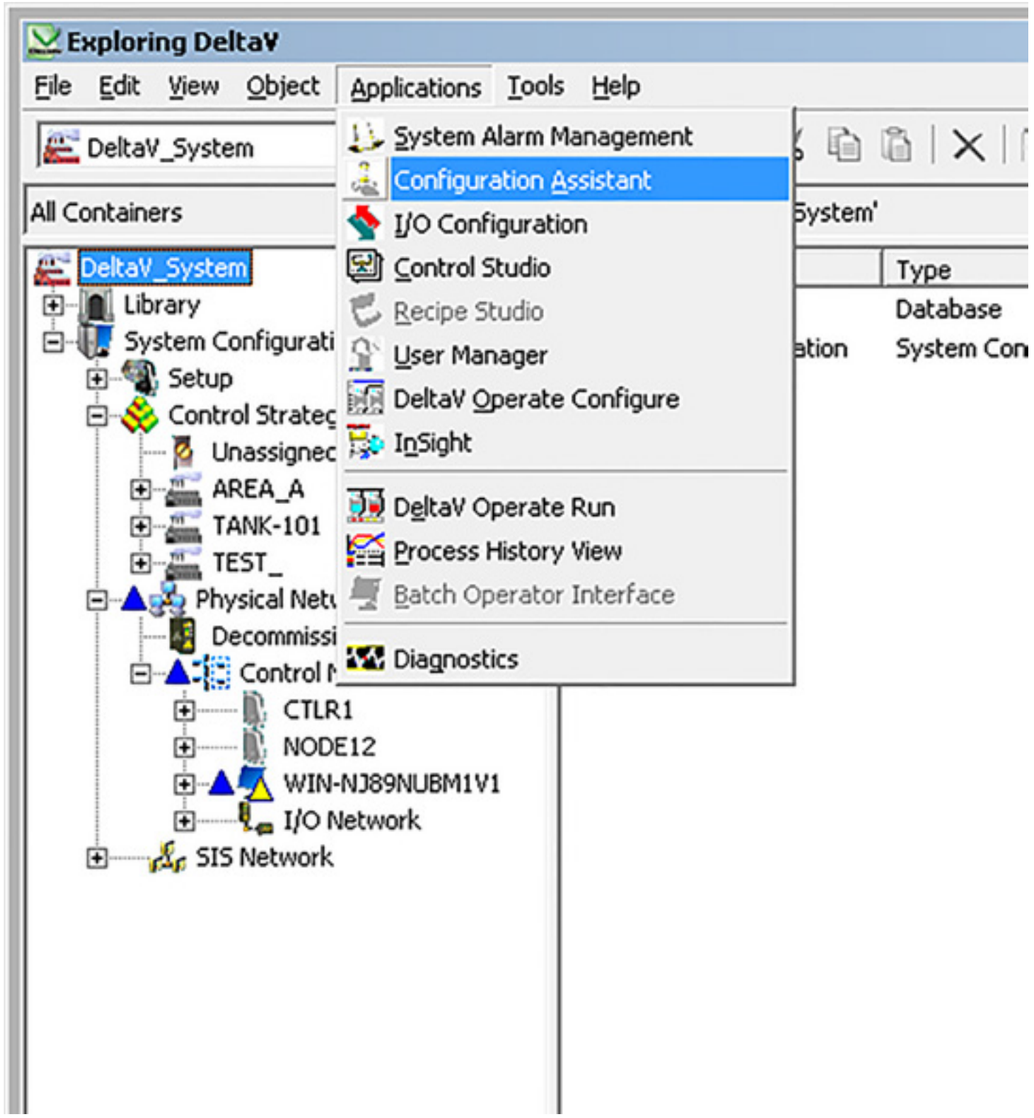
When you click on DeltaV logon you can choose which user name you will log in with by typing the right password. As shown in the window under:



When clicking on windows desktop you will be at the dektop on your computer,. Here you will find the DeltaV system software that includes a variaty of applications to help you configure, operate, document and optimize your process. The primary applications are categorized as Engineering Tools an Operate Tools. Additional tools are available for advanced Control, Installation and Online help.

There are several ways to start an application. One is to click start, point to DeltaV, point to the category and click the name of the application. For instance, to start the DeltaV Explorer you press start, and it might be placed in the start menu. Or you need to press Start-->All programs-->DeltaV-->Engineering-->DeltaV Explorer.

Many Applications allow quick access to other DeltaV applications through buttons on their toolbars and through an applications menu. The Example shows the applications menu, you will also find these applications as toolbar buttons in the DeltaV Explorer.

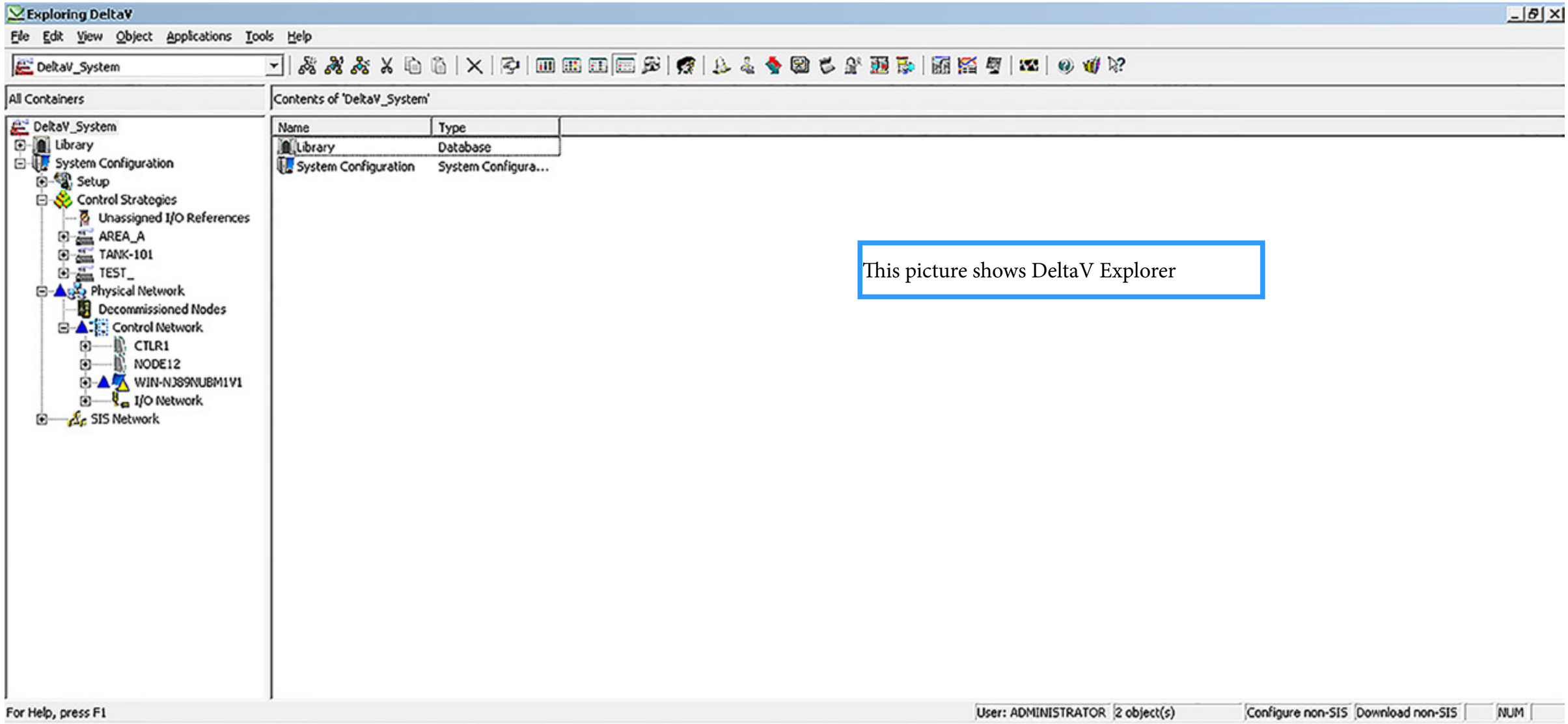


DeltaV Explorer

The DeltaV Explorer allows you to define system characteristics and view the overall structure and alyout of the system hardware and configuration. In addition to viewing your database, you can copy and move objects, modify the properties of objects, and add new objects. Some of the things you can do with DeltaV Explorer are:

- Add workstations and controllers to the database
- Add plant areas and control modules to the database
- Add and edit alarm types and edit alarm priorities
- Create named sets that can be used by control modules
- Edit network, controller, and workstation properties
- Download control modules in controllers
- Load and assign licenses
- Export data for use in an external editing tool such as a spreadsheet or database
- Import data from an external editing tool such as a spreadsheet or database

The DeltaV Explorer also provides a fast way to add control modules to your database. When creating your control strategy, you can simply drag-and-drop control modules from the template library into a plant area. While you are still in the DeltaV Explorer, you can edit the module parameters to tailor them to your application

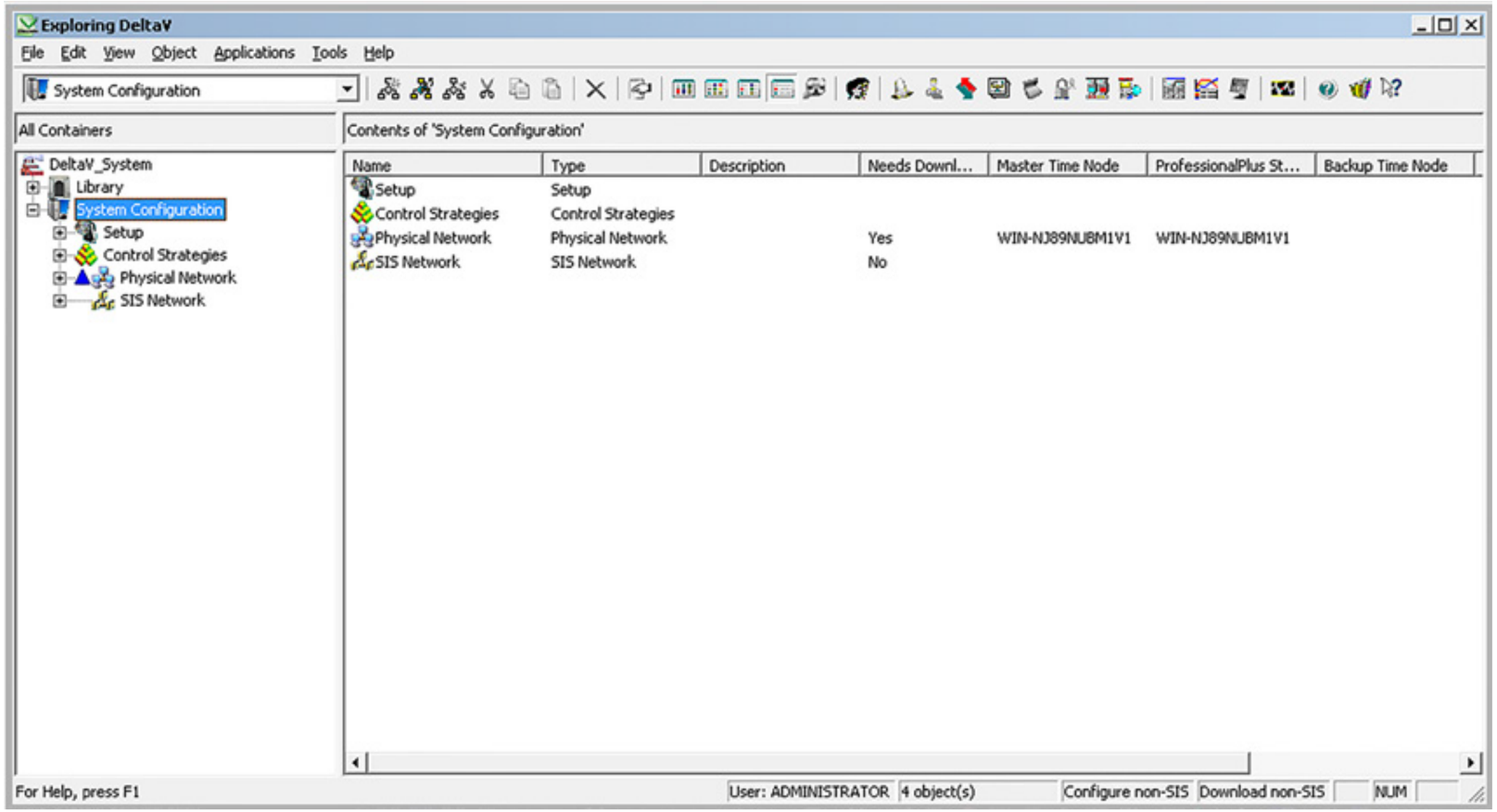


This picture shows DeltaV Explorer

System Configuration

System Configuration contains the control modules in your DeltaV system, the hardware defined for your system and system – wide definitions such as alarm types and licenses. Control strategies – Contains various components that can be used for control. They are either not assigned to an object in the system (in the case of the Unassigned I/O References), or they can be used by multiple objects(in the case of the modules contained in areas, and in the case of the equipment units.

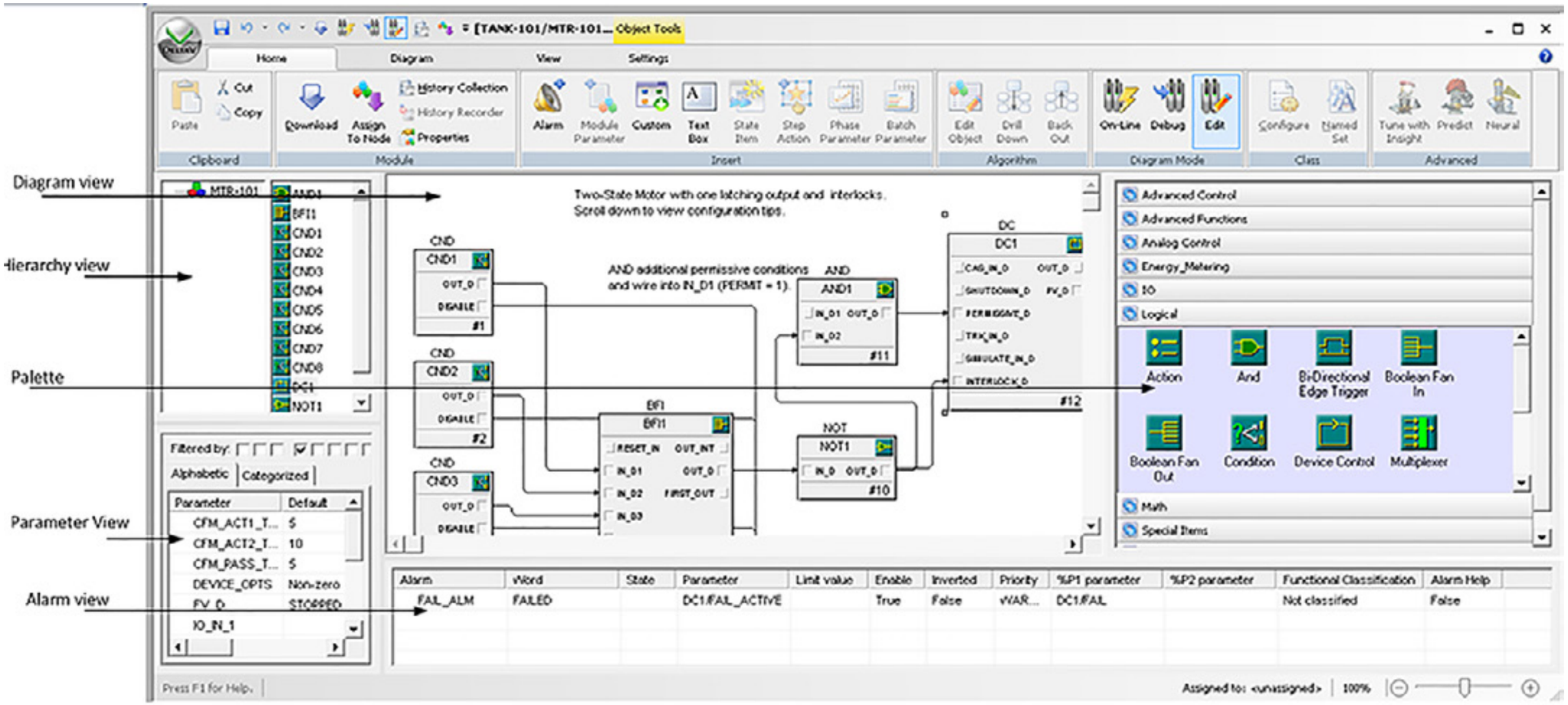
The Physical Network contains the controllers, workstations, I/O Network nodes, placeholders, and decommissioned nodes on the network.



Control Studio

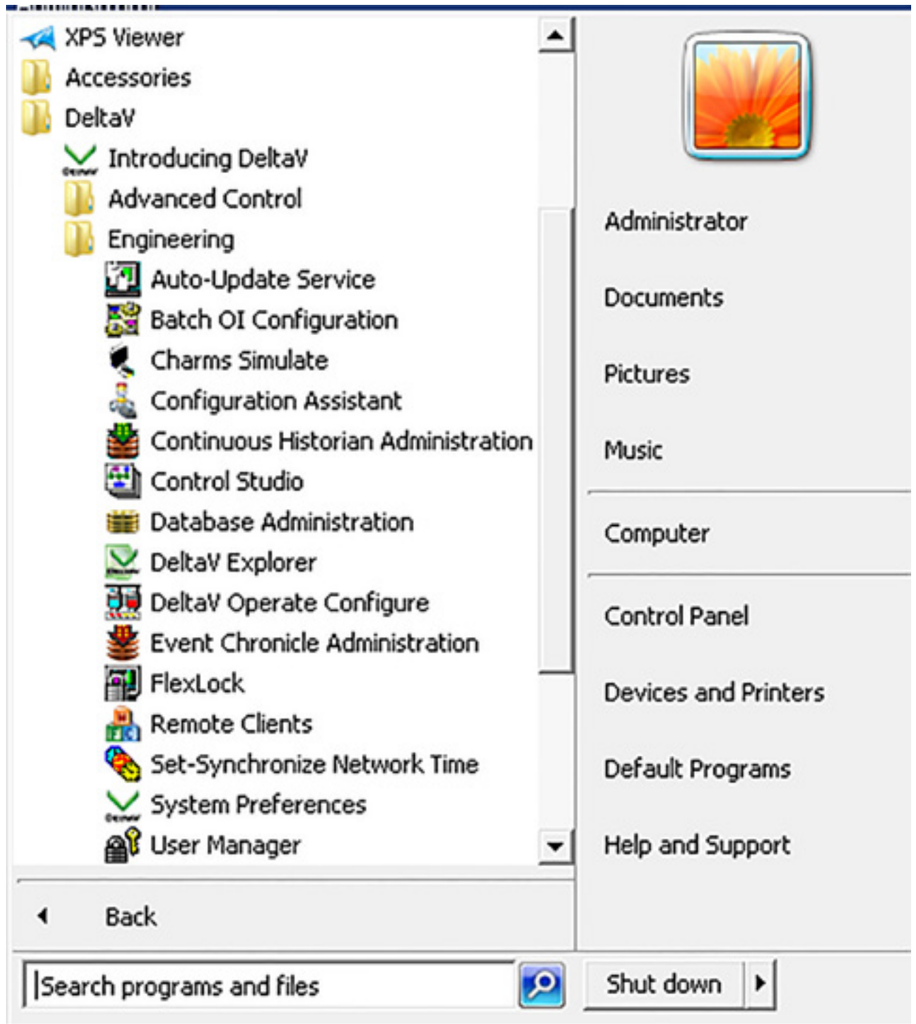
The figure below shows the default arrangement of the Control Studio views. The views are:

- Diagram View - used to create a module's control algorithm graphically on a diagram (includes a palette of items that can be placed on the diagram)
- Parameter View - used to define the module's characteristics, alarm limits, default values, mode, and other parameters
- Hierarchy View - used to see a hierarchy of the elements that make up the module
- Alarm View - used to see the alarms that are defined, their limits, priorities, and other information

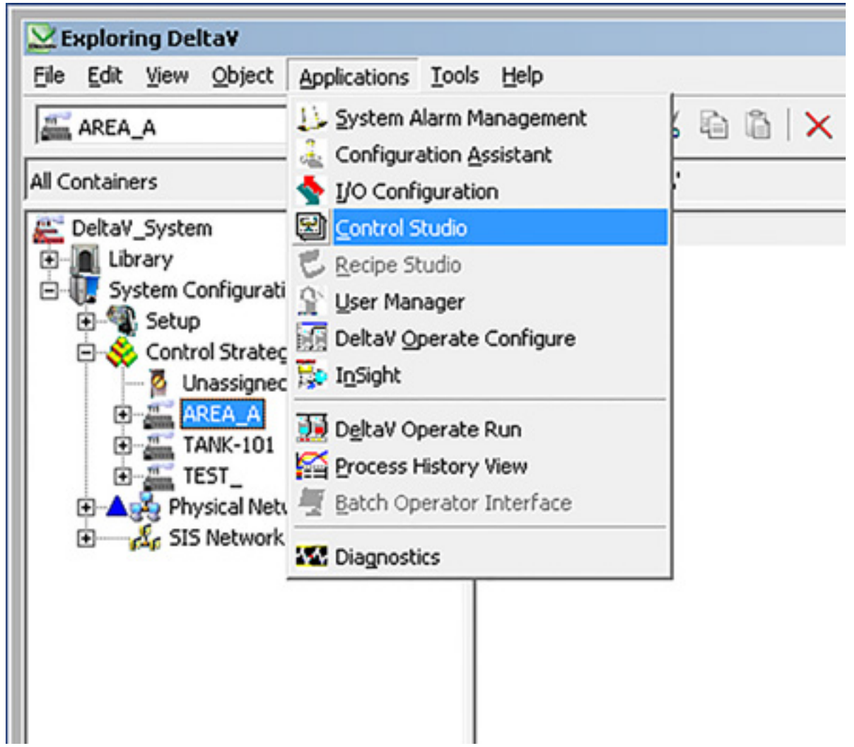


Next

To open Control Studio you can either:
Click Start --> All programs --> DeltaV --> Engineering --> Control Studio



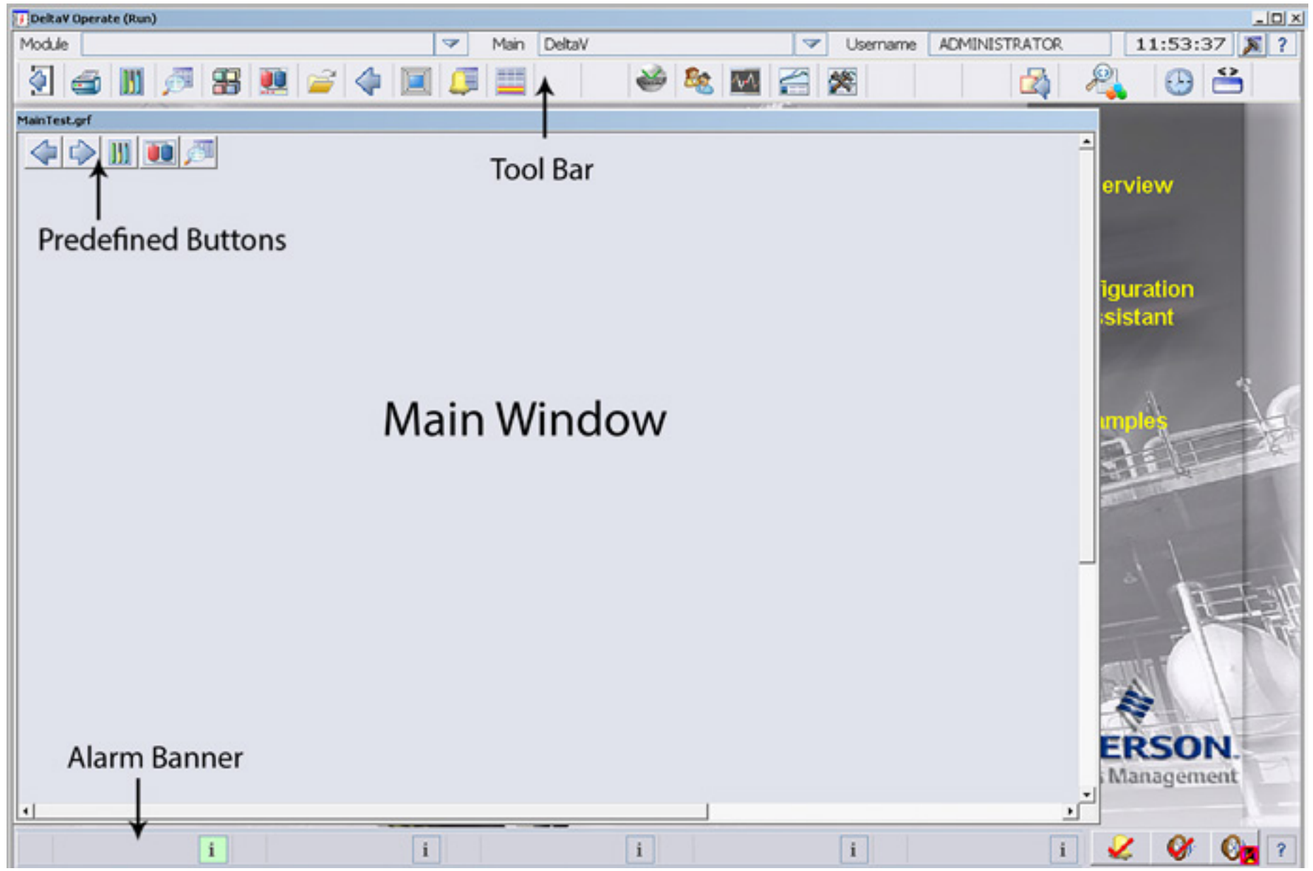
Or if you are in the DeltaV Explorer:
Click Applications --> Control Studio



If you want to open a specific module Template in Control Studio, you can right click it and choose Open--> Open With Control Studio

DeltaV Operate(Run)

DeltaV Operate in configure mode is used to create an operator picture. You can toggle between the two DeltaV Operate modes: configure and run. While you are creating a picture in configure mode, you can preview the picture in run mode. This lets you test the elements of the picture, such as links and push buttons, as you create them.
The Picture shows the DeltaV operate in run mode. To switch from operate configure to operate run click Workspace--> swith to Run or press Ctrl+W. Return to Confirgure mode by clicking the right mouse button and selecting Quick Edit.



The main window is where the operator views a main picture, which is typically a process graphic that provides a view of the process or equipment. A main picture is any picture created using the main template. The main template has some predefined features, such as a small toolbar (with five buttons) in the upper left corner. The template also contains some picture commands that are required by the DeltaV environment.

The Toolbar buttons provide single-click access to important pictures, directories, and other applications.

Next

The Alarm Banner has important predefined functions. The large buttons are used to notify the operator of the highest priority alarms that have been activated. When an alarm is tripped, the name of the associated control module (such as XV-101) is displayed on one of the alarm buttons. By clicking one of these buttons, the operator goes directly to the appropriate process graphic for taking action on that alarm.

Each picture can have a Next Picture and Previous Picture defined for it. The operator can easily jump to those pictures using the forward and back arrows in the upper left corner of a picture created with the main template.

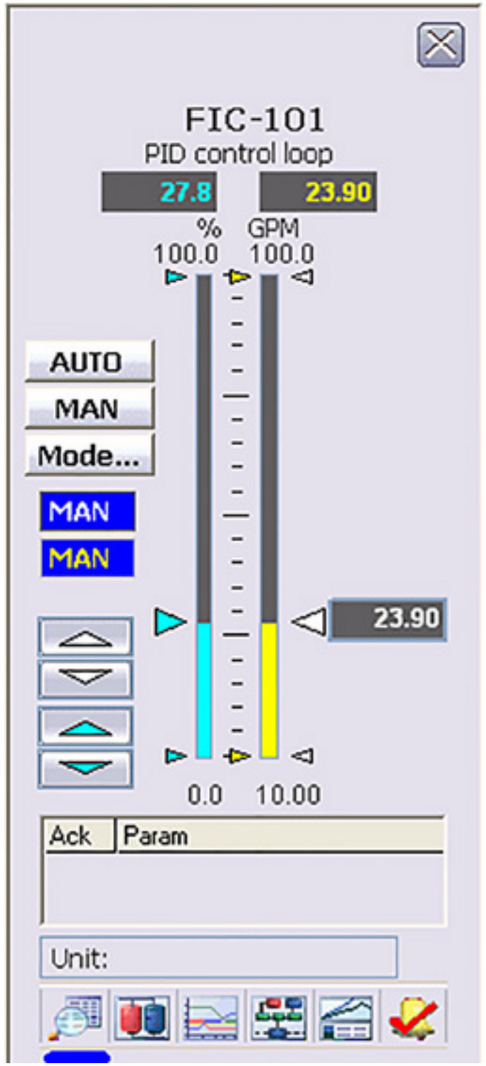
The Main field above the tools on the Toolbar shows the name of the current main picture. The button next to the Main field opens a History List. Simply click a picture in the list to go to that picture.

The operator can use the Open button to replace the current picture in the main window with the selected picture file.

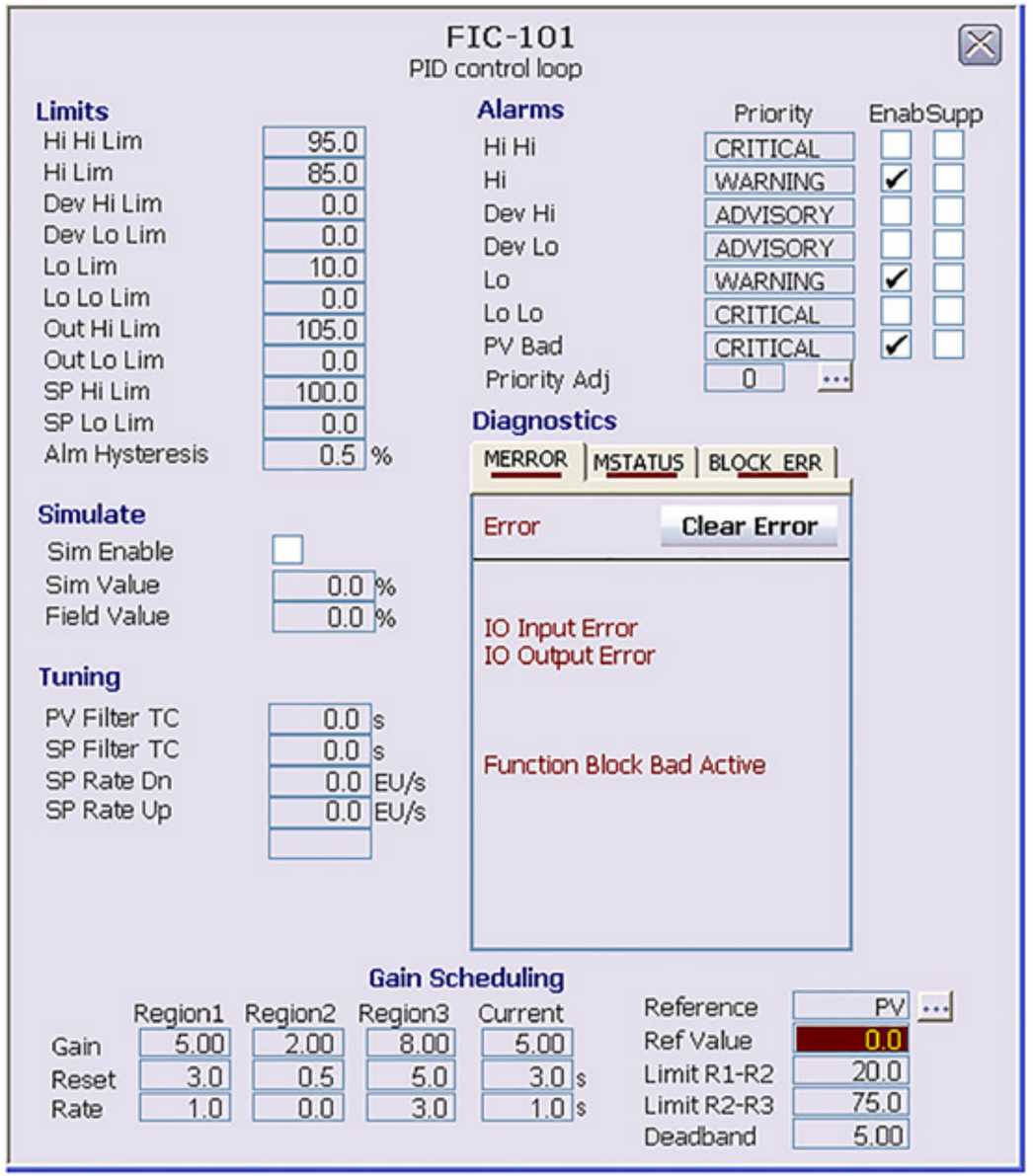
The Alarm List picture is available through a Toolbar button.

Replaces the current main picture with the Primary Control picture for the selected link

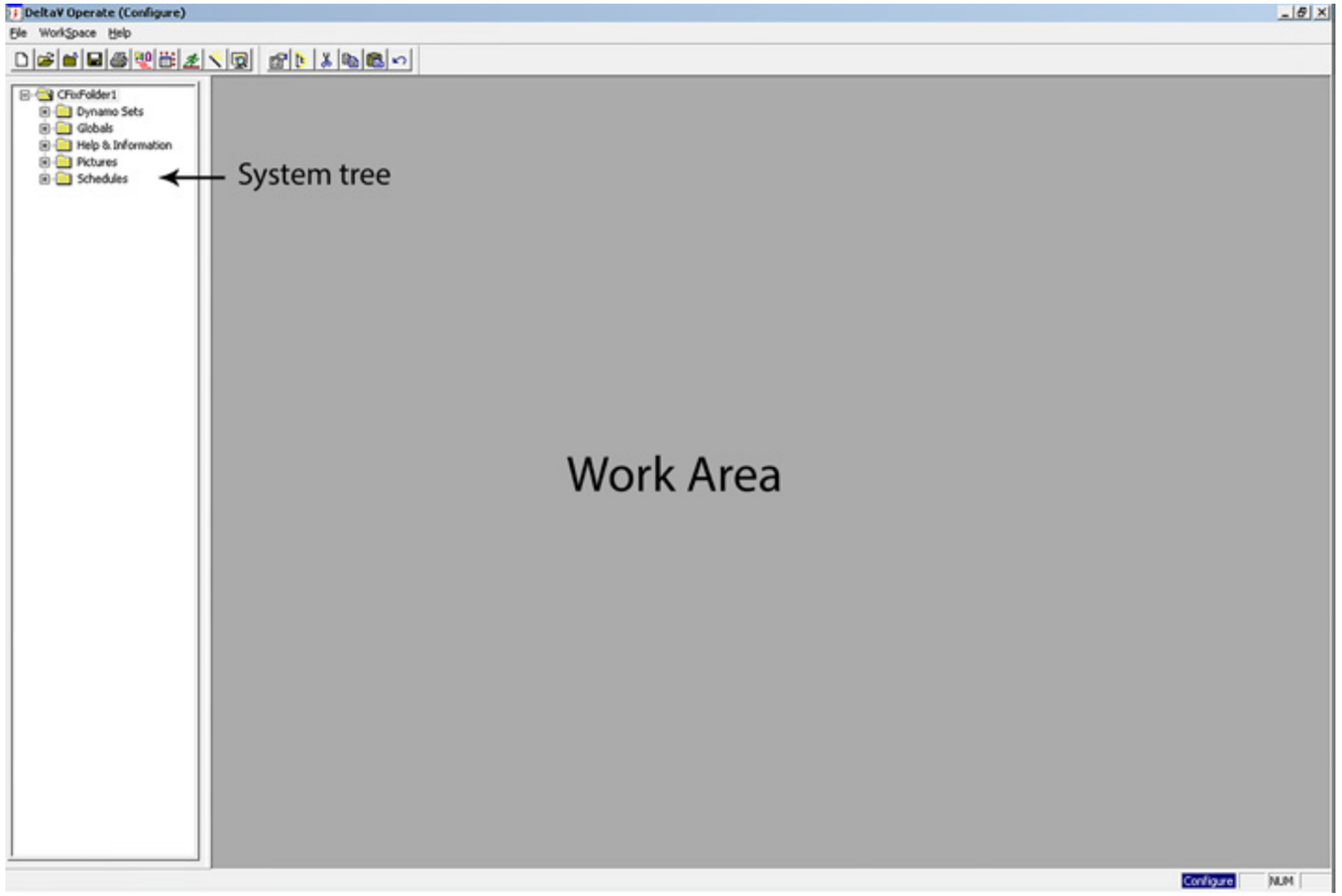
The button displays the Faceplate picture associated with the selected link.
Faceplate pictur shown under.



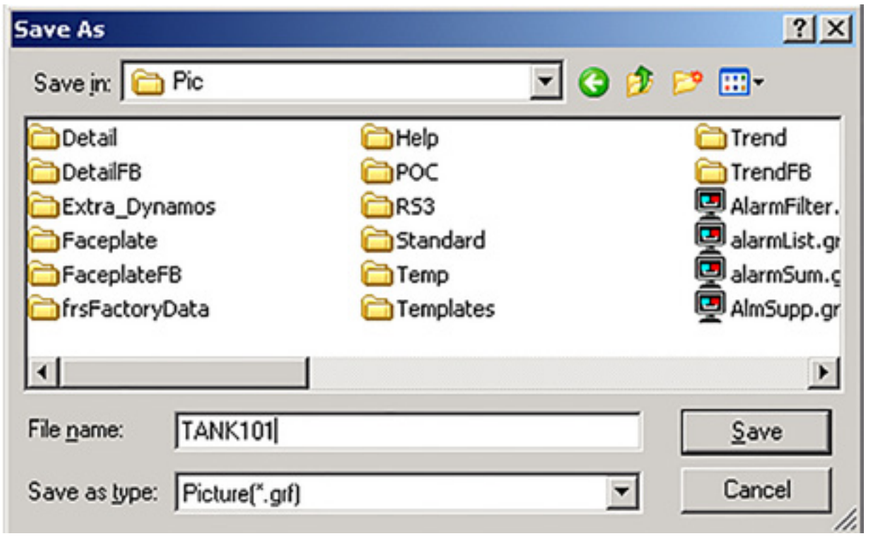
Displays the Detail picture associated with the selected link

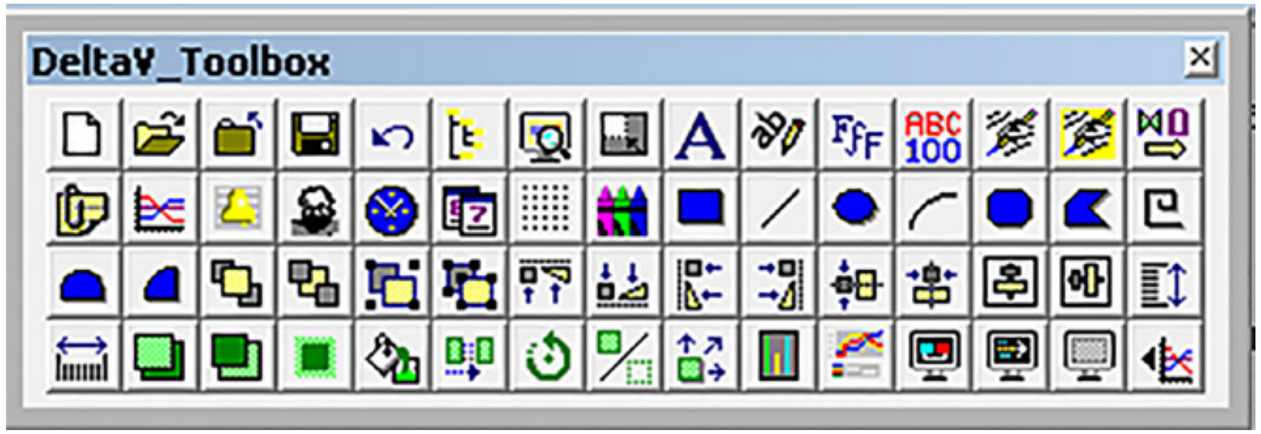


DeltaV Operate Configure



To Open the Main Template:
Expand Pictures--> Templates--> double click main.
Then click file --> Save As-->Click the Up One Level Button --> Write name of operator pic





DeltaV_Toolbox is a group of toolbars assembled in one dialog.

Dynamo Sets folder contains different pictures you can use to create the operate picture you want.

Exercises

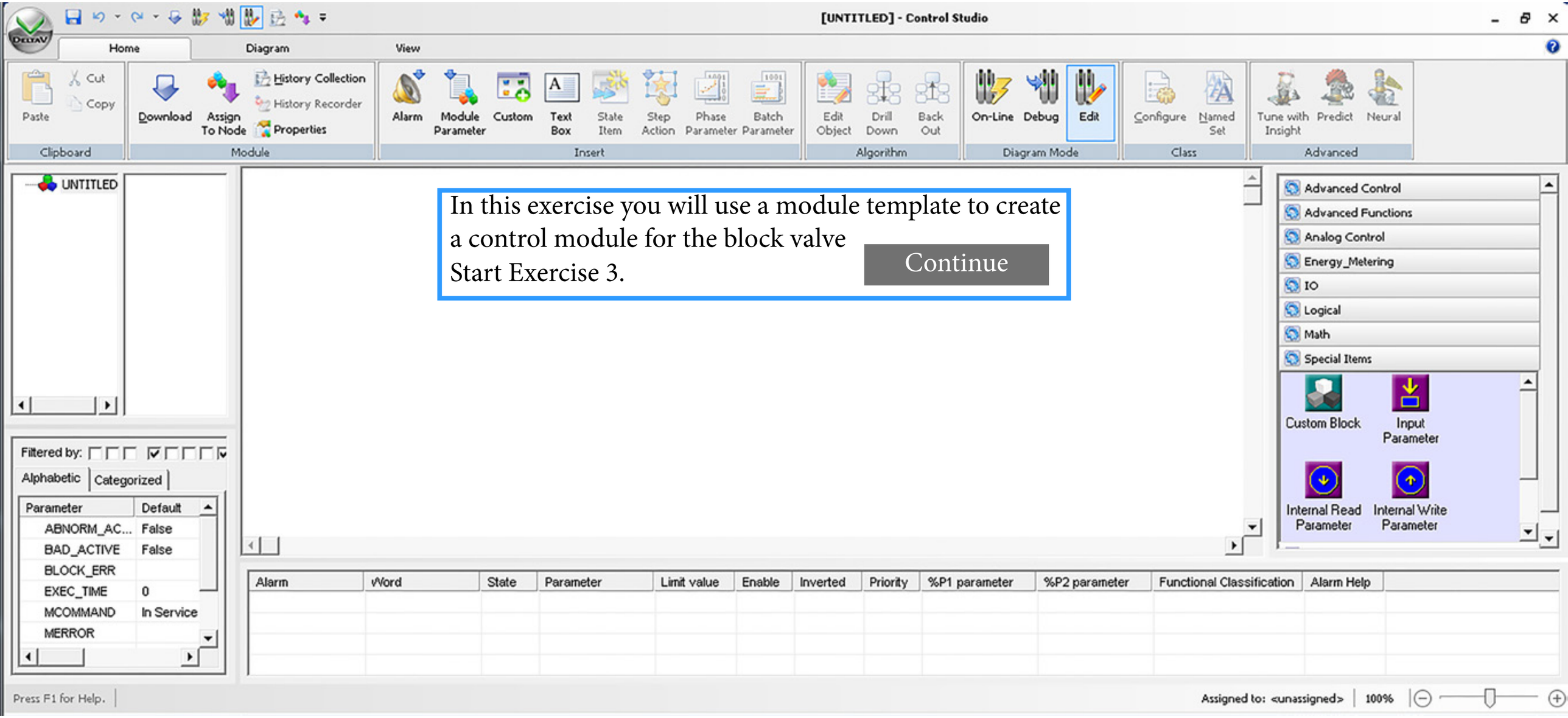
Plant areas are logical, software-based divisions of your control system, which may or may not correspond to physical areas in your plant. Plant areas contain the modules that make up the control strategy. You can have as many as 100 plant areas. How you define your plant areas affects your overall system security scheme because you can authorize access to the system based, in part, on plant areas.

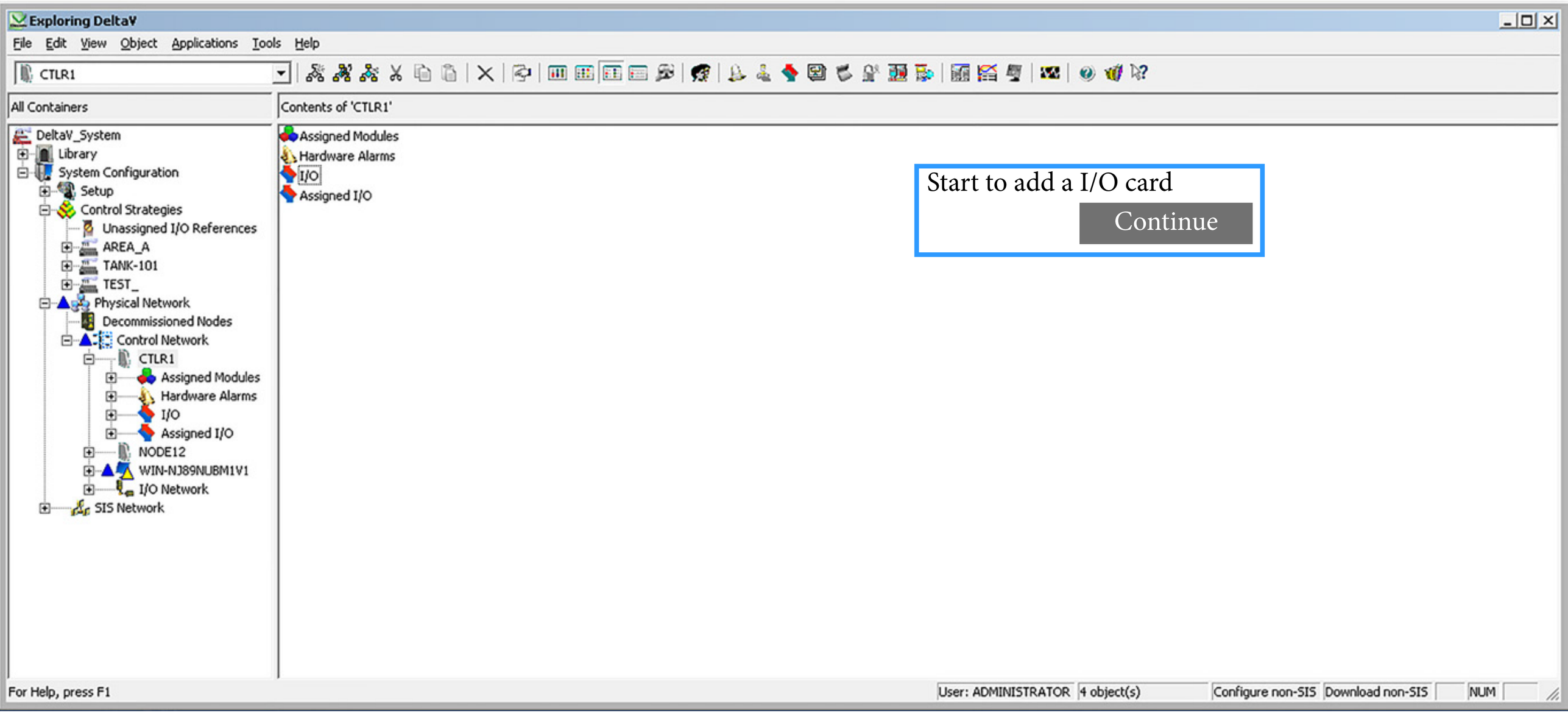
The DeltaV system provides a default system area called AREA_A. You cannot delete AREA_A because it is essential for system operations and for performing certain DeltaV functions. If you decide to create additional plant areas, you may want to put your control modules in other areas and reserve AREA_A for only these system operations and functions. (You can rename AREA_A to a more suitable name for your process.)

In the next procedure we will create a plant area named TANK-101 to hold the tutorial modules. The name must be 16 characters or less, and may contain only alphanumeric characters, hyphens (-), and underscores (_).

Start Exercise 1. Continue

Start Exercise 2. Continue


[UNTITLED] - Control Studio
Home
Diagram
View
Cut
Copy
Paste
Download
Assign To Node
History Collection
History Recorder
Properties
Alarm
Module Parameter
Custom
Text Box
State Item
Step Action
Phase Parameter
Batch Parameter
Edit Object
Drill Down
Back Out
On-Line
Debug
Edit
Configure
Named Set
Tune with Insight
Predict
Neural
Clipboard
Module
Insert
Algorithm
Diagram Mode
Class
Advanced
UNTITLED
In this exercise you will use a module template to create a control module for the block valve
Start Exercise 3.
Continue
Advanced Control
Advanced Functions
Analog Control
Energy_Metering
IO
Logical
Math
Special Items
Custom Block
Input Parameter
Internal Read Parameter
Internal Write Parameter
Filtered by:
Alphabetic
Categorized
Parameter
Default
ABNORM_AC...
False
BAD_ACTIVE
False
BLOCK_ERR
EXEC_TIME
0
MCOMMAND
In Service
MERROR
Alarm
Word
State
Parameter
Limit value
Enable
Inverted
Priority
%P1 parameter
%P2 parameter
Functional Classification
Alarm Help
Press F1 for Help.
Assigned to: <unassigned>
100%


Exploring DeltaV
File Edit View Object Applications Tools Help
CTLR1
All Containers
Contents of 'CTLR1'
DeltaV_System
Library
System Configuration
Setup
Control Strategies
Unassigned I/O References
AREA_A
TANK-101
TEST_
Physical Network
Decommissioned Nodes
Control Network
CTLR1
Assigned Modules
Hardware Alarms
I/O
Assigned I/O
NODE12
WIN-NJ89NUBM1V1
I/O Network
SIS Network
Assigned Modules
Hardware Alarms
I/O
Assigned I/O
Start to add a I/O card
Continue
For Help, press F1
User: ADMINISTRATOR
4 object(s)
Configure non-SIS
Download non-SIS
NUM

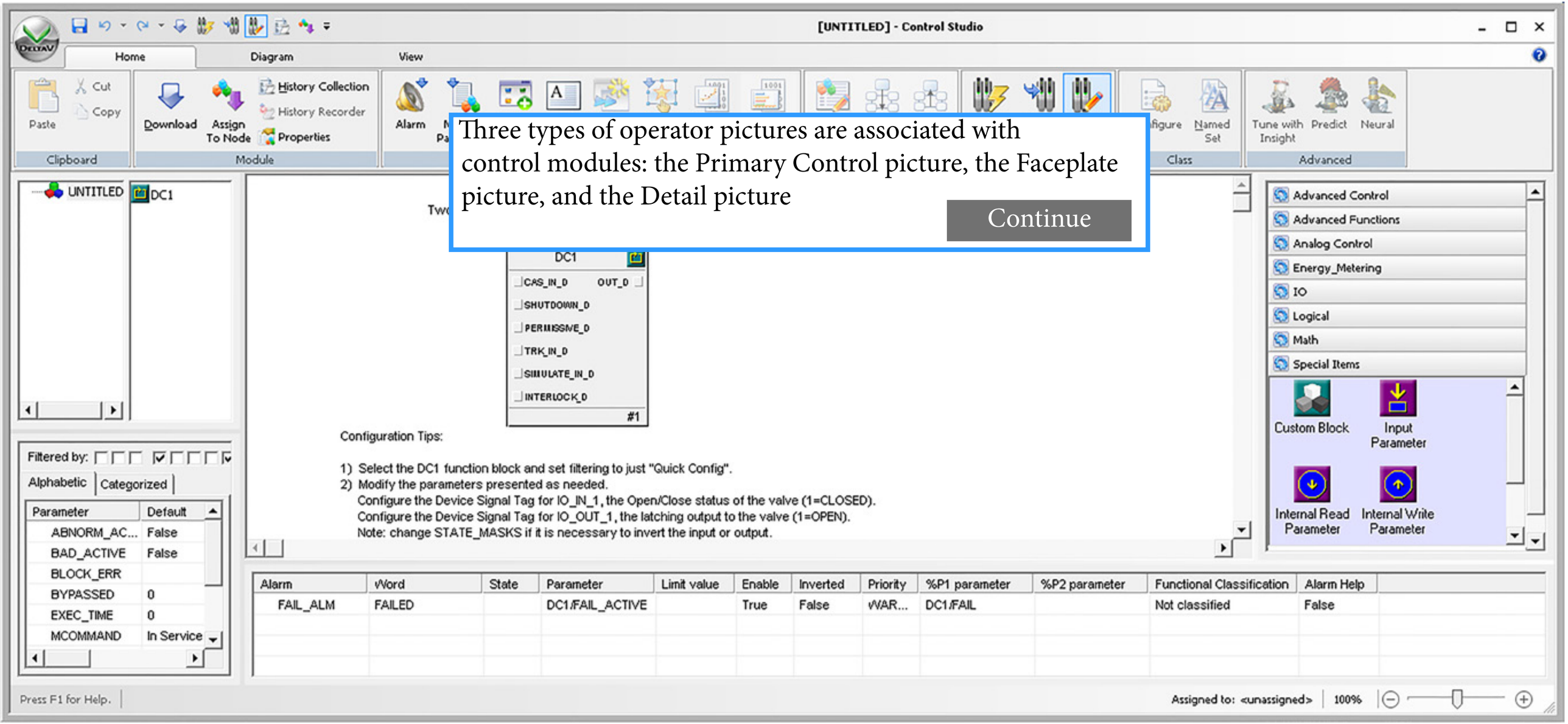
Identifying the operator picture Associated with a Module

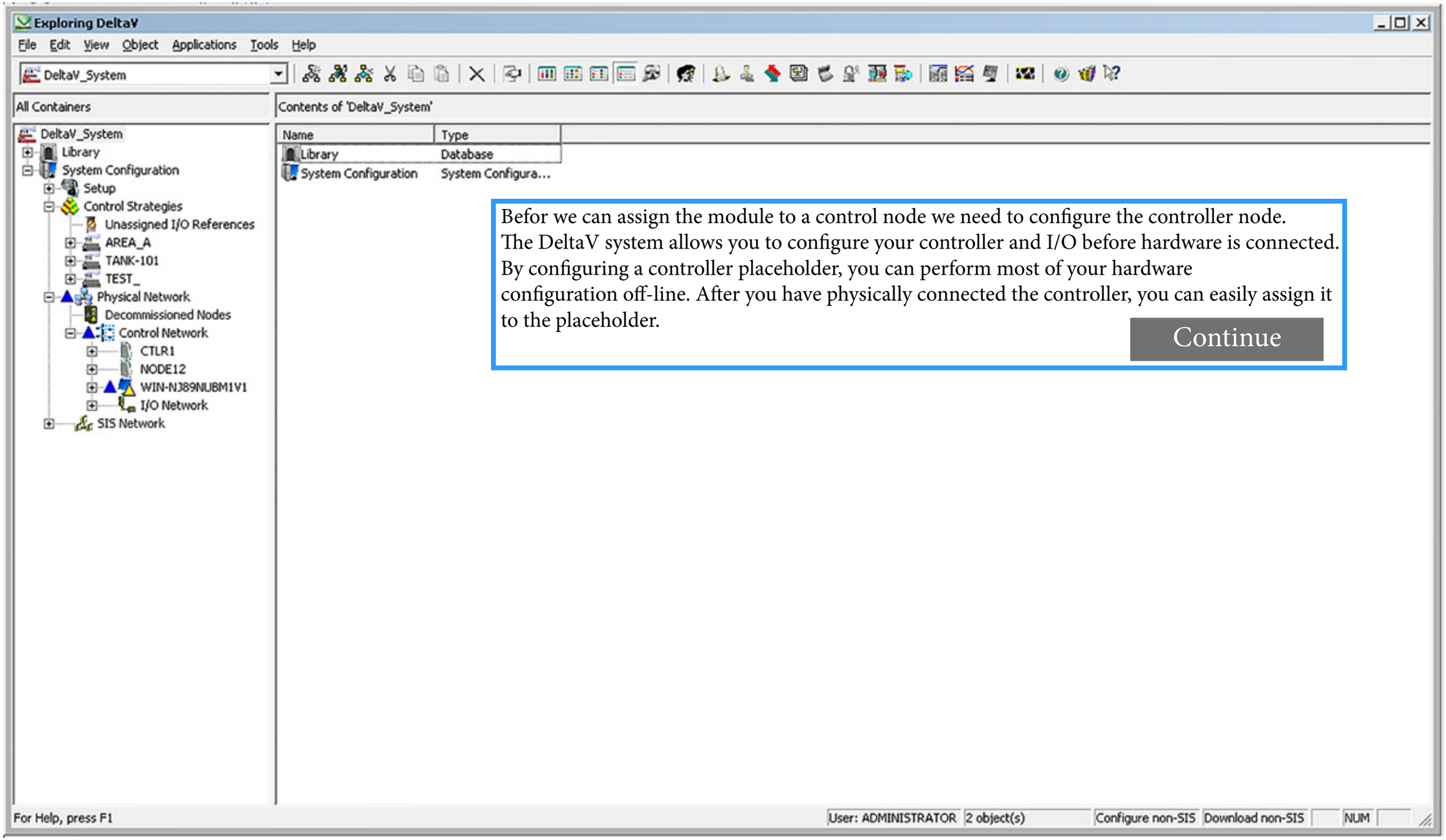
Create a Controller Placeholder

Assigning the Module to a Control Node

Saving the Module

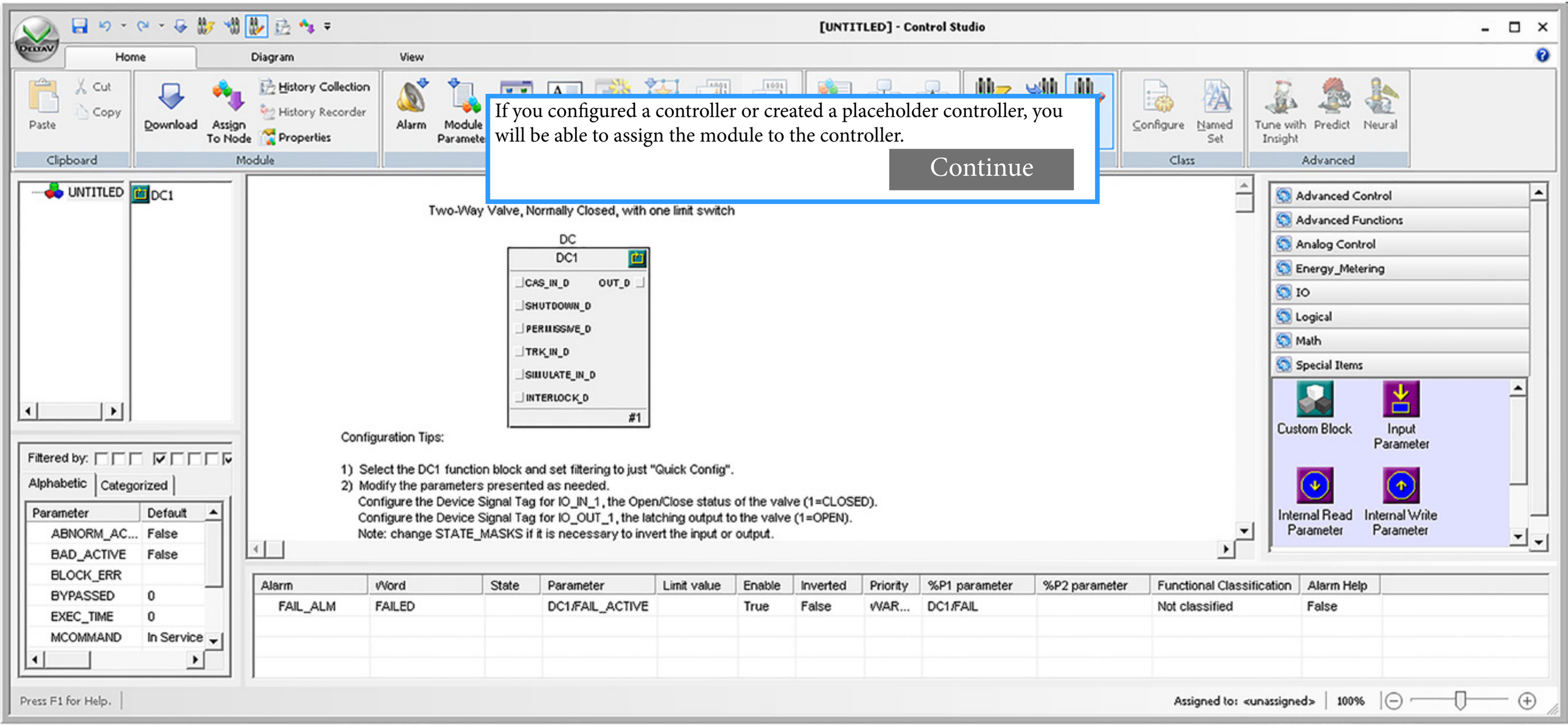
Verifying the Module Configuration

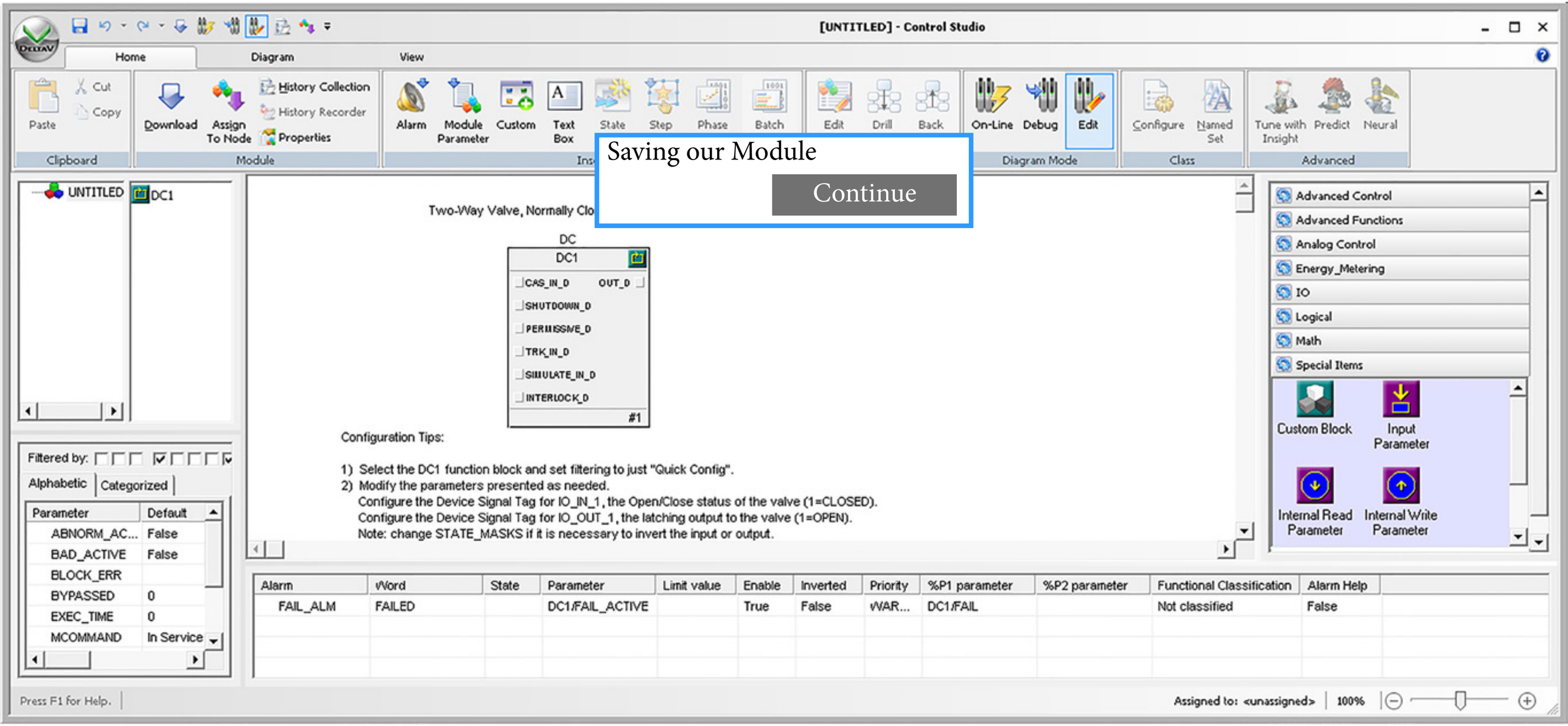

[UNTITLED] - Control Studio
Home
Diagram
View
Cut
Copy
Paste
Download
Assign To Node
History Collection
History Recorder
Properties
Alarm
Named Set
Tune with Insight
Predict
Neural
Clipboard
Module
Class
Advanced
UNTITLED
DC1
Three types of operator pictures are associated with control modules: the Primary Control picture, the Faceplate picture, and the Detail picture
Continue
DC1
CAS_IN_D
OUT_D
SHUTDOWN_D
PERMISSIVE_D
TRK_IN_D
SIMULATE_IN_D
INTERLOCK_D
#1
Configuration Tips:
1) Select the DC1 function block and set filtering to just "Quick Config".
2) Modify the parameters presented as needed.
Configure the Device Signal Tag for IO_IN_1, the Open/Close status of the valve (1=CLOSED).
Configure the Device Signal Tag for IO_OUT_1, the latching output to the valve (1=OPEN).
Note: change STATE_MASKS if it is necessary to invert the input or output.
Advanced Control
Advanced Functions
Analog Control
Energy_Metering
IO
Logical
Math
Special Items
Custom Block
Input Parameter
Internal Read Parameter
Internal Write Parameter
Filtered by:
Alphabetic
Categorized
Parameter
Default
ABNORM_AC...
False
BAD_ACTIVE
False
BLOCK_ERR
BYPASSED
0
EXEC_TIME
0
MCOMMAND
In Service
Alarm
Word
State
Parameter
Limit value
Enable
Inverted
Priority
%P1 parameter
%P2 parameter
Functional Classification
Alarm Help
FAIL_ALM
FAILED
DC1.FAIL_ACTIVE
True
False
WAR...
DC1.FAIL
Not classified
False
Press F1 for Help.
Assigned to: <unassigned>
100%

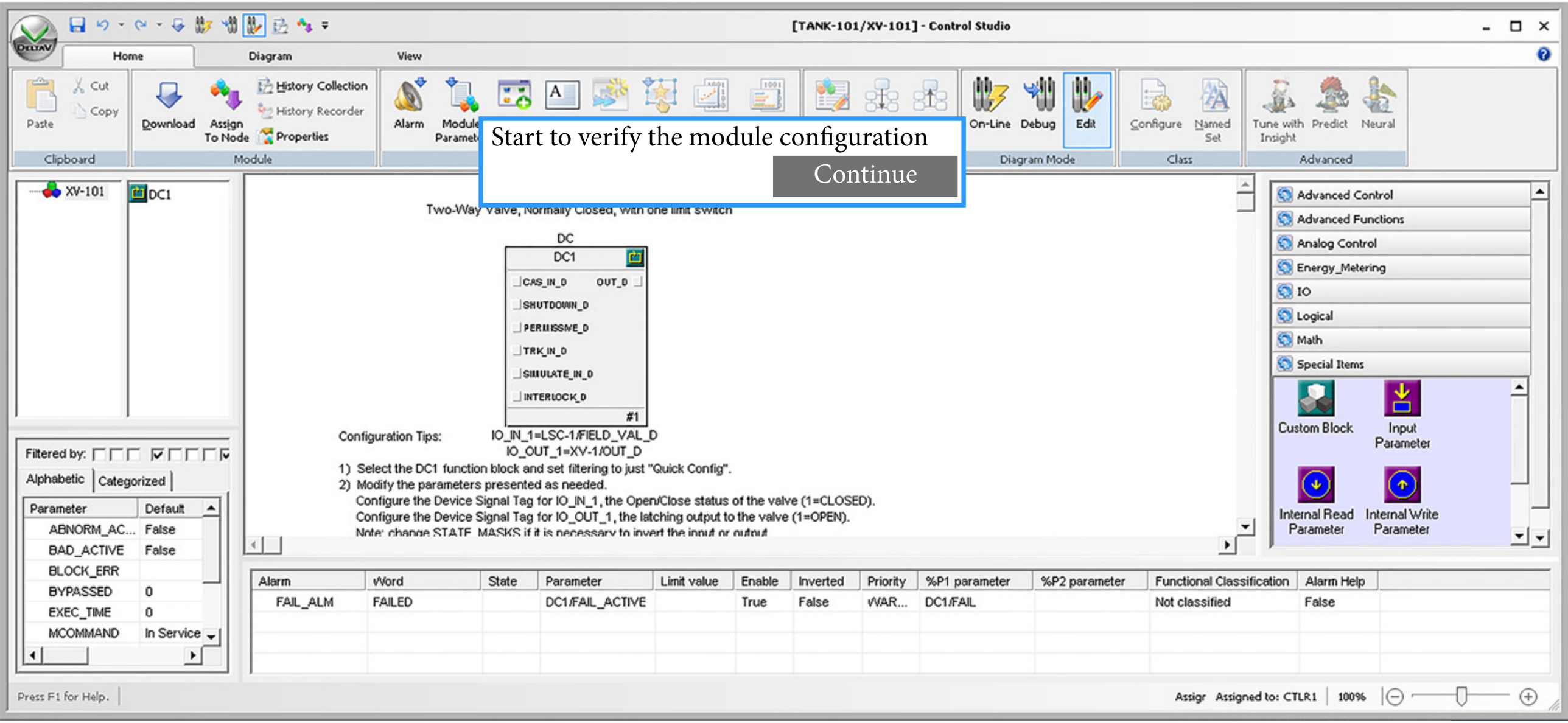


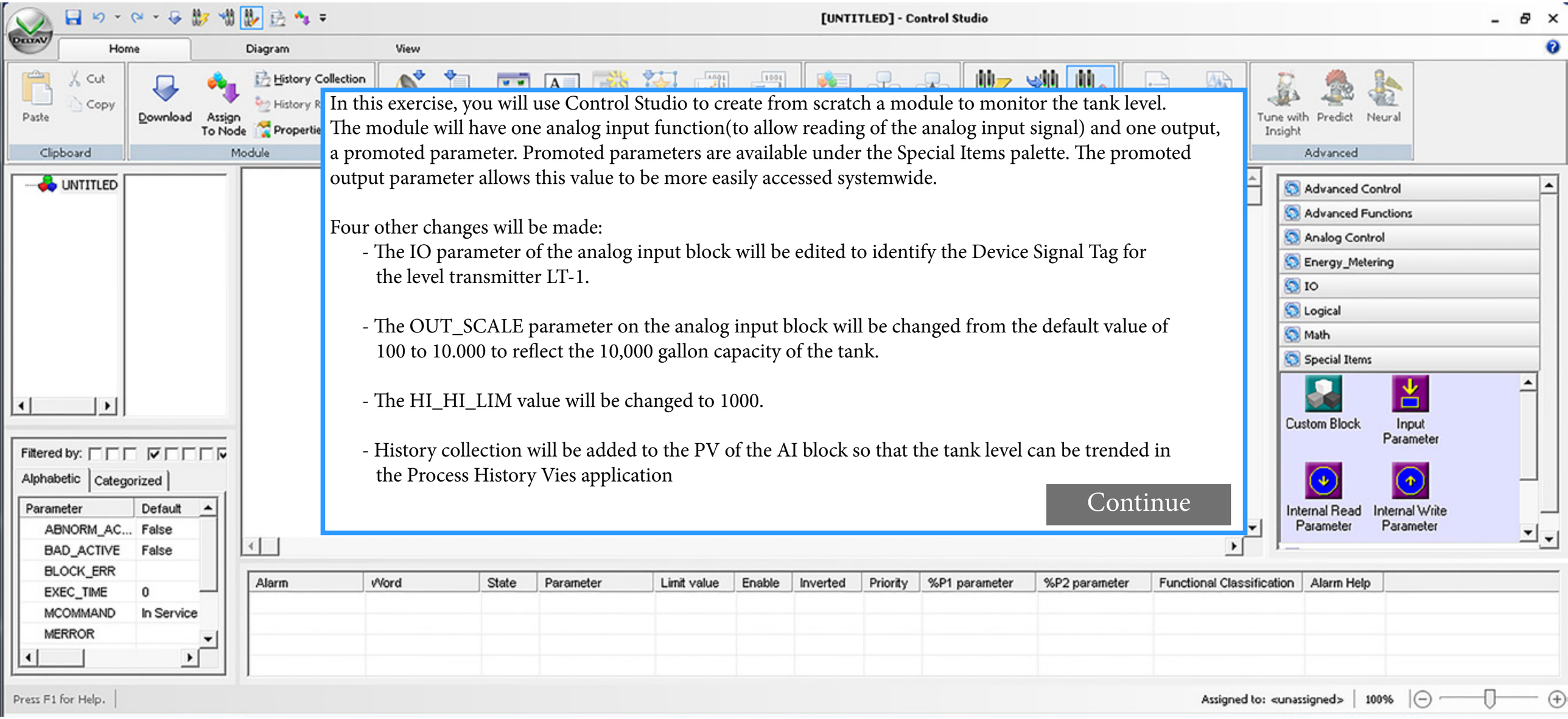
Befor we can assign the module to a control node we need to configure the controller node.
The DeltaV system allows you to configure your controller and I/O before hardware is connected. By configuring a controller placeholder, you can perform most of your hardware configuration off-line. After you have physically connected the controller, you can easily assign it to the placeholder.

Continue


[UNTITLED] - Control Studio
Home
Diagram
View
Cut
Copy
Paste
Download
Assign To Node
History Collection
History Recorder
Properties
Alarm
Module Parameters
Configure
Named Set
Tune with Insight
Predict
Neural
Clipboard
Module
Class
Advanced
If you configured a controller or created a placeholder controller, you will be able to assign the module to the controller.
Continue
UNTITLED
DC1
Two-Way Valve, Normally Closed, with one limit switch
DC
DC1
CAS_IN_D
OUT_D
SHUTDOWN_D
PERMISSIVE_D
TRK_IN_D
SIMULATE_IN_D
INTERLOCK_D
#1
Configuration Tips:
1) Select the DC1 function block and set filtering to just "Quick Config".
2) Modify the parameters presented as needed.
Configure the Device Signal Tag for IO_IN_1, the Open/Close status of the valve (1=CLOSED).
Configure the Device Signal Tag for IO_OUT_1, the latching output to the valve (1=OPEN).
Note: change STATE_MASKS if it is necessary to invert the input or output.
Advanced Control
Advanced Functions
Analog Control
Energy_Metering
IO
Logical
Math
Special Items
Custom Block
Input Parameter
Internal Read Parameter
Internal Write Parameter
Filtered by:
Alphabetic
Categorized
Parameter
Default
ABNORM_AC...
False
BAD_ACTIVE
False
BLOCK_ERR
BYPASSED
0
EXEC_TIME
0
MCOMMAND
In Service
Alarm
Word
State
Parameter
Limit value
Enable
Inverted
Priority
%P1 parameter
%P2 parameter
Functional Classification
Alarm Help
FAIL_ALM
FAILED
DC1/FAIL_ACTIVE
True
False
WAR...
DC1/FAIL
Not classified
False
Press F1 for Help.
Assigned to: <unassigned>
100%


[UNTITLED] - Control Studio
Home
Diagram
View
Paste
Cut
Copy
Download
Assign To Node
History Collection
History Recorder
Properties
Alarm
Module Parameter
Custom
Text Box
State
Step
Phase
Batch
Edit
Drill
Back
On-Line
Debug
Edit
Configure
Named Set
Tune with Insight
Predict
Neural
Clipboard
Module
Diagram Mode
Class
Advanced
Saving our Module
Continue
UNTITLED
DC1
Two-Way Valve, Normally Clo
DC
DC1
CAS_IN_D
OUT_D
SHUTDOWN_D
PERMISSIVE_D
TRK_IN_D
SIMULATE_IN_D
INTERLOCK_D
#1
Configuration Tips:
1) Select the DC1 function block and set filtering to just "Quick Config".
2) Modify the parameters presented as needed.
Configure the Device Signal Tag for IO_IN_1, the Open/Close status of the valve (1=CLOSED).
Configure the Device Signal Tag for IO_OUT_1, the latching output to the valve (1=OPEN).
Note: change STATE_MASKS if it is necessary to invert the input or output.
Advanced Control
Advanced Functions
Analog Control
Energy_Metering
IO
Logical
Math
Special Items
Custom Block
Input Parameter
Internal Read Parameter
Internal Write Parameter
Filtered by:
Alphabetic
Categorized
Parameter
Default
ABNORM_AC...
False
BAD_ACTIVE
False
BLOCK_ERR
BYPASSED
0
EXEC_TIME
0
MCOMMAND
In Service
Alarm
Word
State
Parameter
Limit value
Enable
Inverted
Priority
%P1 parameter
%P2 parameter
Functional Classification
Alarm Help
FAIL_ALM
FAILED
DC1/FAIL_ACTIVE
True
False
WAR...
DC1/FAIL
Not classified
False
Press F1 for Help.
Assigned to: <unassigned>
100%


[TANK-101/XV-101] - Control Studio
Home
Diagram
View
Cut
Copy
Paste
Download
Assign To Node
History Collection
History Recorder
Properties
Alarm
Module Parameter
On-Line
Debug
Edit
Configure
Named Set
Tune with Insight
Predict
Neural
Clipboard
Module
Diagram Mode
Class
Advanced
Start to verify the module configuration
Continue
XV-101
DC1
Two-Way Valve, Normally Closed, With one limit switch
DC
DC1
CAS_IN_D
OUT_D
SHUTDOWN_D
PERMISSIVE_D
TRK_IN_D
SIMULATE_IN_D
INTERLOCK_D
#1
Configuration Tips:
IO_IN_1=LSC-1/FIELD_VAL_D
IO_OUT_1=XV-1/OUT_D
1) Select the DC1 function block and set filtering to just "Quick Config".
2) Modify the parameters presented as needed.
Configure the Device Signal Tag for IO_IN_1, the Open/Close status of the valve (1=CLOSED).
Configure the Device Signal Tag for IO_OUT_1, the latching output to the valve (1=OPEN).
Note: change STATE_MASKS if it is necessary to invert the input or output
Advanced Control
Advanced Functions
Analog Control
Energy_Metering
IO
Logical
Math
Special Items
Custom Block
Input Parameter
Internal Read Parameter
Internal Write Parameter
Filtered by:
Alphabetic
Categorized
Parameter
Default
ABNORM_AC...
False
BAD_ACTIVE
False
BLOCK_ERR
BYPASSED
0
EXEC_TIME
0
MCOMMAND
In Service
Alarm
vWord
State
Parameter
Limit value
Enable
Inverted
Priority
%P1 parameter
%P2 parameter
Functional Classification
Alarm Help
FAIL_ALM
FAILED
DC1/FAIL_ACTIVE
True
False
vWAR...
DC1/FAIL
Not classified
False
Press F1 for Help.
Assigr
Assigned to: CTLR1
100%



In this exercise, you will use Control Studio to create from scratch a module to monitor the tank level. The module will have one analog input function(to allow reading of the analog input signal) and one output, a promoted parameter. Promoted parameters are available under the Special Items palette. The promoted output parameter allows this value to be more easily accessed systemwide.

Four other changes will be made:

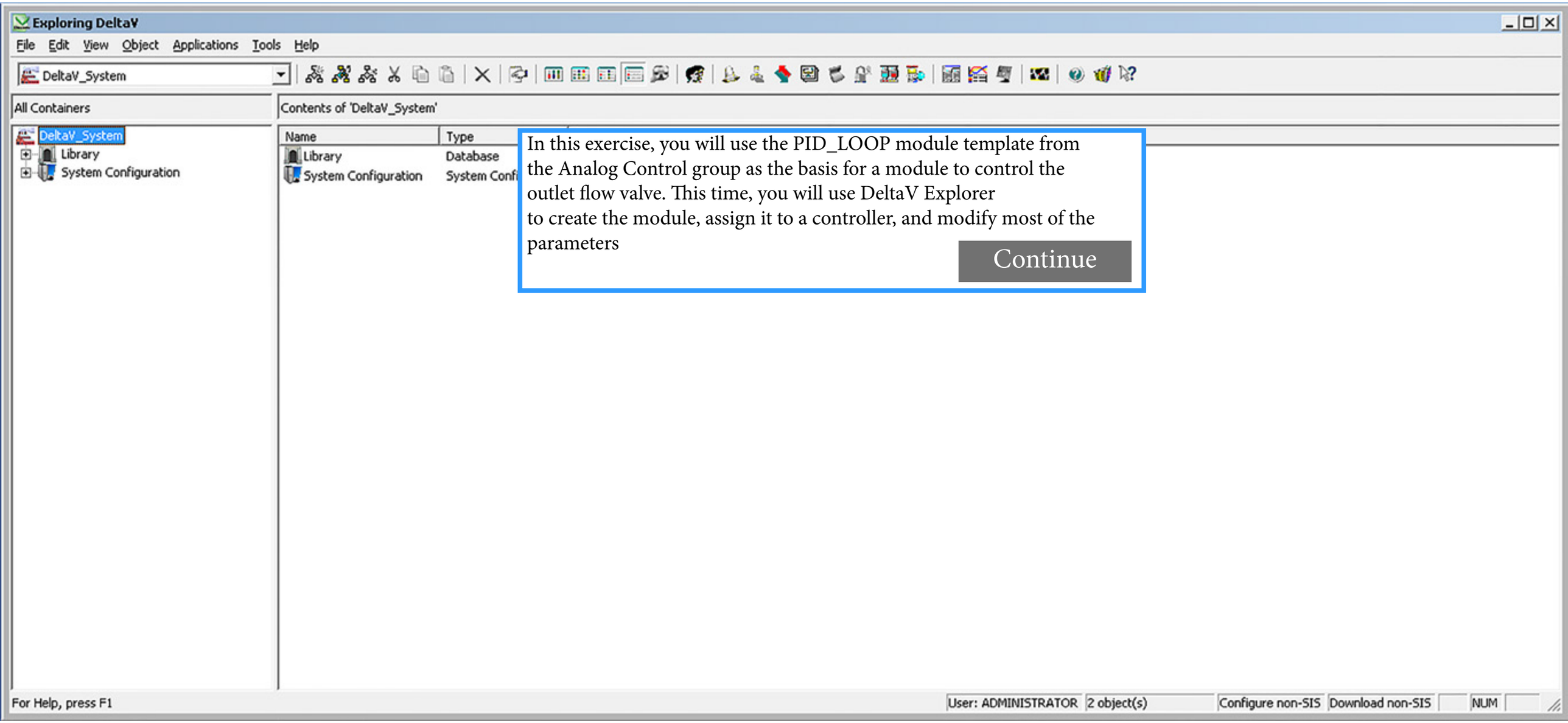
- The IO parameter of the analog input block will be edited to identify the Device Signal Tag for the level transmitter LT-1.

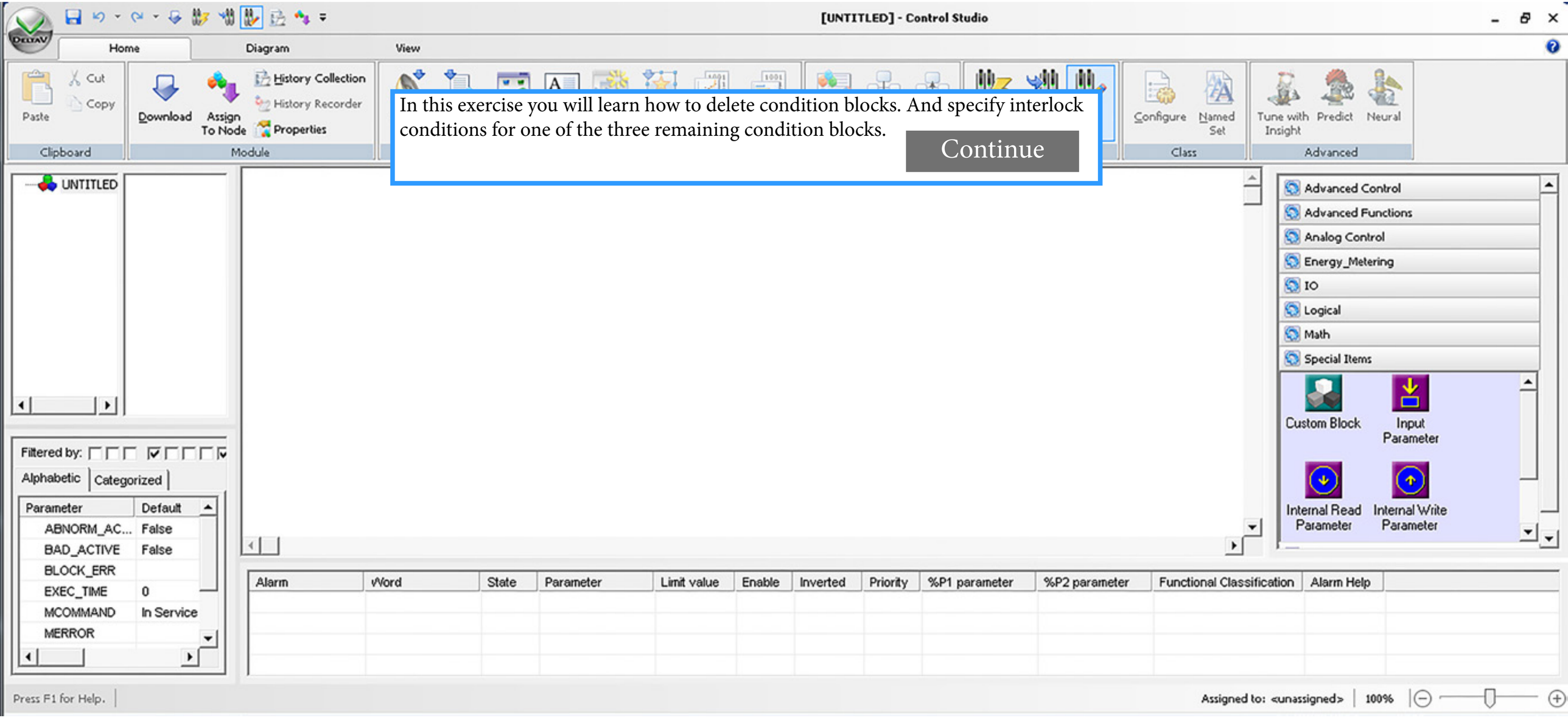
- The OUT_SCALE parameter on the analog input block will be changed from the default value of 100 to 10.000 to reflect the 10,000 gallon capacity of the tank.

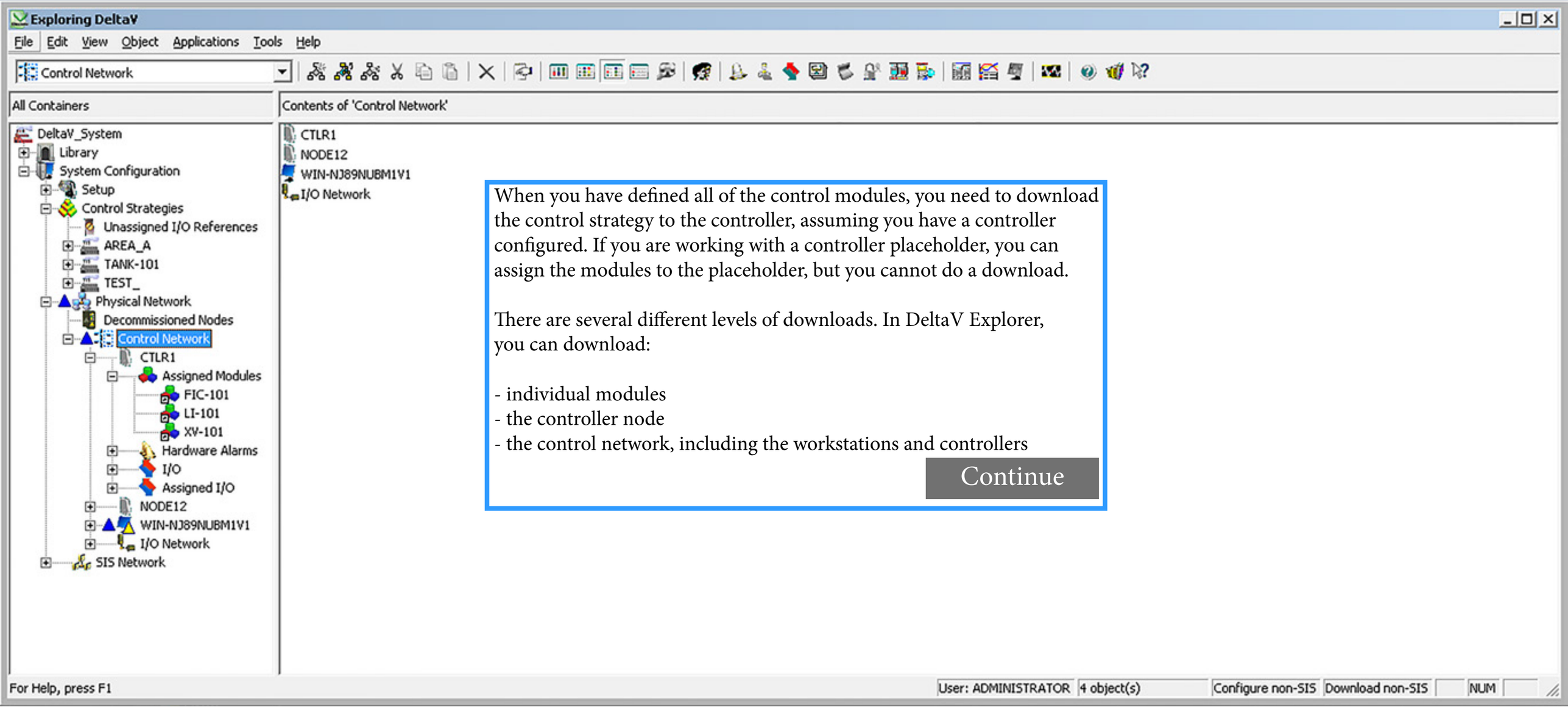
- The HI_HI_LIM value will be changed to 1000.

- History collection will be added to the PV of the AI block so that the tank level can be trended in the Process History Vies application

Continue


Exploring DeltaV
File Edit View Object Applications Tools Help
DeltaV_System
All Containers
Contents of 'DeltaV_System'
DeltaV_System
Library
System Configuration
Name
Type
Library
Database
System Configuration
System Confi
In this exercise, you will use the PID_LOOP module template from the Analog Control group as the basis for a module to control the outlet flow valve. This time, you will use DeltaV Explorer to create the module, assign it to a controller, and modify most of the parameters
Continue
For Help, press F1
User: ADMINISTRATOR
2 object(s)
Configure non-SIS
Download non-SIS
NUM


[UNTITLED] - Control Studio
Home
Diagram
View
Cut
Copy
Paste
Download
Assign To Node
History Collection
History Recorder
Properties
Clipboard
Module
Configure
Named Set
Class
Tune with Insight
Predict
Neural
Advanced
In this exercise you will learn how to delete condition blocks. And specify interlock conditions for one of the three remaining condition blocks.
Continue
UNTITLED
Advanced Control
Advanced Functions
Analog Control
Energy_Metering
IO
Logical
Math
Special Items
Custom Block
Input Parameter
Internal Read Parameter
Internal Write Parameter
Filtered by:
Alphabetic
Categorized
Parameter
Default
ABNORM_AC...
False
BAD_ACTIVE
False
BLOCK_ERR
EXEC_TIME
0
MCOMMAND
In Service
MERROR
Alarm
vWord
State
Parameter
Limit value
Enable
Inverted
Priority
%P1 parameter
%P2 parameter
Functional Classification
Alarm Help
Press F1 for Help.
Assigned to: <unassigned>
100%

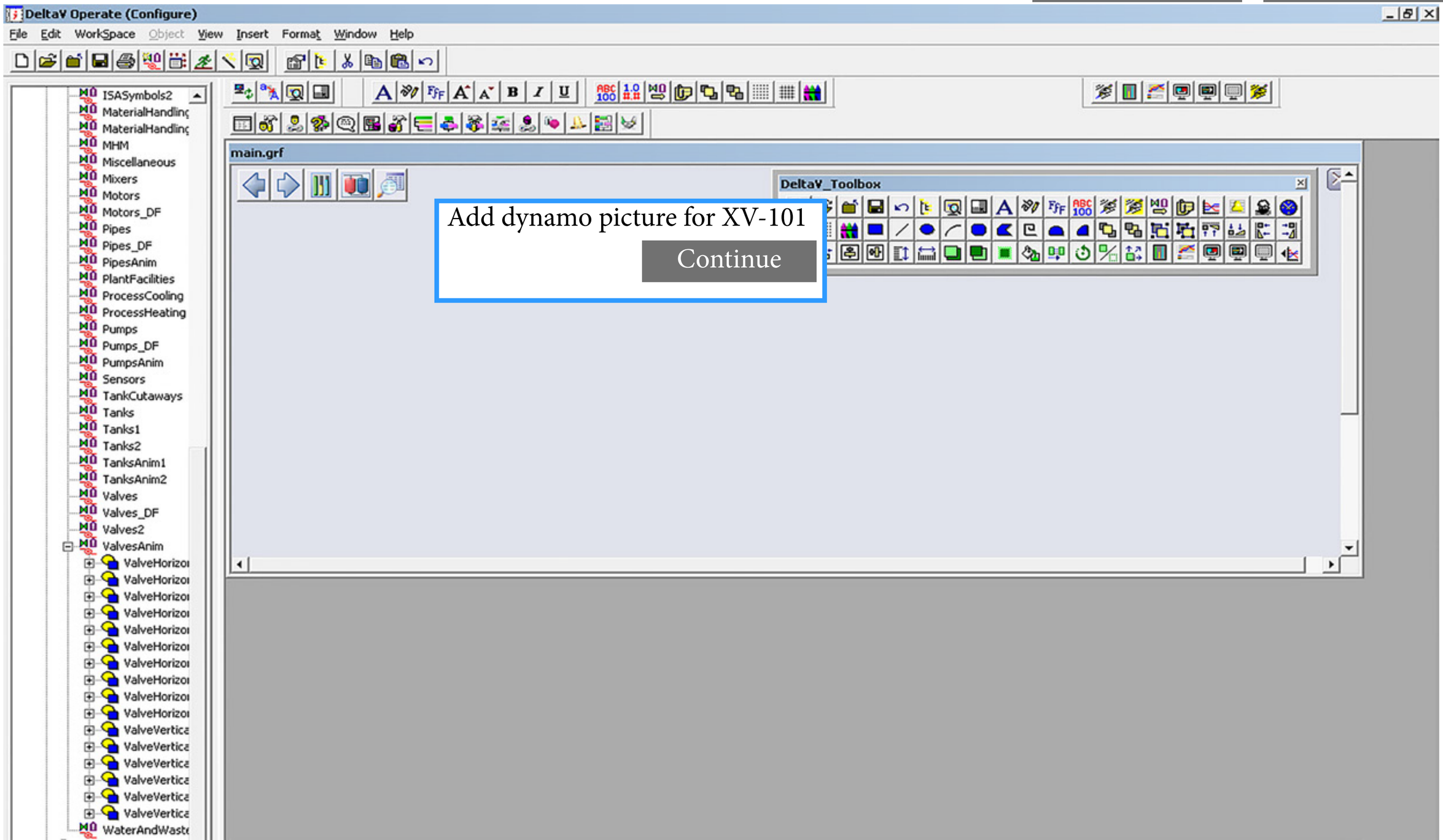


When you have defined all of the control modules, you need to download the control strategy to the controller, assuming you have a controller configured. If you are working with a controller placeholder, you can assign the modules to the placeholder, but you cannot do a download.

There are several different levels of downloads. In DeltaV Explorer, you can download:

- individual modules
- the controller node
- the control network, including the workstations and controllers

Continue


DeltaV Operate (Configure)
File Edit WorkSpace Object View Insert Format Window Help
ISASymbols2
MaterialHandling
MaterialHandling
MHM
Miscellaneous
Mixers
Motors
Motors_DF
Pipes
Pipes_DF
PipesAnim
PlantFacilities
ProcessCooling
ProcessHeating
Pumps
Pumps_DF
PumpsAnim
Sensors
TankCutaways
Tanks
Tanks1
Tanks2
TanksAnim1
TanksAnim2
Valves
Valves_DF
Valves2
ValvesAnim
ValveHorizo
ValveVertica
WaterAndWaste
main.grf
DeltaV_Toolbox
Add dynamo picture for XV-101
Continue