VLC NETWORK GATEWAY DESIGN FOR HOME AUTOMATION APPLICATIONS

V.UMESH - UG Scholar, Dept. of IT, IFET College of Engineering, Villupuram, India,
PADMA PRAKASH G-UG Scholar, Dept. of IT, IFET College of Engineering, Villupuram, India,
Elavarasi.K - Assistant Professor, Dept. of IT, IFET College of Engineering, Villupuram, India.

Abstract— In recent years, the Home Automation has seen a expeditious development using digital technology. This development in the technology helps in connecting the device within the home, easier. Moreover the internet added the potential for monitoring of such network enabled device and there are different ways has been carried out for this purpose. This paper evaluates the potential of VLC for addressing the criteria of monitoring and communicating the data to the server .VLC is an emerging technology. So it can eventually be used for common communications systems .In VLC LED plays the vital role, LED's have a number of advantages, one of which is long time expectancy to help users, the Home Automation Application may be organised according to VLC network gateway, where the content access is realized at the file system level andwhere no additional software installation on devices is required. Unifying the content access at the file system level offers apowerful level for many legacy applications, as far as theseapplications can access all shared data in the Home Network. In the proposed system , the practical implementation of VLC based home automation is developed .In particular, we made a prototype for monitoring the energy meter ,gas flow and gas leakage along with that the monitored data are communicated to the server.

Index Terms— Home Automation,VLC, Network and Monitoring ,LED

INTRODUCTION

Visible Light Communication (VLC) is the use of the visible light portion of the electromagnetic spectrum to transmit information. This is in contrast to established forms of wireless communication such as Wi-Fi which uses radio frequency (RF) signals to transmit data. With VLC, data is transmitted by modulating the intensity of the light in such a way that it is not perceptible to the human eye. The data is received by a photo-sensitive detector which demodulates the light signal into electronic form. VLC is a category of Optical Wireless Communications (OWC). OWC includes infra-red and ultra- violet communications as well as visible light. However, VLC is unique in that the same visible light energy used for illumination may also be used for communication. When a constant current is applied to an LED light bulb a constant stream of photons are emitted from the bulb, observe as visible light. If varying the current up and down slowly the output intensity of the light see dims up and down. Because LED bulbs are semi-conductor devices we can actually vary the current, and hence the optical output, at extremely high speeds which are imperceptible to the human eye but which can be detected by a photo-detector device. Using this technique high speed information can be transmitted from an LED light bulb. Radio frequency communication requires radio circuits, antennas and complex receivers, whereas VLC is much simpler and use direct modulation methods similar to those used in low-cost infra-red communications devices such as remote control units.Infra-red communication is limited in power due to eye safety requirements, whereas LED light bulbs have high intensities and can achieve very large data rates.VLC suppliers provide the components comprising circuits and firmware for both the transmitter and receiver. These components can be integrated into the bulb and consumer device electronics respectively. The transmitter includes the proprietary firmware for modulating the LED output. The receiver includes a photo-detector and the firmware for demodulating the photo-detector output

PROPOSED SYSTEM

In this project we are going to implement Home Automation system using VLC technology. Here monitored gas sensor and flow sensor values are displayed in LCD and EB meter units are transferred from cluster node to server via VLC. Visible light communication (VLC) technology is used to transfer the data from cluster node to server. In server side all the data's stored in visual basic application. If EB meter value reaches the maximum level of current consuming unit that time intimation will be display in LCD and server also.we are using

AT89S52 is a low-power, high-performance CMOS 8-bit microcontroller with 8K bytes of in-system programmable Flash memory. The device is manufactured using Atmel's high-density nonvolatile memory technology and is compatible with the Indus-try-standard 80C51 instruction set and pin out.

ISSN: 2278 – 7798

CODING

```
void main()
{
unsigned char i=0,oc=0;
unsigned char hb=0,hbt=0,hbtt=0;
init();
lcdinit()
); P1_5=
0; P1_6=
0; P1_7=1;
while(1)
{
while(RI==0)
{ A1=0; A2=0; A3=0; Delay();
val=MYDATA;
if(val<120)
{
hbt++;
} hb++; if(hb==100)
{
hbtt=hbt;
hbt=0;
hb=0;
}
txs('A');
txs((hbtt/100)+0x30);      txs(((hbtt%100)/10)+0x30);
txs((hbtt%10)+0x30);
68
lcdcmd(0xC0); lcddata('I'); lcddata('r'); lcddata(' ');
lcddata(' '); lcddata(' ');
lcddata((hbtt/100)+0x30);
lcddata(((hbtt%100)/10)+0x30);
lcddata((hbtt%10)+0x30);
lcdcmd(0xCD);                lcddata((hbt/100)+0x30);
lcddata(((hbt%100)/10)+0x30);
lcddata((hbt%10)+0x30);
A1=1; A2=0; A3=0; Delay();
val1[1]=MYDATA;
lcdcmd(0x88); lcddata('G'); lcddata('=');
lcddata((val1[1]/100)+0x30);
lcddata(((val1[1]%100)/10)+0x30);
lcddata((val1[1]%10)+0x30);
txs('B');
txs((val1[1]/100)+0x30);
txs(((val1[1]%100)/10)+0x30);
txs((val1[1]%10)+0x30);
if(val1[1]>150)
{
P3_5=1;
}
else
{
P3_5=0;
}
A1=0; A2=1; A3=0; Delay();
val1[1]=MYDATA;
lcdcmd(0x80); lcddata('F'); lcddata('L'); lcddata('=');
lcddata((val1[1]/100)+0x30);
lcddata(((val1[1]%100)/10)+0x30);
lcddata((val1[1]%10)+0x30); txs('C');
txs((val1[1]/100)+0x30);
txs(((val1[1]%100)/10)+0x30);
69
txs((val1[1]%10)+0x30);
if(val1[1]>5)
{
P3_6=1;
}
else
{
P3_6=0;
}
} RI=0;
val=SBUF;
switch(val)
{
case 'A': P3_5=1;break; case 'B': P3_5=0;break; case
'C': P3_6=1;break; case 'D': P3_6=0;break; case 'E':
P3_7=1;break; case 'F': P3_7=0;break; default :
break;
}
}
}
void Delay()
{
int i;
for(i=0;i<20000;i++)
{
}
```

IMPLEMENTATION OF PROPSED SYSTEM

ISSN: 2278 – 7798

CONCLUSION

Visible Light Communication (VLC) using LEDs can become a viable option for last mile access and easiy availability. Visible Light Communication (VLC) present technological challenges for using appropriate techniques to construct cheap processing units and high brightness LEDs. Where LEDs lighting technology is being considered as the next generation lighting devices, VLC using LEDs would be promising technology. The technology promises a high mix of importance, from high energy saving using Solid State Lighting technology and high rate data transmission in development of VLC Network Gateway for Home Automation Applications .We just tries to make new concept to achieve more data transfer rate in Li-Fi which may made it as enormous VLC technology. Though the range of open research problems, we believe that the VLC system will be one of the most promising technologies for next-generation optical wireless communication.

.

REFERENCES

1. S. Iwasaki, C. Premachandra, T. Endo, T. Fujii, M. Tanimoto, and Y.Kimura (June 2008)."Visible light road-to-vehicle communication using high-speed camera", in Proc.IEEE IVS'08,Eindhoven, Netherlands, pp. 13-18

2. Khusvinder Gill, Shuang-Hua Yang, Fang Yao, and Xin Lu (May 2009), "A ZigBee-Based Home Automation System", IEEE Transactions on Consumer Electronics, Vol. 55, No. 2.

3. T. Komine and M. Nakagawa , (February 2004.) "Fundamental Analysis for Visible-Light Communication System Using LED Lights", IEEE Transactions on Consumer Electronics, Vol. 50, no. 1, pp. 100-107,

4. N. Kumar, L. A. Nero and R. L. Aguiar,(2006) "Visible Light Communication for Advanced Driver Assistant Systems", The work is part of FCT project VIDASPDTC/EEA-TEL/7521

5. Halpage Chinthaka Nuwandika Premachandra "A Study on On-vehicle High-speed Camera Image Processing for Parallel Visible Light Communication" September 2011

UMESH.V currently pursing B.Tech- information technology final year student in IFET COLLEGE OF ENGINEERING, VILLUPURAM, India.Area of interest includes Embedded sytem, visual basic

G.PADMA PRAKASH currently pursing B.Tech- Information Technology final year student in IFET COLLEGE OF ENGINEERING, VILLUPURAM India. Area of interest includes Software engineering, Information Security and object oriented programming

Mrs.**ELAVARASI K** received the M.E. (Computer Science & Engineering) degree from IFET College of Engineering, Affiliated to Anna University, Villupuram and she completed UG degree from Idhaya Engineering College for women, Chinna Salem.

She is an Assistant Professor with the Department of Information Technology, IFET College of Engineering, and Affiliated to Anna University. Her research interests are including Big Data, Data Structures & Algorithms, and Mobile Computing

ISSN: 2278 – 7798