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Intelligent Protection System by Microcontrollers

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Abstract

With the advent of digital systems and significant progress in all fields of industry experts in the field about the spread and use associated with this sector have fallen so every day interesting events and far-fetched in this field. In this article we will discuss the first to introduce digital systems and the features they'll say, we need to investigate the use of digital systems in the field of protection and safety particularly smart locks will pay and in the end, we're introducing intelligent system design much needed in this area to solve it also criticized the system and the strengths and weaknesses of will say it.

Keywords: Intelligent systems, intelligent lock, auto lock, door locks, building protection, security

1- Introduction

Protection and safety is important in all commercial buildings, offices and even residential, Therefore, in all ages, people have been looking for a way to protect their property. With the advancement of science and the rise of computer systems Much of safety problems were solved, But with all the improvements of these systems, every day we witness and abnormalities, Every day we witness and abnormalities, which are all due to the lack of a system is quite efficient for protection and safety. Today's systems have been developed that are charged with the duty of protection and safety of different places, But humans are far from ideal. In this article we introduce the intelligent system that the protection and safety can cope in different places. Consider a system that is using the latest technology and will be designed to be quite

intelligent. Intelligent systems with capabilities that are can be very important role in the creation of a reliable system of protection and safety in the field of play [1]. In this article we have tried to use these systems to introduce one of the most improved system that to date we have been in this field of design and planning.

2- Review the Present System of Protection and Safety

To this day, many activities is to protect and secure and many projects have been proposed cameras or various traffic control systems or anti-theft doors, even intelligent and non-intelligent locks, each of which has their flaws and virtues, of course, one method of protection explanation does not fit in this article. Each of the tools that have been mentioned so far have been used separately and independently and none has

had to coordinate with each other and in relation to each design and not used [6]. Since the opportunity to review all the tools here are not flaws and criticism of the tools we left for another article. With this introduction to the study of intelligent locks go on the market, Each Smart Lock has a mechanical part and an electronic part, by

command of electronics, mechanical part does its work. In this section we intend to introduce the various electronic locks and given that the mechanical part needs to introduce a separate article the review and analysis of mechanical lock smart section in this article we ignore.

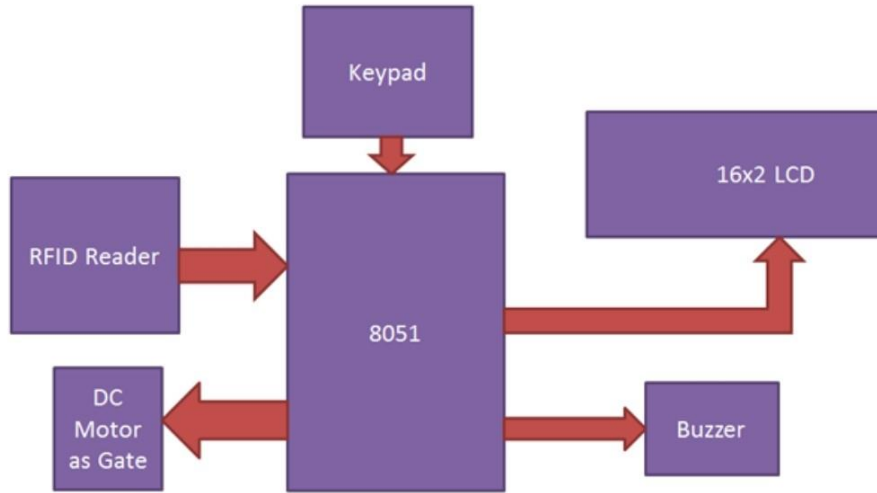


Fig 1. The intelligent universal lock system diagram

Different locks up today using a variety of methods which have been marketed we will continue to introduce and critique each payment:

2.1- Locks that work with the keyboard

The lock with a keyboard, when entering the correct code to pass through, the locks

are in practice not much different from non-smart locks and only to use them should be paid more money therefore, faced with a little welcome. And designers looking for more advanced designs left.

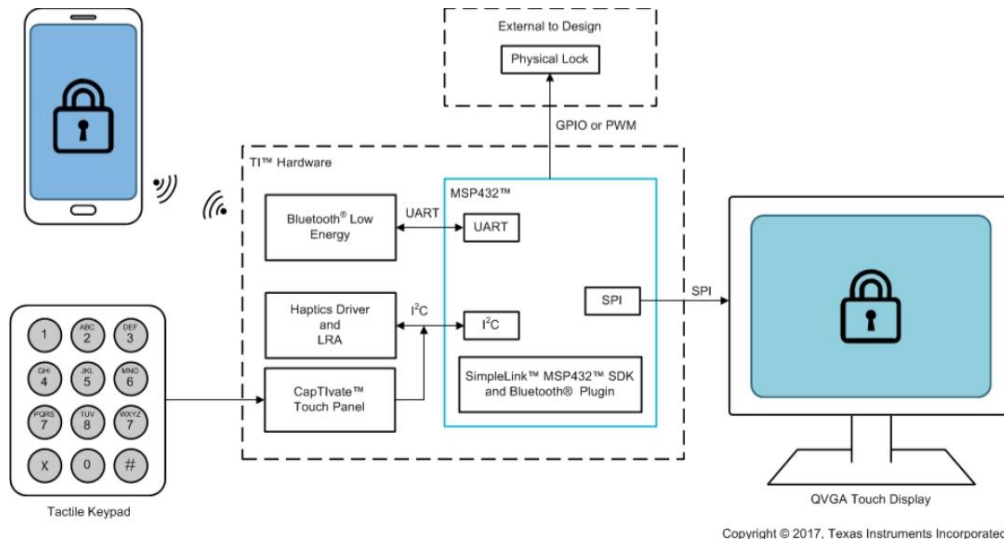


Fig 2. The keypad and Bluetooth lock system diagram by SPI and PWM protocols

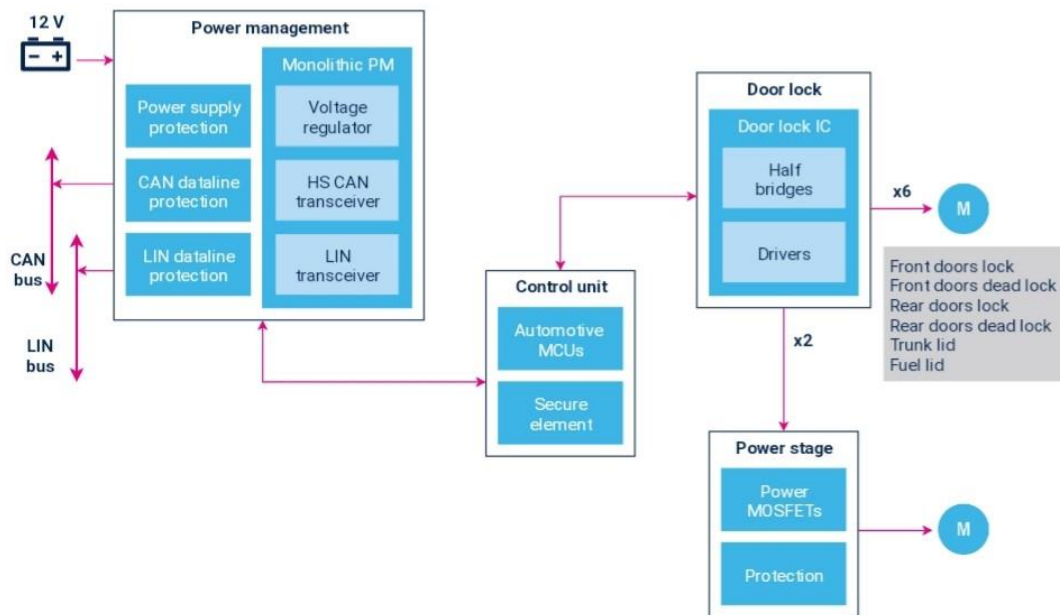


Fig 3. The intelligent special lock system diagram for car by CAN/ LIN bus

2.2- Locks that work with RFID cards

The inside your locks with a card reader module able to read the card code entered and in compliance with their codes, unlock the door [2]. Scope of the locks so far is and after opening the door to another task.

This lock can be cited when the bugs that card to be forgotten by the owner, He made nothing of what is and in no way cannot unlock the door. This is exactly the forms that exist for non-smart locks and Smart unlock this problem is not resolved and only added cost. Locks that in addition to having the ability to have RFID cards, fingerprint modules are. This lock one of the previous problems solved if you do not lock the card to be used but the more fundamental problem, namely inefficiency in the protection and internal security still remains in her seat. In addition to using RFID card locks that use facial recognition module. This type of lock also locks somehow able

to solve problems but never in protection and internal security have contributed. It locks by using face detection devices, that are often designed with a very high margin of error.

There are a lot of locks that express or disadvantages of each discussion is beyond the scope of locks that are used to digitally design but none have failed system which it can be a very reliable and versatile system for the protection and safety be considered. However, all of these different methods are hacked locks this reduces the reliability of their own you, also today, a lot of theft by hacking the lock is done very big reason for the display of these systems is inefficient. According to the tips these days need to design a complete system, It is a sense of protection and safety in different places. In the next section we will introduce the system ideal for protection and safety. [3,4,5,7]

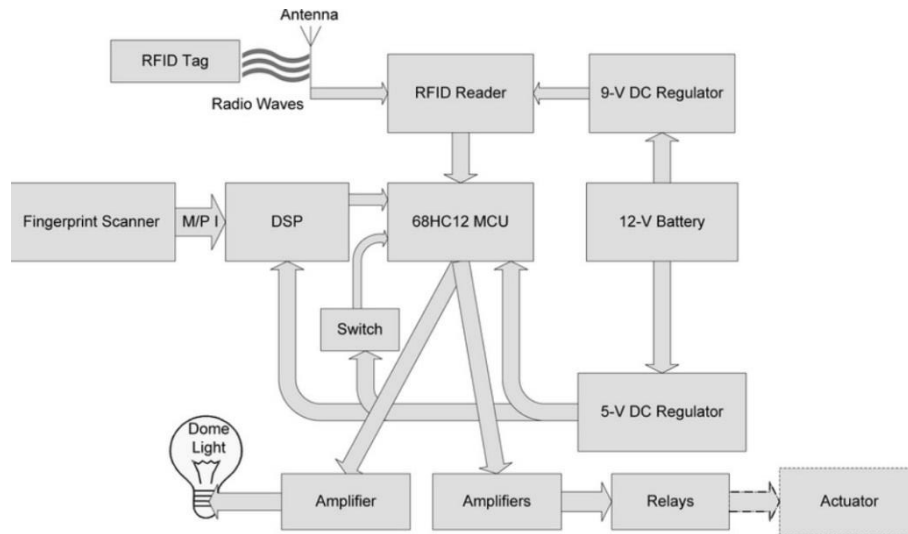


Fig 4. The intelligent special lock system diagram by RFID protocol

3- The introduction of intelligent system proposed

According to the subjects mentioned in the previous section to the conclusion to have a protection system. It is not enough to use only one lock design but we need to use new technologies and new design with a fully functioning immune system and dynamic action. The system should be able to require all protective and safety equipment such as intelligent access control, Immediate and real-time monitoring of multiple locations. Submit events occurred, intelligent and have a potential theft in this section, we will continue to introduce and system design that can meet the above needs. Mechanical and electronic system has two parts to it we will continue to fully explain individual. We'll look first to introduce the mechanical system, Mechanical parts to be one of two types of locks to main doors and another subsidiary for doors, lock the main door has a face detection feature as well as RFID cards module is and works fully automatic door lock key and in no way is out of control, Lock doors by connecting it to the main system and the command that is - in a way that will be described below - will work.

In the electronic camera system thermal sensors (for use in places where the camera can be used), The main control system (brain system) and the lock is electronic, continue to learn how to connect and coordinate the work of the system. Methods in this way the intelligent system that in different scenarios and different situations is responsible for building various tasks we continue to explore different possible scenarios for the protection, safety and building control will be discussed. The first assumption is when someone is in the building and the system should undertake the task of protection and safety, In this case, the sensor system, Face Detection function, your camera is also able to monitor real-time conditions and when something unusual happened with the ability to communicate quickly with Sentinel or manager And even the police will inform them of any incidents. The second assumption is time to open the side door at the determined time and with the guards and employees or office building will start its work, In these cases, lock the main door opens with face detection guard at the same time, which can include door locks ancillary services, non-critical sites,

Study halls and the places are automatically opened, From this moment on, the task of building control systems and undertakes, This means that your cameras can be monitored all movements. Third, it is assumed the office building at a certain time closed and all the people leave, at this moment, using heat sensors and cameras

and face recognition capabilities and image processing could take place in different people's lack of command the main sub-system command to shut the doors and when all doors were closed sub and one in a different location is automatically closed and locked the main door.

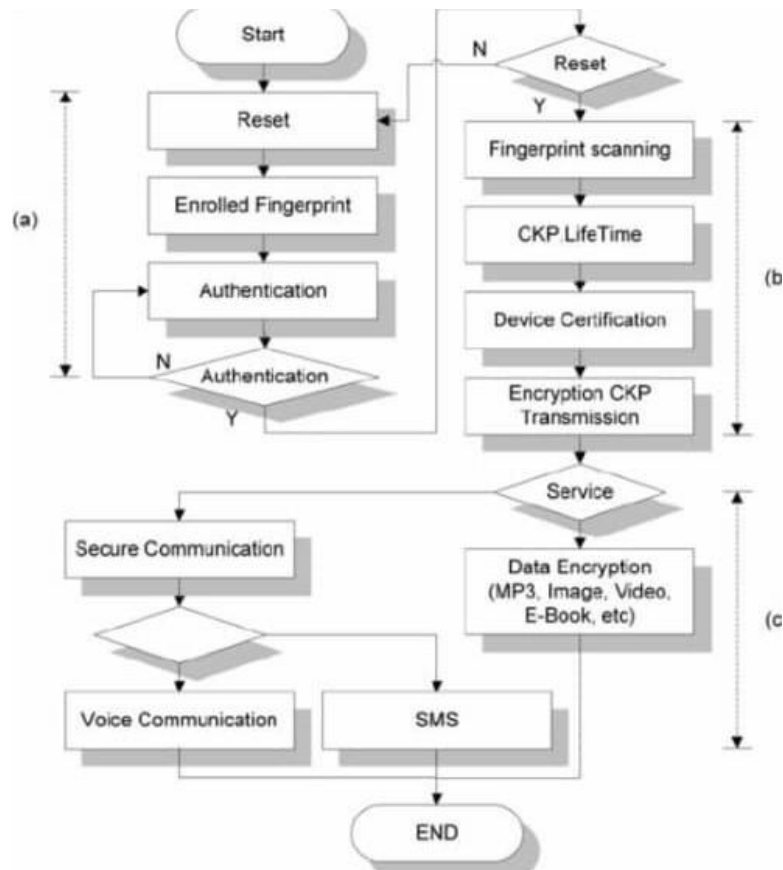


Fig 5. The intelligent special lock system diagram by RFID protocol

3.1- Evaluate the strengths and weaknesses of the proposed system

This system uses various capabilities such as image processing capability and Face Detection also uses various sensors can solve the major problems of protection and safety and according to the system of smart lock. Can be claimed if the hacking of the locks, with fast connections to the security

system or the police would not run into any particular problems. Because face recognition is based on this system, Therefore, regarding how the system works incredibly robust face detection algorithm used to do - discussion of evaluation of face recognition algorithms in this paper - the same point could be a strong point and point system distinguishes this system from other systems, he said.

Since this system does not have more tools than previous systems it does not impose additional costs to the department or location and differences in ideas and systems with previous systems to communicate with each tool. The use of new technologies such as face recognition is, and all this makes differentiation and superiority of this system is the current system.

Conclusion

In this paper, smart locks and looked at the whole system of protection and safety and by providing the tools and their relationship went together to design intelligent systems that can solve all the problems of protection and safety, and finishing with the strengths and weaknesses of the system and finishing with the strengths and weaknesses of the proposed system time has come to the conclusion with the use of modern science and the use of new technologies to solve the problems of protection, safety and control different location address.

References

- [1] Shaarbafe, Sajjad Aghasizade, and Mehdi Mirzaeia. "Effects of suspension normal force control on an optimal anti-lock braking system performance."
- [2] Mohamed, Abeer Samy Yousef. "Biomimetic Architecture: Creating a Passive Defense System in Building Skin to Solve Zero Carbon Construction Dilemma." *EQA-International Journal of Environmental Quality* 29 (2018): 1-28.
- [3] Moreno-Cano, M. V., et al. "An indoor localization system based on artificial neural networks and particle filters applied to intelligent buildings." *Neurocomputing* 122 (2013): 116-125.
- [4] Taraszkiewicz, Antoni, and Karolina Taraszkiewicz. "A sense of security and freedom in a residential environment." *World Transactions on Engineering and Technology Education* 19 (2021): 65-70.
- [5] Blackman, Harold S. "Instrumentation, Control, and Intelligent Systems." (2005).
- [6] Akbari, Mohammad Esmail, et al. "Friction System Simulation on Electro-Mechanic Systems." *Journal of Artificial Intelligence in Electrical Engineering* 9.33 (2020): 33-38.
- [7] S. Nikbakhsh, A. Abasgholi and Sh. Mahmoudi, 1393, "Intelligent communication building with economy, comfort, security and culture", the first National Conference on Intelligent Building Management Systems approach to energy efficiency, Qazvin, Construction Engineering Organization Qazvin province.