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Scanners

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A scanner is a device for transferring information from a physical medium to an electronic file on a computer (a scan of a document). The end result of the scanner is the resulting file that can be opened on a computer or other electronic device (phone, tablet). Scanners come in different types, differ in appearance, cost, and even the principle of operation [1].

Scanning technology can be used for performing various tasks, all of them depending on the application and the specific type of scanner. So, OR-code scanners are designed to read data only from them. But tablet technology can digitize information from different types of media – sheets of paper, books, plastic.

The principle of operation of the scanner is almost identical for each type and consists of two main stages: reading the media and receiving data from it and processing the received information and creating a ready-made image in digital form, sent to a PC.

The principle is described in more detail on the example of a tablet device. A sheet of paper or other material is placed on the work surface (transparent glass) with the side down necessary for scanning. Then one of the ways to scan a document is started on the computer. The device will start the mechanisms, after which the built-in motor will start moving the lamp around the entire area. Afterwards, the light bulb shines on the carrier, the information begins to be reflected on the system of mirrors, thanks to which all data gets to the

analog-to-digital converter. And finally the information is sent ready-made to the computer in accordance with the settings that are set at the start of the scan (resolution, color, file format, and others) [2].

The main element that provides the entire scanning process is the matrix, which can be of two kinds CCD and CIS. CDD matrix consists of a carriage, photosensitive elements and a light bulb that illuminates the copied media. Reflected light hits the lenses. Chromaticity is achieved by dividing the light flux into components of the color spectrum and entering the photocells. Scanners with matrices of this type work quickly, they give a high-quality image at the output. Due to the design features, there is no need to press the cover of the device hard to press down the carrier. Among the disadvantages are the presence of an external power supply and the need for frequent replacement of the light bulb.

In CIS matrices, LEDs of different colors are provided instead of a light bulb. The luminous elements flash alternately during the passage of the carriage, which is achieved by obtaining a color picture. Such devices work slower than CDD, but you can get very high-quality color digital copies [3].

The range of scanners includes the following:

Tablet. It is the most common and familiar to the average user. It is often used at home and in offices. It is very easy to use. It is enough to connect to the computer, install the drivers and scan the necessary documents. The flatbed is called because the sheet is placed on a flat surface – the scanner glass. The top of the workspace is covered with a lid.

Many types of media are scanned, from ordinary sheet paper to thick books. In the latter case, due to the strong pressure of the lid on the book, the binding is damaged.

The "tablet" series also includes scanners for passports, which can be used to process documents of small formats –

passports, checks, business cards, certificates, and other A5, A6 carriers.

Plangent. Outwardly similar to a conventional printer, there is an input and output for the sheet, which is captured and stretched through the internal components. It can scan from both sides of the sheet at the same time, which is an advantage over the usual tablet view. Scans only individual sheets and the cost of equipment is more in comparison with a conventional tablet.

Manual scanner. A portable device that needs to be moved during the scanning process. The sheet is laid on a flat surface, the device leans against the paper and gradually, at the same speed, the device moves by hand around the entire carrier.

Charging and transferring files to the computer is done via a USB cord. The amount of files stored inside this type of scanner depends on the amount of memory. If necessary, the volume can be expanded with a memory card. Its only advantage is mobility and relative cheapness. The disadvantages include quality and the need for some clarity in working with equipment.

References:

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