ARMFIELD PCT40 SYSTEM
CONTROLLED BY REAL TIME TOOLBOX

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The Armfield PCT40 system provides a cost-effective way of teaching a wide range of process control techniques in a simple basic unit. More advanced aspects of process control can be addressed by adding optional extras to the basic system (http://www.armfield.co.uk).

The Armfield data interface can data to be exchanged between the process and a PC with suitable software. Armfield can supply teaching software specific to each piece of equipment, including data logging and control capability, tabular and graphical display of results and full help texts detailing how to use the equipment and perform experiments.

The PCT40 contains everything that is needed to perform a range of single-loop process control experiments in conjunction with a PC.

The PCT40 includes a USB computer interface, and all of the parameters can be controlled directly from the computer, i.e. the pump speeds, the valve positions and the heater power. The computer also displays the readings from the various measurement sensors. The software supplied with the unit includes on/off, time proportioned and proportional/integral/derivative (PID) algorithms where all the parameters are easily accessed and adjusted by the user. This approach means that a separate electronic console is unnecessary for most applications.

Fig.1 ARMFIELD PCT40 system

The PCT40 includes also the 60 way I/O connector carrying signals to/from accessories such as the PC. Realized control system uses multifunction I/O card MF614 connected to this 60 way I/O connector via specially made ribbon cable. The card MF614 has four 12 bit analog output channels and this is its main advantage for our purpose. This card is supported by the Real Time Toolbox.

The software used to read and generate signals is the Real Time Toolbox for use with Simulink in system MATLAB. It can read and display temperatures, pressures, levels of water, flow rate and control pumps, solenoid valves and thermostat. Result is very sophisticated system having simple graphical programming tool. This is easy way for students having not knowledge of more complicated software as for example LabVIEW.