Web Home Controller

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Introduction

The progressive development of information and communication technologies leads to the application of the latest research in the field of process control in industrial environments and work and living environment. Web Home Controller is a device that allows control of processes and events in the real time for “smart” energy-efficient house (control of lighting, heating, security ...). The device is developed by programming the microcontroller and connecting with supporting equipment with necessary interface. Connecting to the device is done with a computer connected to network from any location using an IP address, which shows the part of the house where the device is installed. Except monitoring, device can remotely manage the selected process by the principle of on-off, start opserving alarm zone, take the information about recorded events.

Architecture web home controllera

Architecture universal Web Controller is based on the use of eight bit microcontroller ATmega32, Ethernet controller ENC28J60, DS1307 real-time clock and LCD character display 20x4 character. Mutual connection of two controllers is realized through a standard SPI interface. As the power supply voltage of microcontroller is 5V, for adjusting voltage level between the control line ENC28J60 and the microcontroller uses the integrated circuit 74HCT245. The web controller hardware architecture is shown in Figure 1.

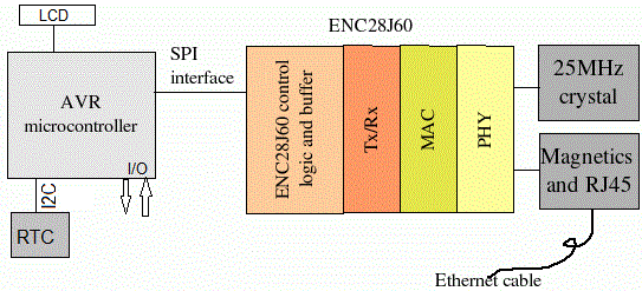
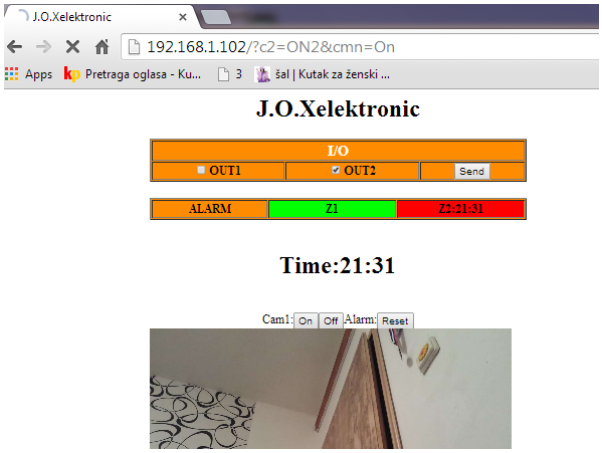


Fig 1. The hardware architecture a web home controller

This solution requires the development of its own software that supports TCP / IP protocol. The software is written in the programming language C micro of Mikroelektronika company. Compiler for AVR microcontrollers includes ethernet library that simplifies programming the microcontroller. The program is designed to allow us to turn on and off the two devices in the house, overseeing two alarm zones, real-time display of controlled web server, record the time of alarm, automatic switching IP cameras in case of accidental activation of the alarm and the ability to switch when we want. The listed functions can be changed depending on the configuration of the building and desires of consumers. A device in the early creating phase shown in Figure 2.

Fig 2. A device in the early creating phase

For writing programs are used the next libraries: Software_I2C, LCD, SPI_Ethernet. The website is created in HTML. If we want to consider an alarm zone in our house we enter an IP address and get display web pages in the browser.



Sl.4 Page in the Web browser

Conclusion

The advantage of using a web server implemented system is that the user can access the web page using the browser without without any additional software. The device can be flexibly designed to meet the various demands of consumers. The only prerequisite for the installation and use of the device is to have a static IP address and internet connection.

Literature

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