

Instrumentation and Control Laboratory for Murdoch University.



OBJECTIVES

- **A full instrumentation and control laboratory built as a series of interchangeable modules.**
- **The modular format allowing mixing and matching of components to suit the concepts being taught.**
- **Modules including pumps, tanks, reservoirs, heaters, heat exchangers and mixers together with monitoring and control equipment.**
- **Made from robust long life materials, to educate students for many years to come.**
- **The safety of students and staff being paramount.**

INTRODUCTION

A leading Western Australian university decided to create an innovative teaching aid to better train their Engineering students.

Control and Thermal's comprehensive design and manufacturing facility coupled with its extensive knowledge of process engineering, made it an obvious choice.

Modular form, a process control and instrumentation laboratory., whereby process components and instruments are in modules and can be mixed and matched to suit a particular process being studied. Students may then be better educated to drive these real-world processes using software monitoring and control techniques.

CTE expanded the concept, developing, designing and manufacturing an 85sqm laboratory consisting of 6 bays. Each bay housing a rack system to hang the process modules being used. Adjacent to each rack is a control panel. Using the control panel, students then connect into the relevant power supplies, instruments, monitors and controllers to be used in the task.

1998 Engineering Excellence Awards winner by the **Institution of Engineers Australia.**

Instrumentation and Control Laboratory for Murdoch University's School of Engineering



Design Composition

Bay layout - As described, the lab consisted of 6 bays of racks for hanging process component modules.

Component modules - Many interchangeable modules were built including pumps, control valves, vessels, heaters and heat exchangers to name just a few.

Multitude of combinations - Combining the modules can create a huge variety of process situations. Where in the past fixed apparatus were used, this often leading to replicating many items.

Control Panels - Each bay was separated by an interface panel housing the required connections for power of varied voltages and instrumentation.

Connectors - To ensure the safety of students and staff, a fool proof system of mismatching connectors was used. To avoid incorrect voltages, instrumentation or fluids and gases intermixing.

SCADA system - All interface panels are connected back to a mainframe computer and the S.C.A.D.A. system. Supervisory Control And Data Acquisition system.

Long life - The lab must stand up to the demands of first time users year after year and as such was largely constructed from stainless steel and other products to ensure years of service.

The Control and Thermal solution

Control and Thermal Engineering's creative design experience in process engineering control, combined with its comprehensive manufacturing facilities means that it is a "one stop shop". From design and manufacture right through to installation and commissioning.

APPLICATIONS

- Process control and instrumentation
- Industrial cooling systems
- Winery process and cooling systems
- Process pilot plants
- Process demonstration plants
- Laboratory equipment
- S.C.A.D.A. systems
- Flocculant batching plants
- Pumping solutions
- One off designs

SERVICES

- Fluid Dynamics design
- Structural and mechanical design
- CAD facilities design
- Structural Certification
- System heat load surveys
- Consultation
- Specialised and certified welding
- Stainless, pipe and tube constructions
- Fabrication services
- Machining services
- Mechanical services
- Electrical services
- PLC programming
- DDC programming

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