ISSN No: 2348-4845
International Journal & Magazine of Engineering, Technology, Management and Research
A Peer Reviewed Open Access International Journal

A Secured Two Way Wireless Communication Based on Power Line Module

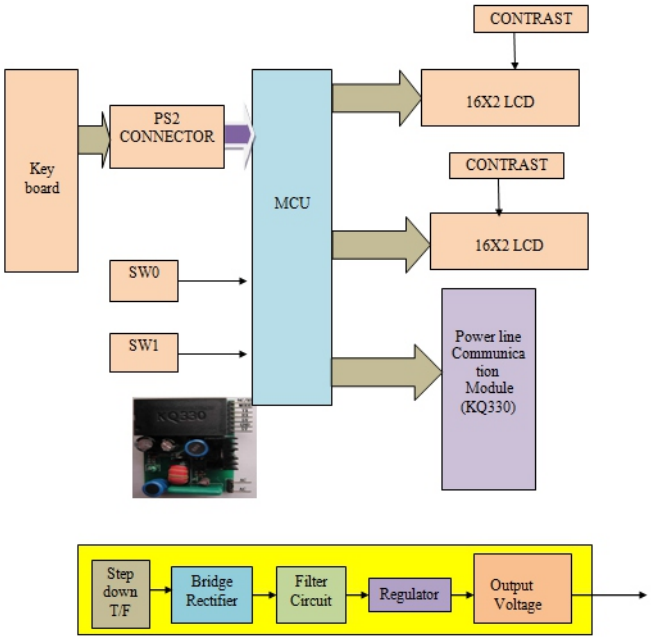
Darshanam Sowmya
M.Tech Student,
Raja Mahendra College of Engineering,
Hyderabad.

B.Nanda Kumar
M.Tech, Ph.D Pursuing,
HOD,
Raja Mahendra College of Engineering,
Hyderabad.

ABSTRACT:

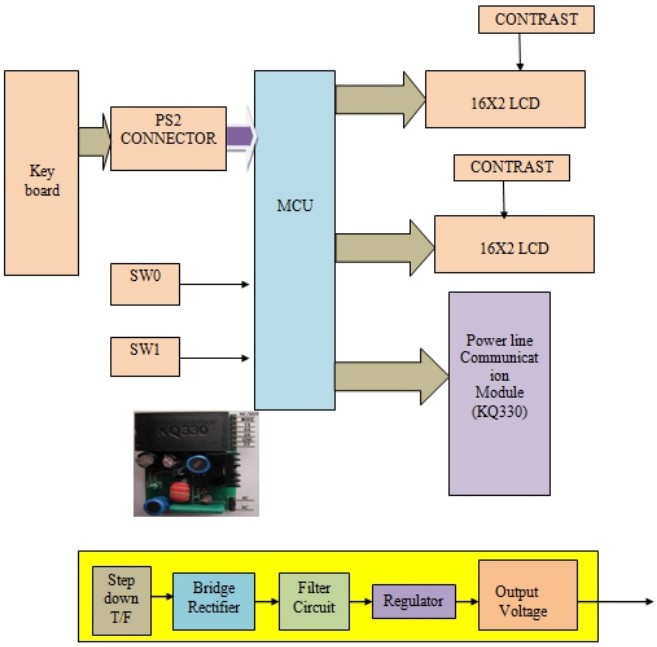
Data Security is primary concern for every communication system. There are many ways to provide security data that is being communicated. However, what if the security is assured irrespective of the hackers are from the noise. This Project describes a design of effective security for data communication by designing for data transmission. The source information is generated by a key board and this will be sent to destination through KQ330(power line module) communication. The receiving system will check the data and displays on the LCD.The power line module communication used here are KQ330 Transmitter/Receiver, The transmitter stage must be carefully designed to take digital signals from the MCU, filter them to eliminate out of band emissions and drive the low impedance of the AC power line. In receiver section of the power line module receive the data through the power line communication module(KQ330) and send to the receiver section of the microcontroller unit and display on the LCD.

Block Diagram: Transmitter/Receiver:



Power supply to all sections

Block Diagram: Transmitter/Receiver:

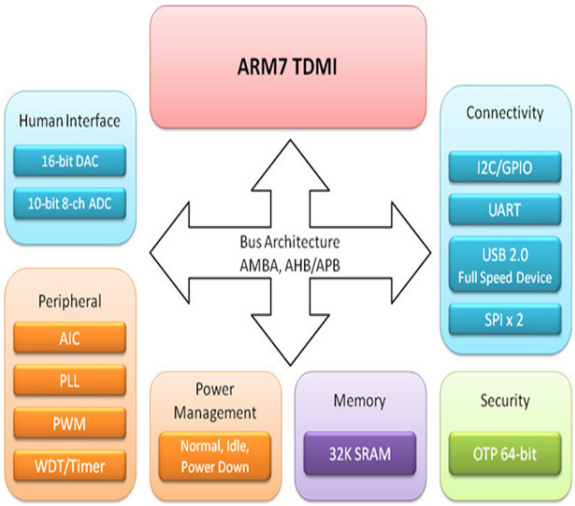


Power supply to all sections

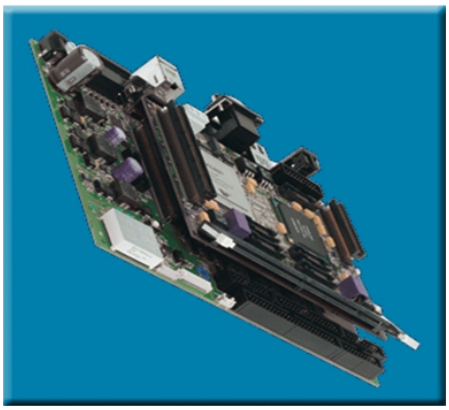
The LPC2148 are based on a 16/32 bit ARM7TDMI-S™ CPU with real-time emulation and embedded trace support, together with 128/512 kilobytes of embedded high speed flash memory. A 128-bit wide memory interface and unique accelerator architecture enable 32-bit code execution at maximum clock rate. For critical code size applications, the alternative 16-bit Thumb Mode reduces code by more than 30% with minimal performance penalty. With their compact 64 pin package, low power consumption, various 32-bit timers, 4- channel 10-bit ADC, USB PORT,PWM channels and 46 GPIO lines with up to 9 external interrupt pins these microcontrollers are particularly suitable for industrial control, medical systems, access control and point-of-sale. With a wide range of serial communications interfaces, they are also very well suited for communication gateways, protocol converters

ISSN No: 2348-4845
International Journal & Magazine of Engineering, Technology, Management and Research
A Peer Reviewed Open Access International Journal

and embedded soft modems as well as many other general-purpose applications.



ARM PROCESSOR:



ARM7TDMI Processor Core:

•Current low-end ARM core for applications like digital mobile phones
•TDMI
oT: Thumb, 16-bit compressed instruction set
oD: on-chip Debug support, enabling the processor to halt in response to a debug request
oM: enhanced Multiplier, yield a full 64-bit result, high performance
oI: Embedded ICE hardware
•Von Neumann architecture

Power supply :

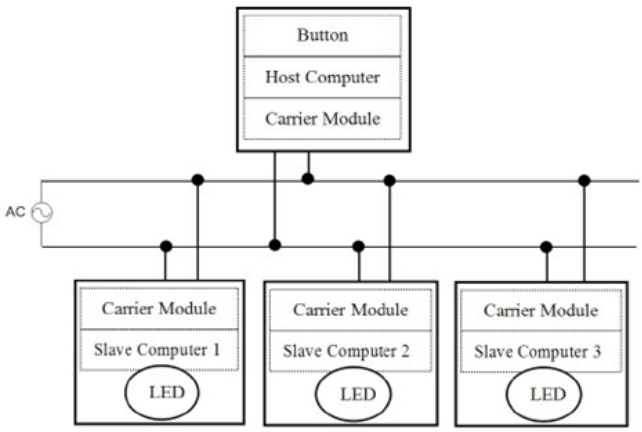
This project uses regulated 5V, 500mA power supply. 7805 three terminal voltage regulator is used for voltage regulation. Bridge type full wave rectifier is used to rectify the ac out put of secondary of 230/12V step down transformer.

Power line module:

The power line carrier communication system is designed based on a FSK-KQ330 (carrier modulation and demodulation module). The system uses STC microcontroller as the core processor and uses FSK-KQ330 as the modem module. The system includes the zero-crossing detecting circuit, the magnifying circuit of triodes, the resonant circuit and the transformer isolation circuit. Master-slave system can transmit data signals over power lines. It not only can apply to intelligent home system, but also can be used for the remote control of the intelligent switch and the intelligent equipment.The power line carrier communication (PLC) is a specific communication way of the power systems. Power line carrier communication refers to the technology which uses the existing power lines to transmit analog or digital signal by way of carrier at high speeds

System design:

The system includes the STC microcontroller (the core processor), FSK-KQ330 module (a modem module), the data transmitting circuit, the data receiving circuit, the zero-crossing detecting circuit, the magnifying circuit of triodes, the resonant circuit and the transformer isolation circuit. Master-slave system can transmit data signals over power lines to achieve the remote control of the host machine. The core of the system includes two parts: one is that STC microcontroller controls the power line carrier module FSK- KQ330 module to send and receive data; the other is that Power line carrier part is composed of power line carrier module FSK-KQ330 and peripheral circuit (resonance detection circuit and amplifier circuit) .



ISSN No: 2348-4845
International Journal & Magazine of Engineering, Technology, Management and Research
A Peer Reviewed Open Access International Journal

PINS FUNCTIONS:

There are pins along one side of the small printed board used for connection to the microcontroller. There are total of 14 pins marked with numbers (16 in case the background light is built in). Their function is described in the table below:

Function	Pin Number	Name	Logic State	Description
Ground	1	Vss	-	0V
Power supply	2	Vdd	-	+5V
Contrast	3	Vee	-	0 - Vdd
Control of operating	4	RS	0 1	D0 – D7 are interpreted as commands D0 – D7 are interpreted as data
	5	R/W	0 1	Write data (from controller to LCD) Read data (from LCD to controller)
	6	E	0 1 From 1 to	Access to LCD disabled Normal operating Data/commands are transferred to
			0	LCD
Data / commands	7	D0	0/1	Bit 0 LSB
	8	D1	0/1	Bit 1
	9	D2	0/1	Bit 2
	10	D3	0/1	Bit 3
	11	D4	0/1	Bit 4
	12	D5	0/1	Bit 5
	13	D6	0/1	Bit 6
	14	D7	0/1	Bit 7 MSB

ISSN No: 2348-4845
International Journal & Magazine of Engineering, Technology, Management and Research
A Peer Reviewed Open Access International Journal

WORKING PROCEDURE:

» The source information is generated by a key board and this will be sent to destination through kq330 (power line module) communication.
» The power line module communication used here are KQ330 Transmitter/Receiver, The transmitter stage must be carefully designed to take digital signals from the MCU, filter them to eliminate out of band emissions and drive the low impedance of the AC power line.
» In receiver section of the power line module receive the data through the power line communication module (KQ330) and send to the receiver section of the microcontroller unit and display on the LCD.

Conclusion:

This Project is a design of effective security for data communication by designing for data transmission. However, what if the security is assured irrespective of the hackers are from the noise. By this project high data security is successfully achieved.

REFERENCES:

[1] Comm. Eur. Union, "Smart grids technology platform. European technology platform for the electricity networks of the future." Belgium, EUR 22040, 2006. [Online]. Available: www.smartgrids.eu.

[2] Gridwise alliance, Realizing the value of an optimized electric grid. U.S., 2012. [Online]. Available: www.gridwise.org.

[3] N. Jenkins, J. B. Ekanayake, and C. Strbac, Distributed Generation. London, UK: IET Publ., 2010.

[4] D. Coll-Mayor, M. Paget, and E. Lightner, "Future intelligent power grids: Analysis of the vision in the European Union and the United States," Energy Policy, vol. 354, pp. 2453–2465, 2007.

[5] S. Galli, A. Scaglione, and Z.Wang, "For the grid and through the grid: The role of power line communications in the smart grid," Proc.IEEE, vol. 99, no. 6, pp. 998–1027, Jun. 2011.

[6] S. Grenard, O. Devaux,O.Carre, andO.Huet, "Power steering," IEEE Power Energy Mag., vol. 9, no. 5, pp. 43–51, Sep./Oct. 2011.

[7] S. Roy, D. Nordell, and S. S. Venkata, "Lines of communication," IEEE Power Energy Mag., vol. 9, no. 5, pp. 65–73, Sep./Oct. 2011.

[8] U.S. Dept. Energy, "A systems view of the modern grid: Integrated communications," Feb. 2007.

[9] V. C. Gungor and F. C. Lambert, "A survey on communication networks for electric system automation," Comput. Netw., vol. 50, pp.877–897, 2006.

[10] M.Korki,N.Hosseinzadeh, H. L. Vu, T.Moazzeni, and C. H. Foh, "A channel model for power line communication in the smart grid," presented at the IEEE/Power Eng. Soc./Power Syst. Conf. Expo., Phoenix, AZ, Mar. 20–23, 2011.