
Honeywell

PlantScape Controller Implementation

Lesson 2

Configuring the Heat Cascade

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Notes

Introduction

The purpose of this Lesson is to give you the knowledge to be able to configure a Heat Cascade control strategy. After you complete this Lesson you should be able to copy and modify CMs, and implement and understand Parameter Connectors.

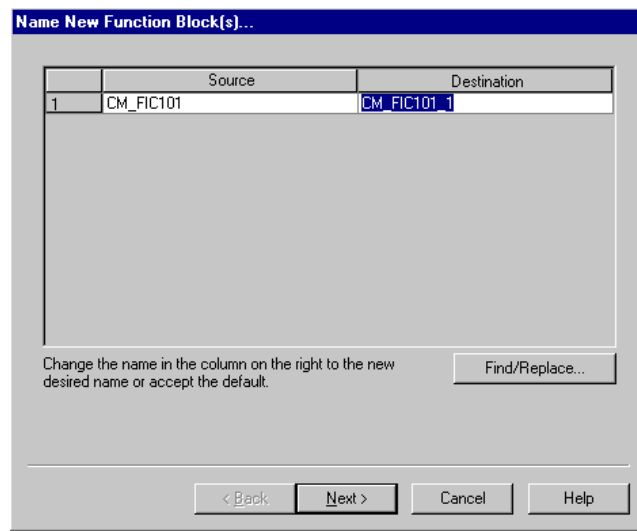
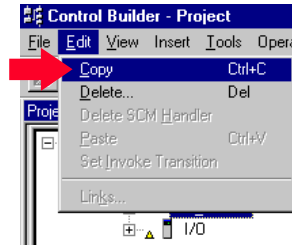
Objectives

- ❶ Given the code contained within a parameter connector, explain what each component stands for
- ❷ Copy and modify an existing CM

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➤ Copying a CM

- Open the **Project** view in Control Builder and select **CM#_FIC101**
- From the drop down menu Click
 - **Edit**
 - **Copy**
- This will bring up the Name New Function Block(s) screen. On this screen you will be able to change the Control Modules name.



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Notes

Copying a CM

Copying a CM to create a similar CM is a common, time-saving technique because

- function blocks and their connections are already present
- many parameters do not have to be modified
- parameters that must be modified, such as the CM name and I/O channel assignments, can be modified from initial dialog boxes or are automatically cleared and set up for data entry

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➤ **Copying a CM**

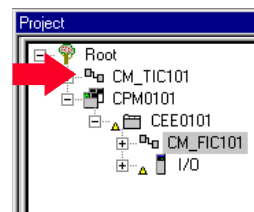
- Modify the Destination name:
 - Name **CM#_TIC101**
- Click **Next** button
- The next screen will be the Non-retained I/O Associations. The list of channels association that will be deleted is displayed.
- Click **Finish** button
- This will result in the creation of a new CM under the Project Root which will be the primary of the cascade

| Name New Function Block(s)... | | |
|-------------------------------|-----------|-----------|
| | Source | Destin |
| 1 | CM_FIC101 | CM_TIC101 |

| Non-retained I/O Associations... | | |
|----------------------------------|----------------|---------------------|
| | Channel | Module |
| 1 | CM_FIC101.AI00 | AI_IOM_01 Channel 0 |
| 2 | CM_FIC101.A000 | AO_IOM_01 Channel 0 |

The above I/O associations will not be retained in the operation.

< Back Finish Cancel Help



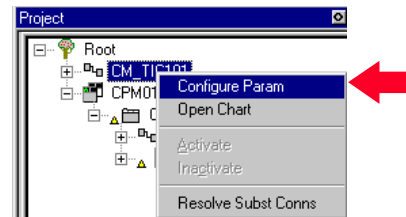
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➤ Configuring Parameters

- Select and then right click on the new CM
- Select
 - **Configure Parameters**
- Modify the settings to match the information below:
 - Description **TEMP CTRL LOOP**
 - Engr Units **DEG C**
 - Keyword **TEMPERATURE**

A screenshot of the 'Parameters Configuration' dialog box, 'Main' tab. The fields are as follows:
Name: CM_TIC101
Description: TEMP CTRL LOOP
Engr Units: DEG C
Keyword: TEMPERATURE
Execution Period: 200MS (dropdown)
Execution Phase: 0
Unit Text: (empty)
Version: (empty)
Enable Alarming Option: ☒
SCM Option: NONE (dropdown)
Execution Order in CEE: 10
SCM Name: de_scm_temp

- Click **OK**
- Assign **CM#_TIC101** to **CEE0101**

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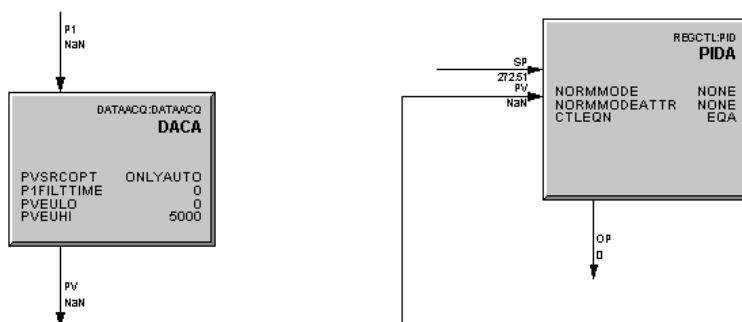
Configuring Parameters

When you use the Copy CM technique to create a new CM, you need to change parameters on the Main page of the Parameters Configuration form. On the Server page, Point Detail and Group Display references are copied and do not have to be re-entered.

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➤ **Modifying the CM**

- Double Click on **CM#_TIC101** to open it in the Control Drawing area
- Select the **AICHANNEL** block and press the delete key
- Select the **AOCHANNEL** block and press the delete key
- Arrange the blocks as shown below



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Modifying the CM

It is always a good idea to keep the CM organized and free of any unneeded components. Components that are removed or rearranged can always be added back if needed at a later time.



➤ **Configuring Blocks, DATAACQ**

- Double Click on the **DATAACQ**
- Modify the settings to match the information below:

| | | | |
|-----------------|------------------|-----------------|------------|
| – Name | DACA | – PVEU Range Lo | 0 |
| – Description | TEMP CTRL | – PV Limits Hi | 100 |
| – PVEU Range Hi | 100 | – PV Limits Lo | 0 |
| – Engr Units | DegC | | |

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Notes

Configuring Blocks, DATAACQ

The **DATAACQ** block for all PID Loop CMs must be named **DACA** so that the supplied PlantScape station PID Point Detail display can be used.



➤ **Configuring Blocks, DATAACQ ...continued**

- Click on the **Alarms** Tab
- Modify the settings to match the information below:

| | <u>Trip Point</u> | <u>Priority</u> | <u>Severity</u> |
|----------------|-------------------|-----------------|-----------------|
| – PV High High | 95 | URGENT | 0 |
| – PV High | 92 | HIGH | 0 |

| | Trip Point | Priority | Severity |
|----------------|------------|----------|----------|
| PV High High : | 95 | URGENT | 0 |
| PV High : | 92 | HIGH | 0 |

- Click **OK**

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Notes

Configuring Blocks, DATAACQ

A primary reason that the DATAACQ block is added to PID Loop CMs is for high and low PV alarming.

Note that the PV High limit must be configured before the PV High High limit.



➤ **Configuring Blocks, PID**

- Double Click on the **PID** Block
- Modify the settings to match the information below:
 - Name **PIDA**
 - Engineering units **DEG C**
 - PVEU Range HI **100**
 - PVEU Range Low **0**

REGCTL:PID Block, PIDA - Parameters [Project]

Configuration Parameters | Monitoring Parameters | Block Preferences

Main | Algorithm | SetPoint | Output | Alarms | SCM | Block Pins

Name: Execution Order in CM:

Description:

Engineering Units:

Process Variable

PVEU Range Hi:

PVEU Range Low:

Manual PV Option:

Mode

Normal Mode:

Normal Mode Attribute:

Mode:

Mode Attribute:

☒ Permit Operator Mode Changes

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Notes

Configuring Blocks, PID

The **PID** block must be named **PIDA** so that the supplied PlantScape station Point Detail display can be used.

The **PID** block contains a large amount of functionality. It has several pages of configuration parameters. Because many parameters are common to similar **PID** blocks, the copy technique is particularly useful here.



For more information on configuring PID blocks, refer to *Control Builder, Components Theory, Regulatory Control, PID Block*.

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➤ **Configuring Blocks, PID ...continued**

- Click on the **SetPoint** Tab
- Modify the settings to match the information below:
 - High Limit **100**
 - Low Limit **0**

The screenshot shows a configuration window with the following elements:

- Tabs: Main, Algorithm, **SetPoint**, Output, Alarms, SCM
- SP: 0
- Input Range:
 - High Limit: 100
 - Low Limit: 0

- Click **OK**

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Notes

Configuring Blocks, PID

SP input range must be within the PVEUHI -- LO range.

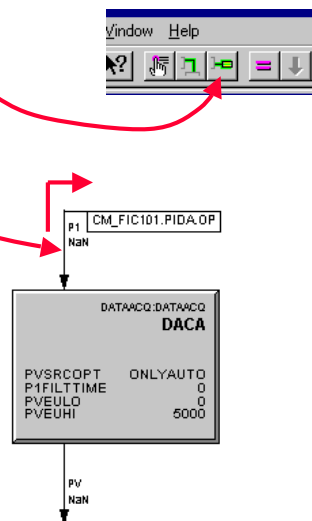
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➤ Adding Parameter Connection to CM#_TIC101 for Simulation

- Add a Parameter Connector to the P1 pin on the **DACA** block.
 - Click on the **Parameter Connection** icon
 - Single-click on the **DACA** Block's **P1** pin; Move slightly up and to the right and double-click
- In the resulting port, type in the full name of the desired block connection, including Control Module, Function Block, & Parameter:

CM#_FIC101.PIDA.OP

Alternate Method: Use the Point Selection Tool
(see next slide)



Note: This step is strictly for process simulation. In a real process the **DACA** input would be an AI Channel block.

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Adding a Parameter Connection

Parameter connections allow one CM to communicate with another CM. The CMs can be in the same controller or in different controllers communicating peer to peer over the Supervisory C-Net.

After clicking on the Parameter Connection icon your mouse pointer will turn into a cross-hair. The same technique used in wiring blocks together is used to add a Parameter Connector. You may add turning points to route your Parameter Connector in available space. You may also re-position the parameter connection after it is entered.

Note: If you want to cancel the connection operation before you are finished, press <Esc>.

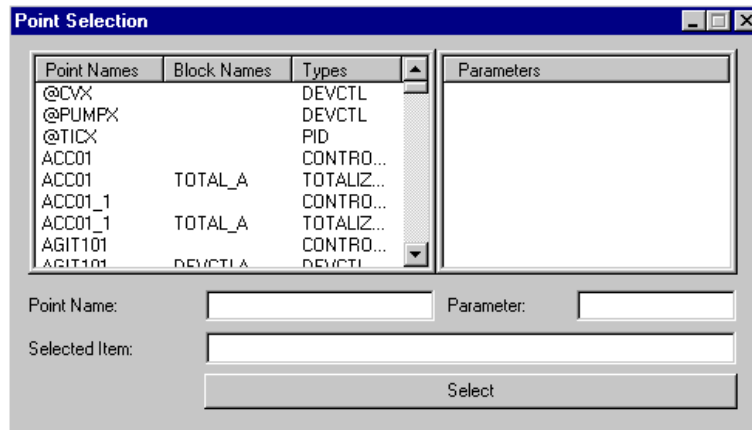
After Double Clicking you will be given a box to enter the information needed for the connection. You will need to enter:

- The name of the CM or SCM to which the connection is being made
- The Function Block within the CM or SCM to which the connection is being made
- The Parameter to which the connection is being made (e.g. CM#_TIC101.PIDA.SP)

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➤ Using the Point Selection Tool

- Click on the button with the dot leader icon (three dots) to access the Point Selection dialog for a particular Parameter Connector.
- Select the desired Point Name from the list of Point Names and associated Block Names/Types on the Point Selection dialog.



- Select the desired parameter from the list of parameters in the right-hand listbox on the Point Selection dialog.
- Click the Select button and then click the Close button in the Point Selection dialog to close the dialog and return to the control drawing.

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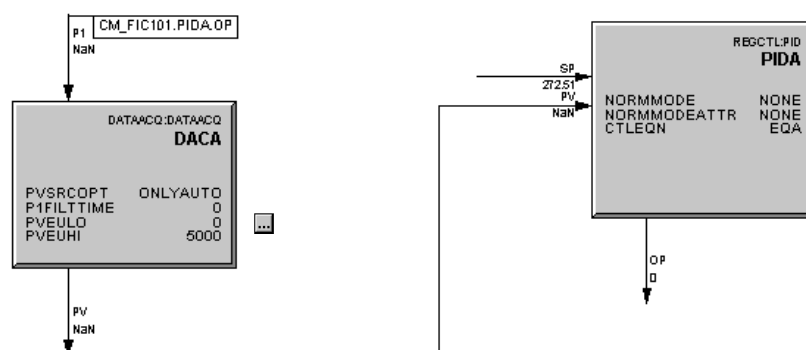
Using the Point Selection Tool

Perform the indicated steps to use the Point Selection tool to find a desired point name and parameter when referencing a particular parameter expression.

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➤ **Adding Parameter Connection to CM#_TIC101 for Simulation**

- A completed **CM#_TIC101** should be similar to the **CM** below

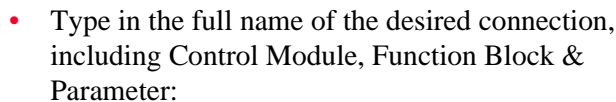


- Close and save **CM#_TIC101**

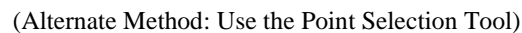
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Notes

- Single-click on the **PID** Block's **SP** pin; Move slightly to the left and double-click



Press **Enter**



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This completes....

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