

Description

A range of applications designed to teach students how to understand the programming and operation of Programmable Logic Control.

Many manufacturing and process industries are now using PLCs to manage their assembly lines and process applications to achieve higher productivity and reliability.

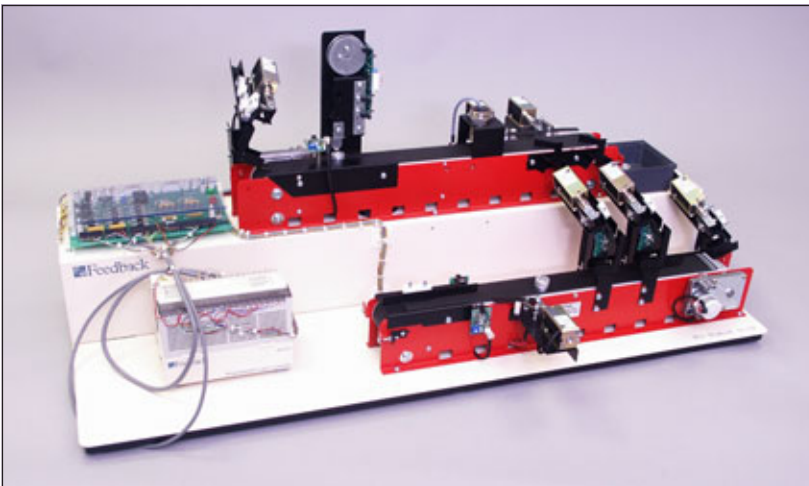
There is therefore a growing need for engineers and technicians who understand the complexities of PLC and who can program and maintain these systems.

Features

- Industrially relevant PLC applications
- Fully documented and supported teaching materials (for Mitsubishi and Allen Bradley PLCs)
- Simple parts assembly applications
- PLC control for advanced process systems with Analogue and Digital control scenarios
- A range of applications that can be interfaced to most modern PLCs

Dual conveyor parts selection PLC workcell with assembly task

34-120



This system may be purchased as a complete dual conveyor system or as an extension to the single conveyor system. It extends the parts selection task into a simple assembly process.

Plastic and metal components are selected by size and are fed onto the chutes for dispensing into a final assembly task where they are combined with a second component. The finished product is then stored by material type or type of assembly.

The added complexity of this dual conveyor system, compared with the 34-100, allows greater study of PLC's in process control systems. Students are required to consider in more detail the structure of control systems. More complex control scenarios can be developed using combinations of timers and counters with master and zone control functions.

The unit is fully self-contained comprising a power supply, interface unit and a range of sensors and solenoid actuators. The interface circuits allow the conveyor system to be operated from any standard industrial PLC system using 24V dc logic levels. There is space within the interface board to drive the optional width detector 34-110 (see page 3) or an additional user defined detector.

The system requires a PLC capable of driving the following inputs and outputs:

Inputs to PLC

Optical proximity - 6, Vertical gauge - 2, Material Detector - 1, Start button - 1, Stop button - 1.

Outputs from PLC

Conveyor Motor - 2, Gauge Motor - 1, Dispenser solenoid - 4, Parts selector/ejector - 4.

Features

- Part selection by logical detection
- Induction and opto-electronic sensors
- Component sort and assembly
- Interfaces to most major PLC types
- Comprehensive courseware manual

Curriculum Coverage

- Fundamentals of logic
- Basics of PLC programming
- Developing ladder logic programs
- Programming timers
- Programming counters
- Structure of control systems
- Sequencer programmes
- Jump instructions and subroutines
- Combined counter and timer functions
- PLC installation practices

Power supply

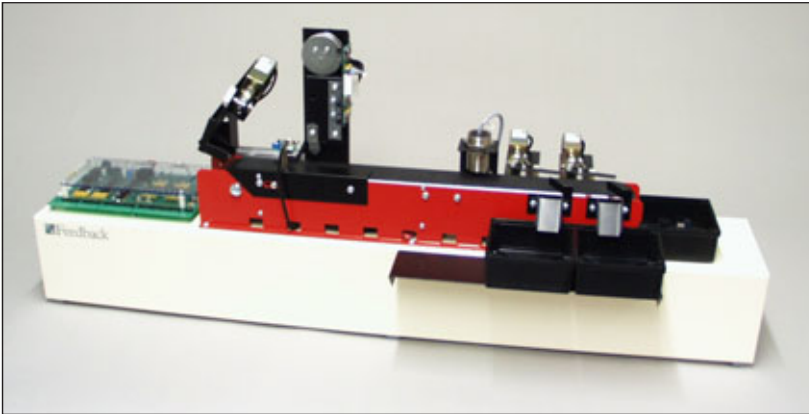
220/240V 110/120V 50/60Hz
100VA.

Specification for 34-120 and 34-100

- A dc motor driven, neoprene conveyor belt system
- Solenoid operated parts dispenser
- dc motor driven gauge unit with 3 optical gauge sensors with ANDed output together with Top Dead Centre and Bottom Dead Centre detector outputs
- Two solenoid selection/ejection levers
- Two optical proximity detectors
- Material detector plastic/steel
- Start button
- Stop/emergency stop button

Single conveyor parts selection PLC Application

34-100



This low-cost conveyor system features a dc motor driven system with vertical gauging unit, inductive & optical proximity detectors.

The conveyor system carries out a simple parts selection process. The first selection is made on the basis of component height, tolerances can be set on the gauging unit allowing rejection of under and oversized components. Rejected components are ejected from the conveyor using a solenoid operated actuator.

Correctly sized components are sorted into plastic or steel. This detection process is carried out by a combination of optical and inductive detectors.

The system requires a PLC capable of driving the following inputs and outputs:

Inputs to PLC

Optical proximity - 2, Vertical gauge - 3, Material Detector - 1, Start button - 1, Stop button - 1.

Outputs from PLC

Conveyor Motor - 1, Gauge Motor - 1, Dispenser solenoid - 1, Parts selector/ejector - 2.

The single conveyor can be upgraded to a dual conveyor by ordering Upgrade Pack 34-105.

Features

- Part selection by logical detection
- Induction and opto-electronic sensors
- Component sort and assembly
- Interfaces to most major PLC types
- Comprehensive courseware manual
- Upgrade path to double conveyor

Curriculum Coverage

- Fundamentals of logic
- Basics of PLC programming
- Developing ladder logic programs
- Programming timers
- Programming counters
- Jump instructions and subroutines
- PLC installation practices

Power supply

220/240V 110/120V 50/60Hz
100VA.

Diameter Gauging Unit

34-110

This unit can be added to either the double or single conveyor systems. It allows the diameter of the components to be measured.

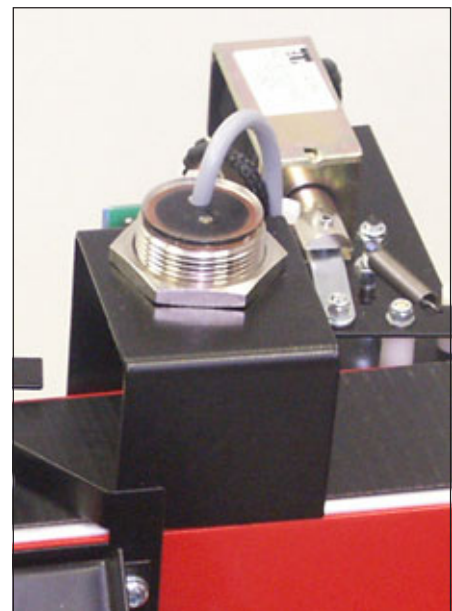
Using a similar system to the height detector, the unit provides three possible outputs: under size, over size, or the logical NAND of the two providing one input to the PLC for correct sized components. The position of the parts probe is controlled by two sensors detecting top dead centre of the drive cam. Acceptable tolerances for components can be preset.

The addition of the second gauge unit allows programs of greater complexity to be developed. The programming of the detector is an excellent introduction to the use of logical detectors for in-process inspection and quality control.

Inputs to PLC

Optical proximity - 2, Vertical gauge - 2, NAND logical - 1.

Outputs from PLC - Gauge motor - 1.

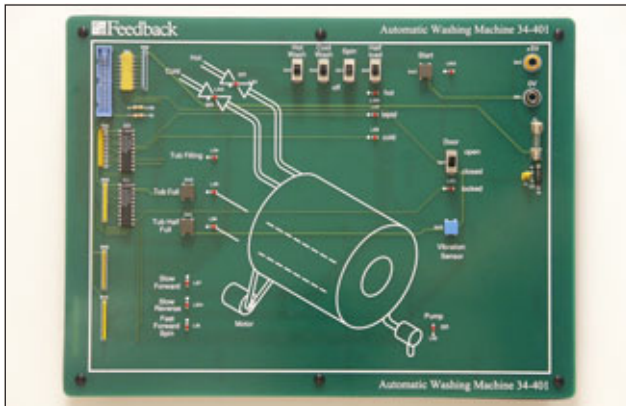


Automatic Washing Machine

34-401

Features

- Demonstrates sequential control
- Initial process conditions can be set
- Demonstrates the use of simple interrupts
- Low cost



This process allows a sequence of events to be controlled. Through program selection switches, initial program conditions can be set. This allows the development of several different programs that can be used as conditional jumps depending on how the initial conditions have been set. Using push-button switches to simulate interrupt conditions, such as unbalanced load, more complex control problems can be developed.

Curriculum Coverage

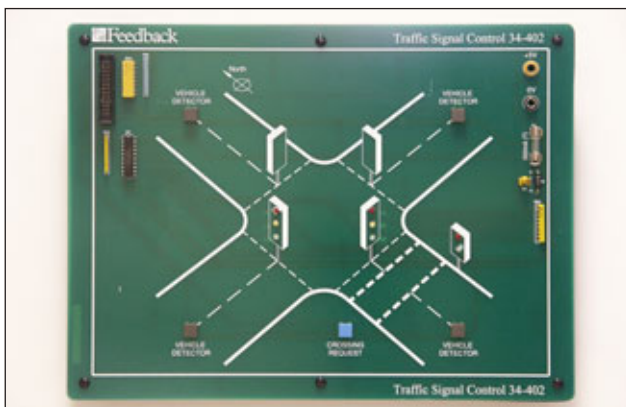
- Fundamentals of logic
- Basics of PLC programming
- Developing Ladder Logic Programs
- Programming timers
- Setting initial conditions
- Time based process control
- Use of interrupts and emergency stop

Traffic Signal Control

34-402

Features

- Timed sequence control
- Interrupt device control
- Easy to understand process
- Low cost



This simple sequence application allows traffic light control of a cross-roads to be implemented on a timed sequence basis. The control program can be further developed to cope with interrupts generated from pedestrian crossing requests or off-peak vehicle detector inputs.

Curriculum Coverage

- Fundamentals of logic
- Basics of PLC programming
- Developing Ladder Logic Programs
- Programming timers
- Programming counters
- Time based process control
- Use of interrupts

Both units use 5V TTL signals and can be interfaced to a PLC using standard 24V dc logic inputs. A 34-403 PLC interface is required to operate the above units .

Ordering Information

Dual Conveyor Parts Selection PLC Workcell with Assembly Task	34-120
Diameter Gauging Unit (optional)	34-110
Single Conveyor Parts selection PLC Application	34-100
PLC Workcell Upgrade (34-100 to 34-120)	34-105
Automatic Washing Machine & Traffic Signal Control package (34-401, 34-402 & 34-403)	34-400
Automatic Washing Machine Application Module	34-401
Traffic Signal Control Application Module	34-402
PLC Interface (for Application Modules)	34-403



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