Northwest State Community College  
Course Information Sheet

# Course Information

Title: PLC 2C

Course Number: PLC131

Credit Hours: 1

Pre-requisite: PLC130

# Description

This course is an in-depth study of the Allen Bradley CompactLogix system and how to use RSLogix5000 programming software to program, monitor, and troubleshoot a system. The primary focus will be on the processor memory structure, the intermediate instruction set, analog I/O modules, and using the RSLogix5000 software. Students will learn all the data structures used across most industrial PLCs, as well as a tag-based system versus an address-based system (SLC-500). Learning how the instructions work within a program will be an essential part of skills development for troubleshooting. A critical part of this course is learning how to search for objects in the L5000 project with RSLogix5000 as a method of increasing troubleshooting efficiency. Students will also learn of the different programming languages used for the ControlLogix platform (Ladder Logic, Structured Text, Sequential Function Charts).

# Learning Outcomes

Upon completion of this course the students will be able to:

1. Manipulate RSLogix5000 to search for ladder & data objects for troubleshooting
2. Manipulate RSLogix5000 to add/modify/display project documentation for troubleshooting
3. Implement Analog I/O module

# Required Material

**Text:**

Electrical Motor Controls for Integrates Systems Workbook, Rockis, Gary & Mazur, Glen A., 5th Edition, American Technical Publishers, ISBN: 978-0-8269-1226-8

**Supplies:**

VOM

# Module 1: AB ControlLogix/CompactLogix Searching and Documentation

In Module 1, the student will learn the basics of documentation and descriptions within an RSLogix5000 project.  The students will learn how to add and modify tag and rung descriptions, as well as alias tags.  Descriptions for Tasks, Programs and Routines will be discussed, as well as descriptions for modules and processors.  The search features of RSLogix5000 will also be discussed, as well as the cross reference functions of the database.  Students will also learn how to find and replace addresses within a project.

Upon completion of this module the student will be able to:

1. Identify the various objects in a CompactLogix project that can be documented.
2. Explain what an alias tag is commonly used for.
3. Identify an alias tag from the ladder view window.
4. Explain how to toggle on/off the rung comments on a ladder display window.
5. Identify an alias tag and the tag it is an alias for, while viewing a ladder logic routine.
6. Determine if it is required to use documentation in a CompactLogix project.
7. Explain what menus allow the user to search for objects in a project.
8. Identify what menu allows the user to navigate to a specific ladder logic rung.

### Module 1 Activites

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 Read Intro to ControlLogix PAC - Chapter 13: Adding Ladder Rung Documentation, pages 333-349

Text Book

 Watch Video: Descriptions Video (7:35)

<https://www.youtube.com/watch?v=3yk0bzduzNo>

 Watch Video: Search and Replace Video (3:29)

<https://www.youtube.com/watch?v=a8whdPQM6cM>

 Watch Video: Searching Video (13:24)

<https://www.youtube.com/watch?v=A_eEwPFvoHY>

 Complete Quiz 131-1

See Quiz PLC131-1 Content Packaging files to upload into an LMS System

 Review Hands-on Lab 131-1.1 and, Lab 131-1.2

See Lab Documents

 Schedule and complete Hands-on Lab 131-1.1

See PLC131 1.1 Lab Document

 Schedule and complete Hands-on Lab 131-1.2

See PLC131 1.2 Lab Document

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# Module 2: AB ControlLogix/CompactLogix Analog Modules

In Module 2, the student will learn how analog signal compare to discrete signals in an industrial control system.  The students will focus on configuring CompactLogix analog input and output modules.   Students will have to interpret the analog module tags.  Electronic keying settings will also be discussed, as well as how to configure the channels of the analog input and analog output modules, as well as the analog combination modules.  Measuring analog signals with test equipment will also be discussed, as well as basic troubleshooting.

Upon completion of this module the student will be able to:

1. Determine what data format the channel values of the 1769-IF4XOF2 analog module are in.
2. Determine how many input channels and output channels are on the 1769-IF4XOF2 analog module.
3. Determine what voltage range is for the 1769-IF4XOF2 analog module channels.
4. Determine what instruction in the CompactLogix system will send information to/from the 1769-IF4XOF2 analog module.
5. Explain which input channels are enabled (by default) on the 1769-IF4XOF2 analog module.
6. Determine what types of Tags are created when the 1769-IF4XOF2 analog module is added to the I/O configuration.
7. Determine if the 1769-IF4XOF2 analog module can do current and voltage sensing on different channels simultaneously.
8. Determine restrictions of the location of the 1769-IF4XOF2 analog module on a DIN rail, with respect to the location of the power supply.

### Module 2 Activities

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 Read Allen Bradley Compact 8-Bit Low Resolution Analog IO Combination Module - Chapter 1 Overview, pages 11 – 16

Text Book

 Read Allen Bradley Compact 8-Bit Low Resolution Analog IO Combination Module - Chapter 2 Quick Start for Experienced Users, pages 17 – 22

Text Book

 Read Allen Bradley Compact 8-Bit Low Resolution Analog IO Combination Module - Chapter 3 Installation and Wiring, pages 23 – 44

Text Book

 Read Allen Bradley Compact 8-Bit Low Resolution Analog IO Combination Module - Chapter 4 1769-IF4XOF2 Module Data, Status and Configuration Channels, pages 45 – 60

Text Book

 Watch Video: Analog Modules Video (6:23)

<https://www.youtube.com/watch?v=xYA0rHukxyk>

 Complete Quiz 131-2

See Quiz PLC131-2 Content Packaging files to upload into an LMS System

 Review Hands-on Lab 131-2.1

See Lab Documents

 Schedule and complete Hands-on Lab 131-2.1

See PLC131 2.1 Lab Document

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