
Honeywell

PlantScape Controller Implementation

Lesson 1

Configuring Operational Overrides

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Notes

Introduction

The purpose of this Lesson is to give you the knowledge to be able configure operational overrides to interlock Control Modules. After you complete this Lesson you will have interlocked all of the valves and pumps for project operation.

Objectives

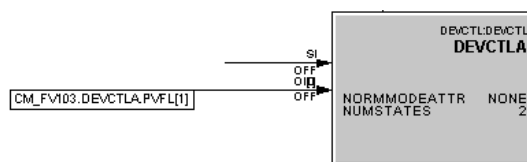
- ❶ Create a new logic CM named CM#_LK01
- ❷ Add parameter connectors and logic blocks to interlock the valves
- ❸ Use CM#_LK01 CM to interlock the pumps

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Modify Existing CMs to Interlock (CM#_FV101)

- Select the **Project** tab
- Open **CM#_FV101**
- Add the following pin to **DEVCTLA**

Pin	Location	Array Indices
OI	Input/Left	[0]



- Add a Parameter Connector to the **OI[0]** Pin
- Enter Parameter Connector Information
 - **CM#_FV103.DEVCTLA.PVFL[1]**
- **Close** and **Save** changes

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Notes

Modifying Existing CMs

Changes may be made to a CM in the project view without deactivating the CM. Eventually the CM will have to be deactivated for the changes to be loaded. Then the CM may be reactivated.



- The device control function block has three kinds of interlocks : Process Overrides, Process Permissives, and the Safety Override. All three deal with the state ordinal values of the device control block : States 0 and 1 for a 2-State; and States 0, 1, and 2 for a 3-State device.
- Process interlocks can be bypassed; the safety interlock cannot.
- In the above example, we added an input pin for the process override interlock OI[0]. When this Boolean parameter goes true, the device is forced to the 0 State.
- The parameter connection we used is also a Boolean parameter. It is a flag that is true when CM#_FV103 is in the 1 State. This interlock therefore closes the Tank A bottom valve when the Reactor drain valve is open.

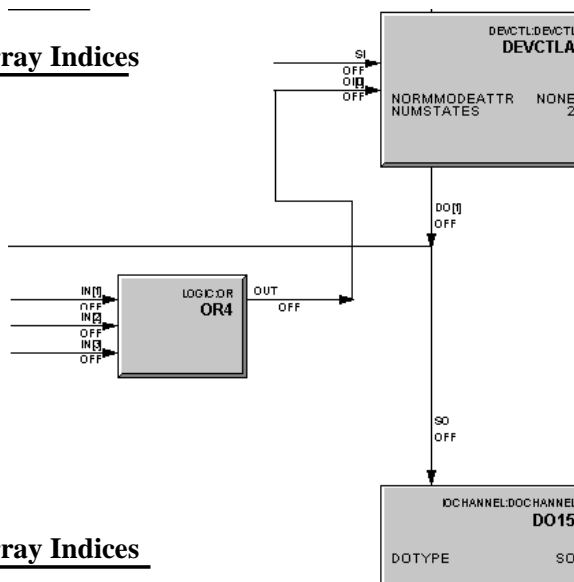
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Modify Existing CMs to Interlock (CM#_FV102)

- Open CM#_FV102
- Add the following pin to DEVCTLA

Pin	Location	Array Indices
OI	Input/Left	[0]

- Add an OR Block
- Add the following Wire
 - OR - OUT to DEVCTLA - OI[0]



- Add the following pin to the OR block

Pin	Location	Array Indices
IN	Input/Left	[3]

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Notes

Interlocking CM#_FV102

To interlock the Tank B bottom valve to the 0 State (closed), we will monitor three different process parameters.

The OR block will allow any one of the three to force the valve to the closed state.



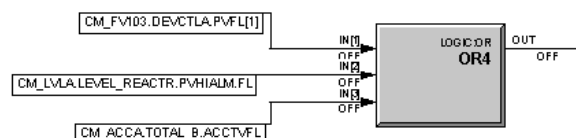
For more information on using the OR block, refer to *Control Builder Components Theory, Logic Functions, Logic Function Blocks, OR Block*.

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Modify Existing CMs to Interlock (CM#_FV102)

...continued

- Add a Parameter Connector to the **IN[1]** Pin
- Enter Parameter Connector Information
 - **CM#_FV103.DEVCTLA.PVFL[1]**
- Add a Parameter Connector to the **IN[2]** Pin
- Enter Parameter Connector Information
 - **CM#_LVLA.LEVEL_REACTR.PVHIALM.FL**
- Add a Parameter Connector to the **IN[3]** Pin
- Enter Parameter Connector Information
 - **CM#_ACCA.TOTAL_B.ACCTVFL**
- **Close** and **Save** changes



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Notes

Interlocking CM#_FV102

The three parameters, any one of which will force the Tank B bottom valve closed are:

- The Reactor drain valve (CM#_FV103) being in the Open (1) state
- The Reactor being full as designated by the PVHI alarm on the Reactor level indicator
- The total amount of ingredient B designated to be charged to the Reactor being reached

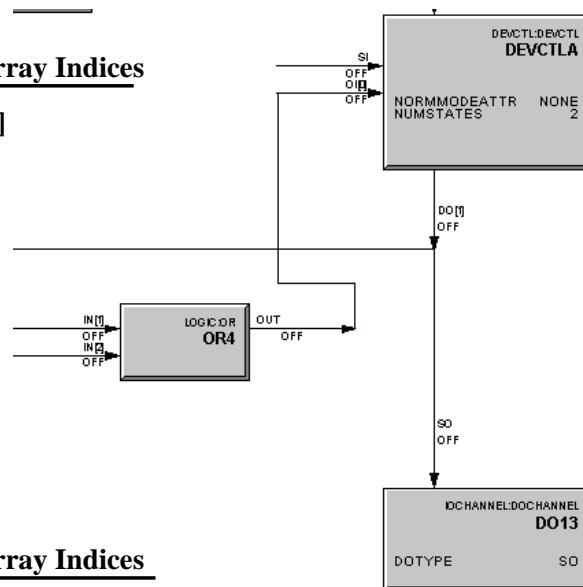
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Modify Existing CMs to Interlock (CM#_ FV103)

- Open CM#_FV103
- Add the following pin to DEVCTLA

Pin	Location	Array Indices
OI	Input/Left	[0]

- Add an OR Block
- Add the following Wire
 - OR - OUT to DEVCTLA - OI[0]



- Add the following pin to the OR block

Pin	Location	Array Indices
IN	Input/Left	[3]

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Notes

Interlocking FV103

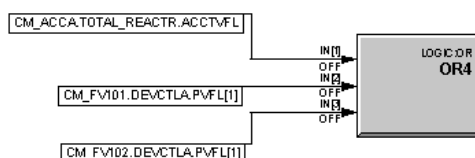
As with CM#_FV102, we will interlock the Reactor drain valve with 3 different parameters, using an OR Logic function block.

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Modify Existing CMs to Interlock (CM#_FV103)

...continued

- Add a Parameter Connector to the **IN[1]** Pin
- Enter Parameter Connector Information
 - **CM#_ACCA.TOTAL_REACTR.ACCTVFL**
- Add a Parameter Connector to the **IN[2]** Pin
- Enter Parameter Connector Information
 - **CM#_FV101.DEVCTLA.PVFL[1]**
- Add a Parameter Connector to the **IN[3]** Pin
- Enter Parameter Connector Information
 - **CM#_FV102.DEVCTLA.PVFL[1]**
- **Close** and **Save** changes



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Notes

Interlocking CM#_FV103

The three parameters, any one of which will force the Reactor drain valve closed are:

- The total amount of product designated to be drained from the Reactor being reached
- The Tank A bottom valve (FV101) being in the Open (1) state
- The Tank B bottom valve (FV102) being in the Open (1) state



Create a New CM (CM#_ LK01)

- Create a new CM
- Modify the settings to match the information below
 - **Main** tab
 - Name **CM#_LK01**
 - Description **INTERLOCK CM**
- Close **CM#_LK01** and save changes
- Assign **CM#_LK01** to **CEE0101**

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Notes

Logic CM CM#_LK01

To interlock the Pumps, we will demonstrate a second method of interlocking: creating a Logic CM and using parameter connections from it to the devices we wish to interlock.

In this CM we will create the interlock strategy for all three pumps, CM#_PMP101, CM#_PMP102, and CM#_PMP103.

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Configure CM (CM#_ LK01)

- Open **CM#_LK01**
- Add a **LE** Block
- Modify the settings to match the information below
 - **Main** tab
 - Name **CHK_FV101RC**
- Add a Parameter Connector to the **IN[1]** Pin
- Enter Parameter Connector Information
 - **CM#_FV101RC.PIDA.OP**
- Add an **OR** Block
- Modify the settings to match the information below
 - **Main** tab
 - Name **CM#_PMP101**

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Notes

Logic CM CM#_LK01

First we will create the interlocks for CM#_PMP101, the pump in the A transfer line. This pump will be interlocked to the Off (0) state when any one of the three following conditions is true:

- The tank A bottom valve is closed
- The Reactor is full as designated by the Reactor level indicator being in PVHI alarm
- The A transfer line regulatory control valve, CM#_FV101RC, is closed as designated by its OP being less than or equal to zero

To check if the third condition is accomplished we will use a Logic LE Function block. The result of that block is then input to an OR block along with parameter connections for conditions 1 and 2.



For more information on using the OR block, refer to *Control Builder Components Theory, Logic Functions, Logic Function Blocks, LE Block*.

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Configure CM (CM#_ LK01) ...continued

- Add the following pin to the **CM#_PMP101** OR block

Pin	Location	Array Indices
IN	Input/Left	[3]

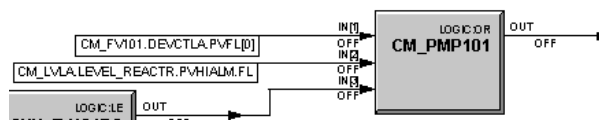
- Add a Parameter Connector to the **IN[1]** Pin

- Enter Parameter Connector Information
 - **CM#_FV101.DEVCTLA.PVFL[0]**

- Add a Parameter Connector to the **IN[2]** Pin

- Enter Parameter Connector Information
 - **CM#_LVLA.LEVEL_REACTR.PVHIALM.FL**

- Soft wire the LE block **OUT** to the **IN[3]** Pin



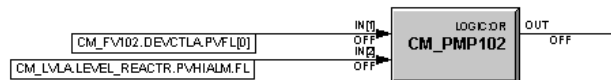
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Notes

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Configure CM (CM#_ LK01) ...continued

- Add a second **OR** Block for **CM#_PMP102**
- Modify the settings to match the information below
 - **Main** tab
 - Name **CM#_PMP102**
- Add a Parameter Connector to the **IN[1]** Pin
- Enter Parameter Connector Information
 - **CM#_FV102.DEVCTLA.PVFL[0]**
- Add a Parameter Connector to the **IN[2]** Pin
- Enter Parameter Connector Information
 - **CM#_LVLA.LEVEL_REACTR.PVHIALM.FL**



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Notes

Logic CM CM#_LK01

Next we will interlock CM#_PMP102, the pump in the B transfer line. This pump will be interlocked to the Off (0) state when either of the following two conditions is true:

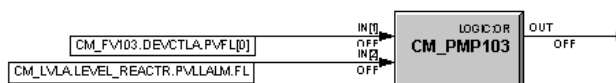
- The tank B bottom valve is closed.
- The Reactor is full as designated by the Reactor level indicator being in PVHI alarm.

This will be accomplished with two parameter connections to an OR block.

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Configure CM (CM#_ LK01) ...continued

- Add a third **OR** Block for **CM#_PMP103**
- Modify the settings to match the information below
 - **Main** tab
 - Name **CM#_PMP103**
- Add a Parameter Connector to the **IN[1]** Pin
- Enter Parameter Connector Information
 - **CM#_FV103.DEVCTLA.PVFL[0]**
- Add a Parameter Connector to the **IN[2]** Pin
- Enter Parameter Connector Information
 - **CM#_LVLA.LEVEL_REACTR.PVLLALM.FL**
- Close and Save changes



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Notes

Logic CM CM#_LK01

Last we will interlock CM#_PMP103, the pump in the Reactor drain line. This pump will be interlocked to the Off (0) state when either of the following two conditions is true:

- The Reactor drain valve is closed.
- The Reactor is empty as designated by the Reactor level indicator being in PVLL alarm.

This will be accomplished with two parameter connections to an OR block.

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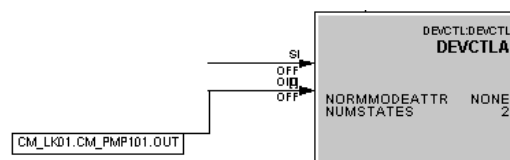
Modify Existing CMs to Interlock (CM#_ PMP101)

- Open CM#_PMP101
- Add the following pin to DEVCTLA

Pin	Location	Array Indices
OI	Input/Left	[0]

- Add a Parameter Connector to the OI[0] Pin

- Enter Parameter Connector Information
 - CM#_LK01.CM#_PMP101.OUT



- Close and Save changes

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Notes

Interlock CM#_PMP101

CM#_LK01 contains the logic required to force the pump to the stop condition. If we want to now use that logic, we can use a single parameter connection from the appropriate logic output in CM#_LK01 to the operational override on the pump.

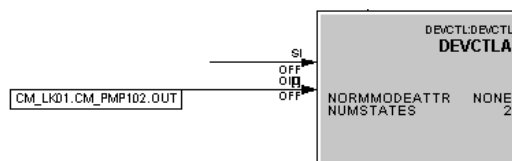
The same applies to CM#_PMP102 and CM#_PMP103.

Note: After configuring the parameter connection for CM#_PMP101, you can select the connection, highlight the text, and go to Edit > Copy. This puts the text in a buffer which can then be pasted into the parameter connections for CM#_PMP102 and CM#_PMP103 for modification.

Modify Existing CMs to Interlock (CM#_ PMP102)

- | Pin | Location | Array Indices |
|-----|------------|---------------|
| OI | Input/Left | [0] |

- Close and Save changes



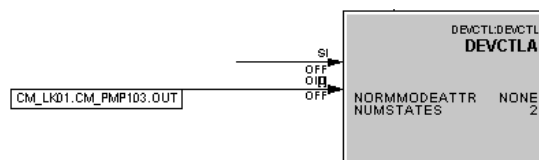
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Notes

Modify Existing CMs to Interlock (CM#_ PMP103)

- | Pin | Location | Array Indices |
|-----|------------|---------------|
| OI | Input/Left | [0] |

- Enter Parameter Connector Information
 - **CM# LK01.CM# PMP103.OUT**



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Notes

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This completes....

PlantScape Controller Implementation

Lesson 1

Configuring Operational Overrides

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