

## Information for the Instructor

The Soda Ash unit is provided as a sample unit for the students. The sequence diagrams, programs, and FactoryTalk View HMI screen for each of the PLCs are provided for this unit.

Feel free to modify the project as you see fit. You can use all of it, or part of it, to suit the size of your class. The reactors are the easiest to adjust to accommodate different team sizes. The current description is for a 3-person team. For a 2-person team, delete an ingredient. Reactor 2 can be expanded for a 4-person team by including ingredient T. A combination of the Stor\_Tnk\_x unit with the corresponding Stor\_LO\_x unit is a good 2-person project.

For a larger class with multiple lab sections, organize the units in a section by reactor (React\_1, React\_2, React\_3, React\_4) and add units that are upstream/downstream of the reactor. This will minimize the need for units from other sections to complete the Week 7 communications testing. For example, a lab section with 6 teams could be RWet\_Unl, TWet\_Unl, Blend, React\_1, Ion\_Exc\_1, Stor\_Tnk\_LO\_1 units with a "stub" for Ion\_Exc\_2 for testing purposes. A lab section that meets early in the week and has 3 teams could be RWet\_Unl, TWet\_Unl, and Blend units. A lab section that meets the next day and has 4 teams could be React\_1, Ion\_Exc\_1, Ion\_Exc\_2, Stor\_Tnk\_LO\_1 units. More reactors and ingredients can be added to increase the project size and handle more teams.

The Week 7 testing is the most stressful week. It is close to what the students will experience on the job during a Factory Acceptance Test (FAT). If they have done their testing ahead of time, it is mostly sitting around with not much to do. The teams that have not done their testing ahead of time are frantically troubleshooting and correcting their program while the others in the section are watching them. In general, one instructor can handle 3 teams this week. Any more teams than that, there should be two people and doing the tests in parallel as much as possible.

Normally, it works best to use all the same processor type for the project processors. However, ControlLogix processors can be used with PLC-5/SLC-500 processors. Though it is possible for PLC-5/SLC-500 processors to communicate with a ControlLogix processor (by using the "Map PLC/SLC Messages" configuration in the ControlLogix processor), you may find it easier for the ControlLogix processor to do both the reading and writing of the PLC-5/SLC-500 information.

Documents for Project:

<b><u>File Name</u></b>	<b><u>Description of File</u></b>
Project Description Revn.doc	Overall description of the project. Modify this document for the specific PLC processors used for the project. MS-Word
KProcess CRD Revn.doc	Control Requirements definition. MS-Word

KProcess Control Narrative Rev <i>n</i> .doc	Describes operation of control system. MS-Word
KProcess Test Plan Rev <i>n</i> .doc	Test plan. MS-Word. Delete units (or mark them as [Not covered in Fall 20xx]). The particular example is for a semester in which there were 24 teams.
KProcess Test Plan Comm Rev <i>n</i> .doc	Communications test plan for Week 7. MS-Word. This is the test plan that will change from semester-to-semester as the units are assigned to different sections. The particular example is for a semester in which there were 24 teams.
Seq Diagrams Guide Rev <i>n</i> .doc	Describes the format of the sequence diagrams (function charts). ControlLogix rev. 31+. MS-Word.
Drawings\*.*	Process P&ID Drawings. "002IN0001" contains the index. All drawings are 11" x 17" Corel Draw ver. 21.0 and PDF. Distribute pdf files to students.

Processor-specific files (in \Chem Process\[processor]\):  
(currently only the ControlLogix is complete)

<b><u>File Name</u></b>	<b><u>Description of File</u></b>
Code Guide [processor] Rev <i>n</i> .doc	Programming standards
Progs\*.*	Soda Ash sample program (sequence diagrams, project file, and associated documentation)
FTView ME\*.*	FactoryTalk View project files
Lib\*.*	Code library files
Duplicating Code ... InfoBetweenControllers...	Using the library files to construct program Documents information being passed between controllers. This document only completely describes the information passed to/from the Soda Ash unit. The students (whole class) will need to formulate the remainder of the document.
FTView ME with [Processor].doc	FactoryTalk View standards. Will need to be modified to fill in the communication details.