

# Wireless Humidity Sensor Application for the Specially Abled Persons using Control Systems

Krishnaveni K

Research Scholar

PG and Research Department of Physics

The Cambridge of South India

Government Arts College (Men)

Kumbakonam, Thanjavur-DT

Tamilnadu, India

Email:krishnavenikumar77@gmail.com

Ida Malarselvi R

Assistant Professor, Department of Physics,

DharumapuramGnanambigai

Government Arts College (Women),

Nagapattinam-DT,

Tamilnadu, India

Priscilla Jarve

Assistant Professor, Department of

Physics, A.D.M. Government Arts

College (Women), Nagapattinam,

Tamilnadu, India

Ramachandra Raja C

Associate Professor

Department of Physics

Government Arts College (Men)

Kumbakonam, Thanjavur-DT

Tamilnadu, India

JosephVedhagiris

Assistant Professor, Department of

Physics,

T.B .M. L .College, Porayar

Nagapattinam, Tamilnadu, India

Manikandan K and Pooja Rani B

A.V. C. College (Autonomous),

Mannampandal-609305,

Mayiladuthurai, Nagai-DT,

Tamilnadu, India

---

**Abstract:** The Wheel chair of our Model is the first to rescue and automated support render to the disable when they may be a Visually, Hearing, Leg impaired, Paralysis attacked, Old age persons etc., to render such kind of support to the disables the sensors of Humidity, Temperature, LDR, are used these sensor send input to the PIC Microcontroller 16F877A and send output to the LCD, Voice board, GSM module to control different loads. This prototype model of the device renders support to the disable when they are alive lonely in house, like a human attender who is always with them and supports them to lead their day to day routine work. A hardware is also developed by using humidity, temp., LDR sensors and its operations verified, A Mathematical analysis done by the applications of Control Systems Block diagram, Signal flow graph, Mason's formulae method to prove the performance of the hardware and signal flow between the input and output of the designed hardware.

**Keywords:** Control System, Humidity, LDR, PIC Microcontroller 16F877A, Temperature, Voice control

---

## I. INTRODUCTION

Disability is happened to people by birth or they might have met an accident in their life. Today cyber age a normal man face many obstacles in their life to earn money and lead their life happy in the society it is a difficult problem for us the disable person also a part of the society, a normal man lift their fingers to render support to the disable and make them comfort like us to live, educated, job doing, family etc., is the motto of this research is to support disable in their part using electronic sensors when they can operate the electronic gadgets without the supports of others

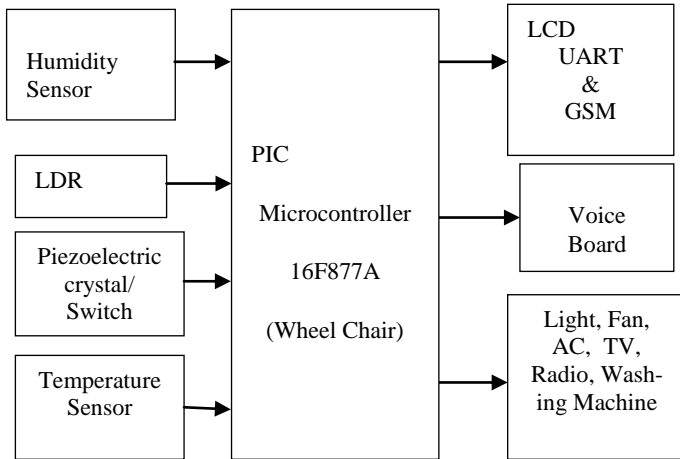
## II. METHODOLOGY

This research work is dedicated to the Specially Abled persons who may have a need of always others support for a single work. Before that the importance of the sensor is highlighted for this research work to render support to them. Sen-

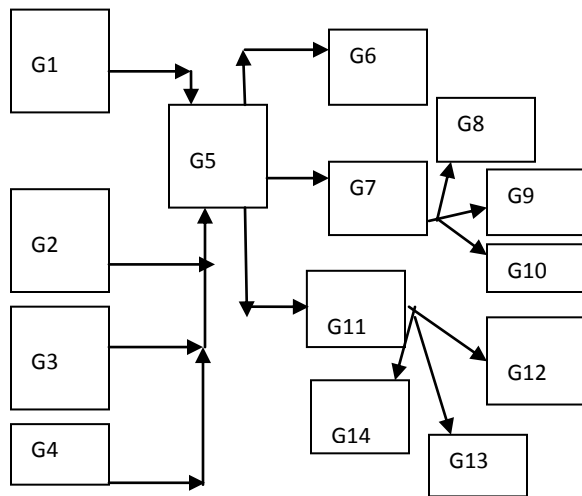
sors are sophisticated devices that are frequently used to detect and respond to electrical or optical signals. A Sensor converts the physical parameter (for example: temperature, blood pressure, humidity, speed, etc.) into a signal which can be measured electrically. By utilizing the sensors temp., humidity, LDR etc., we designed a device and support the disabled. Fig.1 shows the block diagram for the proposed multiple wireless multi sensor devices fitted in the Wheel chair.

The main aim of this work is to provide safe and secure mobility to the wheel chair users while they are in indoors. This proposed wheel chair system consists of facility of having temperature and humidity sensors to monitor the moisture of a room and indoor temp .if it vary the normal value these sensor turn on and off the loads depends on programming our convenience. If the disable person is visually impaired that time they can operate the loads by voice on fan, on light, on AC etc., and off fan, off AC, off light and so on. Fig.2 show the control system block diagram and minimized of its output.

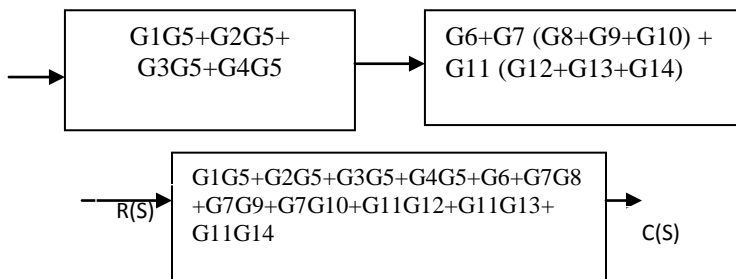
Different loads such as Light, Fan, AC, TV, Radio and Washing Machine automatically controlled by the current room temp. variations and programmed.



**Fig. 1 Humidity Sensor Based Load Control module**  
 Here G1, G2.....G9 Gain of each block

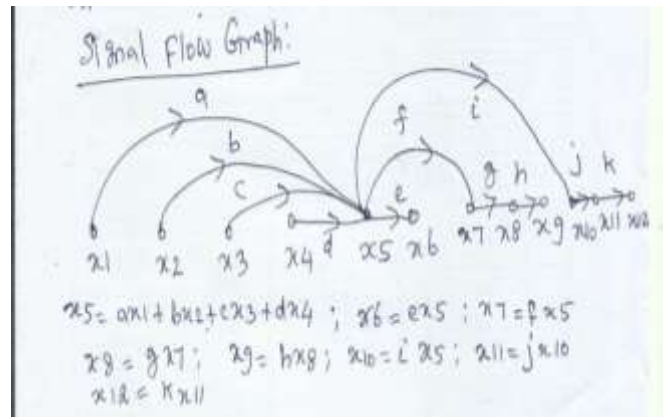


**Fig.2 Block diagram for humidity and temp. sensors using control system**



R(S) and C(S) are reference input and output

**Fig.3 Signal flow graph**



**Fig. 4 Hardware of Temp. and Humidity sensor**



**Mason's Gain Formula:**

Mason's Gain Formula for Humidity Sensor Based Load Control:

n

$$C(S)/R(S) = 1/\Delta \sum P_k \Delta_k$$

$$K=1$$

$$x_{12}/x_1 = abc fgh + abce + dijk / 1 - abc fgh + abce + dijk$$

**III. SENSOR OPERATION**

The room temperature is identified Temperature sensor it is 30°C, Humidity is 088, Light intensity:051 are the set points for the Humidity Sensor Based Load Control circuit. If Room temperature is more than 30°C measure by the sensor that time automatically the PIC Microcontroller 16F877A turn ON the Fan and AC, If the temperature is less than set point 30°C, that time it turn OFF AC and if need turn OFF Fan, Due to low illumination inside the room this device turn ON LED for lighting automatically to support the Disabled, They need not each and every time go here and there to ON & OFF the required LOADS, by thinking the above concept the device Humidity Sensor Based Load Control circuit is designed and its operations verified. Further a Piezo-electric crystal

(Switch) is connected to PIC and the output of the crystal control the loads Washing Machine, TV, Radio by turn ON & OFF

In Fig.2 Humidity Sensor Based Load Control and its Equivalent Block diagram of control system shown, Signal flow graph for the same drawn in Fig.3 and fig.4 the hardware of the circuit in working state shown, Mason's Formulae also derived to verify the performance of the circuit.

#### IV. RESULT & CONCLUSION

Temp. cum Humidity, LDR sensors were support the disable by fitted it in the wheel chair of the person to render them support to turn the fan, AC, light depends upon the temperature daily reported in sensors, the so persons with disabilities be happy and lead their life peaceful without the support of other person and if they would be an entrepreneur or do a job private sectors they can manage the job. Here all the three blocks sensors operations mathematically used to checked with the control system block diagram algebra, Signal flow Graph and Mason's formula by each and combined module individual block performance was verified. All the hardware design in MPLAB and run in proteus for simulation and its performance verified.

#### REFERENCES

- [1]N. A. A. Hadi, M. H. C. HasanN. M. Z. Hashim A. Salleha. A. Salam Z. Hasan "Automatic Smart Kitchen System Using Microcontroller" International Journal For Advance Research In Engineering And Technology, Volume 3, Issue VI, June 2015,ISSN 2320-6802
- [2]Nalina B N, Dr. V N Nitawre, Prof. AshishMulajkar, Prof. SandeepShelke" Real Time Home Automation with Security using PIC Microcontroller" International Journal of Innovative Research in Computer and Communication Engineering,ISSN(Online): 2320-9801,ISSN (Print): 2320-9798
- [3]V. Sathya Narayanan, S. Gayathri "Design of Wireless Home automation and security system using PIC Microcontroller" International Journal of Computer Applications in Engineering Sciences, Special Issue on National Conference on Information and Communication (NCIC'13),www.caesjournals.org,Volume III, Special Issue, August 2013,ISSN: 2231-4946
- [4]S. Sivaranjani, D. Gowdhami, P. Karthikkannan "An Appraisal On Gas Leakage Detection And Controlling System In Smart Home Using IOT" Special Issue: (Emerging Technologies In Networking And Security (ETNS)),ISSN: 0976-3104,2nd-December-2016
- [5]M. Kalpana, B. Siva, B. Sashidhar, M. Lalith Kumar, M. Kiran "Microcontroller Based Home Security System with GSM Technology" International Journal of Scientific Engineering and Technology Research,Volume.05, IssueNo.09, April-2016, Pages: 1857-1859
- [6]F. Shawki, M. El-Shahat. Dessouki, A. I. Elbasiouny, A.N. Almazroui, F. M. R. Albeladi" Microcontroller Based Smart Home With Security Using GSM Technology" IJRET: International Journal of Research in Engineering and Technology, Volume: 04 Issue: 06, June-2015,eISSN: 2319-1163 | pISSN: 2321-7308
- [7]ArchanaHule, Rekha Bandage, Pratik Shah, RashmiMahajan "Android Based Application For Wireless Control Of Wheelchair" by International Journal of Research in Engineering and Technology,

Volume: 04 Issue: 04, Apr-2015,eISSN: 2319-1163,pISSN: 2321-7308

[8]MohdArman Khan, KashishAgarwal, MukeshSaini "Voice Control Wheel Chair"ByInternational Journal of Scientific Research and Management Studies (IJSRMS) ISSN: 2349-3771,Volume 3, Issue 1, page: 49-54

[9] Apsana. S, Renjitha G Nair "Voice Controlled Wheelchair using Arduino" International Advanced Research Journal in Science, Engineering and Technology, Vol. 3, Special Issue 3, August 2016,ISSN (Online) 2393-8021,ISSN (Print) 2394-1588

[10]G. Kalasamy, A. Mohammed Imthiyaz, A. Manikandan, S. Senthilrani "Micro-Controller Based Intelligent Wheelchair Design" IJREAT International Journal of Research in Engineering & Advanced Technology, Volume 2, Issue 2, Apr-May, 2014 ,ISSN: 2320 – 8791 (Impact Factor: 1.479)

[11]Atul Kumar, Prashant Singh, Amit Kumar, S. K Pawar "Speech Recognition Based Wheelchair Using Device Switching" International Journal of Emerging Technology and Advanced Engineering, Website: www.ijetae.com (ISSN 2250-2459, ISO 9001:2008 Certified Journal, Volume 4, Issue 2, February 2014)

[12]Nehal M Pol, Chitali U Patil, Nilesh R Shinde, Kunal S Borade "Voice Controlled Wheelchair for Handicapped People" International Journal of Scientific Engineering and Technology Research,Volume.04, IssueNo.07, March-2015, Pages: 1370-1373

[13]K. Sudheer, T.V. JanardhanaRao, Ch. Sridevi, M.S. Madhan Mohan "Voice and Gesture Based Electric-Powered Wheelchair Using ARM" International Journal of Research in Computer and Communication technology, IJRCCCT, ISSN2278-5841, Vol. 1, Issue 6, November 2012.

Ali A. Abed "Design of Voice Controlled Smart Wheelchair" International Journal of Computer Applications (0975 – 8887)Volume 131 – No.1, December 2015

[14]G Azam and M T Islam Design and Fabrication of a Voice Controlled Wheelchair for Physically Disabled People International Conference on Physics Sustainable Development & Technology (ICPSDT-2015),August 19-20, 2015

[15]Ravi Teja Ch. V, P. Shekar, S. Roja, S. Hariprasad Reddy, Y. Bhargavi "Voice based Wheel Chair for Physically Challenged" International Journal of New Innovations in Engineering and Technology, Volume 3 Issue 1 – March 2015,ISSN : 2319-6319

[16]PramilaKupkar, PrajaktaPandit, Nikita Dhamdhere& P.P. Jadhav"Android Controlled Wheel Chair" Imperial Journal of Interdisciplinary Research (IJIR) ,Vol-2, Issue-6, 2016, ISSN: 2454-1362, <http://www.onlinejournal.in>

[17]Dipanjali P. Panchal, Priya B. Parmar, Nidhi S. Ganasva"Touchpad and Voice Command Based Wheelchair" International Journal of Engineering Development and Research, Volume 5, Issue 1, ISSN: 2321-9939

[18]Jayesh K. Kokate, A. M. Agarkar"Voice Operated Wheel Chair" IJRET: International Journal of Research in Engineering and Technology, Volume: 03 Issue: 02 | Feb-2014, eISSN: 2319-1163, | pISSN: 2321-7308

#### AUTHOR'S BIOGRAPHIES

**Mrs. K. KRISHNAVENI (1977-),** Female, was born in Tamil Nadu, India. She received the B. Sc, M. Sc, M. Phil and DCA degrees and Diploma from the Department of Electronic Science and Physics, CINFOSOFTE Centre, Bharathidasan University, Tamil Nadu, India in 1995, 1998, 2002 and 2005 respectively. She has been a Lecturer, Assistant Professor and Head of the Department in A. V. C. College

(Autonomous), Mannampandal of Tamil Nadu since 2004. She is now doing Research in Ph. D at Department of Physics, Govt. Arts College, Kumbakonam. She has published more than 06 papers in premier journals and 17 in National/International conferences, Seminars and workshops. She concentrated her works in the Wireless Communication and Solar Photovoltaics area.

**Dr. R. IDA MALARSELVI (1965-)**, Female, was born in Tamil Nadu, India. She received the B. Sc, M. Sc, M. Phil and Ph. D degrees from the Department of Physics, Bharathidasan University, Tamil Nadu, India in 1985, 1987, 1989 and 2016 respectively. She has been a Lecturer, Head of the Department, Principal and Assistant Professor in various colleges of Tamil Nadu since 1994. She is currently working in Material Science i.e Designing of Composite Material for biomedical and Dye Formulation in Anti-Cancer Drugs and Solar Cells applications. She is a Life Member in Material Research Society of India. She has published more than 16 papers in premier journals and 16 in International conferences.

**Dr. C.RAMACHANDRA RAJA (1966-)**, male, was born in Tamil Nadu, India. He received the B. Sc, M. Sc, degrees from the Department of Physics, Bharathidasan University, Tamil Nadu, India in 1986, 1988, and M. Phil, Ph. D degrees from Anna University, Chennai, India in 1990 and 1994 respectively. He has been with the college of Arts and Science, Bharathidasan University where he is an Associate Professor and the Head of the research group mainly engaged in the single Crystal growth and characterization of non-linear optical crystals, Smart Material and Bio materials for Artificial Bone transplant and high performance applications. He is a Life Member in Indian Association of Crystal Growth, Material Research Society of India and in ISTE. He is the author of Modern Aspects of Bulk Crystals and thin film preparation (Croatia, 2012). He has produced 11 Ph.D., Scholars and published more than 69 papers in premier International Journals and in 61 International / National conferences. He has completed a Minor Research project sponsored by UGC during 2009-2010 and a Minor Research project sponsored by TNSCST / S & T during 2014-2016.

**(MRS). PRISCILLA JARVE (1972-)**, Female, was born in Tamil Nadu India. She received the B. Sc, M. Sc and M. Phil degrees from the Department of Physics, Bharathidasan University, Tamil Nadu, India in 1992, 1994 and 1996 respectively. She has been a Lecturer, Head of the Department, and Assistant Professor in ADM College for Women (Autonomous), Nagapattinam, Tamil Nadu since 1996. She is currently working towards the Ph.D Degree in Physical Science at Manonmaniam Sundaranar University, Tamil Nadu, India. She is a Member in Vibnet Club, Vigyan Brasar, DST, New Delhi. She has conducted 3 UGC sponsored National Conferences. She has published more than 18 papers in premier journals and 12 in International/ National conferences.

**DR. S. JOSEPH VEDHAGIRI (1962-)**, male, was born in Tamil Nadu India. He received the B. Sc degree from Department of Physics, Gandhigram University in 1982, and M. Sc, M. Phil, Ph. D degrees from the Bharathidasan University, Tamil Nadu, India in 1984, 1998, 2006 respectively. He has been with the college of Arts and Science, Bharathidasan University where he is an Associate Professor in T.B.M.L College, Porayar since 1986. He is working in the areas Electronics, Spectroscopy, Material Science, Condensed Matter Physics, and Solid State Physics. Paper published in premier journals

international journals is 03. He participated and published in seminars and conferences are 06.

