

SCADA 3: ACCESS, KEYPAD AND DOOR LOCK

Access to a room will be granted to a user who inputted the correct access code in the keypad. As soon as the user inputs the code, the program will verify if the code is correct. If so, it will grant access by opening the door. This is done by supplying the DC motor power that will drive the lock open. But if for illegal entries, they will be locked out and will not be granted permission to come in. As soon as the user gets in the room, the door closes and as it gets a full close, it will send a signal to signify that it already did. This will then be recognized by the program and will drive the DC motor to lock the door.

Simple as it may sound, the SCADA ACCESS will use a software approach to implement the procedure mentioned above. Figure 1a shows a schematic of the keypad while 1b shows the pin assignments.

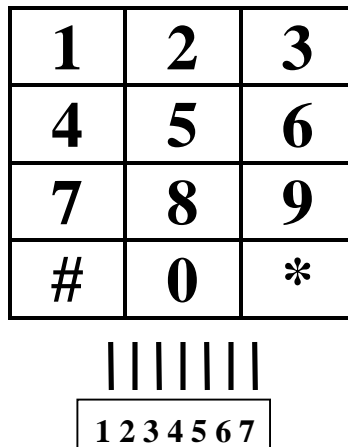


Figure 1a. Keypad used for ACCESS

Pin No.	Assignment
1	Output from CPU
2	Input to CPU
3	Output from CPU
4	Input to CPU
5	Output from CPU
6	Input to CPU
7	Input to CPU

Figure 1b. Pin assignments with corresponding bit value

DOOR LOCK

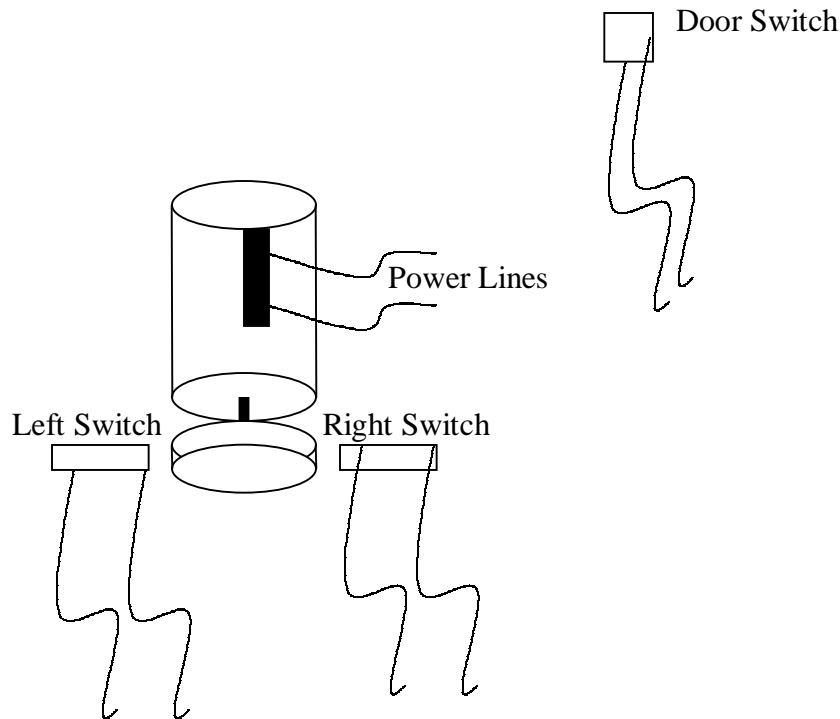


Figure 2. Basic Configuration for a Door Lock

Since we are using a DC motor, we have two status lines, left switch and right switch. When fully locked, the right switch is pressed, this will then be sent to the CPU so that driver will signal to the motor to stop. The same procedure will work for the left switch. The Door switch will be the status for the door whether it is open or close. When fully closed, this switch will be pressed and this signal will be read by the CPU. We can then close the door lock.

THE PROGRAM:

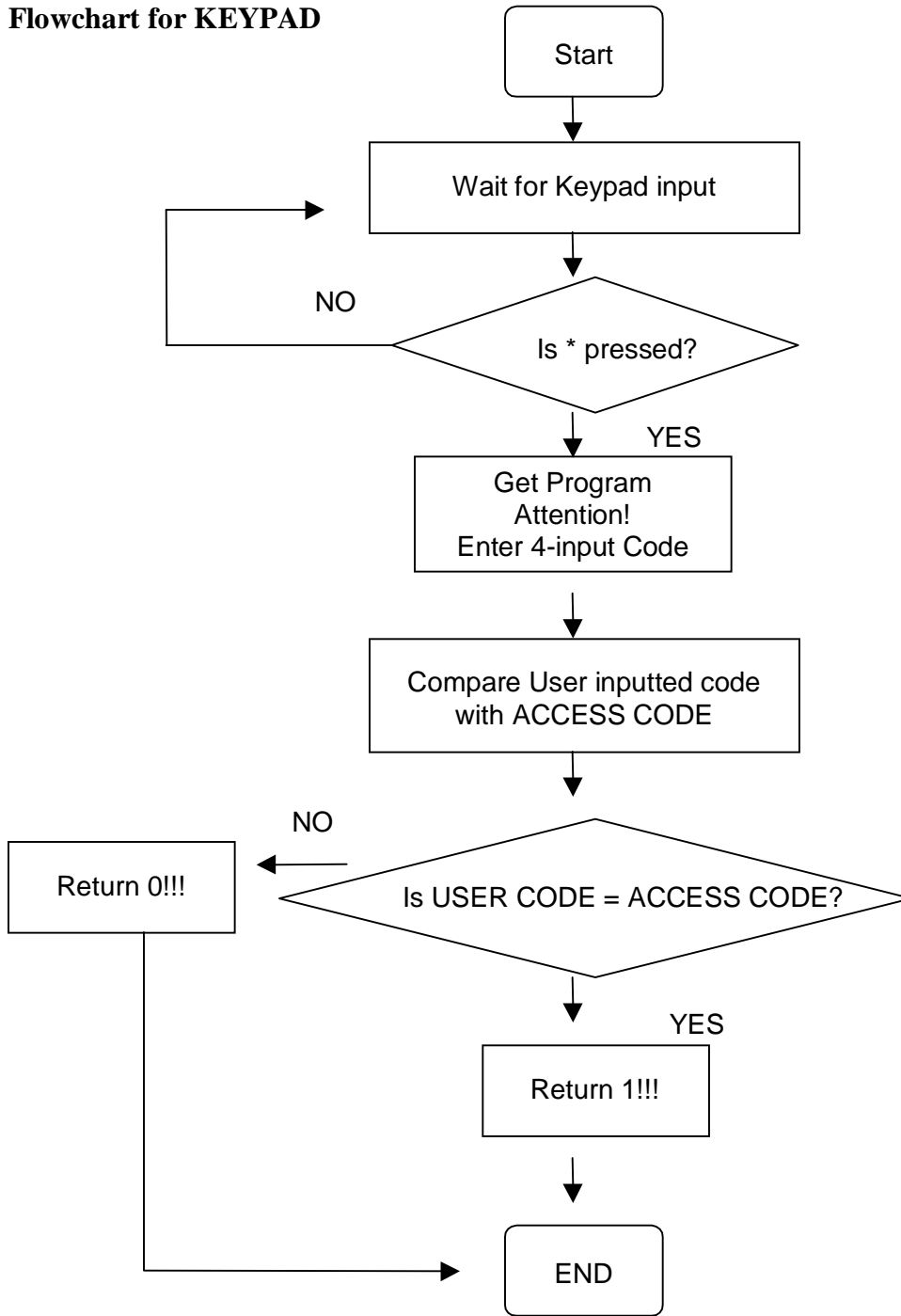
Procedure:

Initial conditions:

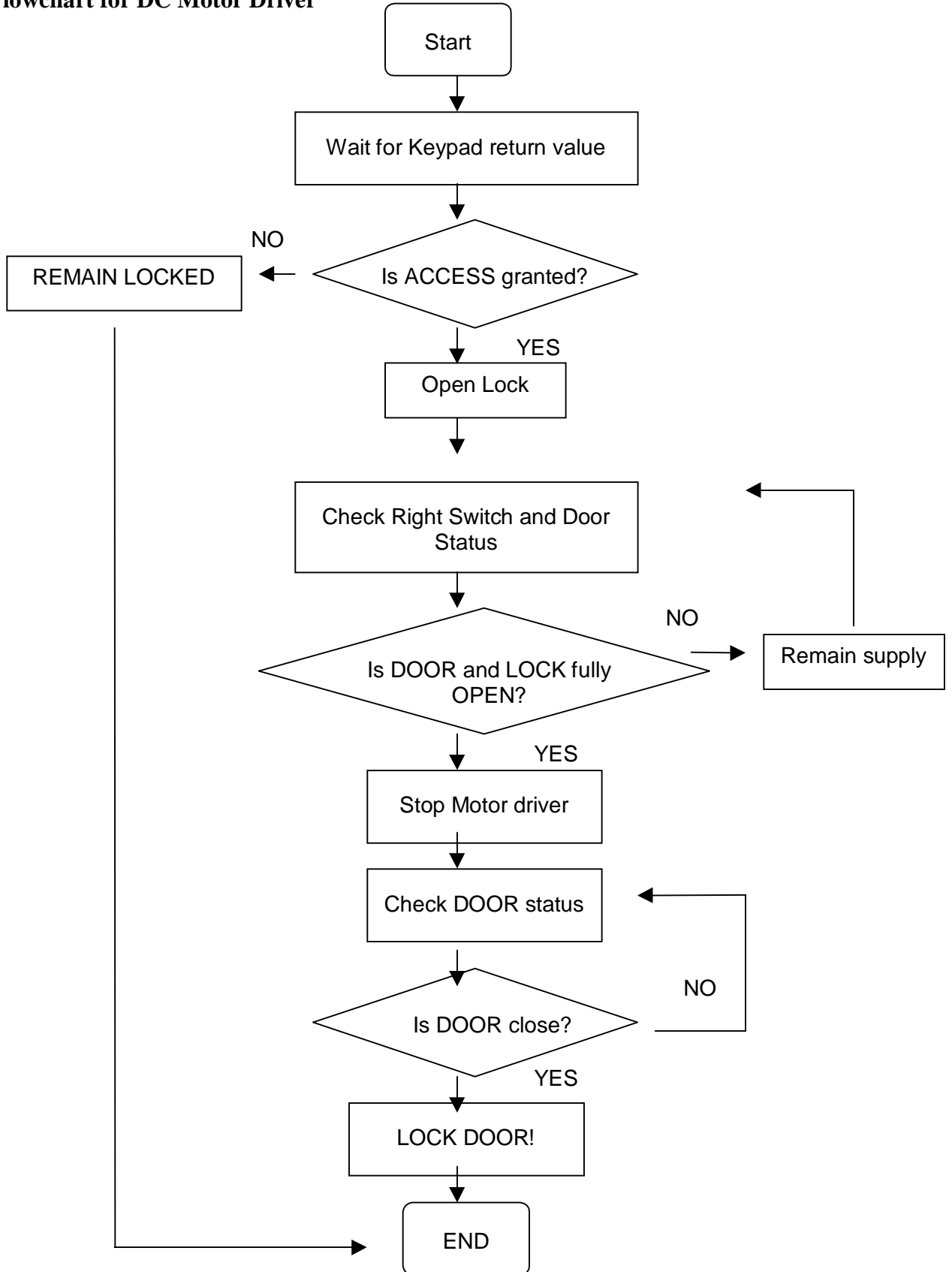
- The door is fully closed
 - DC Motor is locked therefore right switch is ON.
1. In order to get attention of the program, the user will input an *. Other than the *, the program will not give priority to keypad for the reading of code.
 2. When * is pressed, the program will then wait for the input code which will be verified if correct.
 3. If correct, program signals the driver for the motor to open the lock.
If wrong, access denied.

4. Upon full opening of the lock, left switch is pressed. This will be read and driver signal will be turned off.
5. The door switch will then be pressed upon full closure. This will be read and a driver signal will be sent to the motor to lock the door.
6. Then repeat Step 1.

Flowchart for KEYPAD



Flowchart for DC Motor Driver



Circuit Diagram for Motor Supply

The circuit to drive power to motor is shown below. There are two sets of the same circuit. The output of each circuit serves as the input of the DC motor. The computer input determines which circuit is active. If the above circuit is active, it will drive the lock to open. Vice versa happens if the circuit below is active. It is certain that the two circuits will not be active at the same time.

