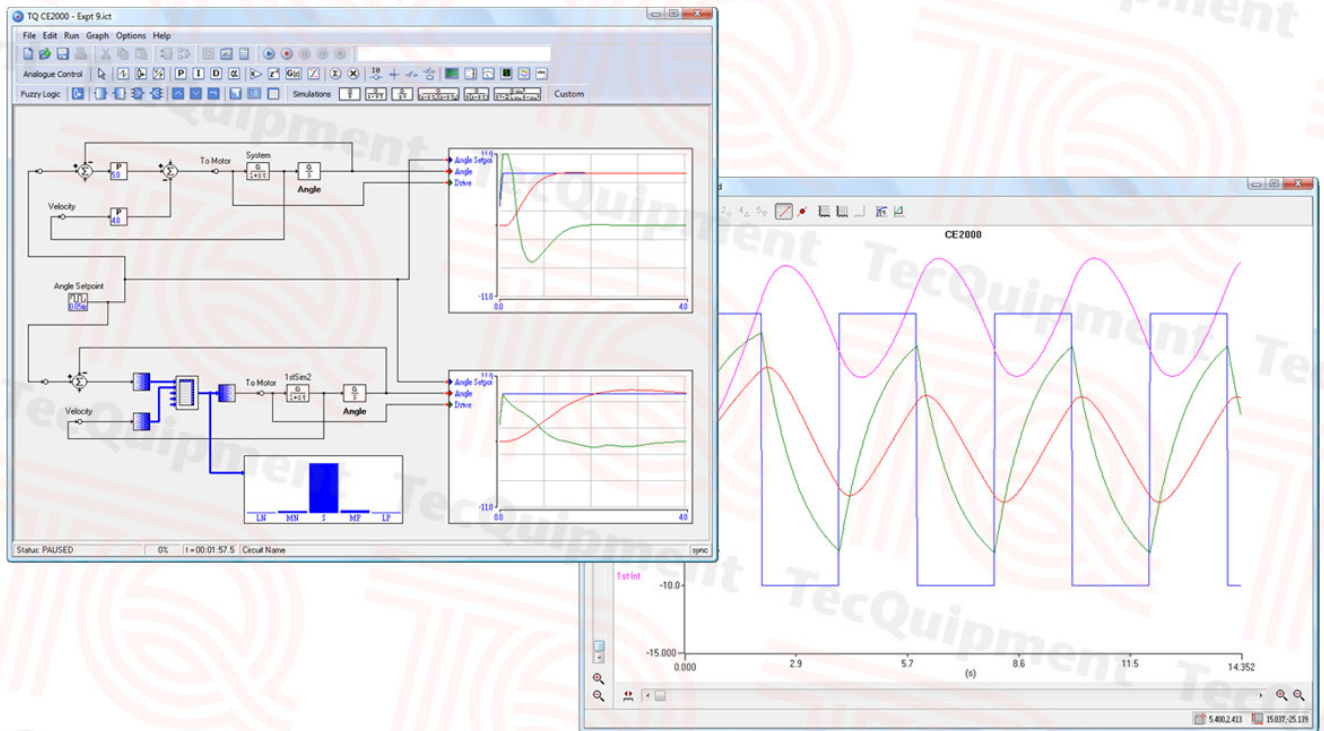


## CE2000

## Control Software

**Icon-based software that simulates control systems and works with TecQuipment's Controller (CE120) or Digital interface (CE122) to control and acquire data from TecQuipment's Control Engineering (CE) range**



- Powerful simulation, control and data acquisition software for use with selected products from TecQuipment's Control Engineering range
- Software only - needs no extra circuit boards in your computer
- Includes a range of ready-made fuzzy logic and control blocks, such as proportional, integral and derivative blocks
- Collected data can be shown and printed as a chart or exported for use in other programs
- Real time display of variables by virtual meters, virtual chart recorders or virtual oscilloscopes
- Easy-to-create control circuits made by linking together drag-and-drop icons
- Users can create their own circuits and save them, or use the ready-made circuits supplied
- Includes ready-made blocks that simulate first and second order systems
- Includes blocks that work as function generators, with a full range of output signals

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- An ISO 9001 certified company

# CE2000

## Control Software

### Description

The CE2000 is a powerful control software package with many features. It is supplied as standard with TecQuipment's Controller (CE120), Digital Interface (CE122) and Process Trainer (CE117). The software allows students and experienced control engineers to develop and test a wide selection of controllers and filters.

The Control Software combines controller design and implementation into one logical process. This reduces a student's learning difficulties and helps them to quickly understand and create a working control system.

Students use the software icons and wire them together on screen, just as they would draw a control system on a piece of paper. The icons include the important parts of controllers, signal generators, manually controlled signals and voltages, and virtual instruments.

The students set the software to record important variables. They can then plot the results in a chart and export the data for use in other programs.

With the CE2000 software students can create one or more types of controller and simulate the theoretical responses. They can then find the response with real systems, such as the products in TecQuipment's Control Engineering range.

The CE2000 software works with selected products in TecQuipment's Control Engineering range. These products give a wide selection of system responses, including linear and non-linear, stable and unstable, oscillatory and multivariable.

Included with the CE2000 software are files that match the experiments supplied with selected products in TecQuipment's Control Engineering range.

Because of its open and flexible structure, the CE2000 and TecQuipment's interface or controller may also model, simulate and run any other compatible system.

For real-time control and data acquisition you must use the software with TecQuipment's Controller (CE120) or Digital Interface (CE122). TecQuipment's Process Trainer (CE117) already contains a built-in interface.

### Experiments

#### *Software only:*

The CE2000 user guide shows students how to use the software and how to build and test common control systems, such as:

- Design and implementation of three-term controllers
- Design of controllers and filters

#### *Software and hardware:*

When used with other products from TecQuipment's CE range:

- Thermal Control (CE103)
- Level Control (CE105)
- Ball and Beam Control (CE106)
- Engine Speed Control (CE107)
- Coupled Drives Control (CE108)
- Ball and Hoop Control (CE109)
- Servo Control (CE110)
- Flow, Level, Pressure and Temperature Control (CE117)

### Standard Features

- Supplied with comprehensive user guide
- Two-year warranty
- Made in accordance with the latest European Union directives

### Essential Ancillaries (not supplied by TecQuipment)

- Suitable computer with a CD-ROM drive, 2 spare USB connections, 15 MB of RAM and Microsoft® Windows® 2000, XP, Vista or Windows 7 operating system.

You need one USB socket for the USB dongle supplied with the software. You need a second USB socket for real time control and data acquisition of signals with hardware, for example - TecQuipment's Controller (CE120), Digital Interface (CE122) or Process Trainer (CE117).

### Recommended Ancillaries

Selected Products in TecQuipment's Control Engineering range, including:

- Thermal Control Process Apparatus (CE103)
- Coupled Tanks Apparatus (CE105/CE105MV)
- Ball and Beam Apparatus (CE106)
- Engine Speed Control Apparatus (CE107)
- Coupled Drives Apparatus (CE108)
- Ball and Hoop Apparatus (CE109)
- Servo Trainer (CE110)
- Process Trainer (CE117)

## CE2000

## Control Software

### Specifications

#### *Simulated signals:*

- Signal generator – sinusoidal, sawtooth and square wave, with variable frequency, amplitude and offset.
- D.C. level – fully variable

#### *Virtual instruments:*

- Digital meter
- Bargraph
- Analogue meter
- Oscilloscope
- Chart recorder

#### *Controller blocks:*

- Proportional gain – fully variable
- Integral gain – fully variable
- Derivative (differential) gain – fully variable
- Phase advance

#### *Simulation blocks:*

- Integer
- First order system
- Double integrator
- Second order system
- First order with integrator system
- Second order underdamped system

#### *Other blocks:*

- Gain
- Voltage to frequency convertor
- Delay
- Discrete transfer
- Saturation
- Summing junction – three input
- Multiplier – three input
- Switch
- Relay

#### *Fuzzy Logic Blocks:*

- Fuzzy Pot
- Fuzzifier
- Defuzzifier
- Fuzzy Multiplexer
- Fuzzy Demultiplexer
- Fuzzy AND
- Fuzzy OR
- Fuzzy NOT
- Fuzzy AND Table
- Fuzzy Combined Meter
- Fuzzy Single Meter