

CSE-590 Computer Architecture

Summer 2015

Electronic Lock - Project 2

Device Usage Guide

States:

LOC	Locked
UnLC	Unlocked
PAUS	Paused

Interaction with the device:

1. **Latch the numbers:** Use switches [4:0] to select a number and press a button to latch the selected number into the corresponding seven segment display. Repeat this to enter multiple digits
2. **Check the code:** Move switch [4] from 0 -> 1 -> 0
3. **Lock the device again:** Move switch [5] from 0 -> 1 -> 0

Working:

1. The initial state of the application is locked state **LOC**
2. Use switches [3:0] to select a number and press a button to latch the number into corresponding display. Repeat this to enter multiple digits
3. To enter and check the code, move the switch [4] from 0 -> 1 -> 0
 - If the code is correct, device unlocks **UnLC**, and the **led blinks**
 - If the code is incorrect for the first time, the device moves to locked state **LOC**
 - If the code is incorrect for the second time, the device pauses for 20 seconds **PAUS**
4. Once the device is unlocked, to lock it back move switch [5] from 0 -> 1 -> 0
5. If the device is paused, it will return back to locked state after **20 seconds**
6. Timeout Window: Once the first button is pressed the time left to enter the remaining code and verify it is **30 seconds**. If not done within this time frame, the device moves to the locked state.

Design:

1. To calculate 20 and 30 seconds, separate counters are used whose values are calculated based upon the slow clock.
2. Flags are maintained to trigger events only during negative edge of switch 4 (Code Enter switch) and 5 (Lock switch).

Unlock Code - 3283