

Wireless Public Address System for Campus Broadcasting and industry

S.Selvakumar, A.P.,
Electronics and
communication engineering
K.L.N. College of engineering
Pottapalayam, Madurai
suruliselvakumar@gmail.com

E.Aravind
Electronics and communication
engineering
K.L.N. College of engineering
Pottapalayam, Madurai
aravindekanath@gmail.com

AJ.Aravind
Electronics and communication
engineering, K.L.N. College of
engineering
Pottapalayam, Madurai
aravindjagadesan@gmail.com

SG.Kailash.,
Electronics and communication engineering
K.L.N. College of engineering
Pottapalayam, Madurai
kailashg97@gmail.com

M.Jeyaram
Electronics and communication engineering
K.L.N. College of engineering
Pottapalayam, Madurai
mail2mjram@gmail.com

Abstract— As regular PA system, a person will address a large public but if it comes to Institution or Hospitals, we need PA for each departments. Our project will give the user (transmitter) a choice for common or selective announcement. This will help the authority to keep in touch with all the departments as per its need. The recent trend is to use WIRELESS PUBLIC ADDRESS SYSTEM using RF or Wi-Fi .It uses ISM band of 2.4 GHz that is unlicensed frequency. It is cheaper and power efficient than Wi-Fi. Separate receiver is connected and transmitter can select the receivers. Fully customizable. Separate Microcontrollers control transmitter and Receiver. The data is sent with error correction. Any other useful information can be sent through text and it will be displayed in Receiver. Our project will integrate various PA in different blocks so the advantages are Liable communication, Cost efficiency, Easy maintenance, Maximum Throughput and Less work force.

Keywords—Wireless public addressing system; Environmental Broadcasting; Multizone Broadcasting.

I. INTRODUCTION

A public address (PA) system is an electronic sound amplification and distribution system with a microphone, amplifier and loudspeakers [1]. In general, PA systems are divided into two categories: analog PA system and wireless PA system, respectively. Presently, wireless PA systems have been widely adopted in many daily public places such as campus, manufacture factory, airport, shopping

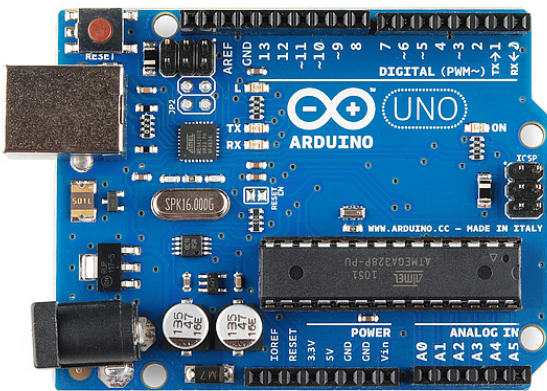
hall, and intelligent building. Compared to traditional analog PA system, generally, the modern wireless PA system can be supported multicast oriented addressing broadcasting, which can be achieved environmental broadcasting requirement. For example, they may have the lesson test and different topics for different classrooms in the campus, thus the environmental broadcasting will be done different subjects broadcasting without each other interference for the different zones at the same time. In addition, the emergency broadcasting is also major considered functionality for the modern wireless PA systems. For the present campus application, wireless PA system should integrate with classroom teaching functions and security system. There are clear demands for the school to combine PA, classroom teaching system and campus security together, also they wanted broadcast to be more flexible and specific.

We met the present school's requirement of single-zone, group and whole campus broadcast. Through user-friendly intuitive operation, teachers could quickly get started. In addition, with the use of user-friendly map-based graphical software, school staff can set automatic music timer schedule to ring the bell, saving human source like never before. Therefore, as shown in Fig. 1, we propose a multi-functions wireless public address broadcasting system, which is a complete all-in-one solution, not only could it broadcast by single zone and groups, it could also be connected to PSTN to make telephone broadcast.



II. RELATED WORK

[Arduino](#) is an open-source platform used for building electronics projects. Arduino consists of both a physical programmable circuit board (often referred to as a [microcontroller](#)) and a piece of [software](#), or IDE (Integrated Development Environment) that runs on your computer, used to write and upload computer code to the physical board.



The Arduino platform has become quite popular with people just starting out with electronics, and for good reason. Unlike most previous programmable circuit boards, the Arduino does not need a separate piece of hardware (called a programmer) in order to load new code onto the board – you can simply use a USB cable. Additionally, the Arduino IDE uses a simplified version of C++, making it easier to learn to

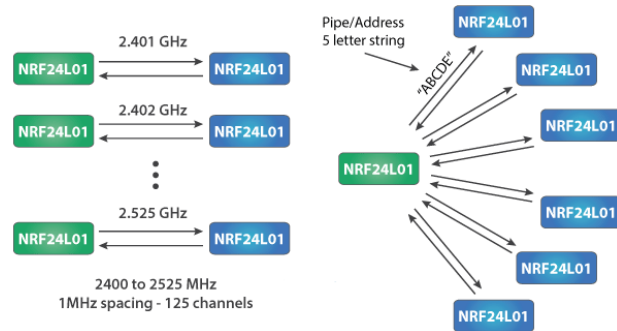
program. Finally, Arduino provides a standard form factor that breaks out the functions of the microcontroller into a more accessible package

The Arduino hardware and software was designed for artists, designers, hobbyists, hackers, newbies, and anyone interested in creating interactive objects or environments. Arduino can interact with buttons, LEDs, motors, speakers, GPS units, cameras, the internet, and even your smart-phone or your TV! This flexibility combined with the fact that the Arduino software is free, the hardware boards are pretty cheap, and both the software and hardware are easy to learn has led to a large community of users who have contributed code and released instructions for a **huge** variety of Arduino-based projects.

III. PROPOSED PROTOCOL

The nRF24L01+ is a single chip 2.4GHz transceiver with an embedded baseband protocol engine (Enhanced ShockBurst™), suitable for ultra low power wireless applications. The nRF24L01+ is designed for operation in the world wide ISM frequency band at 2.400 - 2.4835GHz. To design a radio system with the nRF24L01+, you simply need an MCU (microcontroller) and a few external passive components. You can operate and configure the nRF24L01+ through a Serial Peripheral Interface (SPI). The register map, which is accessible through the SPI, contains all configuration registers in the nRF24L01+ and is accessible in all operation modes of the chip. The embedded baseband protocol engine (Enhanced ShockBurst™) is based on packet communication and supports various modes from manual operation to advanced autonomous protocol operation. Internal FIFOs ensure a smooth data flow between the radio front end and the system's MCU. Enhanced ShockBurst™ reduces system cost by handling all the high speed link layer operations. The radio front end uses GFSK modulation. It has user configurable parameters like frequency channel, output power and air data rate. nRF24L01+ supports an air data rate of 250 kbps, 1 Mbps and 2Mbps. The high air data rate combined with two power saving modes make the nRF24L01+ very suitable for ultra low power designs. nRF24L01+ is drop-in compatible with nRF24L01 and on-air compatible with nRF2401A, nRF2402, nRF24E1 and nRF24E2. Intermodulation and wideband blocking values in nRF24L01+ are much improved in comparison to the nRF24L01 and the addition of internal filtering to nRF24L01+ has improved the margins for meeting RF regulatory standards. Internal voltage regulators

ensure a high Power Supply Rejection Ratio (PSRR) and a wide power supply range.



IV. CONCLUSION AND FUTURE WORK

Ultimately, additional features and future extensions can be applied to the existing system to improve the overall usability and security. For instance, a facial recognition algorithm can be integrated into the camera to further enhance the security of the system. In addition, touch ID maybe integrated with the fingerprint sensor of the lock to share a common fingerprint database so that users can enroll their fingerprints directly from their phones. Furthermore, the lock system availability can be extended to android platforms as well as web applications.

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