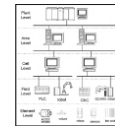


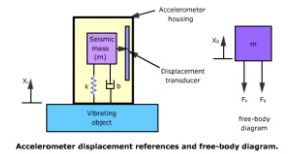
Introduction To Industrial Automation

- Introduction
- Industrial Communication Networks
- Transmission Media
- Transmission Methods



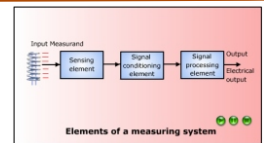
Introduction To Sensors & Measurement System

- Introduction
- Position & Speed Measurement
- Proximity Sensors & Switches
- Linear Variable Differential Transformer
- Digital Optical Encoder
- Electrical Resistance Strain Gage
- Measuring Resistance Changes
- Force Measurement With Load Cells
- Liquid-in-Glass Thermometer
- Electrical Resistance Thermometer
- Piezoelectric Accelerometer
- Introduction to Temperature
- Source of Temperature Measurement Error
- Pressure & Force Measurement
- Displacement & Speed Measurement
- Rotary Variable Differential Transformer



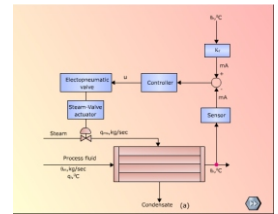
Single Conditioning & Processing

- Introduction
- Unbalance D.C. Bridge
- Push-pull Configuration
- Capacitance Amplifier
- Amplifiers
- Errors & Calibration Introduction
- Systematic Errors
- Calibration & Error Reduction



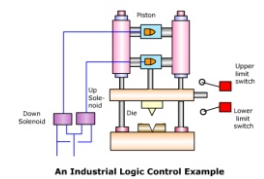
Introduction to Process Control

- Introduction
- The Control Objectives
- The Case for High-Gain Feedback
- Proportional Mode of Feedback Control
- Integral Mode of Feedback Control
- Derivative Mode of Feedback Control
- Alternative Control Configurations
- Command Feedforward
- Controller Tuning
- Proportional Controller
- Functions of a PID Controller
- Adjustment Feature in Industrial Controllers
- Practical Controller Tuning Tips
- Integrating Processes
- Tuning Rules for Digital Controllers



Sequence Control, PLCs & RLL

- Programmable Logic Control
- Industrial Example of Discrete Sensors
- Comparing Logic & Sequence Control
- Evolution of the PLC
- Application Areas
- Special Purpose Modules
- Programming Languages
- Typical Operands of PLC Programs
- Realization of Off-Delay Timer
- Operation Set
- Requirements Analysis
- Design of RLL Program
- Functions Block Diagrams
- The PLC Hardware Environment



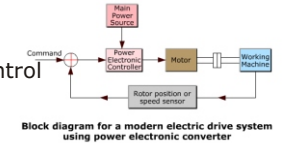
Control Machine Tools

- Fundamentals of C.N.C
- CNC Lathe (Horizontal Type)
- Direction Measurement
- Hydraulics
- Pneumatics



Electrical Drivers

- Learning Objective
- Concept of Electric Drive
- Single Phase DC Drives
- Single-phase Half-Wave Converter Drives
- Single-phase Semiconductor Drives
- Three-phase Half-Wave Converter Drives
- Three-phase Full converter Drives
- Three-phase Dual converter Drives
- Chopper Drivers
- Two-quadrant Chopper Drives
- Stator Voltage & Frequency Control
- Analysis of Induction Motor with Chopper Control
- Synchronous Motor-General
- Synchronous Motor with Different Excitations
- Different Torques of a Synchronous Motor
- Hunting or Surging or Phase Swinging



Networking of Sensors, Actuators & Fieldbus

- Introduction
- Motivation for the Fieldbus
- Field bus Topology
- The Physical Layer
- The Data Link Layer
- The Link Active Scheduler (LAS)
- Acyclic/Unscheduled Communication
- The Field bus message Sublayer (FMS)
- Realisation of Distributed Control Functions Using Functions Blocks in Fieldbus

