

K-10a

ELECTRICIAN TRAINING

SKILL DEVELOPMENT GUIDE

PLC (Allen-Bradley)
K-10a: Replace Processor

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Task Preview

Replace Processor

Processors are replaced in the event that they are faulty or when an upgrade needs to be installed. Before shutting down a machine, the replacement processor should be located. Prior to removing the processor, the Learner must verify that a copy of the program is available on a backup disk because the program will need to be loaded after the replacement unit is installed. DIP switches will need to be set on the replacement unit to match the settings on the original unit. If a memory module is present, the module has to be transferred to the new processor.

The Learner must be aware of the hazards associated with electrostatic discharge (ESD) during this task and must be sure that the correct program is reloaded after the processor installation. If the wrong program is loaded, the machine may not respond to the safety devices or may be damaged.

How your skills will be checked

The Skill Check will require you to replace a processor. All tools, materials, and resources will be available. The Evaluator will verify that your demonstration meets the skill objective by observing or measuring each task standard. You must demonstrate safe work practices during the Skill Check. Contact your Evaluator whenever you are ready for the Skill Check.



Skill Objective

If a processor is faulty or if a new installation is required, replace the processor.

Task Standards

1. You configure the replacement processor's DIP switches to match the original unit.
2. The program that you reload is identical to the program running prior to the installation.
3. The machine operates within specifications and meets production requirements.

What You Will Need

This section contains the safety information, tools, and resources you will need before replacing a processor.

SAFETY FIRST

**DON'T TAKE
CHANCES**

- Follow all Caterpillar Facility Safety Standards when performing this task in the plant.
- Use caution when working around the PLC; high voltage is present on the inside of the PLC cabinet door and near the input/output (I/O) chassis.
- Guard against ESD damage. Remain in contact with an approved ground point while handling the module. Do not touch the backplane connector or connector pins.
- The power to the chassis must be off before removing the processor. Check to ensure that the status indicators are not illuminated.
- Be careful when working near moving or rotating machinery.
- Wear safety glasses and hearing protection in assembly and production areas.



- PC equipped with PLC software
- PLC replacement unit
- Interconnect cable
- Processor Keyswitch Key (if the processor is not in the REM position)
- Password (if necessary)
- Basic electrical hand tools
- Copy of current PLC program
- Floppy disk (to back up the program if a current copy is not available)
- Electrostatic grounding device



- User's Manual for replacement processor



Task Steps

Replace Processor

1. **Verify that there is a current copy of the processor's program.**
 - Ask the Electrical Technician responsible for the machine if a current copy of the program is available. If not, back up the program to save the processor's memory.
 - If there is any doubt about the current copy of the processor's program, then back up the program.
2. **Locate the replacement processor.**
 - Processors are stored in the crib.
 - Ensure that the replacement processor is compatible with the existing software and hardware.
 - The Catalog Number on the faceplate of the replacement unit must match the Catalog Number on the faceplate of the original unit.
3. **Stop the machine cycle and turn off the power to the machine.**
4. **Turn off or remove the power to the processor.**
 - All the status lights should be off.
5. **Remove the original processor from the I/O chassis.**

WARNING: Make sure that the power to the chassis is turned off before removing the processor.

- Note the location of the cables for reconnection.
- Disconnect all the cables from the processor's ports.
- Lift the locking tab (or bar) and the ejector tab, and then slide the processor from the I/O chassis.

WARNING: The hazards associated with ESD exist with the next step. ESD can damage integrated circuits or semiconductors if you touch the backplane connector or connector pins. ESD can also damage the processor when you set the DIP switches. Wear a properly grounded wrist strap when handling the processor. *See Figure 10-1.*

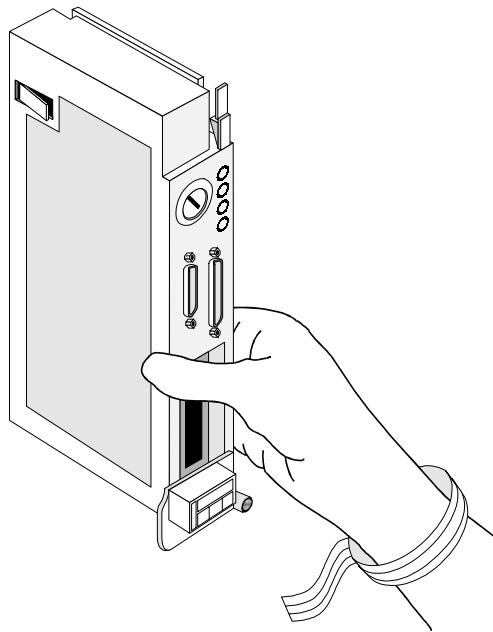


Figure 10-1

Electrostatic Grounding Device

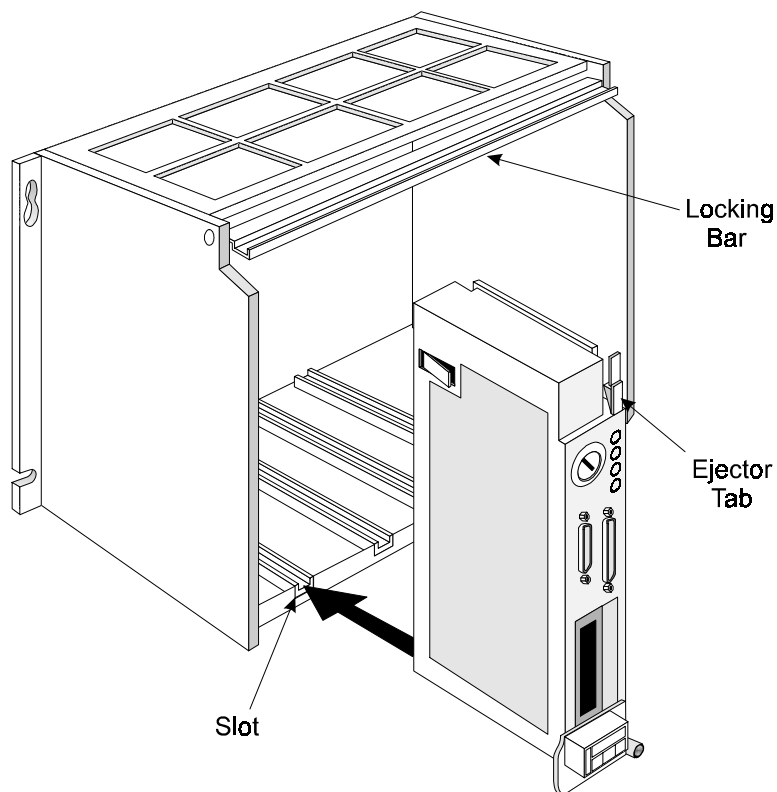
- 6. Set the DIP switches on the replacement processor.**
 - DIP switches are located on the top, bottom, and, possibly, the side of the processor.
 - You must set DIP switch settings on the replacement unit identically to the settings on the original unit. You may either set the switches to match the settings on the original unit or refer to the processor's User's Manual for correct settings.

7. Install the Memory Module in the replacement processor.

- The Memory Module is housed behind a cover plate, to the right of the communication ports on the front panel.
- Remove the Memory Module from the original processor and install the module in the replacement processor.

8. Install the replacement processor into the I/O chassis.

- Slide the processor in the left-most slot of the I/O chassis.
- Press down on the ejector tab and then close the locking tab (or bar) over the processor. *See Figure 10-2.*



**Figure 10-2
Processor Installation**

9. **Reconnect the cabling to the communication ports.**
10. **Turn on the power to the processor.**
11. **Load the processor's program.**
12. **Turn on the power to the machine.**
13. **Cycle the machine to verify that the program is functioning properly.**
14. **Exit the PLC-5 software.**
 - Press the <Return to Menu> function key. The PLC-5 PROGRAMMING SOFTWARE screen displays.
 - Press the <Exit Sys> function key. The ALLEN-BRADLEY MAIN MENU INTERFACE screen displays.
15. **Disconnect the PC from the PLC processor.**
 - Power down the PC.
 - Remove the interconnect cable from the PLC communication port.



Concept Check

Replace Processor

Answer the following questions to check your understanding of replacing a processor. Circle the correct answer in each question. Then compare your responses with the answers at the bottom of this page. Some of the questions may have more than one correct answer. If you have difficulty answering a question, review the Skill Development Guide or ask your Trainer for assistance.

1. Before removing the processor, you must
 - a. remove power from the chassis.
 - b. verify that a current copy of the PLC program exists.
 - c. protect against ESD.
 - d. all of the above
2. ESD damage can result from contact with the backplane connector or connector pins.
 - a. True
 - b. False
3. To ensure that the DIP switches on the replacement processor are set correctly,
 - a. set the switches to match the settings on the original processor.
 - b. do not reset the switches.
 - c. refer to the instructions in the processor's User's Manual.
 - d. a or c
4. When replacing a processor with a similar unit, ensure that the Catalog Number on the faceplate of the replacement processor matches the number on the original processor.
 - a. True
 - b. False

Answers: (1. d 2. a 3. d 4. a)

Next Step

If you are ready to demonstrate the task now, ask your Evaluator or Trainer to schedule the Skill Check. However, if you need to practice some of the steps first, continue to the next section.



Practice

The following practice will help prepare you for the Skill Check. Ask your Trainer to set up the practice for you. After you complete a practice, ask your Trainer to check your work.

Practice

Your Trainer will designate a PLC location for the replacement task. Make sure the power to the processor and machine is turned off before removing the processor. While your Trainer observes, demonstrate and explain the steps for replacing the processor. After installing the processor, reload the PLC program and verify machine operation by cycling the machine.

Be prepared to demonstrate safe work practices during this activity.

Practice Objective

You should replace the processor with a compatible unit. After you have reloaded the program, the machine should have operated within specifications. You should demonstrate the safe practices associated with powering down before processor removal and protecting against ESD.

Next Step

Continue to practice until you are ready for the Skill Check. When you are ready to demonstrate the task, ask your Evaluator or Trainer to schedule the Skill Check.