

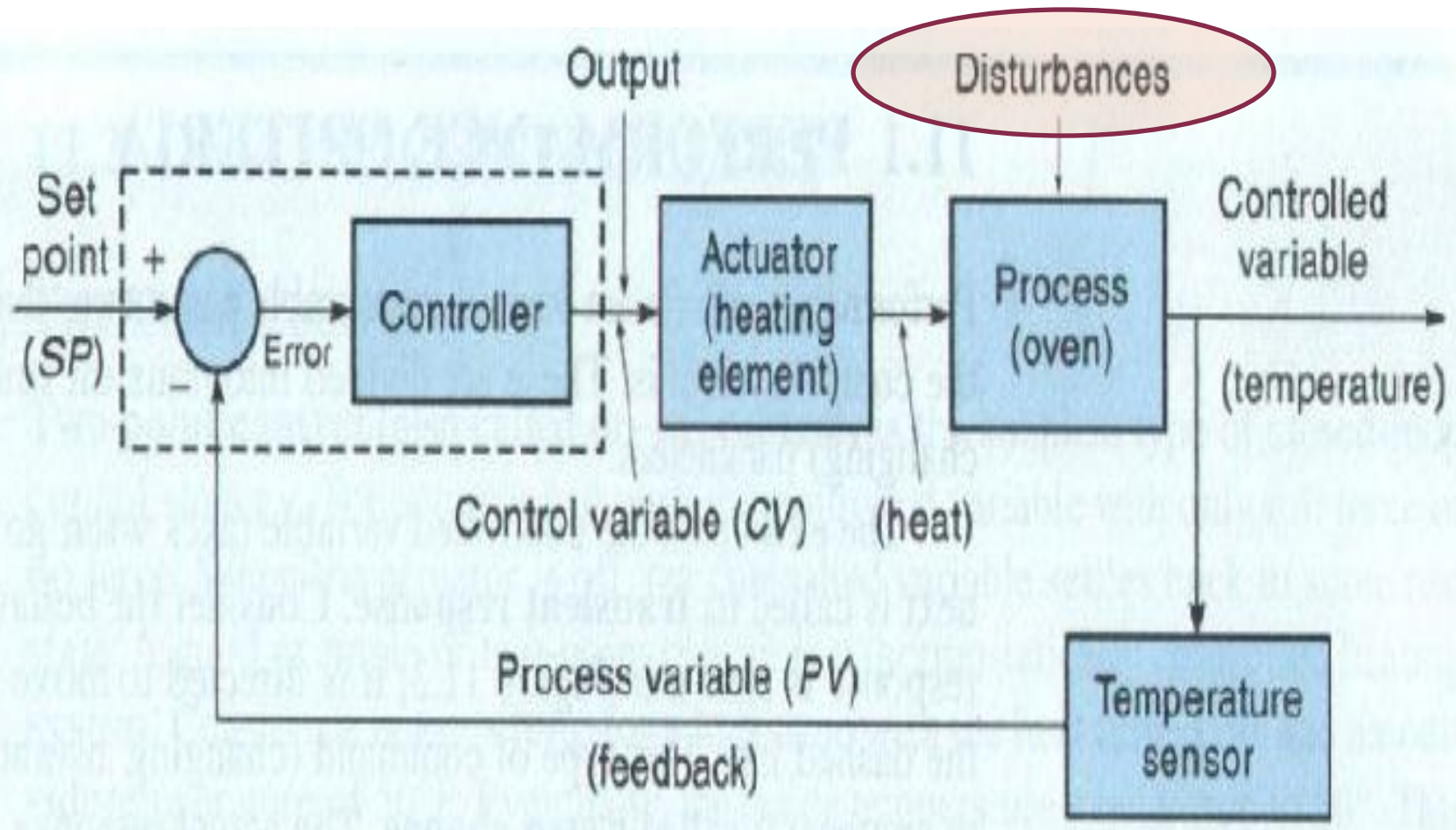


DASAR SISTEM PENGATURAN

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DIAGRAM SISTEM KONTROL INSTRUMENTASI ELEKTRONIKA



KONTROL PROSES



In a modern control system , electronic intelligence controls some physical process

Close Loop Control System A control system that uses feedback

Open Loop Control System A control system that does not use feedback

Regulator System A control system that maintains an output at a constant value

Follow-up System A control system where the output follows a specified path

Event Control System A control system that cycles through a predetermined series of step

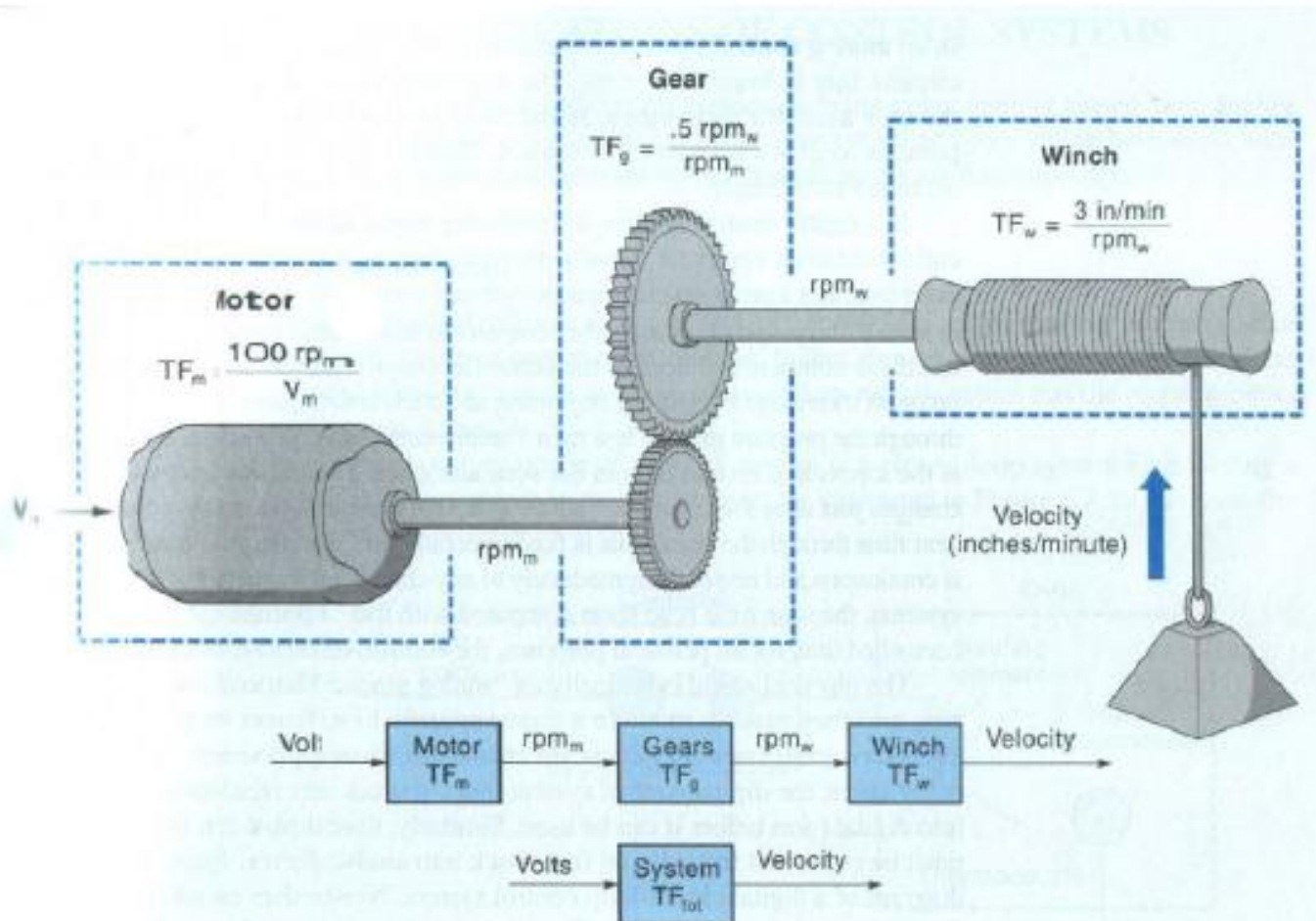
Analog Control System A control system where the controller is based on analog electronic circuits

Digital Control System A control system where the controller is a digital circuits, typically a computer

TRANSFER FUNCTION (FUNGSI ALIH)



Transfer Function A mathematical relationship between the input and the output of a control system component

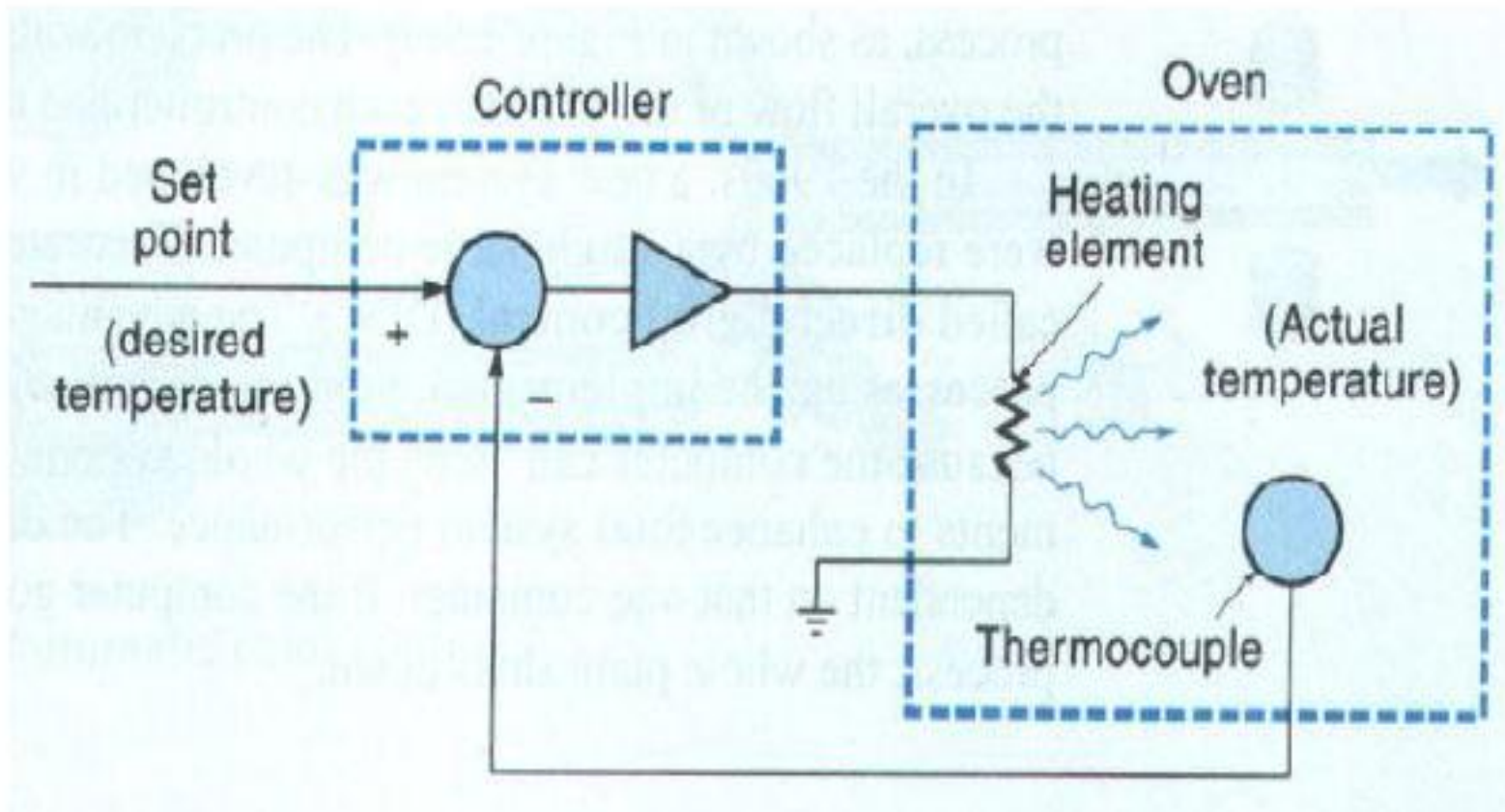


KONTROL PROSES



Process Control

A control system that maintains a uniform, correct output for some industrial process



KONTROL PROSES



Tugas 1:

Membaca dari berbagai literatur tentang sistem kendali & menjelaskan beberapa istilah sbb:

- *Pengukuran*
- *Ketelitian (accuracy)*
- *Ketepatan (precision)*
- *Kalibrasi*
- *Kesalahan (error)*
- *Linieritas*
- *Histerisis*
- *Ambang (threshold)*
- *Resolusi dan kemudahan pembacaan skala*

Ditulis tangan, maksimal 4 halaman kertas A4

KONTROL PROSES



Tugas 2:

Mempresentasikan & menjelaskan proses kerja masing-masing sistem kendali berikut ini:

- Close loop control system dan Open loop control system*
- Regulator system dan Event control system*
- Follow-Up system*
- Analog control system dan Digital control system*

**) cara kerja, contoh-contoh aplikasi, jelaskan salah satu aplikasi secara detail, dan video cara kerja sistem*

KONTROL PROSES



Process Control

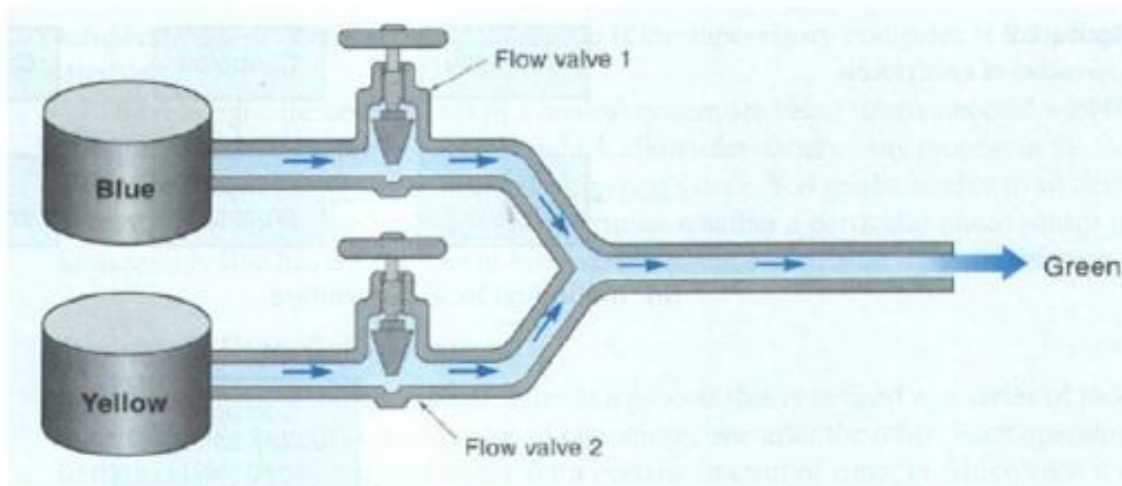
Continuous Process

A process wherein there is a continuous flow of product

Batch Process

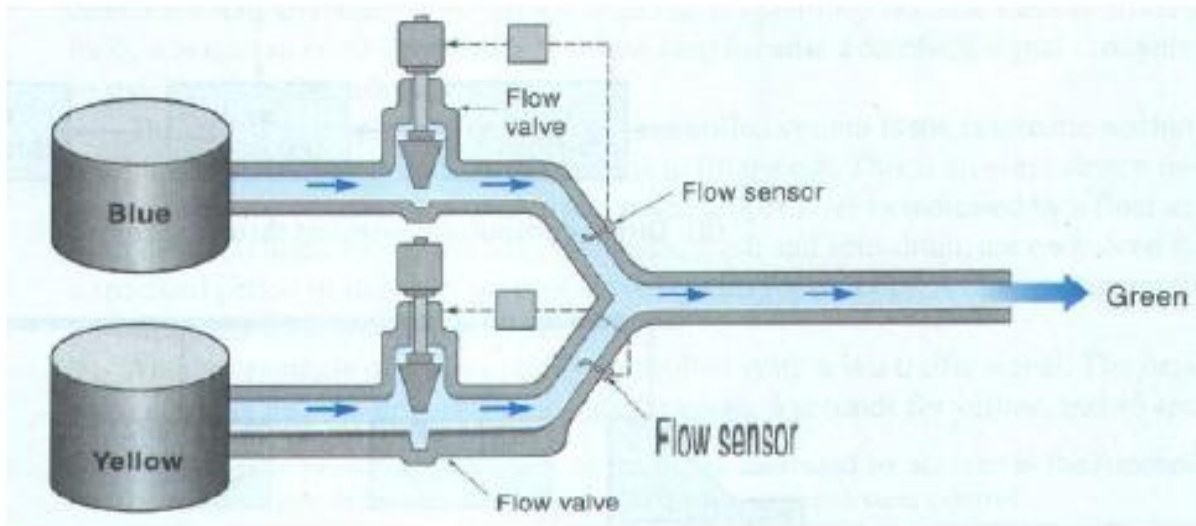
A process that has a beginning and an end and its usually perform over and over

Process Control in Mixing Paint

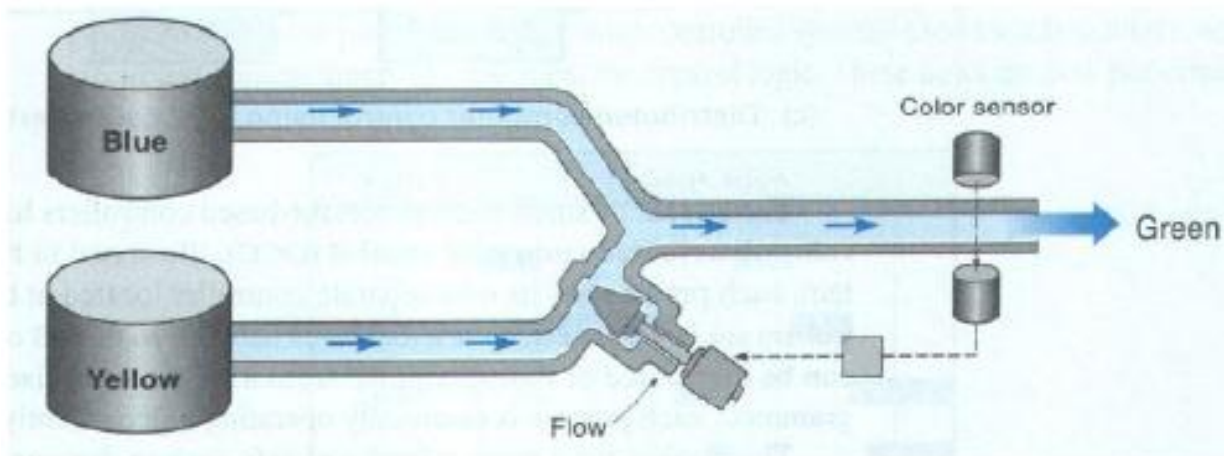


Manual control

KONTROL PROSES



Automatic flow control

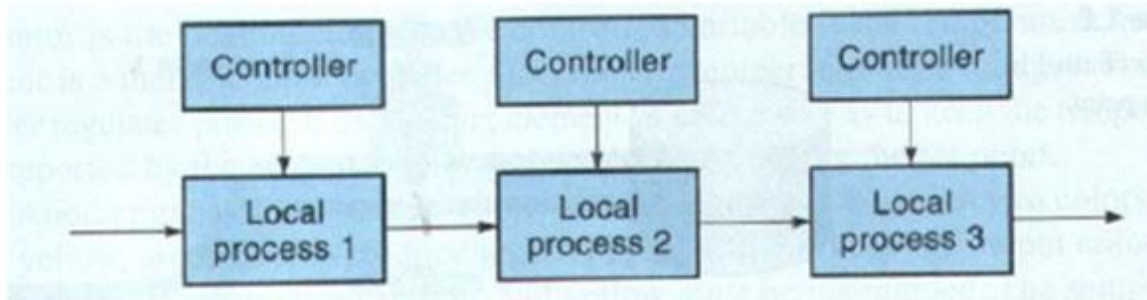


Automatic color control

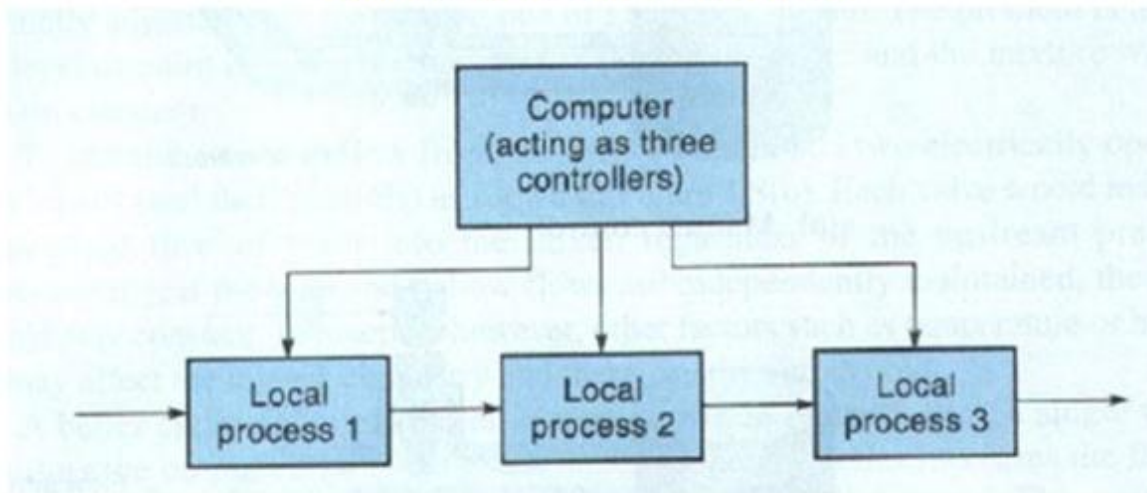
KONTROL PROSES



In a large plant, many processes are occurring simultaneously and must be coordinated because the output of one process is the input of another

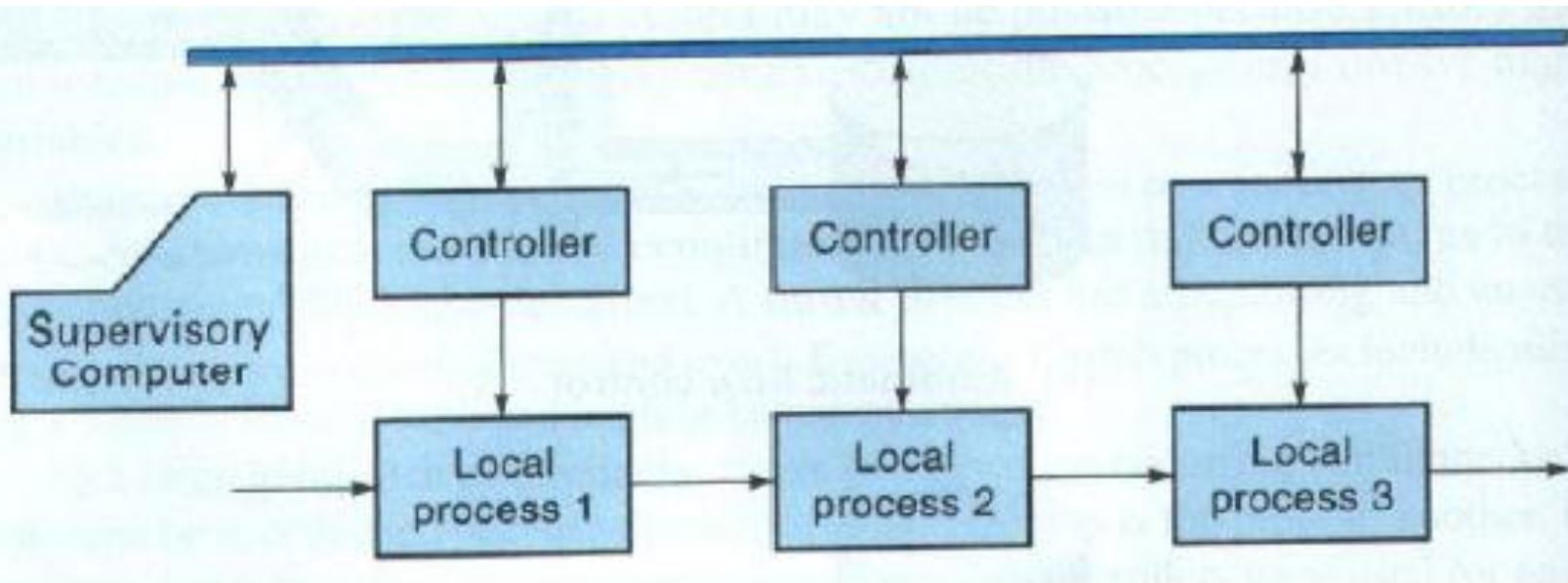


Individual Local Controllers



Direct Digital Control (DDC)

KONTROL PROSES



Distributed Computer Control (DCC)

KONTROL PROSES



Sequentially Controlled System

Sequentially Controlled System

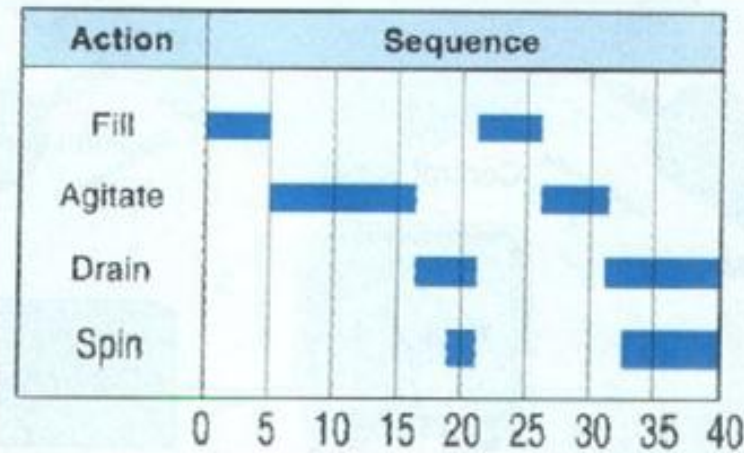
A control system that performs a series of actions in sequence

Event-driven operation

An action that is allowed to start or continue based on some parameter changes

Time-driven operation

An action that is allowed to happen for a specified period of time



Timing diagram for an automatic washing machine

KONTROL PERGERAKAN



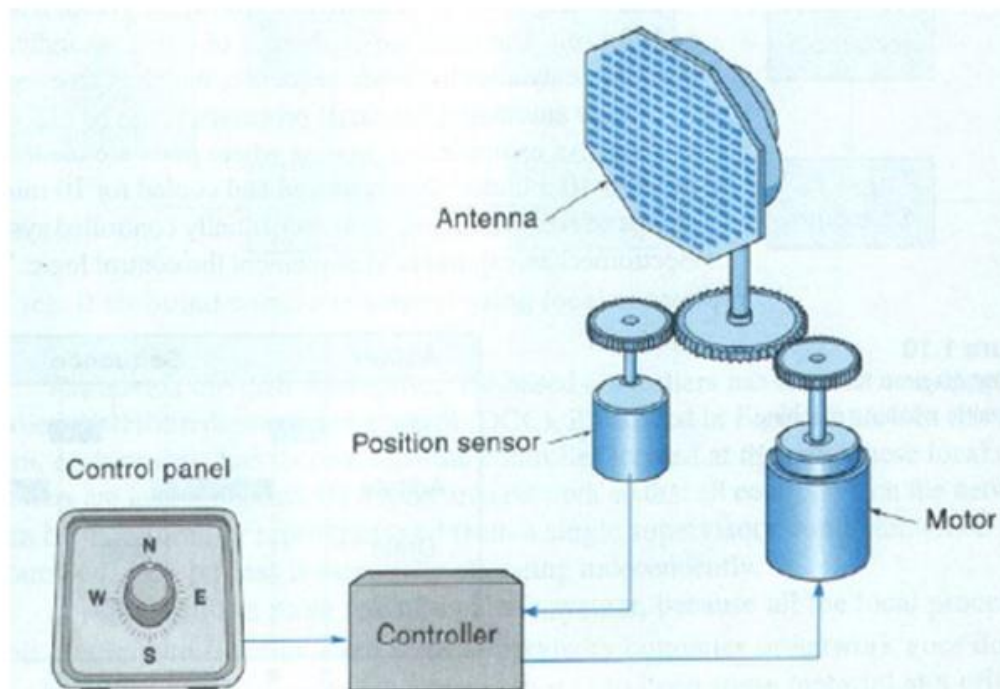
Motion Control

Motion Control

A term that refers to an electromechanical system wherein things move

Servomechanism

An electromechanical feedback control system where the output is linear or rotational movement of a mechanical part



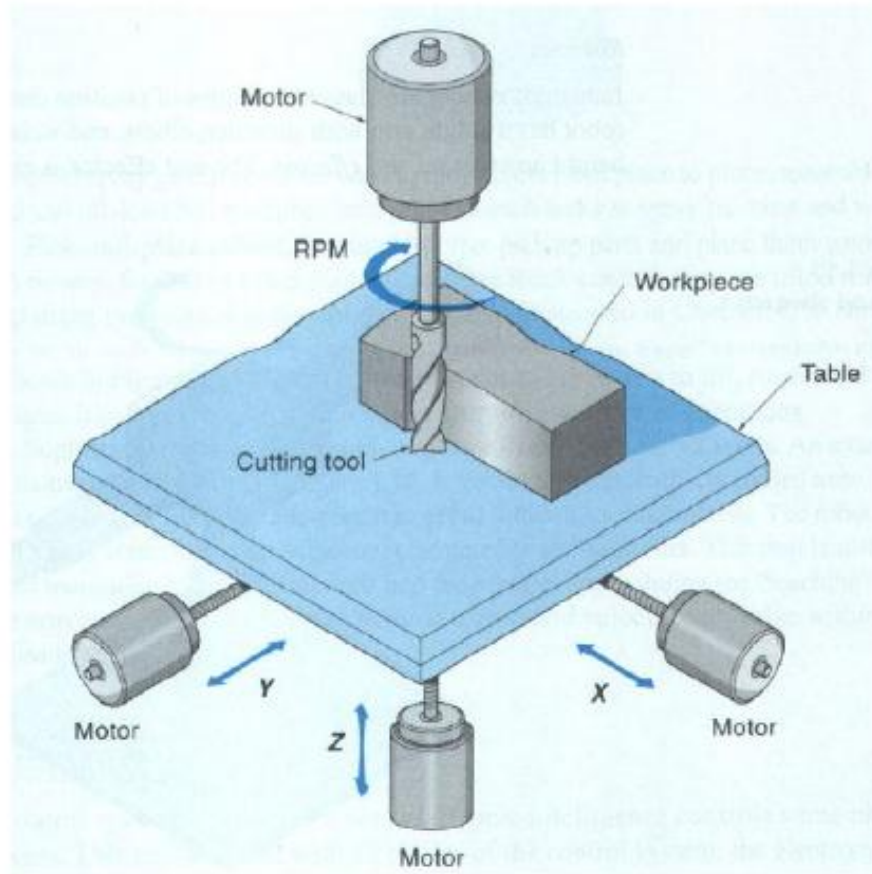
An antenna positioning system

KONTROL NUMERIK



Numerical Control

A digital control system that directs machine tools, such as a lathe, to automatically machine a part



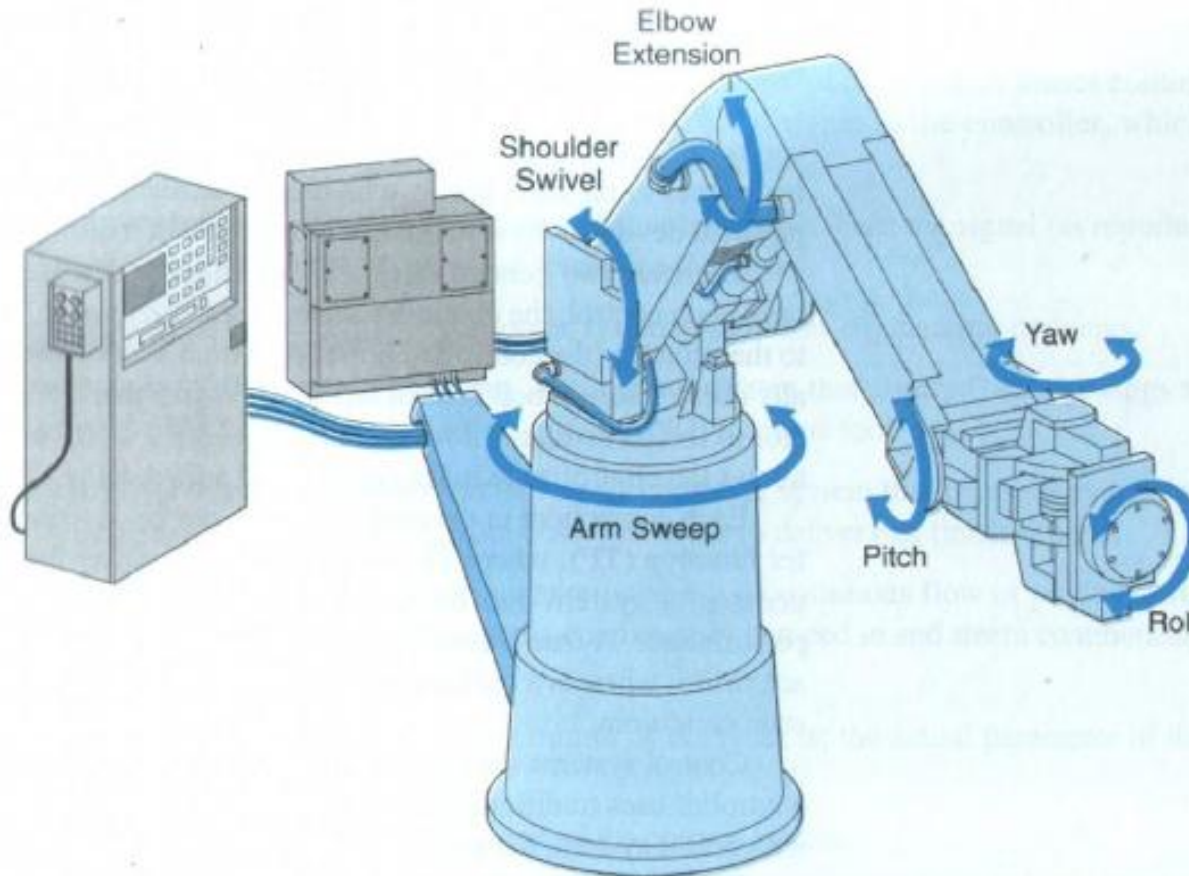
A numerical control milling machine

KONTROL NUMERIK



Robot

A servomechanism type control system in the form of machine with a movable arm



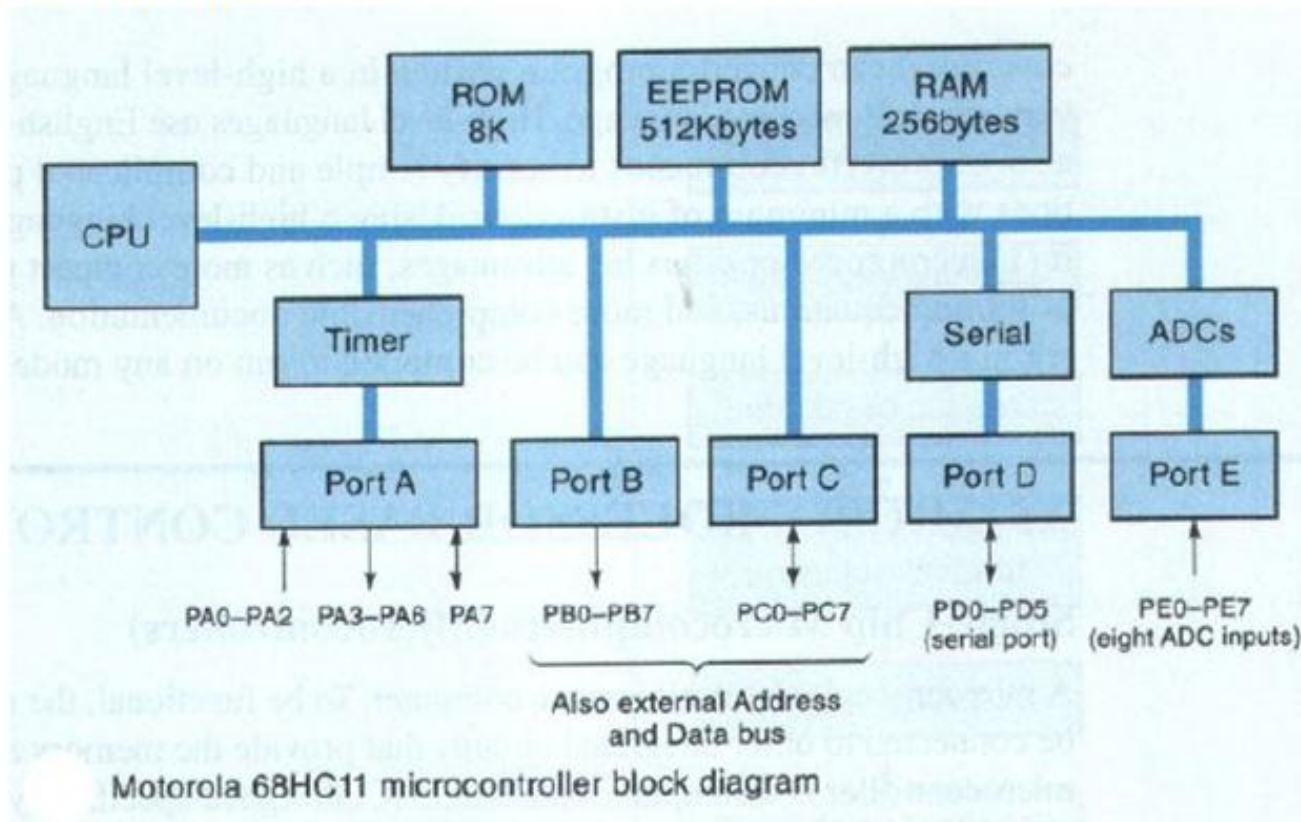
A large industrial robot

KONTROL BERBASIS MIKROPROSESOR



Microprocessor-Based Controllers

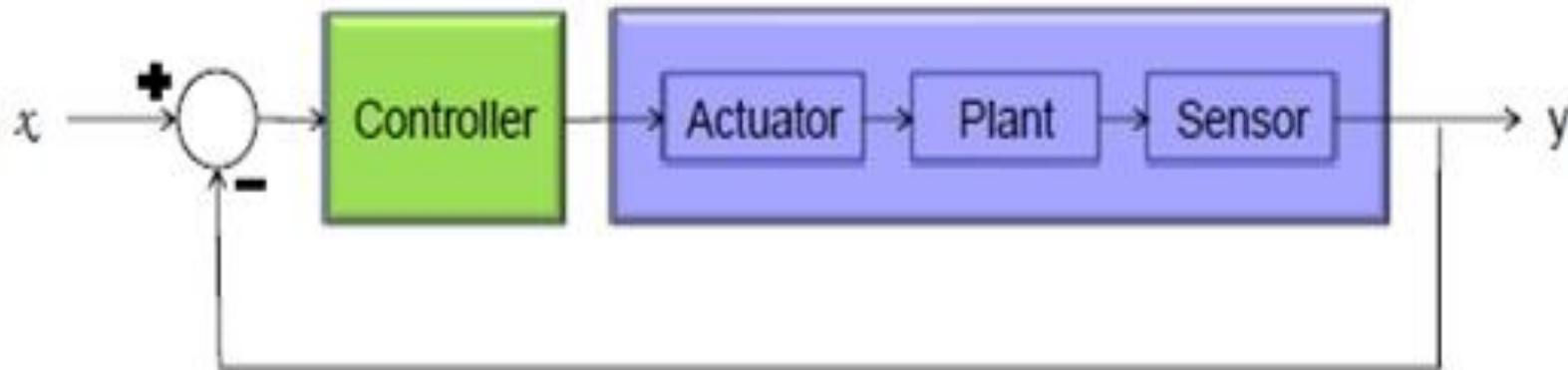
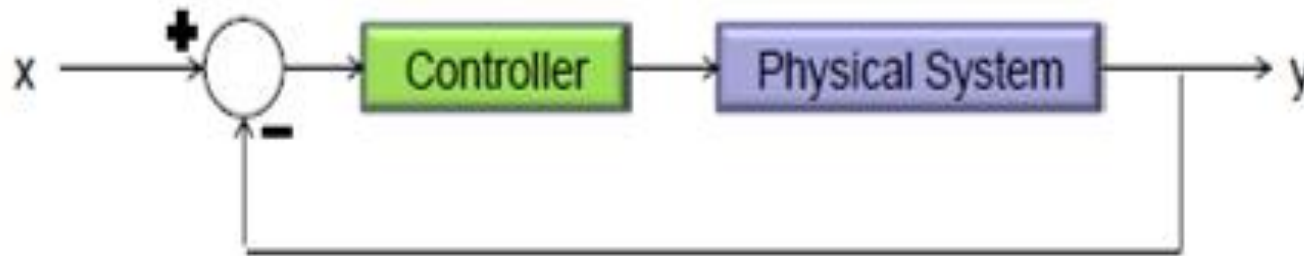
Microcontroller



Embedded
Controller

A small microprocessor-based controller that is permanently installed within the machine it is controlling

SISTEM KONTROL LOOP TERTUTUP



- ⦿ *Plant* → seperangkat *peralatan* yg bekerja bersama-sama untuk melakukan operasi tertentu

KONTROL PROSES

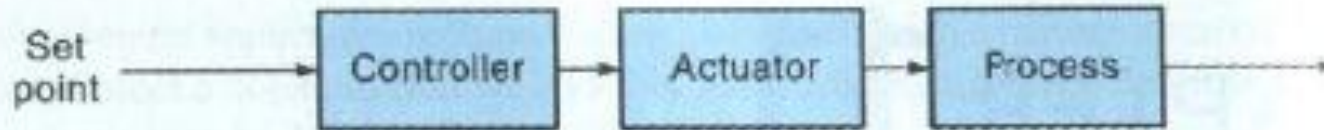


- ◉ *Proses* → suatu kondisi yg berlangsung secara *kontinu*, yg terdiri dari beberapa *perubahan* pada sistem yg dikontrol, yg diarahkan secara sistematis menuju ke suatu *hasil*/keadaan tertentu
- ◉ *Sistem* → *kombinasi* dari beberapa *komponen* yg bekerja bersama-sama utk melakukan *tujuan* tertentu
- ◉ *Aktuator* → alat yg berfungsi sebagai *driver* (berupa rangkaian elektronika)

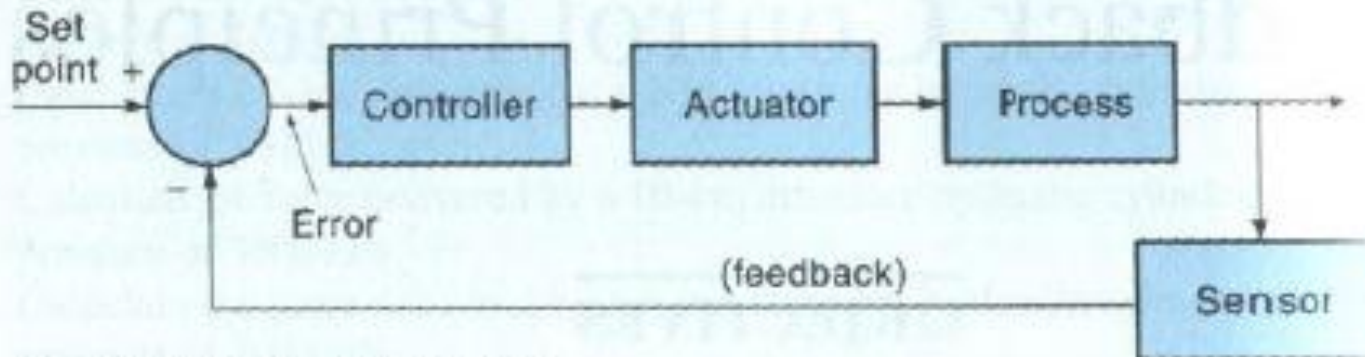
PRINSIP KENDALI UMPAN BALIK



Open- and Closed- Loop System



(a) Open-loop control system



(b) Closed-loop control system



TERIMA KASIH

