Northwest State Community College  
Course Information Sheet

# Course Information

Title: PLC 1B

Course Number: PLC 127

Credit Hours: 1

Pre-requisite: PLC126

# Description

The course is a study of the installation, programming, and troubleshooting of programmable controlled systems currently used in an industrial environment. The focus will be on installation, programming, engineering, and maintenance tasks performed with PLC systems. The primary PLC used for this class will be the Allen Bradley SLC-500 and CompactLogix, using RSLogix 500, RSLogix5000, and RSLinx software. The topics presented will be learned through online instructional material and hands-on labs.

# Learning Outcomes

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

1. Install basic control system based on the SLC-500
2. Manipulate basic control system based on the SLC-500
3. Troubleshoot an Allen Bradley SLC-500 system
4. Program an Allen Bradley CompactLogix with RSLogix5000

# Required Material

**Text:**

Intro to ControlLogix Programmable Automation Controller, Gary Dunning, 2nd Edition; Publisher Delmar Cengage Learning, ISBN-10: 1-111-53929-4

**Supplies:**

VOM

Screw drivers (Phillips, straight blade)

Wire strippers

# Module 1: Allen Bradley SLC-500 Intermediate Instruction Set

In Module 1, the student will learn the operation of the Allen Bradley SLC-500 data comparison and data manipulation instructions. The student will also configure the Ethernet channel of an SLC-5/05 processor with RSLogix500 and create an Ethernet driver in RSLinx to communicate with the SLC-5/05 processor. Next, we will manipulate RSLogix500 to communicate with the SLC-5/05 processor through the Ethernet port.

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

1. Explain the purpose of a MAC address and an IP address in a computer that is used as a program panel.
2. Explain how to determine the MAC address and IP address on a computer used as a program panel.
3. The operation of an SLC-500 program that uses timers and MOV instructions to change the timer preset value.
4. Explain the purpose of PING command.
5. Explain the difference between floating point and integer numbering system values.
6. The operation of an SLC-500 type of program that is using timers and comparison instructions.

### Module 1 Activities

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 Read SLC-500 Instruction Set Manual – Chapter 3: Comparison Instructions, pages 3-1 to 3-6

Text Book

 Read SLC-500 Instruction Set Manual – Chapter 5: Move and Logical Instructions Overview, pages 5-16 to 5-19

Text Book

 Review PowerPoint: SLC-500 Data Formats

<https://literature.rockwellautomation.com/idc/groups/literature/documents/um/1747-um011_-en-p.pdf>

 Review PowerPoint: SLC-500 Comparison Instructions

See attached power point presentation

 Read Networking In the PLC Industrial Computing Lab

See attached power point presentation

 Watch the video: Create an Ethernet driver in RSLinx (6:20)

<https://www.youtube.com/watch?v=QUWtMwR4dAw>

 Complete Quiz 127-1

See Quiz PLC127-1 Content Packaging files to upload into an LMS System

 Review Hands-on Lab 127-1.1, Lab 127-1.2, Lab 127-1.3 and, Lab 127-1.4

See Lab Documents

 Schedule and complete Hands-on Lab 127-1.1

See PLC127 1.1 Lab Document

 Schedule and complete Hands-on Lab 127-1.2

See PLC127 1.2 Lab Document

 Schedule and complete Hands-on Lab 127-1.3

See PLC127 1.3 Lab Document

 Schedule and complete Hands-on Lab 127-1.4

See PLC127 1.4 Lab Document

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# Module 2: Maintain & Troubleshoot an AB SLC-500 System

We will focus on how to maintain & troubleshoot an Allen Bradley SLC-500 system.  A heavy focus will be on how to identify and diagnose a faulty system.

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

1. Determine the state of SLC-500 outputs when the processor goes into a major fault.
2. Explain what will happen to an operating SLC-500 will if the battery needs to be replaced.
3. Explain how a minor fault affects a running SLC-500 processor.
4. Explain the simplest way to reset a faulted SLC-500 processor.
5. Interpret the data in a cross reference report from within the RSLogix500 application.
6. Explain what types of data addresses in the SLC-500 can be forced by RSLogix500.
7. Explain the order in which a user must do an online programming change (ie. Test, accept, assemble, etc.)

### Module 2

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 Review PowerPoint: Maintenance & Troubleshooting

See attached power point presentation

 Watch video: RSLogix500 Searching in a Project Video (6:44)

<https://www.youtube.com/watch?v=Dgka7hO1H00>

 Watch video: Forcing I/O in RSLogix500 (7:52)

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

 Watch video: Online Programming with RSLogix500 (3:33)

<https://www.youtube.com/watch?v=HvfBVoP7iDA>

 Complete Quiz 127-2

See Quiz PLC127-2 Content Packaging files to upload into an LMS System

 Review Hands-on Lab 127-2.1, Lab 127-2.2, and Lab 127-2.3

See Lab Documents

 Schedule and complete Hands-on Lab 127-2.1

See PLC127 2.1 Lab Document

 Schedule and complete Hands-on Lab 127-2.2

See PLC127 2.2 Lab Document

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# Module 3: Basic Allen Bradley CompactLogix Operation

In Module 3, we will focus on the hardware and communication ports on an AB CompactLogix system. We also will use RSLogix5000 to create and download a program to the CompactLogix processor.

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

1. Explain the I/O addressing structure on a CompactLogix system.
2. Explain the rules of placing I/O modules to the left of the power supply on a CompactLogix system.
3. Interpret the CompactLogix processor diagnostic indicators.
4. Explain the purpose of tasks, programs and routines in the RSLogix5000 project.
5. Explain what position the keyswitch must be in for Online Programming.
6. Explain what is stored in Controller Tags in the CompactLogix.
7. Explain where the input and output Tags are located in the ControlLogix memory.
8. Explain the operation of a CompactLogix program that contains relay and timer type instructions.
9. Explain what data type would hold a value that contains a decimal point.

### Module 3

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 Read How to view the Instructional Videos within RSLogix5000

See attached power point presentation

 Watch video: Getting Started with RSLogix5000 (34:28)

<https://www.youtube.com/watch?v=Fw1MgwbolJY>

 Watch video: RSLogix Emulate5000\_RSLinx Setup in a Virtual Machine (7:52)

<https://www.youtube.com/watch?v=ZP0yxqsVLng>

 Watch video: RSLogix Emulate5000\_RSLogix5000 Setup in a Virtual Machine (15:48)

<https://www.youtube.com/watch?v=1T7qduc4qCU>

 Complete Quiz 127-3

See Quiz PLC127-3 Content Packaging files to upload into an LMS System

 Review Hands-on Lab 127-3.1, Lab 127-3.2, and Lab 127-3.3

See Lab Documents

 Schedule and complete Hands-on Labs 127-3.1

See PLC127 3.1 Lab Document

 Schedule and complete Hands-on Labs 127-3.2

See PLC127 3.2 Lab Document

 Schedule and complete Hands-on Labs 127-3.3

See PLC127 3.3 Lab Document

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