

# **K-06a**

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## **ELECTRICIAN TRAINING**

### **TRAINER'S GUIDE**

**Duty K: PLC (Allen-Bradley)  
K-06a: Troubleshoot I/O Module**

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## **Instructions To The Trainer**

1. The Learner will contact you when ready to practice troubleshoot I/O module.
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**

If an I/O module's status lights indicate an abnormal condition or if a "FAULTED" message is displayed, troubleshoot the I/O module.

### **Task Standards**

1. The Learner identifies the I/O module problem.
2. The Learner recommends the appropriate corrective action.

## What The Learner Will Need

This section contains the safety information, tools, and resources you will need before troubleshooting I/O modules.



- 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.
- 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
- Interconnect cable
- Digital Voltmeter (to check the I/O module or device performance)
- Oscilloscope (to check the I/O module or device performance)
- Basic electrical hand tools
- Processor Keyswitch Key (if the processor is not in the REM position)
- Password (if necessary)



- Electrical Schematics
- Ladder Diagram printout
- User's Manual for I/O Module



## 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

Designate a PLC location to practice troubleshooting an I/O module. The Learner should practice the task online. Insert a problem into the hardware or software. Use one of the following problems or create a problem that would require troubleshooting:

Digital I/O Module:

- Place a known bad board into the system.

Intelligent I/O Module:

- Place a known bad board into the system.
- Change a parameter(s) to an invalid or incorrect value.
- If it is possible, perform this practice in the shop. If not, set up the practice in the Lab. Change an address in the BLOCK WRITE INSTRUCTION to the wrong address.

*Example:* 130 is the address of the left slot in Module Group 3 of I/O Rack 1. Address 131 is the address of the right slot in Module Group 3 of Rack 1. This is a commonly overlooked problem.

- Set the DIP switch or jumper plug incorrectly.

*Example:* You have an Analog Output Card with the following ranges: -10 to +10, 0 to +10, and 0 to +5. Set the jumper to an incorrect output voltage range.

Ask the Learner to demonstrate the safe work practices while performing this task.

### Practice Objective

The Learner should locate and identify the problem and recommend the appropriate action. The Learner should demonstrate safe work practices.

## **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.

