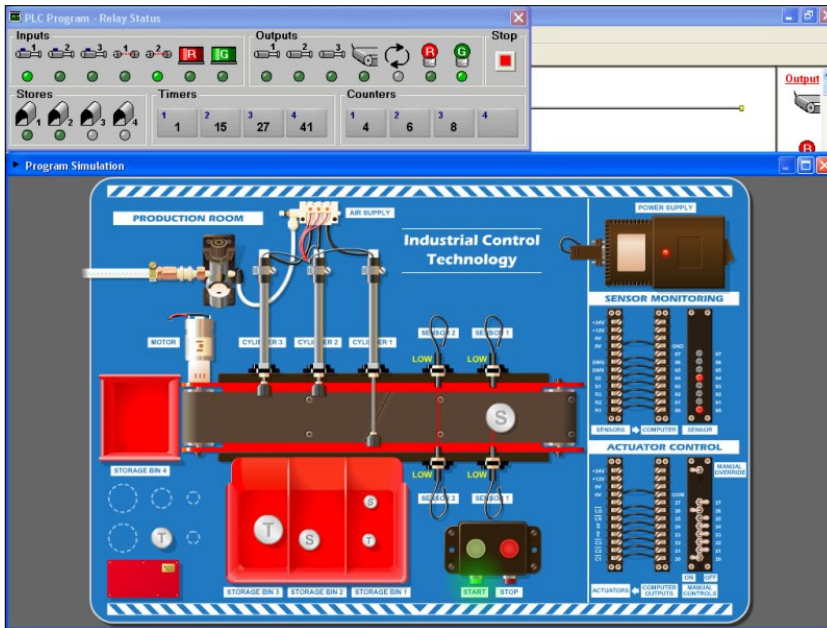# Industrial Control Technology (Engineering Unit)

- Use a counter in a ladder logic program.
- Use a timer to delay lighting a lamp after a button is pressed.
- Adapt a ladder logic program to give indication of the width of a part on a conveyor.
- Create a program that will automatically sort parts according to their width.

Each lesson is designed to meet a number of performance objectives. These include academic, technical and occupational objectives. The lessons are written in such a way as to enable a student to attain the performance objectives, with continuous assessment activity questions and assessment test questions linked to these in order to provide a measure of true competency.

The performance objectives are used by the ClassAct or ClassCampus management systems to generate a comprehensive portfolio of student reports.

The items supplied with this instructional unit include:
- 12 Manufacturing Systems (Gearbox) Kits
- On-screen Student Curriculum CD
- Instructor's Guide

Additional items required:
- ST290/40 Industrial Control Technology
- Computer

This is one of a series of instructional curriculum units designed specifically to operate within a lockstep environment where all students carry out assignments simultaneously within the same topic area. It can be run independently, or as an ideal addition to our ScanTEK Technology Program.

This unit makes use of hardware supplied with the ScanTEK technology module. It includes 10 lessons of on-screen curriculum materials in an html format. These can be delivered via a LAN using our ClassAct classroom management system or via the Internet using our ClassCampus management system.

The curriculum includes continuous assessment, assessment tests and a workbook journal to create a portfolio of work during the lessons. Typical activities include hands-on investigations, problem-solving, and group projects.

Each lesson contains between one and two hours of study. A lesson typically begins with a PowerPoint presentation that provides students with background information required to complete the rest of the lesson. If used with our ClassAct SRS system, questions integrated into the PowerPoint can be tracked as each student responds on their handheld keypad.

Demonstration activities are carried out by the instructor using purpose built hardware. Students carry out hands-on activities using a software simulation of the hardware. The students also have an opportunity to verify their solutions using the hardware.

Where appropriate, research activities that include the use of multimedia explorers are also incorporated.

This instructional unit uses a unique software simulation of our conveyor belt manufacturing system hardware. This enables the whole class to carry out activities in the same topic areas at the same time.

Students create ladder logic programs to control devices on the conveyor belt using a graphical-based programmable logic control (PLC) editor. These programs can be used to control either the hardware or the simulator. Actuator devices include a conveyor belt motor, pneumatic cylinders and indicator lamps. Sensing devices include start/stop buttons, pneumatic cylinder reed switches and infrared beam sensors.

Topic areas include:
- Introduction to Industrial Control and Manufacturing
- Industrial Controllers
- Human Versus Machine
- Logic (AND, OR, and NOT)
- Truth Tables and Step Logic
- Latching Actuators
- Counting Parts
- Timing Events
- Measuring Part Width
- Problem Solving – Sorting Parts

Activities include:
- Simulate custom manufacturing by building models.
- Construct ladder logic programs.
- Investigate the sequence of events for a PLC to activate an actuator.
- Identify how to read and construct truth tables.
- Build a latching program to control an actuator.
- Complete a ladder logic program for an airlock control system.