**PCT
SERIES**

Flow Control - PCT51

armfield.co.uk

PCT51 is a visible and easy to understand water flow control process. Water stored in the sump tank is pumped through a parallel pipe arrangement mounted on the lid of the tank and returns to the tank via two outlets, a software switched divert valve prior to the flow-meter and a manually operated variable valve after the flow-meter. Both outlets also incorporate interchangeable orifices to vary their characteristics.

Repeatable disturbances can be implemented using the solenoid valve and a wide range of different control investigations can be implemented using the interchangeable orifices and adjustable valves.

The PCT51 is an ideal system for demonstrating the onset of instability, the importance of filtering on the sensor output, and the trade-off between filter weighting and proportional gain on stability.

Demonstration / instructional capabilities

▶ Flow control by varying pump speed:

▶ Manual control flow (open loop)

▶ On/Off control and flow (closed loop)

▶ Proportional control flow (closed loop, P only and P+I)

▶ Optimising proportional control of flow (closed loop P+I+D)

▶ Direct control or Indirect control using an external controller:

     PID Controller (PCT54)

     PLC Controller (PCT55)

Related products

PCT40 Multifunction Process Control Teaching System

PCT23-MKII Process Plant Trainer

PCT54 Industrial PID Controller

PCT55 Programmable Logic Controller (PLC)

Ordering specifications

PCT51 Level Control Process
A flow control process trainer, comprising:

▶ 0-4l/min. flow-meter, mounted above 8 litre sump tank

▶ Two discharge ports, one with remote controlled solenoid valve and one with manually controlled valve.

▶ Four interchangeable orifices for use with the discharge valves

▶ Variable speed submersible centrifugal pump

▶ USB interface to PC, plus connection terminals for interfacing to external controllers

▶ Supplied with educational software for PID control as well as data logging.

Requirements			Scale
PC	USB	🚰	

Mains electrical supply:
110 to 240 V, 50 or 60 Hz.
(Note, the units are supplied with: IEC leads to suit European and UK 230V, 50Hz outlets and USA 115V, 60 Hz outlets.)
PC computer with 2 spare USB ports (not supplied by Armfield)
or external controller (PCT54 or PCT55)
Tap Water

Overall dimensions

Length	0.425m (total)
Width	0.350m
Height	0.450m
Packed and crated shipping specifications	
Volume	0.15m³
Gross weight	20kg

Ordering code

PCT51

armfield.co.uk

## SOFTWARE AND INTERFACING FOR THE ESSENTIALS OF PROCESS CONTROL UNITS

Each process is supplied complete with software that allows it to be controlled using a Windows PC via a USB connection.

The effect of making changes to the system or to the controller configuration can be quickly investigated by applying repeatable disturbances or step changes to the process. Comparison of the responses obtained with different control settings clearly demonstrates the need for correct matching of the controller to the system characteristics.

Another fundamental aspect of process control is an understanding of sensors and how they are calibrated. This is demonstrated by a sensor calibration apparatus designed specifically to demonstrate this subject.
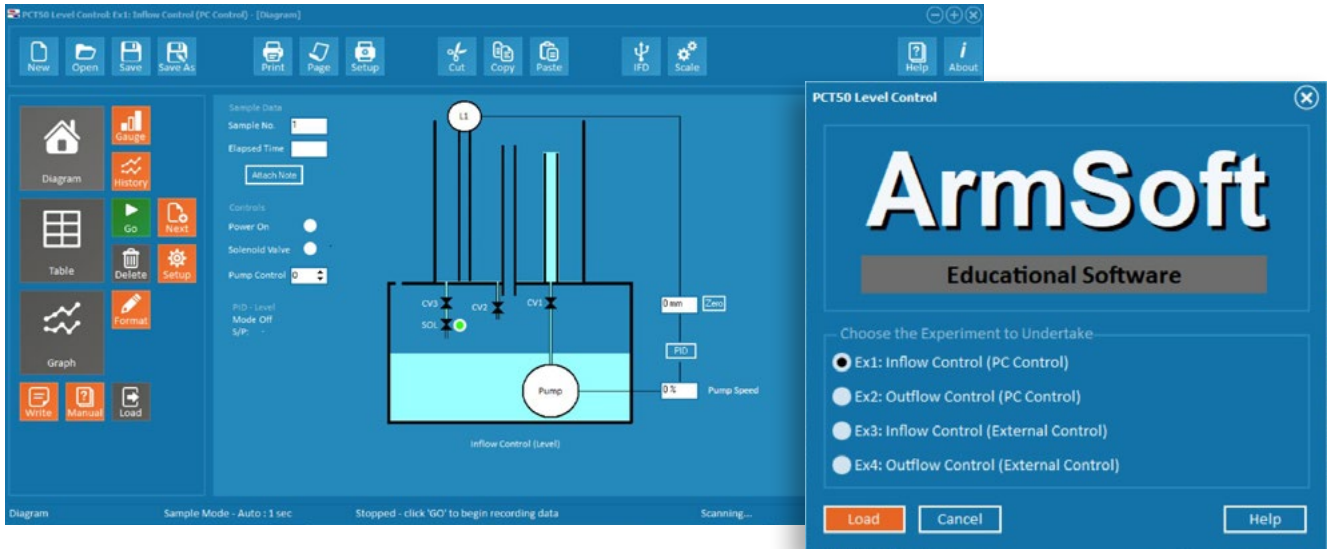
Armfield proprietary software including diagrammatic real-time display.

Pressing the load button allows the operator to select alternative experimental options.
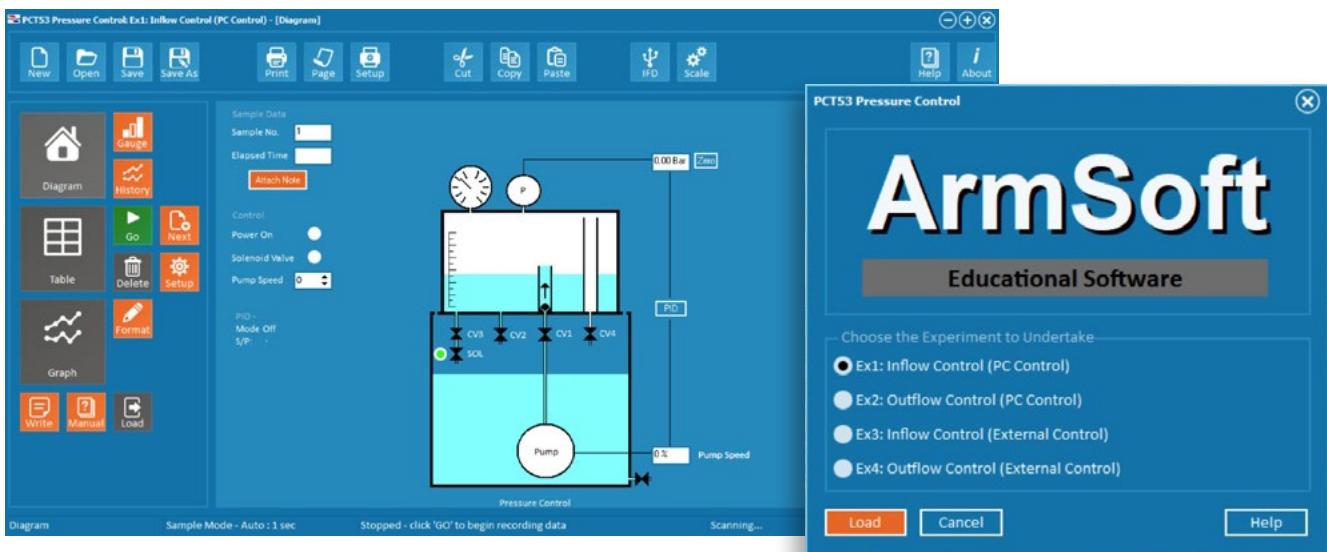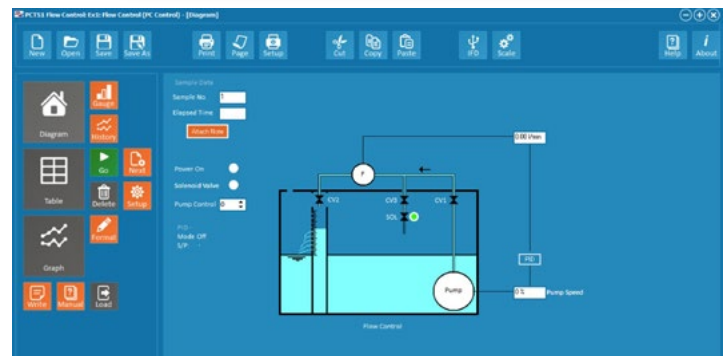

Software

Primarily computer controlled the ArmSOFT software demonstrates a real time diagrammatic display with readings of the relevant sensor outputs and controls the system inputs. The manual on/off time proportional and PID loops can be configured.

The ArmSOFT software enables the operator to control the pump speed and temperature 0 to 100%. Feedback from the sensors is then displayed in real time for the end user with simultaneous data-logging.

The data trend is also displayed graphically in real time and can be exported to another platform such as Excel for further analysis.