# ELTIKOM_Access Control and Security System [Detail Revision]_19Sept2021

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# ACCESS CONTROL AND SECURITY SYSTEM VIA BLUETOOTH APPLICATION ON ANDROID SMARTPHONE

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***ABSTRACT***

*Smartphone technology can be applied not only to establish communication needs but also to support other purposes. One of them is related to personal safety and security functions. It is undeniable that criminal acts can occur anytime and anywhere. Even in a private or residential area, theft could happen. Smartphone and sensor technology can be used as a solution to encounter this problem. In this case, it can be utilized to improve the security control system of the gate or garage door at home. This research presents a prototype of a gate and garage door control and security system that operates through an application on an android smartphone. The application of HC-05 Bluetooth is used to send signals from the smartphone to the Arduino Uno microcontroller, while the micro servo acts as a locking mechanism on the gate itself. The buzzer function is presented to notify homeowners when the gate or garage door is open for more than 15 seconds. This prototype can control gates and garage doors with an average connection time of only about 5 seconds. Thus, this prototype is feasible to use as an alternative to control and improve housing security systems.*

***Keywords**: Access control, Security system, Android smartphone, Locking mechanism, Buzzer alarm.*

***ABSTRAK***

*Teknologi smartphone dapat diterapkan tidak hanya untuk memenuhi kebutuhan komunikasi tetapi juga untuk mendukung keperluan lainnya. Salah satunya adalah yang terkait dengan fungsi keselamatan dan keamanan pribadi. Tidak dapat dipungkiri bahwa tindak pidana dapat terjadi kapan saja dan dimana saja. Bahkan di wilayah pribadi atau di perumahan pun, pencurian bisa saja terjadi. Teknologi smartphone dan sensor dapat digunakan sebagai solusi untuk menghadapi permasalah ini. Dalam hal ini, penggunaannya dapat dimanfaatkan untuk meningkatkan sistem kontrol keamanan gerbang atau pintu garasi rumah. Penelitian ini menyajikan prototipe sistem kontrol dan keamanan gerbang dan pintu garasi yang beroperasi melalui aplikasi smartphone android. Aplikasi Bluetooth HC-05 digunakan untuk mengirimkan sinyal dari smartphone ke mikrokontroler Arduino Uno, sedangkan micro servo berfungsi sebagai mekanisme penguncian pada gerbang itu sendiri. Fungsi buzzer dihadirkan untuk memberi tahu pemilik rumah saat pintu gerbang atau garasi terbuka lebih dari 15 detik. Prototipe ini dapat mengendalikan gerbang dan pintu garasi dengan rata-rata waktu koneksi hanya sekitar 5 detik. Dengan demikian, prototipe ini layak digunakan sebagai alternatif untuk mengontrol dan meningkatkan sistem keamanan perumahan.*

***Kata Kunci**: Kendali masuk, Sistem keamanan, Smartphone android, Mekanisme penguncian, Alarm buzzer.*

## I. INTRODUCTION

Advances in science and technology brought conveniences to human life. In this modern era, smartphone has become indispensable as a basic need for people and it is considered as a very important device because of its significant function in many areas of our lives [1-10]. A smartphone is a mobile device that has many features in purpose to replace the personal computer. Although only occasionally, smartphones can also be used to increase the monitoring security system of a gate or garage door [11, 12, 13, 14]. Some technologies have been applied to improve the security system of a gate because a conventional gate is considered not safe enough. On a conventional gate, the opening and closing of the gate are still by pulling it with human power from close range and using a

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