

## **Custom Design ATM Outline and Specs**

The design, model and simulation of the basic ATM is done using VHDL and the Intel Quartus prime CAD tool. The actual hardware that will be used for the implementation is the DE-10 Lite Development Board. The ATM will verify a user's password and then allow the user with options to deposit or withdraw based on the user's information stored in the memory.

The seven segment displays are used for displaying the data and only three switches are used as user inputs for entering the necessary data that is required. The same three slide switches are used to enter the amount (3 bits so 0-7 is range), account number, select withdrawal or deposit and to enter the passcode. The accounts are users A, B, C, D, E, F and G where each account has an account number 001 to 111. Each account also has a corresponding passcode that is needed to access the account. For simplicity, the passcode and account number was made the same. A push button "pb0" is used as "ENTER" to go to the next state and the other push button "pb1" is used a system "RESET".

Steps below talk about how it's works:

1. Basically, it starts with the start screen which would show HELLO for 4 seconds.
2. The text ACC.NO would be displayed and the user will use the switches to enter a valid account number (001 to 111). The system will wait for one minute and if nothing is entered it will go back to STEP 1.
3. Then PASSCO will be shown and user will need to enter the account's passcode. If the passcode is entered wrong twice then ERROR is displayed for 2 seconds and system goes back to STEP 1. Also, if one minute passes with nothing being entered the system goes back to STEP 1.
4. With the right passcode, then W-0 D-1 is shown where the user uses the first of the three switches to say if they want to withdraw "1" or deposit "0".
5. If withdrawal is selected VALUE 0 is shown and the user can withdrawal some amount from the account using any number of the three switches (3 bits). However, if user tries to withdraw an amount from the account that is not possible then ERROR is shown for 2 seconds and system shows account balance for 3 seconds and then goes back to STEP 1.
6. If deposit is selected VALUE 1 is shown and user can deposit some amount into the account using any number of the three switches (3 bits). However, if user tries to deposit an amount and the resulting account balance will then exceed the set limit of 99 then ERROR is shown for 2 seconds and system shows account balance for 3 seconds and goes back to STEP 1.

7. After the user has finished his activities then the account currently being used along with its balance will be shown in the manner "A. 10". The "A" is the account name for that account number while the "10" is the account balance. This will be shown for 3 seconds and then the system will go back to STEP 1.

A flowchart for this process is shown below:



