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Control Home Appliance Using Arduino Uno

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ABSTRACT: The project is based on modern techniques will make the home get "SMARTHOME". The modern simulating home automation with different operation modes which can be operated by a mobileapplications. The home automation is a network of hardware communication, a home automation system is a technical solution that automating the number of electronic – electrical and technologybased system within a home. We use the more and more Technology with the home automation yourhome technology act as "TECHONOLOGY ON YOUR PALM". So you imagine the Light, Fan, TV, AC and the other equipment of your home is ON and OFF in a few minute. Keywords: Home automation, control, user friendly interface.

I. INTRODUCTION

The main attraction of any automated system is to reduce human labor, effort and time. Home automation is a system that allows users to control a variety of different devices and also makes it easier to control home appliances and save energy. Nowadays home automation is being used more and more. On the other hand, it provides more comfort especially when everyone is busy with their work. Home automation installed in homes not only increases comfort but also allows for centralized control of heating, ventilation, air-condition and lighting. Hence, they contribute to overall cost reduction and are also useful in saving energy which is definitely the main problem today. In current years, wireless systems such as Wi-Fi, Bluetooth have become more and more common in home networking. Even in home automation, the use of wireless technologies offers many advantages that cannot be achieved using only wired networks.

II. GENERAL BLOCK DAIGRAM



Fig 1. General Block Diagram

III. COMMUNICATION SYSTEM

In communication system different types of devices are used to communicate the command given by the user. Such type of devices are as follows : -

IV. BLUETOOTH BASED HOME AUTOMATION SYSTEM USING CELL PHONES:

In Bluetooth based home automation system the home appliances are connected to the Arduino BT board at input output ports using relay. The program of Arduino BT board is based on high level bilateral-C language of microcontrollers; the connection is made via Bluetooth. The password protection is provided so only giving permission to user is allowed to access the appliances. The Bluetooth connection is settled between Arduino BT board and phone for wireless communication. In this system, the python script is used and it can insert one any of the Symbian OS environment, it is portable. One circuit is designed and implemented for receiving the feedback from the phone, which indicate the status of the device.



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Fig 2: Bluetooth based home automation

V. REMOTE CONTROL BASED HOME AUTOMATION SYSTEM

In this Home Automation system we are using ARDUINO UNO and controlling this with a remote controller (remote). We have given C language program to Arduino Uno and this will give signals to the remote to ON and OFF to the individual switch or a bulb. We have use remote based because it is more acceptable to use and there are no difficult features for it.



Fig 3: Remote control based home automation system

VI. GSM BASED HOME AUTOMATION SYSTEM

Because of mobile phones and GSM technology, GSM-based home automation is alluring for research. We considered SMS based home automation, GPRS based home automation mainly for communication in GSM. The system uses transducers that convert the function of the machine into electrical signals that go to the microcontroller. The system's sensors convert physical properties such as sound, temperature and humidity into another quantity such as voltage. The microcontroller study all the signals and converts them into commands to be understood by the GSM module.



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Fig 4:GSM Based Home Automation System

VII. SOUND SENSOR BASED HOME AUTOMATION SYSTEM:

Apart from building various electronic projects with Arduino and more, sound sensors are used in many other day to day applications including: Sound sensor is defined as a module that detects sound waves through its intensity and converting it to electrical signals.

VIII. EXECUTION UNIT

In execution unit mainly a university device ARDUINO UNO and the different types of relay are used. Arduino Uno:As we discussed we know that Arduino Uno is the most standard board available and probably the best choice for a beginner. We can directly connect the board to the computer via a USB Cable which performs the function of supplying the power as well as acting as a serial port.



Pin configuration of Arduino Uno:

Fig 5: Arduino Uno

VIN: This is the input voltage pin of the Arduino board used to provide input supply from an external power source. 5V: This pin of the Arduino board is used as a regulated power supply voltage and it is used to give supply to the board as well as onboard components.

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3.3V: This pin of the board is used to provide a supply of 3.3V which is generated from a voltage regulator on the board

GND: This pin of the board is used to ground the Arduino board.

Reset: This pin of the board is used to reset the microcontroller. It is used to Resets the microcontroller.

Analog Pins: The pins A0 to A5 are used as an analog input and it is in the range of 0-5V.

Digital Pins: The pins 0 to 13 are used as a digital input or output for the Arduino board.

Serial Pins: These pins are also known as a UART pin. It is used for communication between the Arduino board and a computer or other devices. The transmitter pin number 1 and receiver pin number 0 is used to transmit and receive the data resp.

External Interrupt Pins: This pin of the Arduino board is used to produce the External interrupt and it is done by pin numbers 2 and 3.

PWM Pins: This pins of the board is used to convert the digital signal into an analog by varying the width of the Pulse. The pin numbers 3, 5, 6,9,10 and 11 are used as a PWM pin.

SPI Pins: This is the Serial Peripheral Interface pin, it is used to maintain SPI communication with the help of the SPI library. SPI pins include:

SS: Pin number 10 is used as a Slave Select

MOSI: Pin number 11 is used as a Master out Slave In

MISO: Pin number 12 is used as a Master in Slave Out

SCK: Pin number 13 is used as a Serial Clock

LED Pin: The board has an inbuilt LED using digital pin-13. The LED glows only when the digital pin becomes high.

AREF Pin: This is an analog reference pin of the Arduino board. It is used to provide a reference voltage from an external power supply.

Relay :A relay is an electrically operated switch that can be turned on or off, letting the current go through or not, and can be controlled with low voltages, like the 5V provided by the Arduino pins.Controlling a relay module with the Arduino is as simple as controlling any other output as we'll see later on.We will test out the four relays on board the Arduino 4 Relays Shield. This shield is a great add-on for the Arduino UNO board, as it has four relays capable of handling loads up to 48V. To control the relays, we need to use the following pins:

Relay 1 - pin 4.

Relay 2 - pin 7.

Relay 3 - pin 8.

Relay 4 - pin 12.

The sketch we will use is going to be very impel. It will activate all four relays for one second, then de-activating them for one second. The status of the relays can be seen.

Relays allow low-power microcontrollers to handle circuits that uses much higher power than what the board can handle directly. They are typically in used industrial applications to control high power circuits, but it is also used in cars, homes and other electric applications.

Relays are composed by an electromagnet that moves a tiny metallic plank, which is called COM terminal, between two different positions NC terminal and NO terminal. We can decide in which position the COM terminal is connected to through activating/deactivating the electromagnet, by connecting a low power signal in the electromagnet control terminals.

1. LOADIn this project the load unit are used to get the result of whole working of communication system and execution unit are done. The load i.e. the equipment which is used in our home like fans, LED bulbs, motors, TVs, and etc.

II. ADVANTAGE :

1. Managing all of your home devices from one place.

- 2. Flexibility for new devices & appliances.
- 3. Maximizing home security.
- 4. Remote Control of home functions.
- 5. Increased energy efficiency.
- 6. Improved appliances functionality.
- 7. Home management insights.



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IX. CONCLUSION

In this paper we give a general idea to users, how to design and implementation of reliable and variable home automation using the universal device "ARDUINO UNO". Here, we find mainly some methods like, Bluetooth based, Smart-phone based, GSM Based, Remote control and etc.On .In Bluetooth based need of password. Pairing for Arduino BT and Bluetooth. In Smart Phone need of APP which work to Control home applications. In GSM based, need 220/240V, 50Hz power supply from anywhere in the world. By simply sending an SMS, it dedicated SIM card in the system. In Remote control every appliances connected through the remote.

REFERENCES

- [1] Balasingam, S.; Zapiee, M.K.; Mohana, D. Smart Home Automation System Using IOT. Int. J. Recent Technol. Appl. Sci. 2022, 4, 44–53
- [2] Majhi, A.K.; Dash, S.; Barik, C.K. Arduino based smart home automation system. Accent. Trans. Inf. Secur. 2021, 6, 7–12
- [3] Jabbar, W.A.; Kian, T.K.; Ramli, R.M.; Zubir, S.N.; Zamrizaman, N.S.M.; Balfaqih, M.; Shepelev, V.; Alharbi, S. Design and Fabrication of Smart Home with Internet of Things Enabled Automation System. IEEE Access 2019, 7, 144059–144074.
- [4] Froiz-Míguez, I.; Fernández-Caramés, T.M.; Fraga-Lamas, P.; Castedo, L. Design, Implementation and Practical Evaluation of an IoT Home Automation System for Fog Computing Applications Based on MQTT and ZigBee-WiFi Sensor Nodes. Sensors 2018, 18, 2660.
- [5] Kishore. P. T. Veeramanikandasamy, K. Sabbath and S. Veerakumar, "Internet of Things based Low-Cost Real-Time Home Automation and Smart Security System", International Journal of Advanced Research in Computer and Communication Engineering, vol. 6, no. 4, 2017.
- [6] Jump up^ "Research and Markets: Global Home Automation and Control Market 2014-2020 Lighting Control, Security & Access Control, HVAC Control Analysis of the \$5.77 Billion Industry". Reuters. 2015-01-19. Archived from the original on 2016-05-05.
- [7] David, A.Chima, A.Ugochukwu and E.Obinna,"Design of a home automation system using Arduino", International journal of Scientific & Engineering Research, Vol. 6, pp. 795-801, june-2015.
- [8] Zekeriyakeskin, Yunus Emrekocaturk, okan Bingol, Kublai Tasdelen, "Webbased smart home automation: PLC controlled implementation", vol11, NO 3, 2014.
- [9] Prof. M. B. Salunke, Darshan Sonar, Nilesh Dengle, SachinKangude, Dattatraya Gawade, "Home Automation Using Cloud Computing and Mobile Devices", Vol. 3, Issue 2 (Feb. 2013), ||V2|| PP 35-37
- [10] https://robu.in/arduino-pin-configuration/
- [11] https://docs.arduino.cc/tutorials/4-relays-shield/4-relay-shield-basics





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