Computer control of process

Computer aided process control
AIM

• Quality build-in computer aided process control is very important for the electronics industry to maintain a competitive advantage. Its purpose is to maintain and achieve the target of six sigma quality level.
Introduction to process control

- Some examples of process control
- Process dynamics
- Degrees of freedoms of process
- PROCESS CONTROL OBJECTIVES
Basics of computer aided process control

• Process control computer hardware & software
• Design of computer control systems
• Advanced stages of computer control systems
Figure 1.1  Process flow diagram (PFD) of mixing process.
Heat exchanger

Figure 1.40 Stirred-tank heat exchanger temperature control system.
Process control objectives

Figure 1.65 Three critical elements for achieving plant excellence.
Demands on control systems

• 1. High reliability & availability
• 2. Fast trouble shooting
• 3. Simple operation
• 4. Easy configurable
• 5. High accuracy & reproducibility
• 6. Low cabling cost
• 7. Availability of process computers
• 8. Flexibility
Historic development

Fig. 0.1 Historical development.
Economics of computer aided process control

- Till the advent of Microprocessor--- most expensive
- Today---1. Low cost
  - 2. Large complexity
  - 3. High returns
- Benefits:
  - Repeatability in product quality
  - Frequent changes in product specifications
  - Increases productivity of the plant
  - Understanding of the behaviour of process
  - Reduction in dead time of batch processing process
RECENT TRENDS
Computer aided hot air blower
Distributed digital control system

Fig. 0.3 Distributed digital control system.
Total plant hierarchical control system