

## Multifaceted Access Scheme Using I-Button

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**Abstract**— In Present Scenario the advancement in technology is enormous and therefore the Human working efficiency is increasing day by day. But as there are advantages, there are some disadvantages also like misuse of these technologies. For example if some unauthorized person can get access to the system then we have to suffer a lot. Therefore to overcome this above mentioned problem of security, a Control system can be built to prevent unauthorized access. It is called Access control, which is a system which enables an authority to control access to areas and resources in a given physical facility or computer-based information system. An access control system, within the field of physical security, is generally seen as the second layer in the security of physical structure of such systems. And the advantage of it is that this system contains very high end verification technology which is difficult to be intruded by such unauthorized element. One of the latest, next generation and very advanced technologies which is “I-Button” has all the above mentioned features. In this work a multi-access system has been designed using “i-button” for payment of toll tax, petrol filling and recharge. This system will save time of consumers as well as it will provide secure transaction.

**Keywords**- i-Button, LCD, Microcontroller, one wire interface.

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### I. INTRODUCTION

In our day to day life we come across many manually operated systems like toll-tax payment, petrol refill payment, and many more. These manually operated systems are very much time consuming and inefficient at times. So such manual systems have been used from decades. Many researchers have put in their efforts to convert such system into fully automatic system. In many of the researches that came forward, there is one which is called as “I-button”. The Key Part of this work on Multifaceted Access System is “iButton” which is a proprietary technology from Maxim. The iButton is a computer chip enclosed in a 16mm thick stainless steel can.

### II. I-BUTTON

The DS1990A serial number I Button is a rugged data carrier that serves as an electronic registration number for automatic identification. Data is transferred serially through the 1-Wire® protocol, which requires only a single data lead and a ground return. Every DS1990A is factory lasered with a guaranteed unique 64-bit registration number that allows for absolute traceability. The durable stainless-steel I Button package is highly resistant to environmental hazards such as dirt, moisture and shock. Its compact coin-shaped profile is self aligning with mating receptacles, allowing the DS1990A to be used easily by human operators. Accessories enable the DS1990A I Button to be mounted on almost any object, including containers, pallets, and bags [1].



Fig1: i-Button in steel can

#### A. One Wire Interface

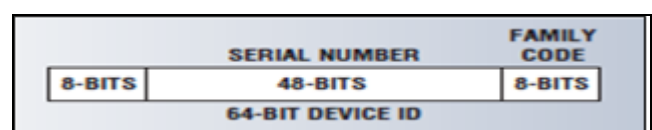
By simply touching the iButton to the two contacts described above, you can communicate with it through our 1-Wire protocol. The 1-Wire interface has two communication speeds: standard mode at 16kbps, and overdrive mode at 142kbps.



Fig 2: One wire interface

#### B. The Unique Address

Each i-Button has a unique and unalterable address laser etched onto its chip inside the can. The address (e.g. 2700000095C33108) can be used as a key or identifier for each i-Button.



Fig

3: 64-bit ID unique to each I Button

### III. WORKING OF THE SYSTEM

Initially the Access is blocked and the idle information is shown on the 16\*2 Alphanumeric LCD Display .this access is only and only activated by a valid I-Button Device and not by any other .As soon as the person shows his personal I Button to the I-Button Reader Placed front of the Panel as show in diagram. Within a second the system read the id and the balance information of the owner through the I-Button by the help of unique one wire protocol executed by microcontroller [2][3].

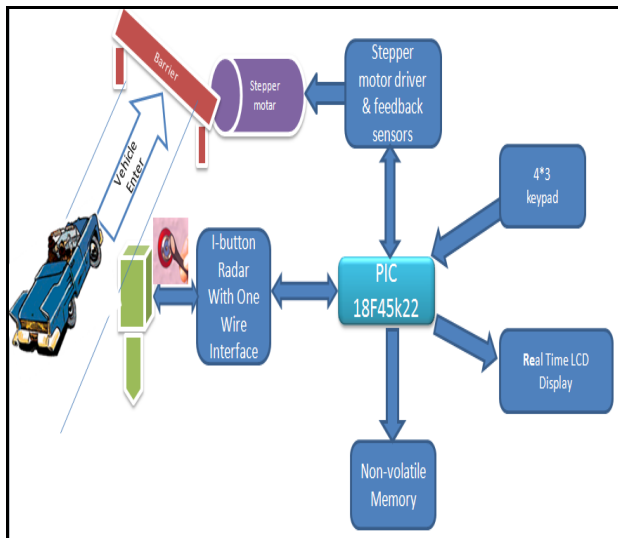


Fig 4: System schematic

that are common when using 1-Wire devices in their Button form factor [5].

The data is further given to the microcontroller where embedded software checks the integrated secured 64 bit ID and matches it with stored authorized ID databases. And when it matches then the system will give the Access otherwise the system will display an error message of unauthorized access.

One of the biggest advantages of this system is that if it detects three unauthorized access attempts in a row. The system will detect as unauthorized activity then it will lock itself and give an error alarm.

All real time activities like I-Button detection, Authentication and opening and closing of the gate process are displayed on a 16\*2 Alphanumeric LCD for visual indication. The record log and all transactions of the day are stored in non-volatile memory so that data is still available even in the case of power fails.

### IV. REQUIREMENT ANALYSIS

#### A. Hardware

Following are the specifications of the various components used to design this multi access system using I-Button [7].

TABLE I

COMPONENTS	SPECIFICATIONS
Microcontroller	89s52
Lcd Display	16*2
Eprom Ic	24c04a
Unipolar Stepper Motor(12v)	27964
Voltage Regulator	Ic 7805
Diode	1n4007
Buzzer	-
Transistor	Bc548
Stepper Motor Driver Ic	ULn2003a
I Button Receiver Knob	-

#### B. Software

Embedded 'C' software is used to program the microcontroller and digital signal controllers for particular applications in this project. It is called an Integrated Development Environment, or IDE, because it provides a single integrated "environment" to develop code for embedded microcontrollers [6].

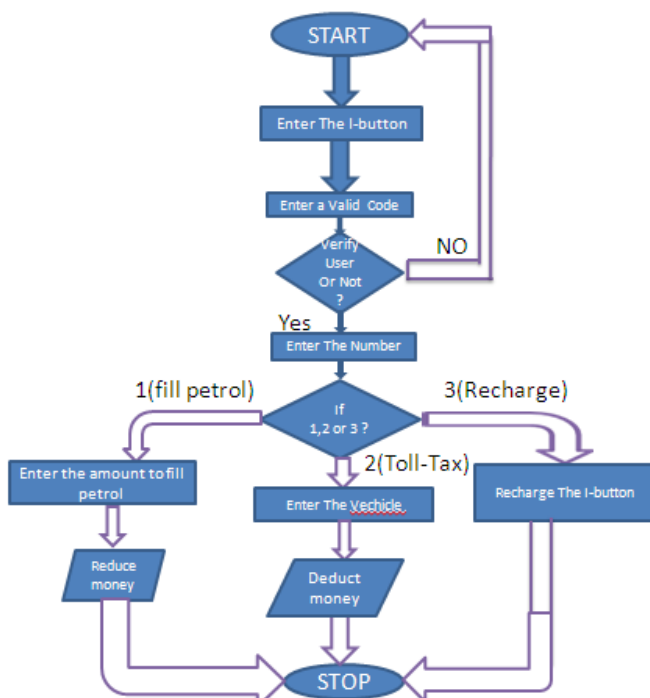


Fig 5. Data flow diagram of the system

This communication uses a single data line and well-defined, time-tested protocols. These include special provisions to handle highly intermittent ("touch") connections

## V. SNAPSHOTS OF THE DESIGNED SYSTEM

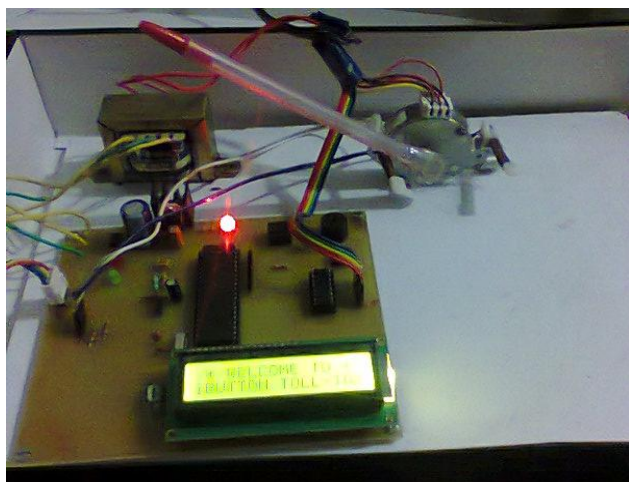


Fig 6 Shaft of the barrier will open for recognized iButton

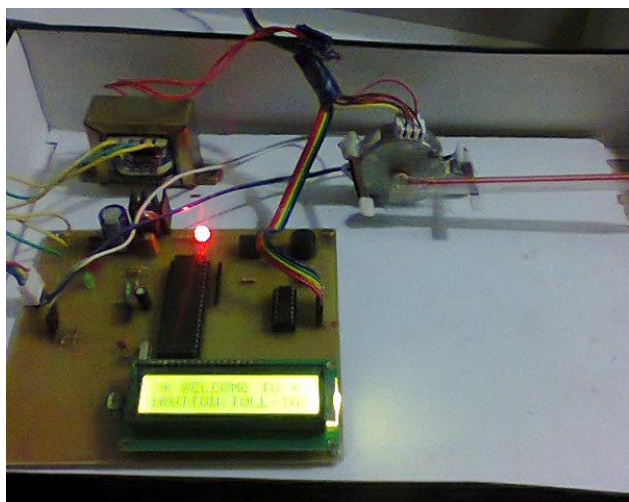


Fig 7: Shaft close after 3 Sec

## VI. CONCLUSION

We conclude that our proposed system is now working as per requirement setup by us initially, with this we had tried our

level best to achieve automatic toll tax system using I button” Periodically”. We had also achieved development in making an automatic system in which one I button can perform the multiple task. Our project is also playing a role for saving the time and avoid heavy traffic by automatic multiple system with I button.. Above all application got success by using powerful ATMEL 89C52 microcontroller and Embedded C Program.

## VII. FUTURE SCOPE

In future the system will be design for more than 5 real time applications at a time and one single button can access those systems. For the security purpose there will be provision in system just like thumb impression, GSM module etc.

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