

ПОДСЕКЦИЯ АНГЛИЙСКОГО ЯЗЫКА

SINGLE-BOARD COMPUTERS IN OUR MODERN LIFE

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The use of single-board computers is discussed briefly. The advantages and disadvantages of these machines are given.

Single-board computers, what is it? This is a device that has everything minimally needed for work, assembled on one board. As a rule, this is CPUs, GPUs, possibly USB and network interfaces - both wired and wireless. Video outputs can be different: from old fashioned VGA or composite video to modern HDMI - if only the integrated video core supports it. They are usually powered by a USB connector and require a current in the range of 500-1500 mA. So they can be powered using a conventional charger for a mobile phone or tablet. But why is it needed? Well the number of tasks that such computer can handle is quite large. The list starts with a home computer and ends with routers and modems. For example, on such a device you can easily install almost complete Linux, turning it into a good machine for working with documents, web surfing, listening to music and other simple tasks. Some models can even digest video playback up to 1080p! And all this with the familiar GUI. The only problems of this computers is different architecture. As a rule, many applications have a version for the ARM architecture, and if not, it is easy to find an analogue, but specific software on this platform is still rarely found.

The other side of the coin is automation and narrow specialization. For instance Raspberry Pi have firmware that allows you to turn it into a Wi-Fi router, network storage or wireless network player. Often, such solutions are as complete as possible and require minimal routine, requiring the installer to only write the desired image to the storage medium (most often a memory card) and specify the necessary settings. The possibilities are truly endless - you can build an entire smart home using only a couple of such boards. Of course, for the sake of this, you will have to sweat with the setup of all such devices, but even here there are ready-made solutions that require only minimal directness of hands.

Do not forget about the growing phenomenon called the Internet of Things (IoT). For example, Microsoft released a special version of Windows 10 named IoT Edition. From the point of view of developing ideas for single-board computers, this is really a step forward: before that, control could only be done through a router. Now this link is disappearing, allowing devices to communicate directly, and even using the usual methods for this - for example, the well-known and popular C# is used to interact with Arduino.

The main thing that allows single-board computers to communicate with the outside world is the GPIO ports. These are the ports, which can be both inputs and outputs, allowing the device to interact on an on-off basis. Such simplicity of the idea allows, for example, turning the light bulb on or off when receiving an email with the appropriate command.

Now some words about Raspberry Pi, one of the most popular single-board computers. Initially this solution was conceived for teaching computer science to schoolchildren and students. However, over time, Raspberry has become increasingly used by engineers and enthusiasts to create a wide variety of devices: wireless access points, weather stations, cameras, etc. The first modifications of the Raspberry Pi appeared on sale in 2012. One of the latest models, the Raspberry Pi 4B, appeared at the end of 2019. Some people can use it in illegal purposes. For instance hacking or pin testing. In such way, they can steal some of your data and sell it on dark marketplaces. So be careful.

The board is based on the Broadcom processors, which contains four 64-bit ARM Cortex-A72 cores with a clock frequency of 1.5 GHz. Unlike any previous board, the Raspberry Pi 4 Model B is available in three different models, each of which offers different memory options with 1 GB, 2 GB or 4 GB of LPDDR4 RAM. There are 2 USB 3.0 ports and 2 USB 2.0 ports. Mini HDMI connection with USB type c charger. By the way you can add necessary gadgets through the purchase of additional add-ons that you can simply instal on board.

As for our country, the most everyday example of using single-board devices is the electronic public transport boards that work on Raspberry Pi boards.

References:

1. <https://gagadget.com>
2. <https://intex-press.by>