K-07a

ELECTRICIAN TRAINING

SKILL DEVELOPMENT GUIDE

PLC (Allen-Bradley)
K-07a: Replace I/O Module
Issued 01/01/98

Task Preview

Replace I/O Module

A Learner replaces an input/output (I/O) module if the module is determined to be faulty or when new circuitry has been added to the PLC. The Catalog Number and Series information on the faceplate of the replacement unit must be identical to the original unit. With Intelligent I/O modules, the Learner must configure the DIP switches and PC jumpers to match the original unit.

Before replacing I/O modules, the Learner must ensure that the main disconnect is OPEN and must remove primary AC power from the power. Failure to remove power to the I/O chassis could result in injury to personnel, damage to the equipment, or unexpected machine movement. The Learner must also observe the precautions associated with electrostatic discharge (ESD) when replacing a module.

How your skills will be checked

The Skill Check will require you to replace an I/O module. 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 an I/O module is faulty or when new circuitry has been added to the PLC, replace the I/O module.

Task Standards

1. The replacement I/O module's Catalog Number and Series information matches the original unit.
2. If the replacement I/O module is an Intelligent I/O module, you configure the replacement unit to be identical to the original unit.
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 an I/O module.

- 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 I/O chassis.
- Be careful when working near moving or rotating machinery.
- Wear safety glasses and hearing protection in assembly and production areas.
- 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 main disconnect must be OPEN. You must not remove I/O modules from or insert them into the I/O chassis when the primary AC power is applied to the power supply. Doing so could result in injury to personnel, damage to circuitry, or unexpected machine movement.

- Basic electrical hand tools
- Replacement module
- PLC location
- Electrostatic Grounding Device

- User's Manual for I/O Module

Task Steps

Replace I/O Module

WARNING! I/O modules must not be removed when power is supplied to the I/O chassis.

1. Turn off the power to the I/O chassis.

- Do not remove I/O modules when the primary AC power is applied to the power supply. Always remove power before removing or inserting the module. Failure to do so could result in injury to personnel or unexpected machine operation.

2. Remove the module from the I/O chassis.

- Pull up on the module group cover.
- Push up on the locking tab and swing the wiring arm down.
- Pull up on the release lever.
- Pull the module out of the I/O chassis slot.

3. Locate the replacement module.

- Replacement modules are located in the crib.
- Make sure you select the correct module for replacement. If you install the wrong module, the module could incur damage; also, the device that the module is driving could be damaged.

- The Catalog Number and Series information on the replacement unit's identification plate must be identical to the information on the module you are removing. *See Figure 7-1.*

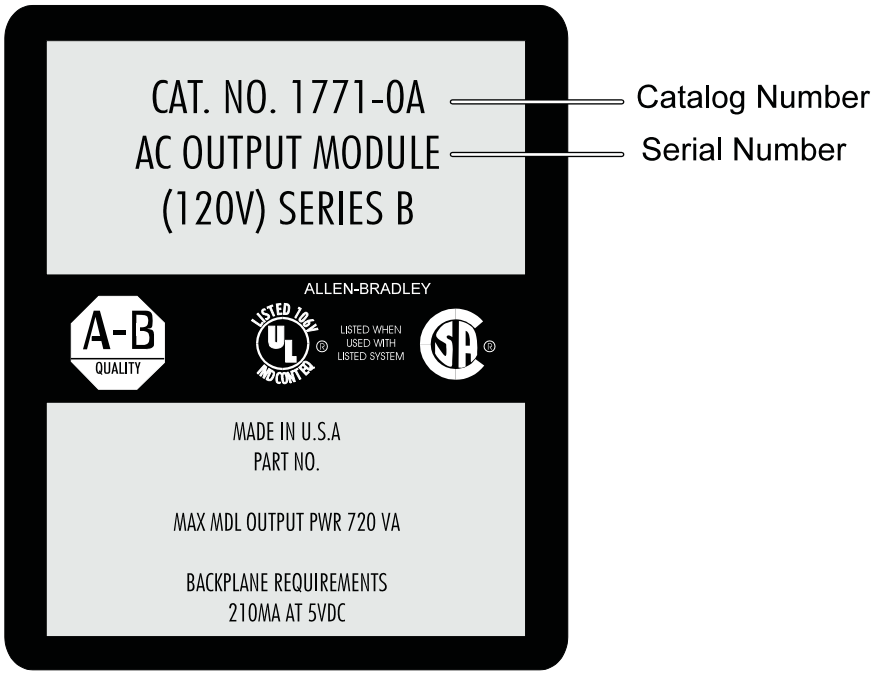

Figure 7-1
Module Identification Plate

- 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.
- If the replacement unit is an Intelligent I/O module, remove the coverplates from the original unit to see how the DIP switches and PC jumpers are configured. Then, remove the coverplates on the replacement module and configure it to match the original module. Replace the coverplates.

4. Insert the replacement module into the I/O chassis.

- Slide the module into the slot until it is securely seated in the backplane connector.
- Return the swing arm to an upright position and lock it.

5. Restore power to the power supply.

- I/O modules usually have RUN and FLT (fault) status indicator lights. At power-up, the green RUN indicator illuminates and remains on. If a fault occurs, refer to the I/O module's User's Manual for fault causes and corrective actions.

6. Cycle the machine to ensure that the PLC program is operating properly.

Concept Check

Replacing an I/O Module

Answer the following questions to check your understanding of replacing an I/O module. 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. Failure to remove the power to the I/O chassis before removing the module could result in

    a. unexpected machine movement.

    b. damage to the circuitry.

    c. injury to personnel.

    d. all of the above

2. The Catalog Number on the faceplate is the only information on the faceplate that you need to check to ensure you are selecting the correct replacement module.

    a. True

    b. False

3. You needed to replace a 120-volt output module. You installed a 24-volt output module by mistake. This could damage the

    a. module.

    b. device the module is driving.

    c. PLC.

    d. none of the above

Answers: (1. d 2. b 3. a, b)

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

Practice replacing an I/O module. Your Trainer will designate a PLC location for the practice. While your Trainer observes, demonstrate and explain the steps for replacing an Intelligent I/O module. Your Trainer will ask you to select and configure the module. After installing the module, verify that the PLC program is working by cycling the machine.

Be prepared to demonstrate safe work practices during this activity.

Practice Objective

You should select the appropriate module and configure the module to match the original module. You should demonstrate safe work practices during the task steps.

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.