



Keyboards

Keyboard Basics

<p>Definition: A primary input device that allows users to enter text, characters, and commands into a computer system.</p> <p>Keyboards typically use an arrangement of keys to represent characters, numbers, symbols, and functions.</p> <p>Types of Keys:</p> <ul style="list-style-type: none"> • Alphanumeric keys: Letters and numbers. • Punctuation keys: Symbols such as commas, periods, and question marks. • Special keys: Shift, Ctrl, Alt, Windows key, etc. • Function keys: F1-F12, providing shortcuts for specific tasks.
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Keyboard Types

QWERTY:	The most common keyboard layout, named after the first six letters on the top row. Designed to prevent mechanical typewriters from jamming.
DVORAK:	An alternative layout designed to increase typing speed and reduce errors by placing frequently used letters on the home row.
Ergonomic Keyboards:	Designed to reduce strain and promote a more natural hand and wrist position. Often split or contoured.
Mechanical Keyboards:	Use individual mechanical switches for each key, providing tactile feedback and durability. Popular among gamers and typists.
Membrane Keyboards:	Use a pressure pad under the keys. Common, cheap, and quieter than mechanical keyboards.

Connectivity

USB:	Universal Serial Bus; the most common wired connection type for keyboards. Provides both power and data transfer.
Bluetooth:	A wireless technology that allows keyboards to connect to devices without cables. Requires pairing and batteries or charging.
Wireless (RF):	Uses a radio frequency signal to connect to a receiver plugged into the computer. Similar to Bluetooth but typically uses a dedicated receiver.

Pointing Devices

Mouse

<p>Definition: A handheld pointing device that detects two-dimensional motion relative to a surface. This motion is translated into movements of a cursor on the screen.</p> <p>Mice are used for selecting, dragging, and interacting with graphical elements in a user interface.</p> <p>Types of Mice:</p> <ul style="list-style-type: none"> • Optical Mouse: Uses an LED and a sensor to detect movement on a surface. • Laser Mouse: Uses a laser to provide more precision and sensitivity. • Trackball Mouse: Features a ball that the user rolls with their fingers or thumb to move the cursor. • Wireless Mouse: Connects via Bluetooth or RF, providing freedom from cables. <p>Key Features:</p> <ul style="list-style-type: none"> • Buttons: Typically includes left, right, and middle (scroll wheel) buttons for various functions. • Scroll Wheel: Used for vertical scrolling through documents and web pages. • DPI (Dots Per Inch): Measures the sensitivity of the mouse; higher DPI means more precise tracking.
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Touchpad

<p>Definition: A flat, touch-sensitive surface that detects the user's finger movements to control the cursor. Commonly found on laptops.</p> <p>Touchpads emulate the functionality of a mouse, allowing users to navigate and interact with the graphical interface.</p> <p>Key Features:</p> <ul style="list-style-type: none"> • Multi-touch Support: Allows for gestures like pinch-to-zoom, two-finger scrolling, and three-finger swiping. • Integrated Buttons: Some touchpads have physical buttons, while others use tap-to-click functionality. • Sensitivity Adjustment: Users can adjust the sensitivity of the touchpad to match their preferences.

Touchscreen

<p>Definition: A display screen that is also an input device. Users can interact with the screen by touching it with their fingers or a stylus.</p> <p>Touchscreens are commonly found on smartphones, tablets, and interactive kiosks.</p> <p>Types of Touchscreens:</p> <ul style="list-style-type: none"> • Resistive Touchscreen: Uses two layers of electrically conductive material separated by a gap. Pressure on the screen causes the layers to connect, registering the touch. • Capacitive Touchscreen: Uses a layer of transparent conductive material that creates an electrostatic field on the surface of the screen. Touching the screen disrupts the field, which is detected by sensors. • Infrared Touchscreen: Uses an array of infrared beams and sensors around the edges of the screen. Touching the screen blocks the beams, registering the touch. • Surface Acoustic Wave (SAW) Touchscreen: Uses ultrasonic waves on the screen's surface. Touching the screen absorbs some of the wave, which is detected by sensors.
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Audio & Visual Input Devices

Microphones

Definition: A device that converts sound waves into electrical signals. Used for recording audio, voice communication, and speech recognition.

Microphones are essential for tasks such as podcasting, video conferencing, and voice-controlled applications.

Types of Microphones:

- **Dynamic Microphone:** Rugged and reliable, suitable for live performances and recording loud sources.
- **Condenser Microphone:** More sensitive and capable of capturing a wider range of frequencies, often used in studios.
- **USB Microphone:** Connects directly to a computer via USB, providing a convenient option for recording audio.
- **Lavalier Microphone:** Small and clip-on, used for hands-free recording and public speaking.

Polar Patterns:

- **Omnidirectional:** Captures sound from all directions.
- **Cardioid:** Captures sound primarily from the front, rejecting sound from the rear.
- **Bidirectional:** Captures sound from the front and rear, rejecting sound from the sides.

Gaming and Specialized Input Devices

Gaming Controllers

Definition: A device used to control video games, providing input through buttons, joysticks, triggers, and other controls.

Gaming controllers are designed for ergonomic comfort and precise control, enhancing the gaming experience.

Types of Gaming Controllers:

- **Gamepad:** A handheld controller with buttons, directional pads, and analog sticks, commonly used for console and PC gaming.
- **Joystick:** A stick that can be moved in multiple directions, used for flight simulators and arcade games.
- **Steering Wheel:** Used for racing games, providing realistic control over the vehicle.
- **Motion Controller:** Uses motion sensors to track the player's movements, allowing for immersive gameplay.

Webcams

Definition: A video camera that streams or records video, typically used for video conferencing, online streaming, and surveillance.

Webcams are commonly integrated into laptops and can also be connected externally via USB.

Key Features:

- **Resolution:** Measured in pixels (e.g., 720p, 1080p), indicating the clarity and detail of the video.
- **Frame Rate:** Measured in frames per second (FPS), indicating the smoothness of the video.
- **Field of View (FOV):** The angle of the scene that the webcam can capture.
- **Built-in Microphone:** Many webcams include a built-in microphone for audio capture.

Barcode Scanners

Definition: A device used to read barcodes, which are optical machine-readable representations of data.

Barcode scanners are commonly used in retail, logistics, and healthcare for inventory management and point-of-sale transactions.

Types of Barcode Scanners:

- **Laser Scanner:** Uses a laser beam to read the barcode.
- **Imager Scanner:** Uses a camera to capture an image of the barcode, which is then decoded.
- **Pen Scanner:** The user manually swipes the pen over the barcode.
- **Wireless Barcode Scanner:** Connects wirelessly to a computer or mobile device.

Scanners

Definition: A device that captures images from physical documents and converts them into digital form.

Scanners are used for archiving documents, creating digital copies of photos, and optical character recognition (OCR).

Types of Scanners:

- **Flatbed Scanner:** The document is placed on a glass surface, and a scanning head moves beneath it.
- **Sheet-fed Scanner:** Documents are fed through the scanner automatically.
- **Handheld Scanner:** A small, portable scanner that the user manually moves over the document.
- **Document Scanner:** Designed for high-volume scanning of documents, often with features like automatic document feeding and duplex scanning.

Key Features:

- **Resolution:** Measured in DPI (dots per inch), indicating the level of detail captured.
- **Color Depth:** The number of bits used to represent each color, affecting the accuracy of color reproduction.
- **Scanning Speed:** The time it takes to scan a document.

Biometric Input Devices

Definition: Devices that use unique biological characteristics to identify and authenticate users.

Biometric input devices are used for security purposes, such as access control and identity verification.

Types of Biometric Input Devices:

- **Fingerprint Scanner:** Reads and records the unique patterns of a person's fingerprint.
- **Facial Recognition:** Uses cameras and algorithms to identify individuals based on their facial features.
- **Iris Scanner:** Scans the unique patterns of the iris.
- **Voice Recognition:** Analyzes a person's voice to verify their identity.