

K-05b

ELECTRICIAN TRAINING

TRAINER'S GUIDE

Duty K: PLC (Modicon)

K-05b: Modify PLC Program

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Instructions To The Trainer

1. The Learner will contact you when ready to practice modifying a PLC program.
2. Be prepared to demonstrate the steps for this task.
3. Ask the Learner to contact the Evaluator when ready for the Skill Check.



Skill Objective

Upon notification of the need for a permanent or temporary modification to a machine program, modify the program.

Task Standards

1. Modification of the program results in the machine running according to specifications.
2. Temporary modifications are removed, and the program is modified or returned to the original condition.

What The Learner Will Need

This section contains the safety information, tools, and resources you will need before modifying a PLC program.



- Follow all Caterpillar Facility Safety Standards when performing this task in the plant.
- You will perform this task online. Perform the steps carefully; mistakes could result in injury to personnel or damage to the equipment.
- Use caution when working around the PLC; high voltage is present on the inside of the PLC cabinet door and near the I/O chassis.



- P190 programmer (Typically used with the 184, 384, 484, 584, 884, and 984 processors.)
- P230 programmer (Used with the 984 processor and the 184, 384, 484, 584, and 884 processors in the P190 emulator mode.)
- PLC communication cable
- Tape Loader Tape (P190 only)
- Program Loader Tape (P190 only)
- Modicon Bus Plus (Used with all processors.)



- Basic Help Keys, available on programmer software
- Modsoft Programmer User's Manual (GM-MSFT-001 Rev. F)
- Modicon P230 Quick Key reference card
- Ladder Diagram printout
- Modbus Plus Data Highway Chart
- Machine Print



Practice Set-Up

The Learner may perform the following practice to help prepare for the Skill Check. Set up the practice for the Learner. Assist the Learner during the practice, if necessary; answer any questions concerning the task; and be prepared to demonstrate the task to the Learner. Make sure the Learner follows safe work practices while practicing the task.

Practice 1

Provide access to all different types of PLCs and Programmers in the shop. Allow the Learner to observe all Modicon PLC types and learn where the MEMORY PROTECT KEYLOCK on each of the units is located. Ask the Learner to find the “Power On” or “Power” light on all PLCs and to identify the I/O module “Active” lights on all PLC I/O module types. Ask the Learner to discuss the safe work practices that pertain to working around the PLC with a programmer in the shop.

Practice Objective 1

The Learner should become familiar with the various types of Modicon PLCs in the shop including the 184, 384, 584, 884, and 984. The Learner should be able to find the MEMORY PROTECT KEYLOCK on each unit. The Learner should be able to identify the I/O boards and locate the “Active” lights on input and output boards.

Practice 2

Provide the Learner with experience making modifications to a node in a network on one of the machine programs. Have the Learner do this with both types of programmers (P190 and P230). Supervise this activity in the shop because it can be hazardous if not performed correctly. Have the Learner practice changing a contact from normally-open to normally-closed and back again. Ask the Learner to describe safe work practices required for this task.

Note: If the Learner must turn the MEMORY PROTECT KEYLOCK off to demonstrate the activity, verify that any changes to the program are changed back to the original program settings.

Practice Objective 2

The Learner should be able to enter a network and make changes to a specific node. With your supervision, the Learner should practice “forcing” an output coil on and off. The Learner should point out the corresponding output board indicator light as it turns on and off.

Practice 3

Have the Learner practice modifying machine programs from both ONLINE and COMBINED menus on the job site with your supervision. The Learner should locate a remote address using the routing process as defined in the Skill Development Guide E-04: Connect and Operate Programmer. Have the Learner discuss safety issues when making ONLINE modifications.

Practice Objective 3

The Learner should be able to locate a remote address from the ONLINE menu for modifications. The Learner should demonstrate the routing process as specified in Skill Development Guide E-04: Connect and Operate Programmer.

Practice 4

Have the Learner practice identifying the network number for a problem device. Ask the Learner to discuss safety issues when working around a machine.

Practice Objective 4

The Learner should locate a “problem” device on a machine and note its location ID number. The Learner should locate that device on the Machine Print and note the register reference number. Using the register reference number from the schematic, the Learner should locate the device in the Ladder Cross Reference of the Ladder Diagram printout and note the network reference number. The Ladder Cross Reference will tell the Learner where the device is located in the ladder logic program. The network number is the one the Learner will need when modifying the program.

Next Step

Allow the Learner to continue practicing and developing skills needed to demonstrate the task. The Learner should ask the Evaluator to schedule a Skill Check whenever he or she is ready to demonstrate the task unaided and meet all the task standards and safe work practices.

