THE CONTROLLING OF HOME ENERGY MANAGEMENT SYSTEM USİNG WI-FI

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ABSTRACT

Home automation is the residential extension of building automation. House automation may include centralize control of lighting and fan, appliances to provide improved convenience, ease, energy efficiency and security system. Home automation system integrates electrical devices in a house with each other. In this project automation of home is done by android mobile phones with Wi-Fi communication. Android is a Linux-based operating system designed primarily for touch screen mobile devices such as smart phones and tablet computers with the Open source. Android phone or any other devices having inbuilt Wi-Fi and microcontroller takes as main role of commanding and controlling operation. The electrical unit having microcontroller, to make the controlled reliable operation, android has been employed. The communication between mobile and PIC controller has been taken place by Wi-Fi without internet connection. With the use of Wi-Fi software in phone the command is given to loads. For the specified commands the loads can be turned on or turned off. The end devices are controlled by RF and give the alert to the end user. In our system, door opening and closing with the help of wireless is also included.

Keywords: Wi-Fi, Antenna, Arm Cortex, Intelligent switch, Net nod.

I. INTRODUCTİON

Home automation is the residential extension of "home automatic control". It is the managing action of home electrical devices and home activity. It include centralized control of electric light, bulb, ventilation and AC, personal computer, printer and other systems to provide advanced method to control energy efficiency and security. Home automation is for intelligent switch control network.

II. A NETWORK CONTROL SYSTEM STRUCTURE

Due to the environment of the building lighting system,the system devices selection mainly considerate the economy and stability.First, the house intelligent switch control system should beadapted to several type of voltages, and the stability andsafety should be guaranteed as well.Second, the system should have a strong anti-jammingcapacity and quick communication fidelity.Last, with long hours' work, any other electricalinterference and radio transmission should be kept away.The main issue of the house intelligent switch controlsystem is a protocol and the IC of CAN buscommunication system .in this fig(1) the circuit board contains ARM CORTEX , Wi-fi slot, antenna and temperature sensor. This circuit board is consisting of multipurpose board developed with advanced technology. We can add extra application like gas or smoker sensor, buzzer, motor driver.
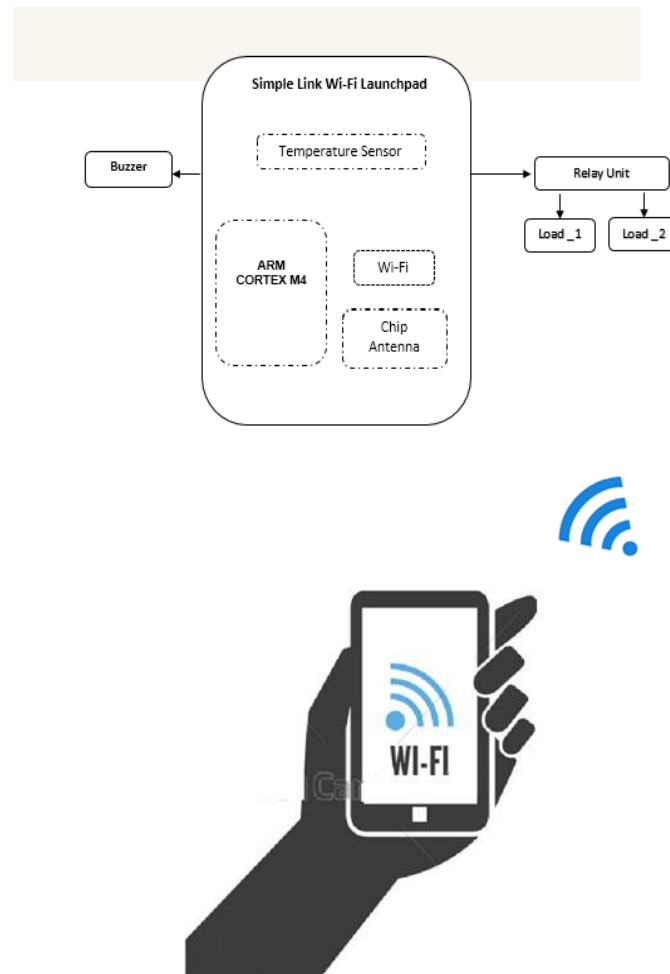
Fig. 1 Wi-Fi for Home Reliable & Manipulation System

III. SYSTEM SOFTWARE DESIGN

The system works as one of the host and multiple-slaver. When the system starts each and every node works on the slave mode and releases the CAN bus waiting for receiving commands. The node that being operated works as a host immediately and broadcasts command messages without dispatch. At first the host must check the data line bus if it is busy or not. When two or more the system starts all registers of CAN bus controller ARM CORTEX are initialized. Then all nodes must listen to the bus and creates the confirm error messages. When the data BUS line is not busy, the system works on a sleeping mode but the SPI interface keeps working as normal and is accessible for all registers. While working on the sleeping mode, the MCU can still be waked up by activated CAN bus and then the MCU works on a normal mode listening to the bus. CAN2.0B standard data frame is set as the transmission protocol and starts with a dominant SOF(Start of Frame) bits and all nodes are allowed to be synchronous. After the SOF bits there are 12 arbitral bits and follows the 6 control bits. While the recognized bit of the control bits turns dominant, it indicates the standard frame. After the control bits, is the data frame with a length of $8*N(0 \leqslant N \leqslant 8)$ bits. In this system, there are 48 bits of data that contain 12 nodes and each control 4 lights. When the lights are turned on or off, the message will be changed at once in the ijata frame and broadcasted on the CAN bus. The rest nodes that receive the message translate the command and do as they told by the host. CRC verify bits is the last confirm bits with a length of two Standard data frame. While broadcasting message arbitral bits are used to recognize and resolve the conflicts on the CAN bus. What's more

the arbitral bits also show the purpose of the sending message. Every time the host will receive confirm messages from all slave nodes after broadcasting message.
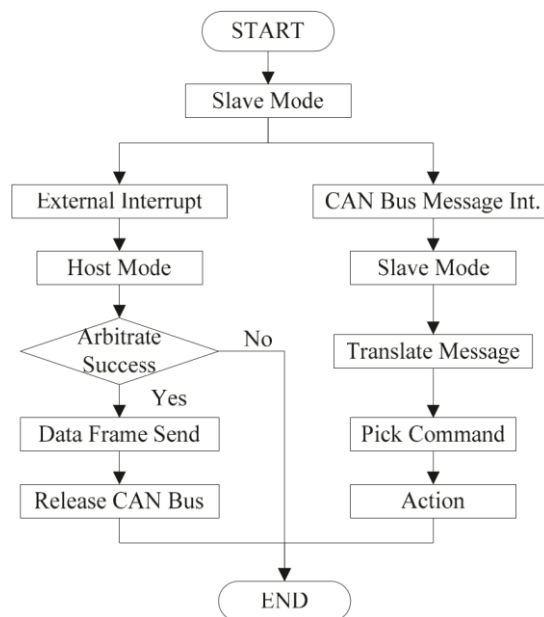

Figure 2. Design of the System Software

IV. WORKING

In this project automation of home is done by android mobile phones with Wi-Fi communication. **Android** is a Linux-based operating system designed primarily for touch screen mobile devices such as smart phones and tablet computers with the Open source. Wi-Fi and RF has used for reliable operation of data transmission. Wi-Fi is standardized wireless guarantees the high level of compatibility among devices. Wi-Fi devices connect to each other irrespective of their model. Wi-Fi with the help of low power signals technology requires very less energy reducing the battery consumption or electrical power without internet connection.
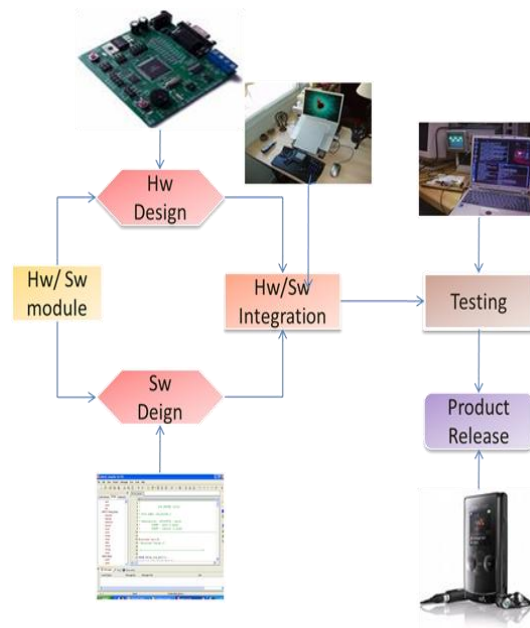

Fig. 3 Working Flow Chart Graph

V. CONCLUSION

This project has been tested and verified on hardware and software. The working with a considerably different group of users, with various needs, an interface suitable to them was achieved. Our interface integrates accessible interface ideas in a unique portable interface that can contribute to people with disabilities and autonomy at home. Despite to be a potential solution to improve the efficiency of people with impairments, the interviews have shown that home automatic control is not considered as a possible solution to these people. They consider home automation a high technology solution out of their availability. For researching and developing lower cost and simpler solutions. The next steps to this research are the development of the interface with the interview feedback to integrate the new explore-by-touch features available in the new tablets operating systems libraries and the repetition of the described experiments with larger groups of users.

VI. ACKNOELEGEMENT

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