



International Journal of Intellectual Advancements and Research in Engineering Computations

Microcontroller based score board with wireless communication using zigbee technology

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ABSTRACT

This paper discusses implemented various sports and games scoreboard and timer (Game clock, short clock). The scoreboard of any sport shows the status of the on going match or game by displaying the significant data like timer and scores of teams. Scoreboard is used for various features. Scoreboards are specially used for displaying scores of a game played between two teams. Some games can be a timer based or an untimer. Players and viewers rely on the numerical figures that are shown on the scoreboard especially the scores of each team and the game clock to determine which team is winning. The scoreboard displaying data inform of seven 7-segment LEDs to implement a remotely controlled programmable clock and scoring board. In some scoreboard controlled clock and scoreboard status wired as well wireless. This survey paper discusses about merits of various methods, technology and communication system used for scoreboard. This paper will also discuss the future scope for multi-sport scoreboard that is cost efficient, portable, and easy to use.

Keywords – Microcontroller, score board, Zigbee Technology.

INTRODUCTION

Commonly the scoreboard is located near the committee to be able to update the scores via a computer connect e connected to the gadget. In this manner, the scores are updated using a program that sends the input from the laptop to the scoreboard. Digital scoreboard applies technology to the scoreboard because in the old timer, the scores are written on board which can be erased or even edited that may result to cheating. Traditional scoreboard uses a board with the team name placed at the top and the corresponding score below its name. The game time is only declared verbally by the announcer same with the shot clock. In the current playing games, players need to know the left time of each period match in main timer and team score etc. Electronic timer with the advantages of its convenient operation, compact size and visualization has been widely used in

games like basketball, kabaddi, kho-kho these games are timed whereas volleyball, badminton these are untimed games.

NBA timing and score system was designed by a chip called 8031 of MCS-51. This system design consists of timer counting, score counting, keyboards for controlling and display sub-systems (Luo-Sheng, 2004) [1].

1. A new timer and score equipment for basketball match was designed and made by Chinese Basketball Association, used in 2004 CBA for league match played for NBA in Beijing, which was helpful for the present timer and scoring equipment specially in sport purpose and have great room for development and application (Zhang et al., 2006) [2].
2. The control system for basketball scoreboard was designed based on single-chip microcomputer with 16*16 matrix LED, which

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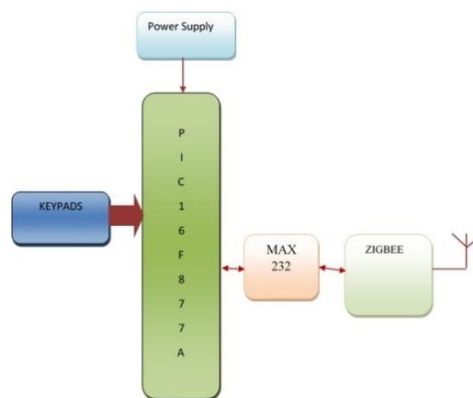
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- could be long-term operation and so on (Wei-Yu et al.,2008) [3].
3. The design of scoreboard system of timer and score system was based on 89C51, which had the functions of the total timer in countdown, with its features of score modular design, simple structure and easy to prepare (Han et al.,2009) [4].
 4. The device was based on P89V51RB2 single-chip microcomputer, which can display the time left in timer and the score, the real time and score can be amended (Rong-Jian et al., 2010) [5].
 5. The countdown timer circuit was designed which uses STC89C52 single-chip microcomputer, which can countdown 999 numbers, accurate to seconds. (Ze-Shi, 2011) [6].
 6. There also one reset button must be which will set all the status or values to their initial as define at the start of the match (Sandra Ilijin, 2015) [7].
 7. Although timer of scoreboard systems are convenient to use, there are some demerits during the use of them, some are inconvenient for players as small in size and the position of placement and some are difficult to install and repair as well [8].
 8. low efficiency and reliability. So, these are Survey details will discuss the various details about scoreboard system design used to achieve the goal and results by authors [9].

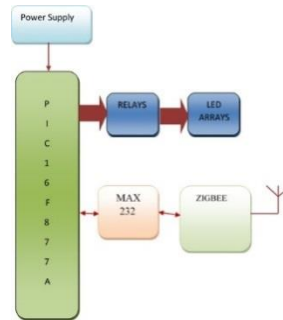
PROPOSED SYSTEM

For design such a score board: An appropriate selection of microcontroller ,4:16 decoder for multiplexing, seven segment LED display with some LED sign for possession/Service indicator as well for time out left indication, a controller system, a Communication system, and software for text editor for writing code and the programs [10].

BLOCK DIAGRAM TRANSMITTER



RECEIVER



PIC MICROCONTROLLER

PIC16F877A is used in lot of pic microcontroller projects. PIC16F877A also have many application in digital electronics circuits. It has a total number of 40 pins and there are 33 pins for input and output. The PIC microcontroller PIC16f877a the most renowned microcontrollers in the industry. This controller is very convenient to use, the coding or programming of this controller is also easier. the advantages is that it can be write-erase as many times as possible because it use FLASH memory technology.

ZIGBEE

ZigBee is an IEEE 802.15.4-based specification for a suite of high-level communication protocols used for wireless networking. It is a wireless technology developed as an open global standard to

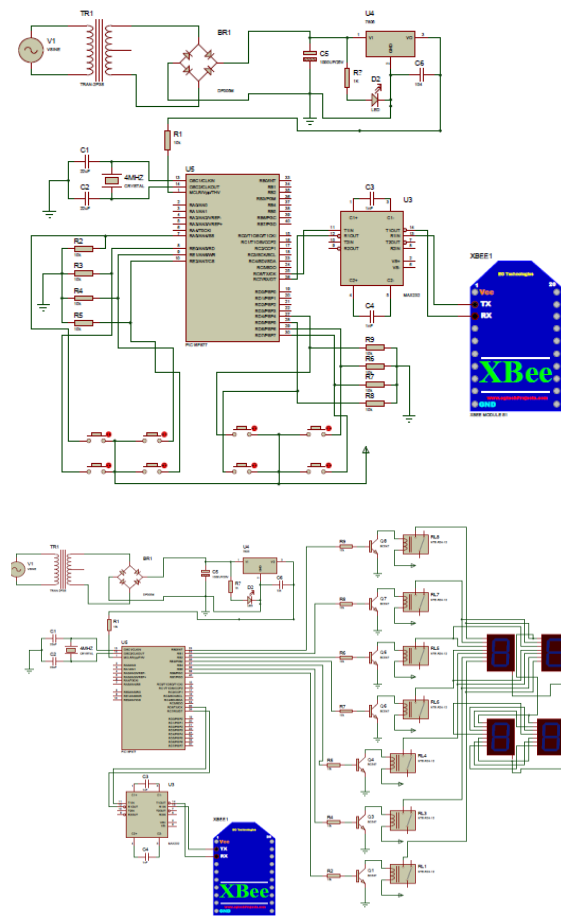
address the unique needs of low-cost, low-power wireless M2M networks. ZigBee (CC2500) is a low cost true single chip 2.4 GHz transceiver designed for very low power wireless applications. The RF transceiver is integrated with a highly configurable baseband modem.

CC2500 is TEXAS made low cost RF module working on 2.4Ghz ISM band. This chip is mounted on a RS232 Breakout board & configured for easy interface with your Microcontrollers or PC.

CC2500 RF Module is a transceiver module which provides easy to use RF communication at 2.4 Ghz. It can be used to transmit and receive data at 9600 baud rates from any standard CMOS/TTL source. This module is a direct line in replacement for your serial communication it requires no extra hardware and no extra coding. It works in Half Duplex mode i.e. it provides communication in both directions, but only one direction at same time



CIRCUIT DIAGRAM



Advantages

- Wired as well as wireless communication connectivity with control unit and display unit.
- Easy to operate as special function keys are assigned for specific task.
- Power efficient because of display digits made up group of oval LEDs which will visible in outdoor and indoor games.
- This product is used for games like basketball, kabbadi, kho-kho, volleyball, badminton etc.

APPLICATION

1. Games like
2. Basketball,
3. Kabbadi,
4. Kho-kho,
5. Volleyball,
6. Badminton etc

CONCLUSION

In this survey paper we discussed the minimum required display data for scoreboard of both teams that are competing team score, team fouls, remaining timeout these are for each team, and main game clock timer as well shot clock and every quarter are being shown by today's scoreboard designs but as of right now a low cost method for keeping score of the tournaments are currently not available; Existing Systems are costly as the functions of scoreboard increases with increase in cost. There is very need for multi-sport scoreboard that is cost efficient, portable, and easy to use power efficient and indoor outdoor purpose. The display values on the scoreboard are transmitted wireless as well as wired for long distance about 100 meter to 200 meter.

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