Product Name :	**Product Code :**
Control and Instrumentation Principles	CE597

Description :

Control and Instrumentation Principles

Technical Specification :

Control & Instrumentation Principles

This trainer allows the investigation of control system principles by using a servo mechanism comprising a d.c. motor, a variety of sensors and both analogue and digital controllers. Students are also introduced to the fundamentals of transducers and signal processing. The curriculum is divided into twenty four assignments ranging from basic control concepts to more advanced topics such as transfer function analysis. The product uses The software (supplied separately) in which each assignment comprises clear objectives, background, theory and experimentation. All required test instrumentation is provided within the software and includes a four channel real-time data logger and bar-graph display, voltmeter, frequency counter and transfer function analyzer with Bode and Nyquist displays. The system comprises three items, the mechanical unit, electronic unit and a power supply. The mechanical unit is an open-board format containing servo mechanism and support electronics. It contains a power amplifier driving a d.c. motor connected to a set of transducers and an adjustable eddy current brake. The digital encoders are of pen construction to allow visual inspection of their functionality. A dual-function LCD meter measures either voltages or rotation speed. The electronic unit comprises an open printed circuit board with front panel mimic. It contains analogue signal processing blocks, an embedded controller with USB interface, analogue to digital converters, PWM drive and the instrumentation data converters. A complete block diagram is on the front panel with access via 2 mm sockets to allow each practical to be configured rapidly and the instrumentation blocks connected. LEDs show the output signals from the digital encoders. A function generator block is provided with sine, square and triangle output signals.

Curriculum Coverage

Operational amplifiers
Analogue transducers
Motor & eddy current characteristics
Positive & negative feedback
Gain & stability
Velocity feedback
Following error
System time constant
Closed-loop position & speed control
Analogue controllers (PID)
Feed-forward systems
Analogue & digital conversion
Digital speed & position measurement
Absolute & incremental encoders
Digital controllers
Transfer function analysis
Open & closed-loop transfer functions

Features:
Teaches the concepts of control, sensors & signal processing
24 assignments
Comprises mechanical plant, electronic unit & power supply
Analogue & digital controllers
Analogue & digital sensors
Digital controller using an embedded processor
Linear & PWM motor drive
On board sine, square & triangle wave generator
Open & closed loop transfer functions with Bode & Nyquist displays
Functional workstation including power supply
The software software with built-in instrumentation required (supplied separately)
Comprehensive experiment manual

Technical data:
Tachogenerator 2.5 volts/1000 rpm
Dimensions: height 150 mm x width 295 mm x depth 220 mm
Weight: 2.3 kg
The software is used extensively within the telecommunications, control and basic electronics ranges. The teaching content is provided within the software; this includes the underlying theory, written so that it does not make extensive use of mathematics. An important part of the content is to highlight the assignment learning objectives and to convey relevant background to the student. Consequently, the student is well prepared for the practical work using the hardware, and can put the results into perspective. The software operates so that its appearance and the range of instrumentation depend on the context. So, for example, if the practical-work requires the use of complex instrumentation such a constellation or a phase meter, one is made available, whereas at lower levels of study it would not be provided. Test instruments are initialised with settings suitable for the required measurements, but students are often expected to change them during the practical work.

The instruments have cursors to make measurements and their displays may be printed or exported for inclusion in laboratory reports. The software Package now includes The software Tools. This allows teachers and lecturers full edit facilities with the creation
of new content and additional assignments. Laboratory Architect determines the range of assignments available to the students and to configure the look and feel of the The software environment. Assignment Builder creates new or edits existing laboratory assignments and configures the test equipment. Content is edited using any HTML editor or Microsoft Word. Winwiz creates and edits work board â€žpatchingâ€œ diagrams. It also

configures test equipment monitor points and â€žfurther informationâ€œ points on the practical diagrams. Practical diagrams are edited by Microsoft Visio. (Visio is not supplied as part of The software) Manual Builder creates a version of the content ready formatted for printing. Free of charge online software updates are included. The software creates complete courses containing assignments from any of the installed The software products plus external resources such as documents, multimedia material, third party programs, web urls, or locations on local intranets. Includes Course Designer and Course Presenter.

Features:
Now includes The software Tools
Allows teachers & lecturers full edit facilities
New content & additional assignments
Free of charge online software updates
Hands off for teachers, hand on for students
Self-paced
Unrestricted, open learning environment
Practical demonstration of theory & concepts
Interactive patching diagrams
Real-time embedded instrumentation
Automatic instrumentation configuration
Data export for analysis
USB connection to hardware
Editing tools include laboratory architect, assignment builder, Winwiz & manual builder
Compatible with 32-bit &-64 bit versions of Windows XP, Vista, Windows 7 & Windows 8.

Naugralabequipments

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