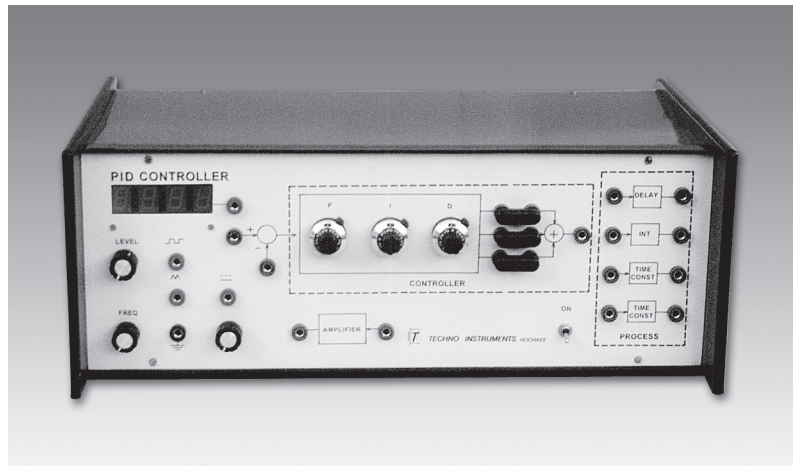


- ◆ PID-action study on CRO
- ◆ Simulated blocks for flexible system
- ◆ Time delay (transportation lag) block
- ◆ Synchronised square and triangular source for flicker free display



Introduction

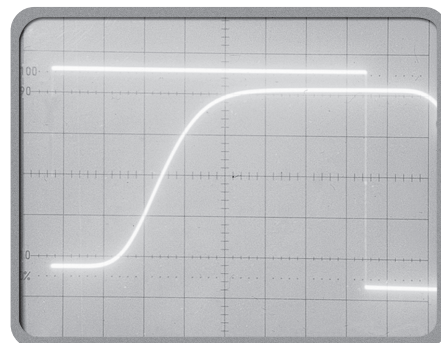
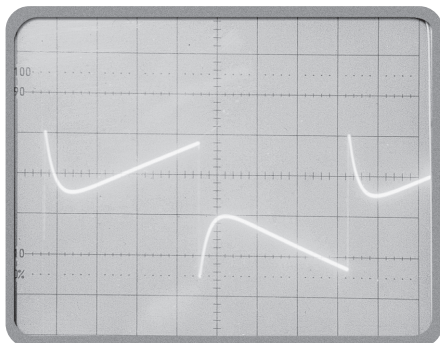
Proportional-Integral-Derivative (PID) control has been especially popular in industrial processes like chemical, petroleum, power, food and manufacturing industries. These systems are usually slow, complex and are characterised by relatively incomplete or uncertain mathematical description. The PID controller, parameters of which may be adjusted experimentally, is therefore particularly attractive in such situations.

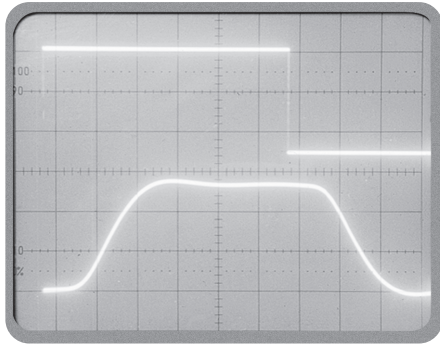
The experimental unit consists of simulated building blocks like error detector, dead time, integrator and time constants, which may be configured into a

variety of systems. A PID section with adjustable proportional gain, derivative and integral time constants provide the control action. Built-in set value, square and triangular sources enable the students to study the response on a CRO. The accompanying literature includes system description, theory, experimental procedure and typical results. An important feature of the system is that the simulated blocks are designed to operate at frequencies suitable for CRO viewing. The effect of controller parameter adjustments are therefore seen immediately. No expensive recorders are required for conducting the experiments.

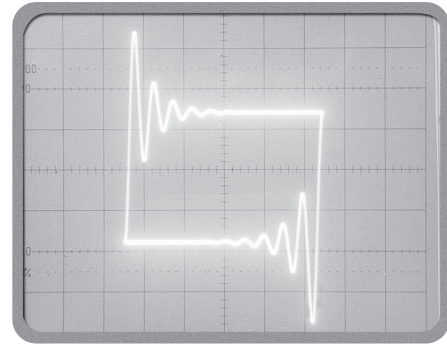
Experiments

- Open loop response of various process configurations (10 in all)
- Study of closed loop response for above
- P, PI, PD and PID design and performance evaluation in each case





Well adjusted PID response



X-Y display

Features and Specifications

- Simulated blocks – dead time (transportation lag), integrator, time constants, error detector and gain
- PID Controller (configurable as P, PI, PD or PID)
 - Proportional Band: 5% to 50% (Gain 2-20)
 - Integral time: 10msec - 100msec
 - Derivative time: 2-20msec
- Built-in signal sources
 - Set value: -1V to +1V
 - Square wave: 1V p-p (min.) at 40Hz (typical)
 - Triangular wave: 1V p-p (min.) at 40Hz (typical)
- Built-in 3½ digit DVM for d.c. measurements
- Built-in IC regulated power supply
- 220V±10%, 50Hz mains operation
- Detailed literature and patch chords included
- Essential accessory – a CRO

Schematic Diagram

