The Mini-Storage Security System

ETEC 471

Senior Project Proposal

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Introduction:

The project that I am proposing is a mini-storage security system. It will be a security system that monitors every storage units and checks if there are any illegal entries. My demo will not only simulate the basic security functions, but also have an additional second level security function that other mini-storages on the market do not have.

First of all, each user will have one selected gate code to enter or leave the storage area. Secondly, multiple enters should be admitted. It means that when there is one user in the area, the following users can enter the area without causing any system conflicts. Finally, a second level security function provides extra protection to each storage units.

Description:

When the gate code has been entered, the front gate will be opened for 30 seconds; 30 seconds is enough for a vehicle to drive pass the front gate. After 30 seconds, the front gate will be turned off automatically. In order to leave the storage area, the gate code has to be entered again.

Usually, the storage unit itself is only protected by a padlock and a monitoring system. That means if a thief follows you into the storage area or breaks in at midnight with proper tools, he can cut the padlock off and take whatever he wants. In order to prevent this problem, a second level
security function is necessary.

Besides a padlock, my security system will allow renters to select a second password for their units. This password will associate with the gate code, which means that when a renter enters the front gate, the system will check two codes: the gate code and the unit password. If the gate code is valid but the unit password is not, the person will be denied. Also if a thief breaks in without passing the security check and tries to open the unit door, he will set off the alarm.

Please refer to Figure 2 on page 6 for the system block diagram. On the diagram it shows how the user interface (keypad and LCD display) and sensors interface to the microcontroller. In my system, the power will come from a regular wall outlet.

Benefits:

Currently, all the mini-storages on the market have only the first level security function, which might cause the potential problem of losing property. Also, the person who in charge of the storage area has to keep his eye opens for the most of time, which is a heavy load work. By including the additional second level security function, both owner and renter will be benefited.

Demonstration:

I will build a simulation board that is similar the sketch (Figure 1 on page 5). First of all, the gate codes will be pre-written into the ROM, therefore during the demonstration people can enter
codes to test the basic function, such as enter / leave the front gate or multiple entries. Secondly, in order to test the second level security function, jumpers will be used as the storage door. Only the door that matches both codes can be opened. If the non-matching jumper is disconnected, the alarm will be activated until the reset button is pressed. As shown on the sketch, LED’s will be used to indicate the system status. Solid red LED indicates the armed status. Solid green LED indicates the unlocked status and flashing red LED means the alarm status. Because it is a mini-storage simulation, at least 10 to 20-plus storage units should be built.

**Completion:**

It is possible to complete this project with my present knowledge and resources. The past senior projects contain useful information, such as how to program the user interface (keypad) or how to deal with the multiple signals simultaneously. Also, from the ETEC 374 course, the last alarm lab contains similar details that can be applied to this project.
Final Product Sketch

Figure 1
Block Diagram of the Mini-Storage Security System

Figure 2