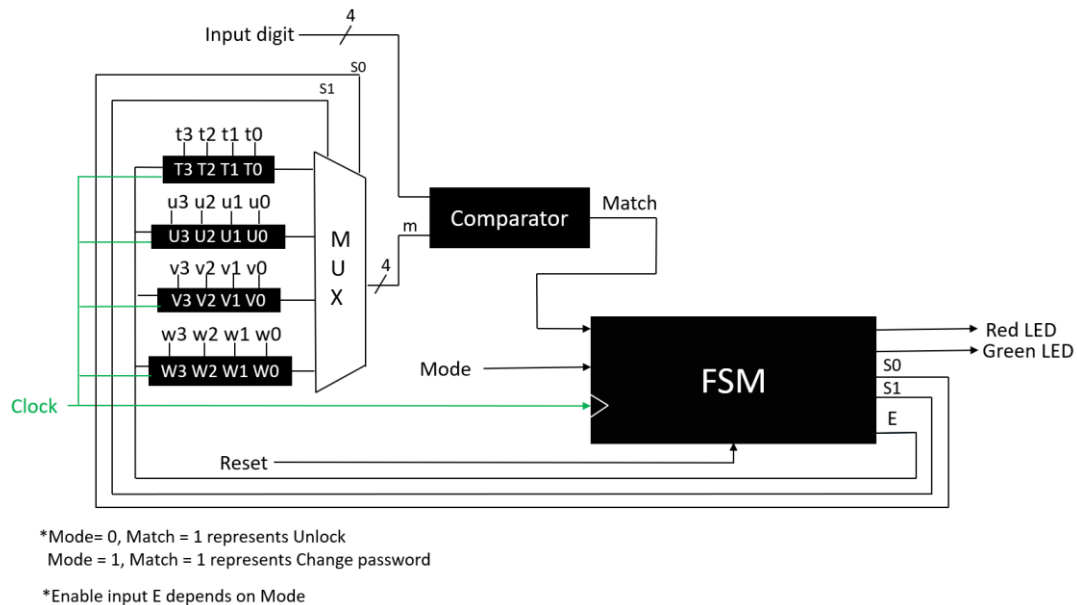


System Layout (FSM and I/O)



Registers: The group of blocks on the left containing the letters T, U, V, W represent registers that will be used to store the correct password to be compared with the password given as input by users. Each password will have 4 digits, each digit of which will be represented in BCD. The capitalized string of letters represents the password already saved in the system while the string of small letters represents the new password that will replace the old password should the user choose to change the password.

Multiplexer: The multiplexer has 4 data inputs and 2 select inputs **S0** and **S1** (not to be confused with state 0 and state 1 in the state diagram). The select inputs help the comparator to compare the digits one by one in the right order.

Comparator: The comparator, as the name suggests, compares the password given by the user as input and output coming from the multiplexer. It generates output **Match = 1** if the passwords are same. Otherwise, the output will be **Match = 0**.

Finite State Machine: The FSM processes **Match**, **Mode**, **Clock**, and **Reset** signals as inputs. The clock drives the system's progression through states, while the reset returns it to the initial state. If any entered password digit does not match the corresponding stored digit, the red LED is activated to indicate access denial. If all the four digits of the entered password match the corresponding digits of the store password, then the green LED is activated to indicate successful authentication.