



PlantScape Controller Implementation

Lesson 1

Configuring a Two State Device Control Module

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Notes

Introduction

The purpose of this Lesson is to give you the knowledge to be able to create and configure a device control CM. Device control CMs give the operator a user friendly interface to the Digital I/O configured to control a two state valve, or a three state motor, etc. After you complete this Lesson you will have configured a two state device control module. Note: The output from the CM will cause a DO channel light to turn on when the valve is open. Feedback for the PV will be simulated by soft-wiring the output back to the input of the DEVCTL block.

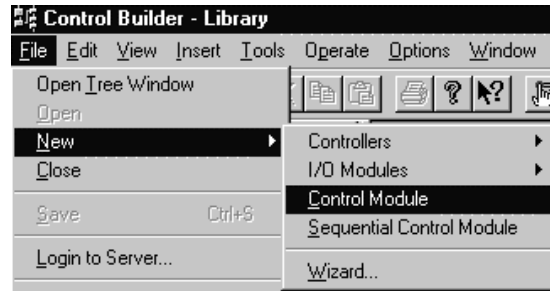
Objectives

- ❶ Create a new CM named CM#_FV101, using the knowledge you gained in Unit 4, to control a two state valve.
- ❷ Add and configure the Function Blocks needed to control the valve.
- ❸ Operate your newly created Device Control CM from station.



Creating and Configuring a New CM

- Click
 - **File**
 - **New**
 - **Control Module**
- Double Click on the newly created CM in the control drawing area of Control Builder
- Enter the following information
 - Name **CM#_FV101**
 - Description **PREWEIGH_A VALVE**
 - Execution Period **100MS**



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Notes

Creating and saving a module

To create a Control Strategy, a Control Module must be created and function blocks inserted and connected.

After creating the Control Module it will appear under the Root Project Tree. Control Module names are sequentially numbered (for example, CM30, CM31, etc.).

The new Control Module is automatically saved to your hard drive.



Creating and Configuring a New CM ...continued

- Click on the **Server** tab
- Enter the following information
 - Point Detail Page
 - Group Detail Page

sysDtlDEVCTLA.dsp

sysGrpDEVCTLA.dsp

- If using Distributed Server Architecture (DSA) it is required that you enter an appropriate **Control Area** on the Server Parameters tab or an error message results. Consult your instructor about whether or not a specified Control Area must be entered on the form.

- Click **OK**
- Close **CM#_FV101** and save changes
- Assign **CM#_FV101** to **CEE0101**

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Notes

Configuring a module

To configure a CM, you must do two things

- Define the parameters of the entire object
- Create, configure, and connect function blocks

They can be done in any order. For this training we will configure the Control Module parameters first.

Assigning CMs to the CEE

Before you create and configure the function blocks in your CM, assign the CM to the CEE.



Before Control Builder will allow you to associate an IOM to a channel block (for example, associating DI_IOM_O1 to the channel block in your FV101), it checks to be sure that the CM and the IOM are assigned to the same CEE.



Adding and Configuring Functions Blocks

- Open CM#_FV101
- Click on the **Library** tab and add the following Function Blocks to CM#_FV101

<u>Library Directory</u>	<u>Block Name</u>
– DEVCTL	DEVCTL
– IOCHANNEL	DOCHANNEL
– LOGIC	ONDELAY
- Enter the following information in the **ONDELAY** block
 - Delay time **5**

LOGIC:ONDELAY Block, ONDELAY3 - Parameters [Project]

Main	Block Pins	Configuration Parameters	Monitoring Parameters	Block Preferences
Name: ONDELAY3				
Execution Order in CM: 30				
Delay Time: 5				

- Click **OK**

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Notes

Assigning Function Blocks to a CM

Once the CM and the IOMs are assigned to the same CEE, you can add function blocks to your CM and configure them. In this exercise, we are simulating the feedback for the PV. We will connect the outputs from the Device Control block back into its input. The delay block allows for this to appear more realistic. It also allows us to configure and test feedback alarming.



For more information on how to add function blocks to a CM, refer to the *Control Building Guide, Control Module Creation, Creating an Instance of a Basic Function Block*.



Adding and Configuring Functions Blocks ...continued

- Double click on the **DOCHANNEL** block and enter the following information
 - Name **DO00**
 - Module Name **DO_IOM_0n** (Use your assigned IOM)
 - Assign Channel **0**

Channel Number	Channel Name
0	CM_FY101.DO00
1	

- Click **OK**

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Notes

Configuring a DOCHANNEL Channel block

Once the DOCHANNEL is configured to a Digital Output module name you will be able to assign it to a channel. The channel would normally be hardwired to real process device. In our training we are assigning this module to Channel Slot 0. This will cause the DO channel light 0 to turn on when output 1 in the Device Control Module is activated.



For more information on how to configure function blocks, refer to the *Control Building Guide, Control Module Creation, Using the Block Configuration Form*.



Adding and Configuring Functions Blocks ...continued

- Open the **DEVCTLA** block
- Click the **Block Pins** tab and remove the **DI[2]** pin
- Enter the following information in the Main tab:
 - Name **DEVCTLA**
 - Description **CM#_FV101 DEVCTL**
- Enter the following Block Sizing Information:
 - Number of Inputs 1
 - Number of Outputs 1
 - Number of States 2
- Enter the following State Names Information:
 - State 1 Name **OPEN**
 - State 0 Name **CLOSED**

Configuration Parameters	
Main	Inputs
Name:	DEVCTLA
Description:	CM_FV101 DEVCTL
Engineering Units:	

Block Sizing	
Number Of Inputs:	1
Number Of Outputs:	1
Number Of States:	2

State Names	
State 1 Name:	OPEN
State 0 Name:	CLOSED

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Notes

Configuring DEVCTLA block

CM#_FV101 is simulated to be a valve in the display case.

For this single input, single output scenario, we have specified two states for the Device Control Module. State 1 is assigned the name OPEN and State 0 is assigned the name CLOSED to indicate the open and closed states of the valve.



For more information on how to configure function blocks, refer to the *Control Building Guide, Control Module Creation, Using the Parameters Configuration form*.



It is important that you follow the configuration exactly as shown above. This function block is what controls the actual hardware of your plant.

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Adding and Configuring Functions Blocks ...continued

- Click the **Inputs** tab and enter the following information
 - Number of Digital Inputs **1**
 - Input 1 - OPEN state **checked**
 - Input 1 - CLOSED state **unchecked**

The screenshot shows the 'Inputs' tab of a configuration window. At the top, there are four tabs: 'Main', 'Inputs', 'Output', and 'M'. The 'Inputs' tab is selected. Below the tabs, there is a section for 'Number of Digital Inputs' with a dropdown menu set to '1'. Below this, there is a table with four columns labeled '4', '3', '2', and '1'. Under each column, there are two rows: 'CLOSED' and 'OPEN'. For column '1', the 'CLOSED' row has an unchecked checkbox and the 'OPEN' row has a checked checkbox. The other columns are empty.

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Notes

Configuring DEVCTLA block

Since feedback for State 1 is coming from output 1 we select input 1 for State 1 feedback.



Adding and Configuring Functions Blocks ...continued

- Click the **Outputs** tab and enter the following information
 - Number of Digital Outputs **1**
 - Output 1 - OPEN state **checked**
 - Output 1 - CLOSED state **unchecked**

	Outputs			State Name
	3	2	1	
State 1	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	OPEN
State 0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	CLOSED

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Notes

Configuring DEVCTLA block

In this scenario we have configured output #1 to go on when the operator selects state 1, OPEN. This will cause the DO channel light 0 to turn on when the CM#_FV101 is changed to the OPEN state.



Adding and Configuring Functions Blocks ...continued

- Click the **Alarms** tab and enter the following information

	<u>CLOSED</u>	<u>OPEN</u>	<u>Priority</u>	<u>State 2</u>	<u>Severity</u>
- Command Disagree	5	10	HIGH	N/A	0
- Command Fail	0	0	LOW	N/A	0
- Bad PV				LOW	0

- Click **OK**

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Notes

Device Control Alarms

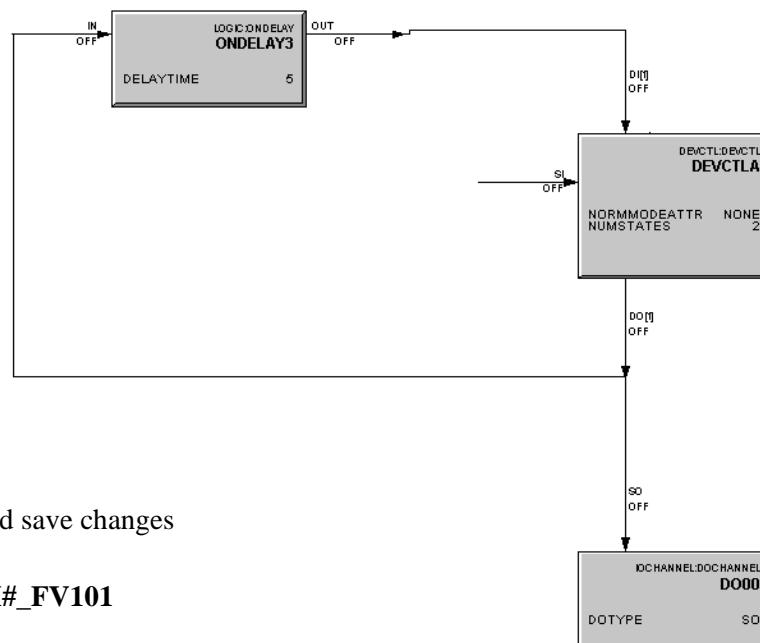
If we want to initiate a Command Disagree alarm on the Open command, we can change the OnDelay block time to 10 or greater.

See online help for descriptions of Command Fail and Command Disagree alarms

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Wiring Blocks

- Arrange blocks and wire them together as shown below



- Close **CM#_FV101** and save changes
- Load and Activate **CM#_FV101**

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Notes

Wiring Blocks

Your final step in this Creating a Control Module training is to connect the function blocks together to form a control strategy. You can connect blocks together at any time you choose, before or after configuring them.



For more information on how to connect Function Blocks, refer to the *Control Building Guide, Control Module Creation, Connecting and Disconnecting blocks*.

Quick Method

- Open a CM in the **Project** tab
- Double-click on the pin to be wired from and observe the cursor change to a plus (+) sign
- Click the pin to be wired to and a wire connects the two blocks



When the Device Control Block was added we removed the **DI[2]** pin. It will not be used in the project.

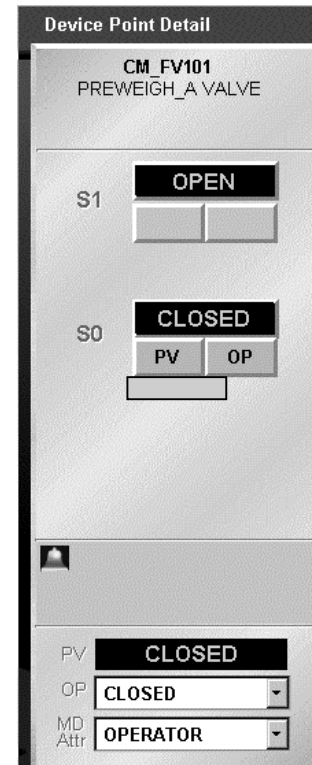


Operating FV101 From Station

- In Station Command Zone, type in **CM#_FV101** and click on the magnifying glass icon



- Click on **OP** and change the status from CLOSED to OPEN. Observe as the status changes from closed to open
- Add **CM#_FV101** to Group #3, Slot1.
- Name the group Transfer A and B.
- Operate from the group.



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Notes

Operating From Station



For more information on how to operate from Station refer to the *Operator's Guide, Getting Started*.

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This completes....

PlantScape Controller Implementation

Lesson 1

**Configuring a Two State
Device Control Module**

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Notes