Honeywell

PlantScape Controller Implementation

Lesson 2

Configuring a Flow Totalizer

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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 flow totalizer CM. After you complete this Lesson you will have configured the Totalizer Block that will keep running totals of all flows in the project.

Objectives

❶ Create a new CM named CM#_ACCA to totalize flows into and out of the reactor

❷ Add and configure TOTALIZER Function Blocks

❸ Add NUMERIC and SELREAL Function Blocks to simulate flow rates

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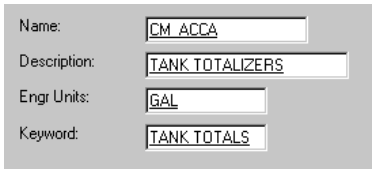
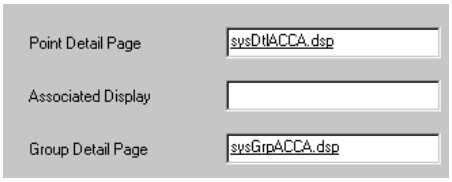
Adding and Configuring a new CM

- Create a new CM
- Modify the settings to match the information below
  - **Main** tab
    - Name **CM#_ACCA**
    - Description **TANK TOTALIZERS**
    - Engr Units **GAL**
    - Keyword **TANK TOTALS**
    - Execution Period **200ms**
  - **Server** Tab
    - Point Detail Page **sysDtlACCA.dsp ***
    - Group Detail Page **sysGrpACCA.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.
- Close **CM#_ACCA** and save changes
- Assign **CM#_ACCA** to **CEE0101**

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Notes

Adding and Configuring a new CM

When adding a new CM you can use any one of the following three methods
• Click 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.)

* Note: sysDtlACCA.dsp and sysGrpACCA.dsp are <u>not</u> standard detail and group displays. They were modified from standard detail and group displays for this course.

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

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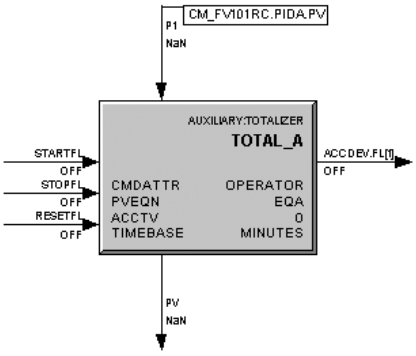
Adding and Configuring Function Blocks (Tank A)

- Open **CM#_ACCA**
- Add a **TOTALIZER** Block (Under **AUXILIARY** category in Library)
- Double click on the **TOTALIZER** Function Block
- Modify the settings to match the information below
  - Name **TOTAL_A**
  - Description **TANK A FLOW TOTAL**
- Add a Parameter Connector to the **P1** Pin
- Enter Parameter Connector Information
  - **CM#_FV101RC.PIDA.PV**



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Notes

Adding and Configuring Function Blocks (Tank A)

The Tank A totalizer will have a different configuration than those for Tank B and the Reactor. Tank A has a Regulatory Control valve, CM#_FV101RC, in its transfer line. Tank B and the Reactor have only 2-State valves. The regulatory control valve allows the totalizer block to read the flow directly from PIDA.PV in CM#_FV101RC.

For more information on how to configure and use TOTALIZER function blocks refer to the *Control Builder Components Theory, Auxiliary Function, TOTALIZER Block.*

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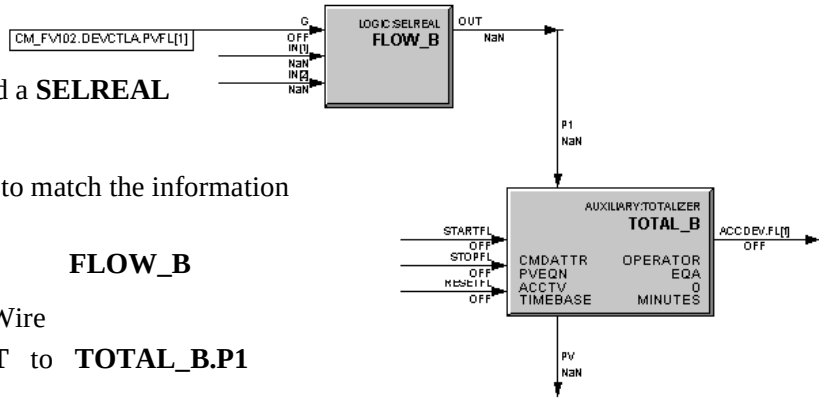
Adding and Configuring Function Blocks (Tank B)

- Add a second **TOTALIZER** Function Block
- Modify the settings to match the information below
  - Name **TOTAL_B**
  - Description **TANK B FLOW TOTAL**



- To simulate a flow*, add a **SELREAL** (logic) Function Block
  - Modify the settings to match the information below

    Name **FLOW_B**
  - Add the following Wire

    FLOW_B.OUT to **TOTAL_B.P1**
  - Add a Parameter Connector as shown above

    CM#_FV102.DEVCTLA.PVFL[1]

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Notes

Adding and Configuring Function Blocks (Tank B)

* In the configuration of Tank B's totalizer we add a SELREAL Block to simulate a flow input to the TOTAL_B Block. In the SELREAL Block, when the value of the parameter connector becomes true (FV102 is opened), the OUT real value will be set to to (IN[2]). When the parameter connector becomes false (CM#_FV102 is closed), the OUT real value will be set to (IN[1]) .

In a real world situation, we would have an Analog Input Channel block supplying the actual flow rate.

For more information on how to configure and use SELREAL function blocks refer to the *Control Builder Components Theory, Logic Function, SELREAL Block.*

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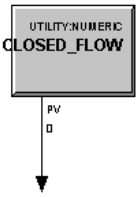
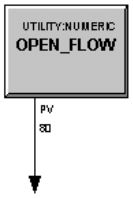
Adding and Configuring Function Blocks (Tank B)

- To aid in the flow simulation, add two **NUMERIC** blocks
- Modify the settings to match the information below
  - Name Block 1 **CLOSED_FLOW**
  - Name Block 2 **OPEN_FLOW**





- Configure **CLOSED_FLOW**:

Name	CLOSED_FLOW
Access Lock	OPERATOR
PV High Limit	5
PV Low Limit	0
Actual Value	0
PV Display Format	D1

- Configure **OPEN_FLOW**:

Name	OPEN_FLOW
Access Lock	OPERATOR
PV High Limit	100
PV Low Limit	0
Actual Value	80
PV Display Format	D1

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Notes

Adding and Configuring Function Blocks (Tank B)

The inputs to the **SELREAL** Function Block cannot be set in project. Therefore we are adding two **NUMERIC** blocks. One (**CLOSED_FLOW**) will be used for flow when the valve is closed. It will be set to **0.0**. The other (**OPEN_FLOW**) will be used for flow when the valve is open. It will be set to **80.0**. (**D1** for the PV Display Format sets up 1 decimal place.)

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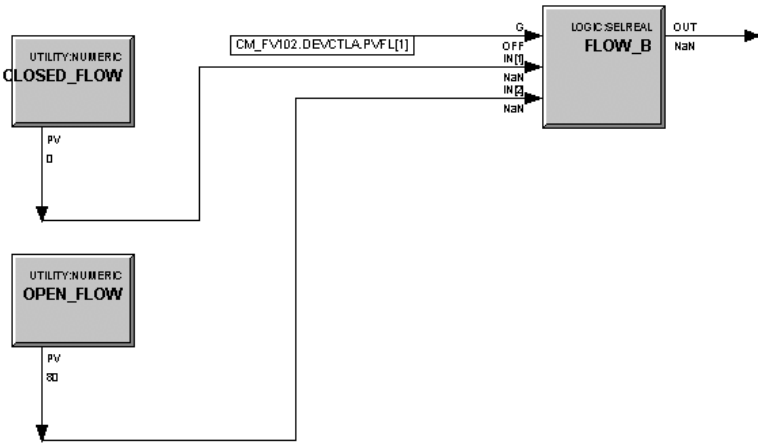
Adding and Configuring Function Blocks (Tank B)

- Wire the **NUMERIC** blocks to the two inputs of the **SELREAL** block as shown



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Notes

Adding and Configuring Function Blocks (Tank B)

Now in the SELREAL Block, when the value of the parameter connector becomes true (FV102 is opened), the OUT value will be set to to flow rate (IN[2])or 80.0. When the parameter connector becomes false (CM#_FV102 is closed), the OUT value will be set to (IN[1]) or 0.0 .

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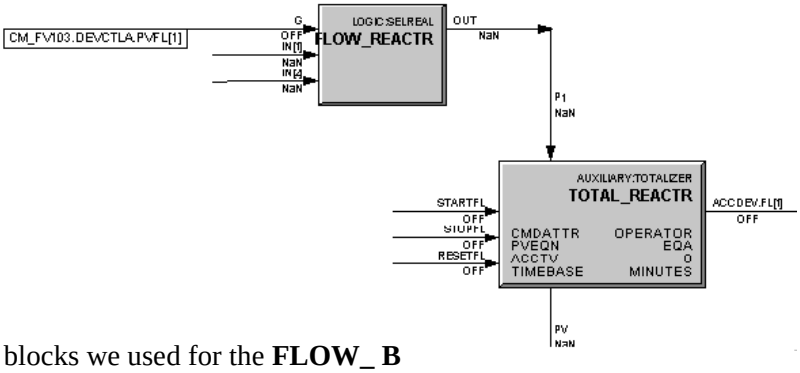
Adding and Configuring Function Blocks (Reactor Drain)

- The configuration of the Reactor Drain totalizer is identical in concept to that of the Ingredient B totalizer.
- Add the blocks and configure them as shown
  - Note that the block names drop the “o” in reactor



- Use the same **NUMERIC** blocks we used for the **FLOW_ B** simulation to simulate reactor valve flow
- The finished CM is shown on the next page

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Notes

Adding and Configuring Function Blocks (Reactor)

Just as we did in the configuration of the Tank B totalizer, we add a SELREAL Block and use the FLOW_CLOSED and FLOW_OPEN NUMERIC blocks to simulate a flow to the TOTAL_REACTR Block.

In a real world situation, we would have an Analog Input Channel block supplying the actual flow rate.

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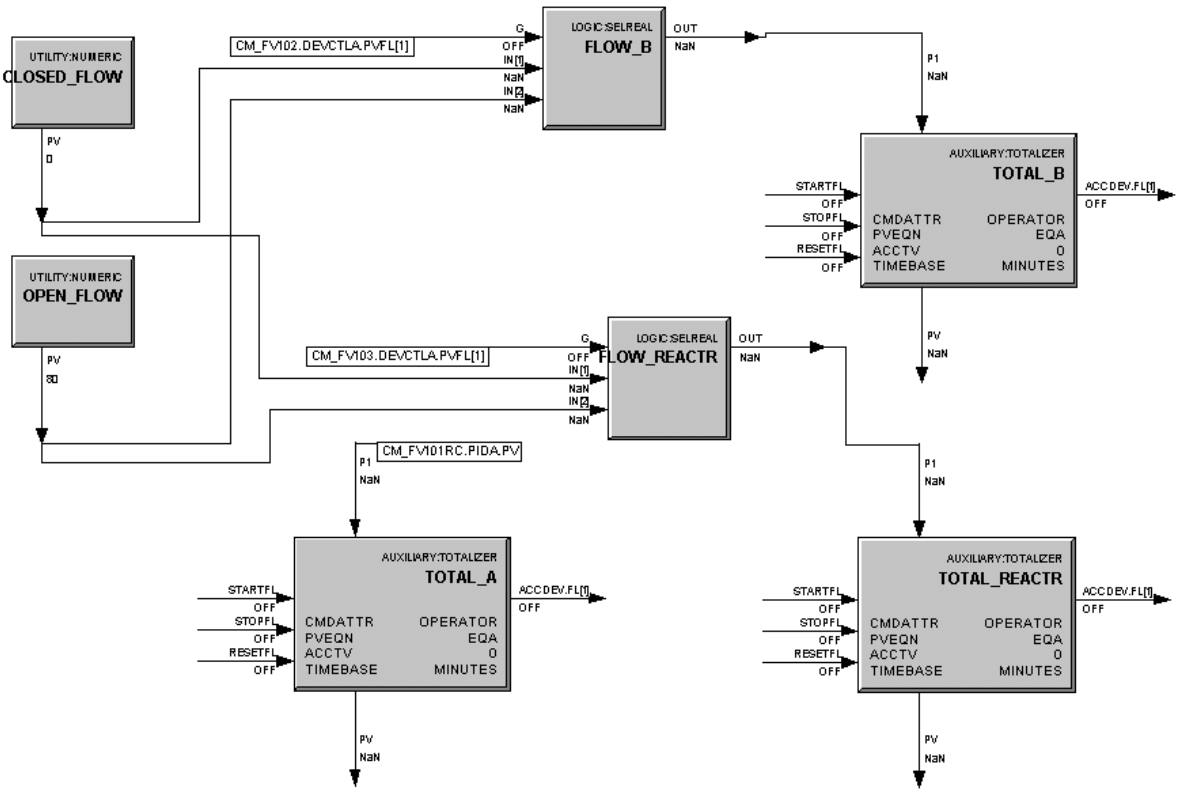
Completed CM_ACCA



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Notes

Completed CM

Note that in this CM there are three non-related, unconnected functions: the totalizers for tank A; for tank B; and for the reactor. A CM is just a container for up to 40 function blocks. The blocks may or may not be related to each other.

Since the configuration of a CM is essentially anything you want it to be, for many of your configurations there will be no supplied station detail display. In those instances, you can modify a supplied display or create your own.

The detail and group displays for this CM for the class were created by modifying the detail and group displays for the PID CM type.

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Finish CM_ACCA

- Close and save **CM#_ACCA**
- **Load** and **Activate CM#_ACCA**
- Note: After the initial load of a **TOTALIZER** block, it must be **RESET** to get a 0.0 accumulated value (**PV**) instead of NaN, and a PV status (**PVSTS**) of NORMAL instead of BAD**.** We will **RESET** the three totalizer blocks in **CM_ACCA** prior to using them.

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Notes

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This completes….

PlantScape Controller Implementation

Lesson 2

Configuring a Flow Totalizer

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Notes