
Honeywell

PlantScape Controller Implementation

Lesson 2

Configuring a Three 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 three state device control CM. After you complete this Lesson you will have configured and operated a three state device control module. This CM will also use simulated tail to mouth feedback.

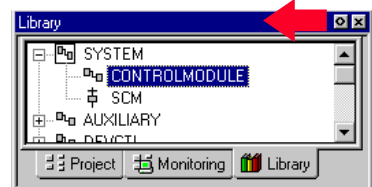
Objectives

- ❶ Create a new CM named **CM#_AGIT101** using the knowledge you gained in Lesson 1, to control a three state agitator.
- ❷ Add and configure the Function Blocks needed to control the agitator
- ❸ Operate your newly created Device Control CM from Station

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- From the **Library** view expand the System tree and double click on CONTROLMODULE to create a new Control Module

- Double click in the new Control module drawing



- Enter the following information:

- **Main Tab**

- Name **CM#_AGIT101**
- Description **REACTOR 3 STATE AGITATR**

Main	Server
Name:	CM_AGIT101
Description:	REACTOR 3 STATE AGITATR
Engr Units:	

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Notes**Adding and Configuring a New CM**

Since **CM#_FV101** is a 2-State device and the agitator is a 3-State, copying and modifying is not effective. We will therefore create the agitator new from the Library. (You will also get more practice configuring a Device Control CM from scratch!)

When adding a new CM you can use any one of the following three methods:

- File > New > Control Module
- Drag a CM from the Library Tab to the Project Tab
- Double click on the CM in the Library Tab (This method adds the CM to the Project and opens the chart for configuration, in one step. It also allows more work area since only one tree needs to be open.)



Creating and Configuring a New CM

- Enter the following information:

- **Server Tab**

- PDP **SysDtlDEVCTLA.dsp**
 - GDP **SysGrpDEVCTLA.dsp**

The screenshot shows a form titled 'Point Detail Page'. It contains three input fields: 'Associated Display' (empty), 'Group Detail Page' (containing 'sysGrpDEVCTLA.dsp'), and 'sysDtlDEVCTLA.dsp' (highlighted in blue).

- Click **OK**
 - Close and save **CM#_AGIT101**.
 - Assign **CM#_AGIT101** to **CEE0101**
 - 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 specific **Control Area** must be entered on the form.

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Notes

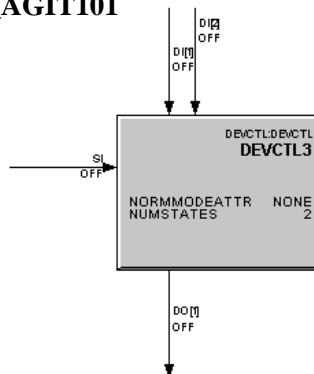


Before any Function Blocks are inserted into the CM, it is good practice to assign the CM to the corresponding CEE. This will enable you to completely configure the I/O Channel Function Blocks without having to close and reopen the CM.

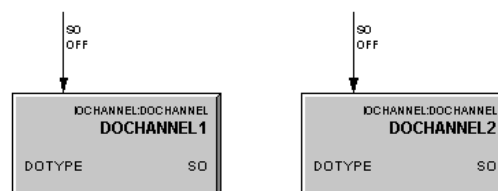
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Adding and Configuring Functions Blocks

- Insert the following function blocks in CM#_AGIT101
 - 2 DOCHANNEL
 - 1 DEVCTL



- Arrange the blocks as shown



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Notes

Adding and Configuring Function Blocks

The above arrangement is used for wiring reasons. In this instance the wiring specifics are known and we can arrange the blocks accordingly. In other cases, blocks may have to be rearranged several times during configuration to facilitate the soft wiring.



Arranging blocks can be demanding in a small work area. Closing one tree view can expand the work area. Also, scaling the display to make it smaller can facilitate this task.



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Configuring the DOCHANNEL Function Blocks

- Configure the left **DOCHANNEL** with the following information
 - **Main Tab**
 - Name **DO12**
 - Module Name **DO_IOM_0n**
 - Assign to Channel **12**
- Click **OK**
- Configure the right **DOCHANNEL** with the following information
 - **Main Tab**
 - Name **DO06**
 - Module Name **DO_IOM_0n**
 - Assign to Channel **06**
- Click **OK**

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Notes

Configuring the DOCHANNEL Function Blocks

Above we have selected channels 12 and 6 to assign our DOCHANNEL blocks. When DO channel light 12 comes on the Agitator will be active in low mode. When both 6 and 12 are on, this represents the Agitator being in high mode.



For more information on the DOCHANNEL block refer to the *Control Building Components Reference, DOCHANNEL block*.

Honeywell**Configuring the DEVCTL Function Block ...continued**

- Configure the **DEVCTL** with the following information

- **Main tab**

- Name **DEVCTLA**
- Description **DEVCTL FOR AGITATOR**

- **Block Sizing**

- Number of Inputs **2**
- Number of Outputs **2**
- Number of States **3**

The screenshot shows the configuration interface for the DEVCTL function block. It has two main sections: 'Block Sizing' and 'State Names'. In the 'Block Sizing' section, there are three dropdown menus: 'Number Of Inputs' set to 2, 'Number Of Outputs' set to 2, and 'Number Of States' set to 3. In the 'State Names' section, there are four text input fields: 'State 1 Name' with 'HIGH', 'State 0 Name' with 'LOW', 'State 2 Name' with 'STOPPED', and 'In Between' with 'Inbet'.

- **State Names**

- State 1 Name **HIGH**
- State 0 Name **LOW**
- State 2 Name **STOPPED**
- InBetween Name **Inbet**

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Notes**Device Control State Assignments**

The Device Control CM is designed to give the operator a user friendly interface to the digital I/O signals which control a 2 or 3-State device.

For this double input, double output scenario, we have specified three states for the Device Control Module. State 1 is assigned the name HIGH, state 0 is assigned the name LOW, state 2 is assigned the name STOPPED and the Inbetween state is assigned the name Inbet.



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

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Configuring the DEVCTL Function Block ...continued

- Configure the **DEVCTL Inputs** tab with the following information
 - Number of Digital Inputs **2**

Input 2	Input 1	State Descriptor
off	off	STOPPED
off	on	LOW
on	off	Inbet
on	on	HIGH

The screenshot shows the 'DEVCTL Block, DEVCTLA - Parameters [Project]' window. The 'Inputs' tab is selected. The 'Number of Digital Inputs' is set to 2. Below this, there are four input slots labeled 4, 3, 2, and 1. Each slot has a checkbox and a dropdown menu. The dropdown menus are set to 'STOPPED', 'LOW', 'Inbet', and 'HIGH' respectively. The checkboxes for inputs 2 and 1 are checked.

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Notes

Device Control Input Assignments

On the Inputs tab, enter the appropriate feedback inputs for the Device Control CM to handle the three-state device.

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Configuring the DEVCTL Function Block ...continued

- Configure the **DEVCTL Outputs** tab with the following information:
 - Number of Digital Outputs: **2**

Output 2	Output 1	State Name
on	on	HIGH (State 1)
off	on	LOW (State 0)
off	off	STOPPED (State 2)

Number of Digital Outputs:

	Outputs			State Name	Safe
	3	2	1		
State 1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	HIGH	<input type="radio"/>
State 0	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	LOW	<input type="radio"/>
State 2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	STOPPED	<input checked="" type="radio"/>

- Click **OK**

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Notes

Device Control Output Assignments

Outputs for controlling the device are wired from the appropriate DO module(s) to the device and feedback inputs from the device are wired to the appropriate DI module(s).

DO and DI channel function blocks are then brought into the Device Control CM and configured to map to these DO and DI channels.

Using assigned states with specified names, corresponding output conditions are designated in the configured DEVCTL block to work in conjunction with the designated inputs for feedback to define device control requirements.

The operator (or SCM or Logic Interlock) can then pick a state for the device and the Device Control CM handles the correct inputs and outputs to control the device.

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Wire Blocks Together

- Wire blocks together using the following information
- **DEVCTLA**
 - **DO[1]** TO **DEVCTLA - DI[1] and DO12 - SO**
 - **DO[2]** TO **DEVCTLA - DI[2] and DO06 - SO**



For a detailed diagram see the next slide

- Close and save
- Download and Activate

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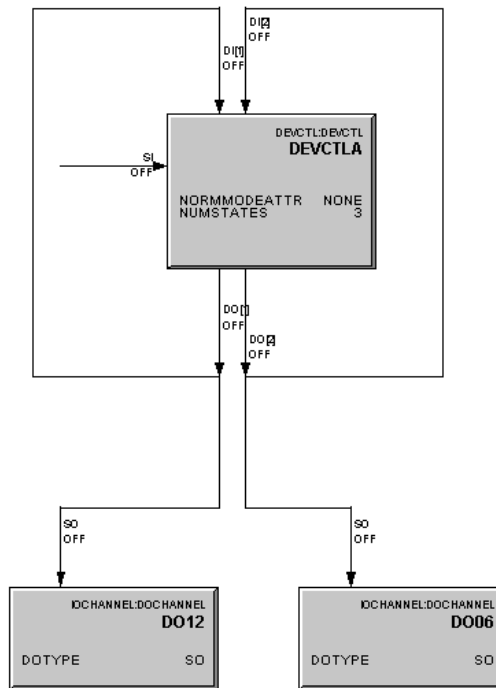
Notes

Wire Blocks Together

According to the state assignments, when the operator selects state 0 (low), DO[1] will go true which will turn on DO channel light 12. When the operator selects state 1 (High) both outputs DO[1] and DO[2] will go true which will turn on both lights 12 and 6.

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Wiring Diagram for AGIT101



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Notes

Simulation versus Real World

As we did with the previous Device Control CMs, we are simulating the feedback from the device in this exercise.

DO(1) and DO(2) are connected to DO channels just as you would do in a real world situation. However DO(1) and DO(2) are also connected to DI(1) and DI(2) to simulate feedback. You would use DI Channel function blocks connected to DI(1) and DI(2) in a real world situation. These function blocks would be mapped to the appropriate digital input feedback signals from the device.

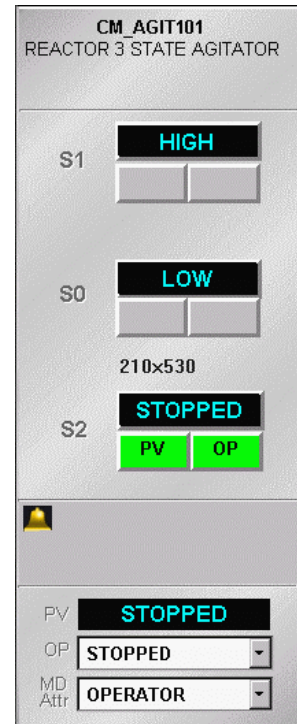
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Operating AGIT101 From Station

- Open Station
- Type in **CM#_AGIT101** and Click on the magnifying glass icon



- Click on **OP** and change the status from STOPPED to LOW. Observe as the PV changes accordingly. Also observe DO channel light 12 turn on.
- Click on **OP** and change the status from LOW to HIGH. Observe as the PV changes accordingly Also observe DO lights 12 and 6 turn on
- Stop the Agitator and observe the results



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Notes

Before you begin

Operating from Control Builder is very useful, especially for troubleshooting and debugging, but for day-to-day operations you will probably prefer to use PlantScape's Station software.

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This completes....

PlantScape Controller Implementation

Lesson 2

**Configuring a Three State
Device Control Module**

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Notes
