



ROHINI

COLLEGE OF ENGINEERING AND TECHNOLOGY

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DEPARTMENT OF BIOMEDICAL ENGINEERING

III Semester

BM3301 SENSORS AND MEASUREMENTS

UNIT – 5

5.9 Thermal Recorders

A thermal recorder, also known as a thermal printer or thermo graphic printer, is a type of printer that uses heat to create images or text on heat-sensitive paper. Thermal printing is widely used in various applications where quick and cost-effective printing is required. There are two main types of thermal printing technologies: direct thermal and thermal transfer.

Direct Thermal Printing:

In direct thermal printing, heat is applied directly to the heat-sensitive paper, causing it to darken and create the desired image or text. This method is commonly used for printing labels, receipts, tickets, and other short-term applications.

Thermal Transfer Printing:

Thermal transfer printing involves the transfer of ink from a ribbon onto the paper using heat. The process includes a thermal print head that heats the ribbon, transferring the ink onto the paper. This method is often used for higher-quality printing where durability and resistance to environmental factors are required.

Components and Working of Thermal Recorders:

Thermal Print Head: The thermal print head contains many tiny heating elements. These elements are selectively heated to create the desired patterns on the heat-sensitive paper.

Heat-Sensitive Paper:

Special heat-sensitive paper is used in thermal printing. The paper contains a layer of thermal coating that reacts to heat by changing color.

Ribbon (in Thermal Transfer Printing):

In thermal transfer printing, a ribbon with heat-sensitive ink is used. The ribbon is placed between the print head and the paper. When the print head heats up, the ink from the ribbon is transferred to the paper.

Working Process:

1. **Data Processing**: The data to be printed is processed by the printer's control system.
2. **Heating Elements Activation**: In direct thermal printing, the specific heating elements corresponding to the desired pattern are activated.
3. **Heat Transfer**: The activated heating elements generate heat, which reacts with the heat sensitive coating on the paper. This reaction causes the coating to darken and create the image or text.
4. **Image Formation**: The darkened areas on the paper form the printed image or text.

Advantages of Thermal Recorders:

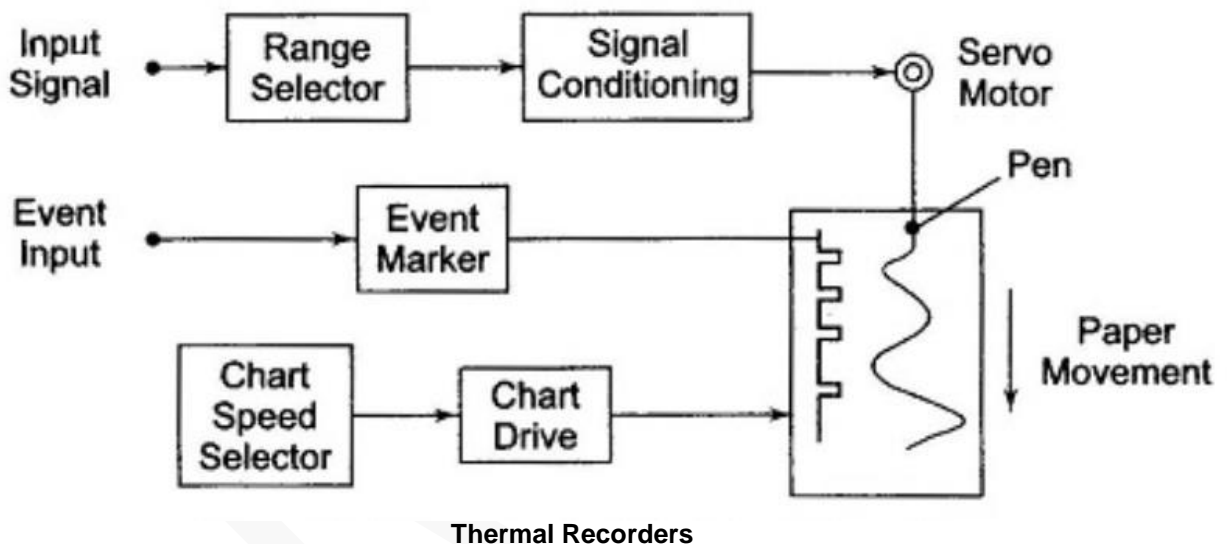
- Speed: Thermal printers are fast and suitable for applications that require quick printing.
- Low Maintenance: Thermal printers have fewer moving parts, reducing maintenance needs.
- Cost-Effective: Thermal printing often has lower consumable costs compared to other printing methods.
- Quiet Operation: Thermal printers are quieter compared to impact printers like dot matrix printers.

Applications:

- Retail: Thermal printers are used for printing receipts, price tags, and labels in retail environments.

- Logistics: Labels for packages and shipments are often printed using thermal printers.
- Healthcare: Thermal printing is used for printing patient wristbands, labels for medical samples, and prescription labels.
- Manufacturing: Labels for products and parts are printed using thermal printers.
- Point of Sale (POS): Thermal printers are used for printing receipts at checkout counters.

Thermal printers are valued for their simplicity, speed, and cost-effectiveness. However, the print quality and durability may vary depending on the specific type of thermal printing technology used and the application requirements.



In this system, a special movable pen which is thermally heated by passing an electric current through it is used. This system requires a thermally sensitive paper which changes its colour on application of heat.