**Microprocesso**r

A **microprocessor** is a computer processor where the data processing logic and control is included on a single [integrated circuit](https://en.wikipedia.org/wiki/Integrated_circuit), or a small number of integrated circuits. The microprocessor contains the arithmetic, logic, and control circuitry required to perform the functions of a computer's central processing unit. The integrated circuit is capable of interpreting and executing program instructions and performing arithmetic operations.[[1]](https://en.wikipedia.org/wiki/Microprocessor#cite_note-1) The microprocessor is a multipurpose, [clock](https://en.wikipedia.org/wiki/Clock_signal)-driven, [register](https://en.wikipedia.org/wiki/Processor_register)-based, [digital integrated circuit](https://en.wikipedia.org/wiki/Digital_integrated_circuit) that accepts [binary](https://en.wikipedia.org/wiki/Binary_code) data as input, processes it according to [instructions](https://en.wikipedia.org/wiki/Instruction_(computing)) stored in its [memory](https://en.wikipedia.org/wiki/Computer_memory), and provides results (also in binary form) as output. Microprocessors contain both [combinational logic](https://en.wikipedia.org/wiki/Combinational_logic) and [sequential digital logic](https://en.wikipedia.org/wiki/Sequential_logic), and operate on numbers and symbols represented in the [binary number](https://en.wikipedia.org/wiki/Binary_number) system.

The integration of a whole CPU onto a single or a few integrated circuits using [Very-Large-Scale Integration](https://en.wikipedia.org/wiki/Very-Large-Scale_Integration) (VLSI) greatly reduced the cost of processing power. Integrated circuit processors are produced in large numbers by highly automated [metal–oxide–semiconductor](https://en.wikipedia.org/wiki/Metal%E2%80%93oxide%E2%80%93semiconductor) (MOS) [fabrication processes](https://en.wikipedia.org/wiki/Semiconductor_device_fabrication), resulting in a relatively low [unit price](https://en.wikipedia.org/wiki/Unit_price). Single-chip processors increase reliability because there are much fewer electrical connections that could fail. As microprocessor designs improve, the cost of manufacturing a chip (with smaller components built on a semiconductor chip the same size) generally stays the same according to [Rock's law](https://en.wikipedia.org/wiki/Rock%27s_law).

Before microprocessors, small computers had been built using racks of [circuit boards](https://en.wikipedia.org/wiki/Circuit_board) with many [medium-](https://en.wikipedia.org/wiki/Medium-scale_integration) and [small-scale integrated circuits](https://en.wikipedia.org/wiki/Small-scale_integration), typically of [TTL](https://en.wikipedia.org/wiki/Transistor%E2%80%93transistor_logic) type. Microprocessors combined this into one or a few [large-scale](https://en.wikipedia.org/wiki/Large-scale_integration) ICs. While there is disagreement over who deserves credit for the invention of the microprocessor, the first commercially available microprocessor was the [Intel 4004](https://en.wikipedia.org/wiki/Intel_4004), designed by [Federico Faggin](https://en.wikipedia.org/wiki/Federico_Faggin) and introduced in 1971.[[2]](https://en.wikipedia.org/wiki/Microprocessor#cite_note-IEEE-2)

Continued increases in microprocessor capacity have since rendered other forms of computers almost completely obsolete (see [history of computing hardware](https://en.wikipedia.org/wiki/History_of_computing_hardware)), with one or microprocessors used in everything from the smallest [embedded systems](https://en.wikipedia.org/wiki/Embedded_system) and [handheld devices](https://en.wikipedia.org/wiki/Handheld_device) to the largest [mainframes](https://en.wikipedia.org/wiki/Mainframe_computer) and [supercomputers](https://en.wikipedia.org/wiki/Supercomputer).

**Vacuum tube**

The type known as a **thermionic tube** or **thermionic valve** utilizes [thermionic emission](https://en.wikipedia.org/wiki/Thermionic_emission) of electrons from a [hot cathode](https://en.wikipedia.org/wiki/Hot_cathode) for fundamental electronic functions such as signal [amplification](https://en.wikipedia.org/wiki/Amplifier) and current [rectification](https://en.wikipedia.org/wiki/Rectifier). Non-thermionic types such as a vacuum [phototube](https://en.wikipedia.org/wiki/Phototube), however, achieve electron emission through the [photoelectric effect](https://en.wikipedia.org/wiki/Photoelectric_effect), and are used for such purposes as the detection of light intensities. In both types, the electrons are accelerated from the cathode to the [anode](https://en.wikipedia.org/wiki/Anode) by the [electric field](https://en.wikipedia.org/wiki/Electric_field) in the tube.

Audio power amplifier using tubes, in operation. Red-orange glow is from heated filaments.

Illustration representing a primitive triode vacuum tube and the polarities of the typical dc operating potentials. Not shown are the impedances (resistors or inductors) that would be included in series with the C and B voltage sources.

The simplest vacuum tube, the [diode](https://en.wikipedia.org/wiki/Diode) (i.e. [Fleming valve](https://en.wikipedia.org/wiki/Fleming_valve)), invented in 1904 by [John Ambrose Fleming](https://en.wikipedia.org/wiki/John_Ambrose_Fleming), and contains only a heated electron-emitting cathode and an anode. Electrons can only flow in one direction through the device from the cathode to the anode. Adding one or more [control grids](https://en.wikipedia.org/wiki/Control_grid) within the tube allows the current between the cathode and a node to be controlled by the voltage on the grids.[[5]](https://en.wikipedia.org/wiki/Vacuum_tube#cite_note-5)

These devices became a key component of electronic circuits for the first half of the twentieth century. They were crucial to the development of [radio](https://en.wikipedia.org/wiki/Radio), [television](https://en.wikipedia.org/wiki/Television), [radar](https://en.wikipedia.org/wiki/Radar), [sound recording and reproduction](https://en.wikipedia.org/wiki/Sound_recording_and_reproduction), long-distance [telephone](https://en.wikipedia.org/wiki/Telephone) networks, and analog and early digital [computers](https://en.wikipedia.org/wiki/Computers). Although some applications had used earlier technologies such as the [spark gap transmitter](https://en.wikipedia.org/wiki/Spark_gap_transmitter) for radio or [mechanical computers](https://en.wikipedia.org/wiki/Mechanical_computer) for computing, it was the invention of the thermionic vacuum tube that made these technologies widespread and practical, and created

**What is evaluation of Sensor Technology?**

A sensor refers to a device that can sense a specified measurement parameter and convert it into a usable output signal. Sensing technology, computer technology, and communication are collectively known as the three pillars of information technology. Sensing technology is a multidisciplinary, modern science and engineering technology focused on the obtaining of information from natural sources, processing and identifying that information, and using it for planning, designing, developing, manufacturing, and testing. The degree of application and evaluation of sensors is an important indicator of a country Informatization. Intelligent sensing technology is a comprehensive and intensive technology involving various disciplines such as micro-mechanical electronic technology, computer technology, signal processing technology, sensing technology, and artificial intelligence technology. It can realize functions that traditional sensors cannot .Smart sensors are mainly composed of sensors, microprocessors, and related circuits. At present, smart sensors have been widely used in various fields such as aerospace, aviation, national defense, science and technology, and industrial and agricultural production.

As a tool for humans to obtain information, sensors are an important part of modern information technology. Most of the output of traditional sensors are analog signals, which do not have signal processing and networking functions. They need to be connected to specific measuring instruments to complete signal processing and transmission functions. Smart sensors are based on silicon material micro fabrication and CMOS circuit integration technology. According to the manufacturing technology, smart sensors can be divided into three categories: micro electromechanical systems (MEMS), complementary metal-oxide semiconductors (CMOS), and spectroscopy. MEMS and CMOS technologies are easy to achieve low-cost mass production and can integrate sensor elements, bias, conditioning circuits, and even ultra-large-scale circuits in the same substrate or the same package, enabling the device to have multiple detection functions and intelligent data processing functions. For example, smart devices that use the Hall Effect to detect magnetic fields, the See beck effect to detect temperature, the **piezoresistive effect** to detect stress, and the photoelectric effect to detect light.

**What is an Arm processor**?

An Arm processor is one of a family of central processing units ([CPUs](https://www.techtarget.com/whatis/definition/processor)) based on the reduced instruction set computer ([RISC](https://www.techtarget.com/whatis/definition/RISC-reduced-instruction-set-computer)) architecture for computer processors. Arm Limited, the company behind the Arm processor, designs the core CPU components and licenses the [intellectual property](https://www.techtarget.com/whatis/definition/intellectual-property-IP) to partner organizations, which then build Arm-based chips according to their own requirements. Arm Limited does not manufacture or sell any chips directly.

Acorn Computers first developed the Arm processor in the 1980s. Until recently, the name Arm was treated as an acronym, ARM, which at first stood for Acorn RISC Machine and then for Advanced RISC Machine. The acronym is still widely used, although Arm Limited uses only Arm when describing its processor technology. Arm Limited offers designs for both 32-bit and [64-bit](https://www.techtarget.com/searchdatacenter/definition/64-bit-processor) RISC [multicore processors](https://www.techtarget.com/searchdatacenter/definition/multi-core-processor). The processors use a much simpler [instruction set](https://www.techtarget.com/whatis/definition/instruction-set) than their [Intel](https://www.techtarget.com/whatis/definition/Intel) counterparts, which are based on the complex instruction set computing ([CISC](https://www.techtarget.com/whatis/definition/CISC-complex-instruction-set-computer-or-computing)) architecture. The two types of processors also employ different methods to optimize performance and increase efficiency. For example, Intel takes a hardware approach to maximizing performance, whereas Arm takes a software approach.