

# AUTOMATION

## LEVEL I

WE IMPROVE WORKPLACE SAFETY & PERFORMANCE

### TRAINING DESCRIPTION:

This program is designed for an entry level maintenance person or a seasoned veteran who is already familiar with motor controls. Whether your work involves facility maintenance, production maintenance or HVAC controls, automation plays a key role. This program begins with an overview of different types of sensors including thermocouples, RTDs, photo-electric devices, capacitive proximity switches, inductive, proximity switches, and introduction to programmable logic controllers. Regardless of the manufacturer, PLCs have four basic parts which include the power supply, the central processing unit, the input/output section, and some type of programming device. We will break down each of these key components in a basic, easy to understand format. We will concentrate on understanding the sections from a troubleshooter's aspect. During the discussion, different brands of PLCs will be introduced to show how similar they are to each other. Once the student fully grasps the basics, then the course continues to accelerate. The input/output section is examined in greater detail.

### TRAINING BENEFITS:

- Technical qualifications are clearly established.
- Safer work environment; trained workers have less accidents.
- Reflects a positive image of the company.
- Applicable skills are available upon return to the workplace.

### TRAINING TOPICS:

#### TEMPERATURE SENSORS

- Thermocouples
- RTDs

#### PHOTO-ELECTRICS

- Reflective
- Retro-Reflective
- Diffused
- Fiber Optics
- Troubleshooting Tips

#### PROXIMITY SWITCHES

- Inductive
- Capacitive
- Ultra-Sonic
- Troubleshooting Tips

#### PLCs

- Advantages of PLCs
- Basic Component Operation
- Input/Output Modules
- Ladder Logic vs. Ladder Diagrams
- Hardware Troubleshooting
- Common Instructions
- Timers
- Counters
- Addressing
- Troubleshooting Using the Program
- Troubleshooting Without Documentation

#### HANDS-ON PLC LABS

- One Output with One Input
- Logic Change
- Two Outputs with One Input
- Three-Wire Control with a Motor Starter
- Add Auxiliary Contacts
- Light On When Running
- Light On When Not Running
- Timers/Counters
- Proximity Switches
- Hands-On Wiring of All Components
- Hands-On Troubleshooting During Labs

#### CLASS DISCUSSION AND REVIEW

*REMEMBER:* Attendees should bring a multimeter, preferably the one they use on the job, with them for this hands-on training.

4-DAY  
TRAINING

CLASS SIZE: UP TO 14  
CLASS LENGTH: 24 HOURS  
CLASS NUMBER: N\_A514

**Lewellyn**  
TECHNOLOGY