

K-09a

ELECTRICIAN TRAINING

SKILL DEVELOPMENT GUIDE

PLC (Allen-Bradley)

K-09a: Troubleshoot Processor

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Task Preview

Troubleshoot Processor

Problems associated with the PLC are either hardware-related or software-related, such as invalid data. The processor's status indicators and the program's fault codes help you determine what is causing the processor to fault. A fault description, when used with the status file word information, helps determine the cause and the location of the fault.

Failure to identify a problem could adversely affect the quality of a product and cause excessive downtime.

How your skills will be checked

The Skill Check will require you to troubleshoot 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's status lights indicate an abnormal condition or if a "FAULTED" message is displayed on screen, troubleshoot the processor.

Task Standards

1. You identify the processor's problem.
2. You recommend the appropriate corrective action.
3. The machine operates within specifications after you correct the problem.

What You Will Need

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



- 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
- Processor Keyswitch Key (if the processor is not in the REM position)
- Password (if necessary)



- User's Manual for processor



Task Steps

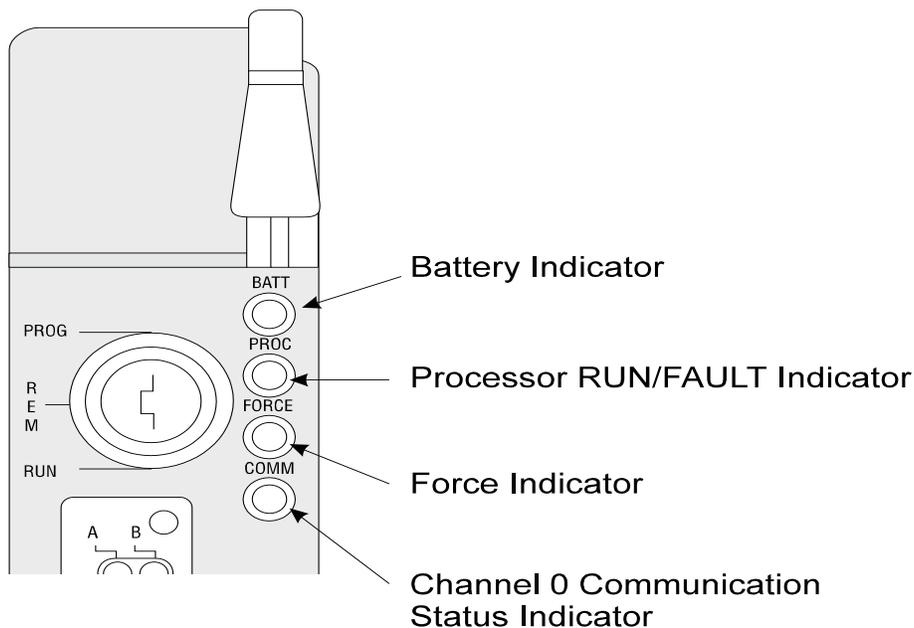
Troubleshoot Processor

1. **Using the interconnect cable, connect the PC to the PLC.**
 - When connecting to a 5/15 or 5/25 - Connect the PC cable to the PEER COMM INTFC communication port (that is for the programming terminal) on the front panel of the PLC.
 - When connecting to a 5/40 - Connect the PC cable to the Data Highway+ communication port Channel 1A on the front panel on the PLC. If communication is not established, connect to the Channel 2A.
2. **Turn the PC power on.**
 - The ALLEN-BRADLEY MAIN MENU INTERFACE screen displays.
 - If the PC boots up to DOS, perform these steps: At the C:\ prompt, type **cd\ipds**. Press <Enter>. Type **abmenu** and then press <Enter>. The ALLEN-BRADLEY MAIN MENU INTERFACE screen displays.
3. **Press the <PLC-5> function key.**
 - The PLC-5 PROGRAMMING SOFTWARE screen displays.
 - There are two paths for connecting to the PLC. You can go through the WHO screens or go directly online to the PLC station. When you are operating at a stand-alone station, you can go directly online. Electricians frequently use the WHO screens when connected to a data highway. If the PC is connected to a highway, go to step 5. If not, go to step 7.
4. **Press the <Who> function key.**
 - DH+ NETWORK MENU displays.
5. **Press the <Who Active> function key.**
 - The WHO ACTIVE - Active Station Identification screen displays the stations on the highway.
 - Select the station you need to connect to before going online.

6. Go online.

- Cursor to the PLC station you need to connect to, using the arrow keys.
- Press the <Online Program> function key.
- The status of the processor will be “FAULTED” when you go online. If the processor’s memory has been corrupted, you will not be able to connect online without using the Keyswitch to go into the PROG Mode and then clearing the memory. This does not indicate a hardware fault.

7. Check the processor’s status indicators. See Figure 9-1.



**Figure 9-1
Front Panel Status Indicators**

- The front panel of the processor has four status indicators:

BATT Indicator	lights red when battery is low
PROC Run/Fault	lights green when run running; lights red when faulted
FORCE INDICATOR	lights amber when I/O forces are enabled
COMM Indicator	lights green when the channel is communicating
- Refer to the “Using Status Indicators” section of the processor’s User’s Manual for descriptions of the problems and recommended actions associated with these indicators.

8. Access the data table and monitor the fault codes.

- The fault codes displayed in the Status File are listed by number and description in the “Processor Status File” section of the User’s Manual. Refer to the manual for a description of the fault. Status file word 13 identifies the file where the fault occurred. Status file word 14 identifies the rung where the fault occurred.

9. Clear the major fault.

- You may clear a major fault using either of these methods: Turn the keyswitch on the processor from REM to PROG to RUN or use the <Clear Major Fault> function key.
- If the fault is resetable, the processor returns to the PROG mode. If processor does not reset, go to step 12.

10. Press <Esc> to return to the Ladder Main Menu.

11. Change the processor’s mode.

- Press the <Change Mode> function key or use the keyswitch on the front panel of the processor.
- Press the <Rem RUN Mode> function key. The screen prompts asks you to confirm that you want to change modes.
- Press the <Yes> function key to confirm that you want to change modes.

12. Verify operation.

- If the processor faults again, interpret the fault code to determine if the problem is a hardware problem or a software problem. Refer to the “Processor Status File” and “Troubleshooting” sections of the User’s Guide for fault code information.
- If the problem is software-related, troubleshoot the program using the fault code information displayed in the “Processor Status File.”
- Reload the program if the problem is data-related. Typical data-related faults could occur because of invalid data or data exceeding an anticipated range. Updating the data in the program may correct the problem.
- If the problem is hardware-related, de-energize, reseal the processor, and then energize the processor. If the hardware fault remains, replace the processor.

13. 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.

14. Disconnect the PC from the PLC processor.

- Power down the PC.
- Remove the interconnect cable from the PLC communication port.



Concept Check

Troubleshoot Processor

Answer the following questions to check your understanding of troubleshooting 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. When you attempt to go online and a “FAULTED” message displays, your first step should be to
 - a. press <Clear Major Fault>.
 - b. monitor the Data Table.
 - c. check the processor’s status indicators.
 - d. turn the power off, then on.
2. Clear a major fault by
 - a. turning the processor’s keyswitch from REM to PROG to RUN.
 - b. pressing the <Clear Major Fault> function key.
 - c. clearing the memory and reloading the program.
 - d. a, b, or c
3. If the processor faults when you attempt to go online, you probably have a hardware problem.
 - a. True
 - b. False

4. You can determine the file where the fault occurred by reading the fault description and looking at status word file
 - a. 12.
 - b. 13.
 - c. 14.
 - d. 15.

5. You can determine the rung where the fault occurred by reading the fault description and looking at status word file
 - a. 12.
 - b. 13.
 - c. 14.
 - d. 15.

Answers: (1. c 2. d 3. a 4. b 5. c)

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 processor for you to troubleshoot. The Trainer will have set up a hardware or software problem for the troubleshooting task. While your Trainer observes, demonstrate and explain the steps for checking the processor's indicator lights and monitoring the fault codes. Identify the problem and recommend the corrective action. After correcting the condition, run the program to verify machine operation.

Be prepared to demonstrate safe work practices during this activity.

Practice Objective

You should identify the problem. The processor should operate without displaying fault messages. You should demonstrate safe work practices.

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.

