Wireless-Keyless Electronic Door Lock

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Abstract:

The Wireless-Keyless Electronic Door System is a door lock system designed to help the user to never have to worry about forgetting their keys again. The lock system has two main parts: the keypad/transmitter and the receiver/lock. The keypad will attach in a place of convenience close to the door, and the lock will be installed into the door that you wish to secure, replacing the current lock. When a certain secret security code is entered, the door will unlock providing entrance. There is also a lock button that can be used to quickly lock the door without the use of traditional keys, although keys can be used to lock/unlock the door.

Description:

My Wireless-Keyless Electronic Door System has several parts to it. The front part consists of a keypad where you will enter the code to unlock the door as well as an LCD display that will display simple outputs like the code entered, whether or not the door will unlock, or if you lock the door, it will display that the door has been secured. The way that the user will program the lock code is to plug it into the users PC and a terminal emulator will guide them through how to set up their code.

The lock part of the system will replace the current lock that is in the door. Both will have to be battery powered. The keypad will have a sleep timer on it to conserve energy. It will only be active when someone is trying to lock/unlock the door.

As part of the keypad, there will be an embedded microcontroller that will monitor the input from the keypad, and will control whether or not the signal gets sent to the lock. When the signal is sent to the receiver, there will be another MCU that will decipher whether or not the correct signal was received. This will add more security to the system. The codes saved will have to be stored in non-volatile memory to prevent them being wiped clean when the power is shut off, due possibly to the batteries dying.

Background and Benefits:

The main benefit to this system is that you will never have to worry about forgetting your keys again. It will allow more people to keep their houses locked during more hours of the day due to the ease of use, which will contribute to the house being safer. The longer you leave your door unlocked, the more likely it is that you can have some sort of home intrusion.
Some examples of similar products include the Schlage Electronic Pushbutton Deadbolt Lock. Other examples include similar designs built by Black & Decker, Samsung and Morning. Most of these aren’t wireless. They are self-contained units that completely replace your existing lock system. The advantage of my lock system is that you can place the keypad in a place that will be most convenient to the person using the lock; maybe outside a garage or beneath an overhang to shield it from weather, or even out of the reach of children.

**Societal and Global Impacts:**

The main benefit to this system is it will allow home owners to keep their houses and valuables more secure. By having a simple locking system that uses an easy to remember code, there won’t be any more leaving the door unlocked to make sure that you don’t get locked out. Just remember your code and you can lock your house and know that your valuables are safe.

**Development and Demonstration:**

This system will be demonstrated by bringing in the lock that I have designed. There will be no need to actually have a door, because it is simple enough to see if the lock is working or not. The keypad, transmitter, hardware and display will be hooked up through a breadboard. The code will be programmed into the MCU. The next step will be showing how the system works. Locking and unlocking the door as well as showing that incorrect codes will not work.