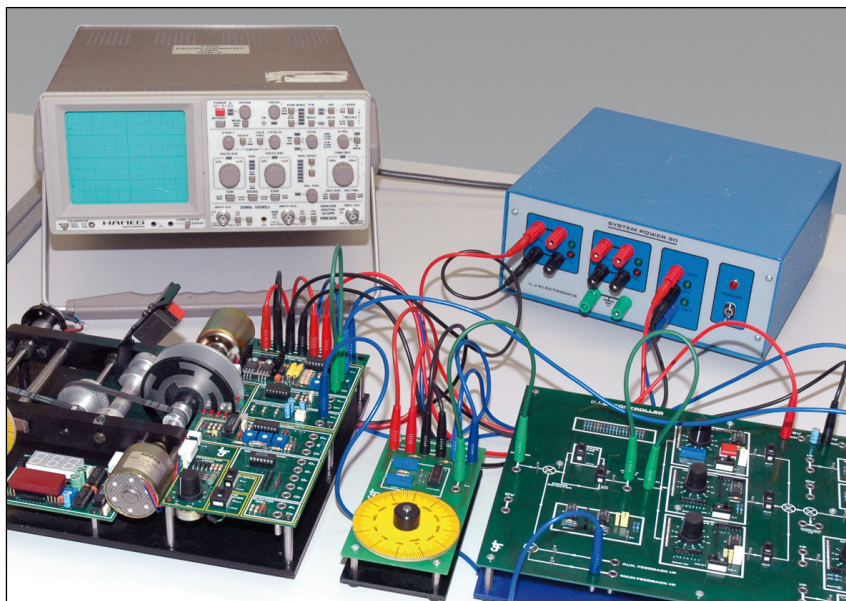# CA03 - Analog Motor Control

The CA03 teaching set comprises:
- MS15 DC motor control module.
- AS3 Command potentiometer.
- AS4 PID COntroller
- CS1 Set of 36 x 4mm leads.
- Power supply unit.

Additional items required:
- Digital Storage Oscilloscope
- Function Generator

The CA03 teaching set introduces students to the principles of analog motor control, through a wide range of practical activities.

This comprehensive teaching set includes a DC motor control module, command potentiometer, PID controller module, input/output interface module, and curriculum manual. A power supply unit and connection leads are also provided.

The curriculum manual is fully compatible with the ClassAct computer managed learning system. It is divided into a series of chapters, each covering a specific topic area and providing background theory, practical activities and student assessment questions.

Each chapter is designed around a list of performance objectives. These objectives are used by the ClassAct management system to generate a student competency report.

A student workbook is also provided, allowing students to record basic theory and practical results as they work through the curriculum manual.

Finally, the teaching set includes an instructor's guide. This provides solutions to all of the questions and practical activities contained in the curriculum manual.

Typical topic areas include:
- The Digital Storage Oscilloscope
- Transient and Steady State Response
- Proportional Speed Control
- Proportional Position Control
- Second Order Response Parameters
- Velocity and Transient Velocity Feedback
- Controller Characteristics
- Integral Speed Control
- Proportional Plus Integral Speed Control
- Proportional Plus Integral Plus Derivative Position Control
- Instability

Typical activities include:
- Describe the Main Elements of a PID Controller
- Investigate the data capture features of a digital storage oscilloscope.
- Conduct simple step, ramp and frequency response tests.
- Demonstrate Proportional Speed control.
- Outline the reasons for adding velocity feedback
- Demonstrate the change in following error when transient velocity feedback replaces velocity feedback.
- Discuss the effects of noise when subjected to derivative action.
- Demonstrate various combinations of PID control
- Demonstrate the stabilizing effect of a proportional action on a system controlled with integral action.

CA03 – Analog Motor control

	No.	Average time
Chapters	23	50 minutes
Total		20 hours