

CHAPTER 9 SOLVED PROBLEMS

General instructions for problems SP9-1 to SP9-6:

Write a ladder logic program for the application and implement it for one of the following PLC ladder logic languages:

ControlLogix/CompactLogix, **or**
 MicroLogix/SLC-500, **or**
 S7-1200/1500 **or** Siemens S7-300/400 (Portal or Classic), **or**
 Modicon, **or**
 Emerson PACSystems

If any part of the operation is ambiguous, write down your additional assumptions. The physical inputs, physical outputs, and internal tags/variables for each situation are given in the problem. **DO NOT** assign any more physical inputs!

Unless otherwise specified, assume the analog input channel values corresponding to the lowest and highest sensor value are the same as specified for the Chapter 7 problems.

Your solution should include the following:

1. Function chart
2. Specify the PLC processor used.
3. Ladder logic diagram (with comments). For consistency among the different PLCs, use only variables/symbols/tags in the ladder logic. Use instructions and function blocks consistent with the PLC processor.
4. Table listing additional internal memory (tags/variables/symbols) used and a brief description of their use. For the ControlLogix, Modicon, and PACSystem processors, also indicate the data type for the internal memory. For MicroLogix/SLC-500, indicate the memory address and for S7, indicate the memory address and data type.

SP9-1. Oiler Station Control. Implement the oiler station control of problem SP6-9 using the move-based approach of section 9.2.

SP9-2. Erbia Can Tipper/Rotator Control. Implement the station of problem SP6-13 using the move-based approach of section 9.2.

SP9-3. Leak Check Station Control. Implement the valve leak check station control of problem SP7-9 using the move-based approach of section 9.2.

SP9-4. Oiler Station Control. Implement the oiler station control of problem SP6-9 using the counter-based approach of section 9.3.

SP9-5. Erbia Can Tipper/Rotator Control. Implement the station of problem SP6-13 using the counter-based approach of section 9.3.

SP9-6. Leak Check Station Control. Implement the valve leak check station control of problem SP7-9 using the counter-based approach of section 9.3.

2 Other Function Chart Implementations

SP9-7. Oiler Station Control. Implement the oiler station control of problem SP6-9 using the shift register-based approach of section 9.4.

SP9-8. Erbia Can Tipper/Rotator Control. Implement the station of problem SP6-13 using the shift register-based approach of section 9.4.

SP9-9. Leak Check Station Control. Implement the valve leak check station control of problem SP7-9 using the shift register-based approach of section 9.4.