Almamoun University collage

Power electrical Engineering

المسيطرات الرقمية والمعالج الدقيق

Third year Class

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2stSemester
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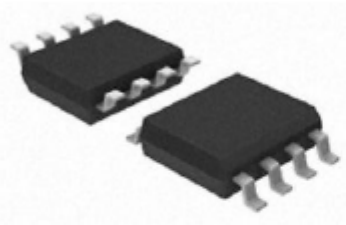
Lecture 3

Memories



•The **program memory** receives and holds the downloaded program instructions from the programming device

-This memory is usually an EEPROM (electrically erasable programmable ROM) or a battery-backup RAM, both of which are capable of retaining data

Data memory is RAM memory used as a "scratch pad" by the processor to temporarily store internal and external program-generated data

For example, it would store the present status of all switches connected to the input terminals and the value of internal counters and timers.

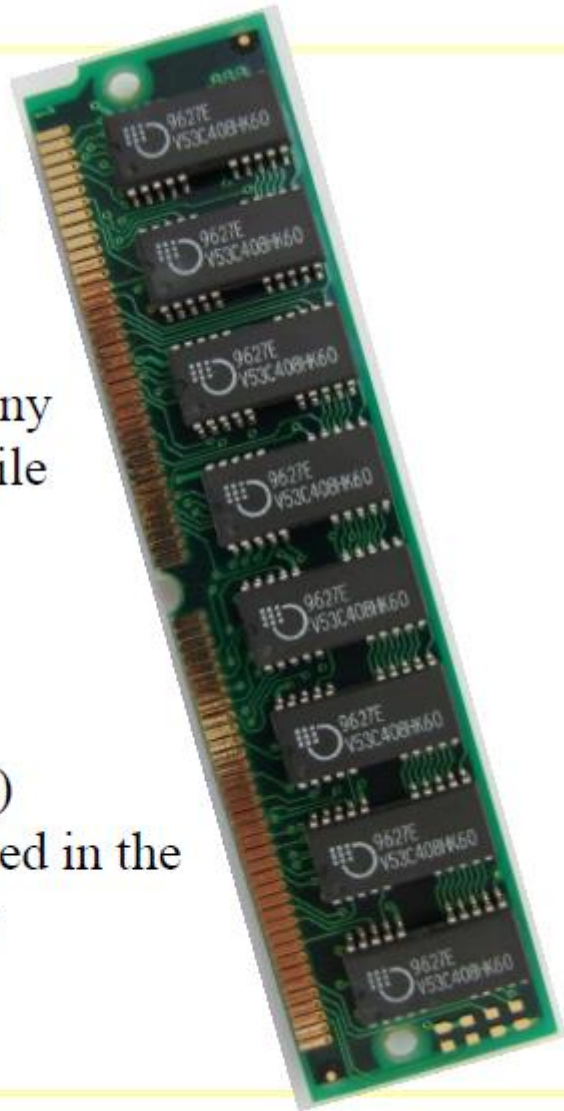
Memory Designs

VOLATILE.
A volatile memory is one that loses its stored information when power is removed.

Even momentary losses of power will erase any information stored or programmed on a volatile memory chip.

Common Type of Volatile Memory

RAM. Random **A**ccess **M**emory(Read/Write)
Read/write indicates that the information stored in the memory can be retrieved or read, while write indicates that the user can program or write information into the memory.



Memory Designs

Several Types of RAM Memory:

1.MOS
2.HMOS
3.CMOS

The CMOS-RAM (**C**omplimentary **M**etal **O**xide **S**emiconductor) is probably one of the most popular. CMOS-RAM is popular because it has a very low current drain when not being accessed (15microamps.), and the information stored in memory can be retained by as little as 2Vdc

Memory Designs

NON VOLATILE.
A non volatile memory is one that does not lose its stored information when power is removed.

•**EPROM, E**rasable **P**rogrammable **R**ead **O**nly **M**emory

Ideally suited when program storage is to be semi-permanent or additional security is needed to prevent unauthorized program changes.

The EPROM chip has a quartz window over a silicon material that contains the electronic integrated circuits. This window normally is covered by an opaque material, but when the opaque material is removed and the circuitry exposed to ultra violet light, the memory content can be erased.

The EPROM chip is also referred to as **UVPROM.**

Memory Designs

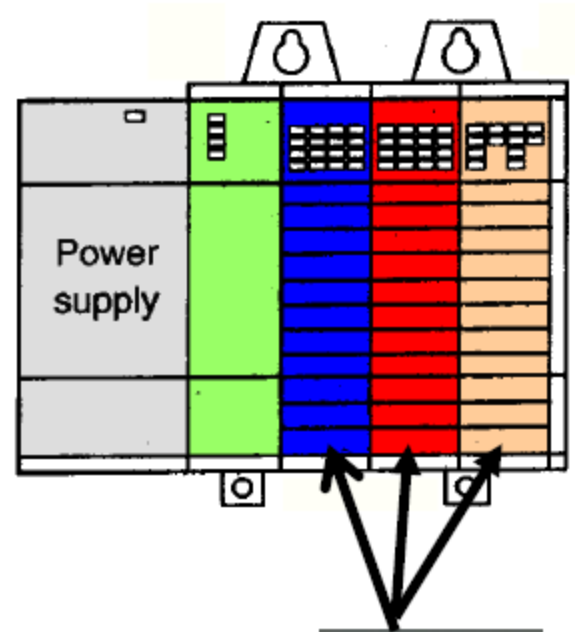
NON VOLATILE

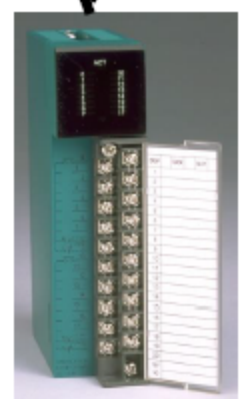
EEPROM, **E**lectrically **E**rasable
Programmable **R**ead **O**nly **M**emory

Also referred to as E^2PROM, is a chip that can be programmed using a standard programming device and can be erased by the proper signal being applied to the erase pin.
EEPROM is used primarily as a non-volatile backup for the normal RAM memory. If the program in RAM is lost or erased, a copy of the program stored on an EEPROM chip can be down loaded into the RAM.
Battery backed CMOS RAM can also be classified as non-volatile

I/O Section

Consists of input modules and output modules.





Input module connects to :

Field sensors: switches, flow, level, pressure, temp. transmitters, etc.

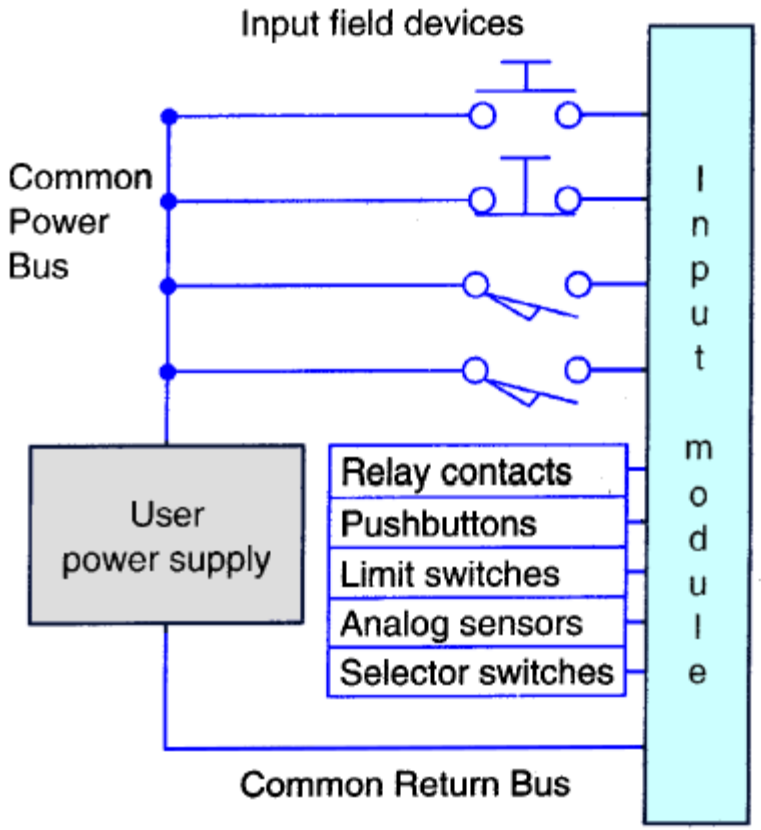
Output modules connect to:

Field output devices: motors, valves, solenoids, lamps, or audible devices

I/O Section

Input Module

Forms the interface by which input field devices are connected to the controller.



The terms “field” and “real world”are used to distinguish actual external devices that exist and must be physically wired into the system.

I/O Section

Output Module

Forms the interface by which output field devices are connected to the controller.

PLCs employ a relay or an optical isolator which uses light to electrically isolate the internal components from the input and output terminals.