Smart Home System

Using RTOS

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WHAT IS SMART HOME AUTOMATION?

- Any suite of devices, appliances, or systems that connect into a common network that can be independently and remotely controlled.

- It can also be referred more loosely as a “connected home”.

- It is used to remotely control home's thermostat, lights, audio speakers, TVs, security cameras, locks, appliances, and more are all connected – into a common system, which can be controlled from your smart phone or through a mobile touch screen device.

Smart Home project :

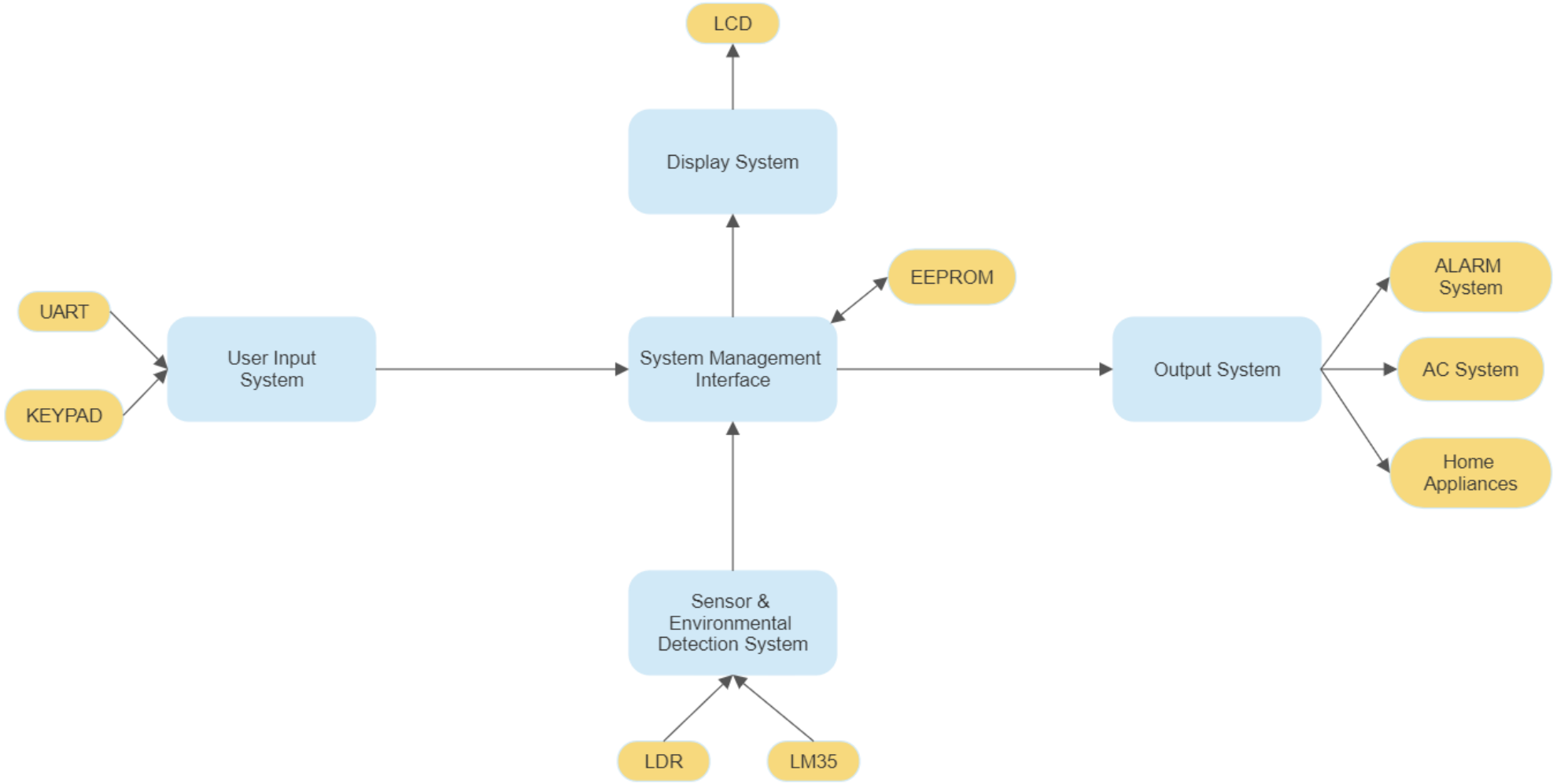
System Features :-

- ❑ Door lock & unlock
- ❑ Temperature adjustment
- ❑ Light adjustment
- ❑ Fire fighting & Alarming
- ❑ Security system

System Hardware

- ✓ LCD
- ✓ Keypad
- ✓ EEPROM
- ✓ UART
- ✓ LEDS &Buzzer
- ✓ LDR
- ✓ LM35
- ✓ Relay
- ✓ Motor

System Design



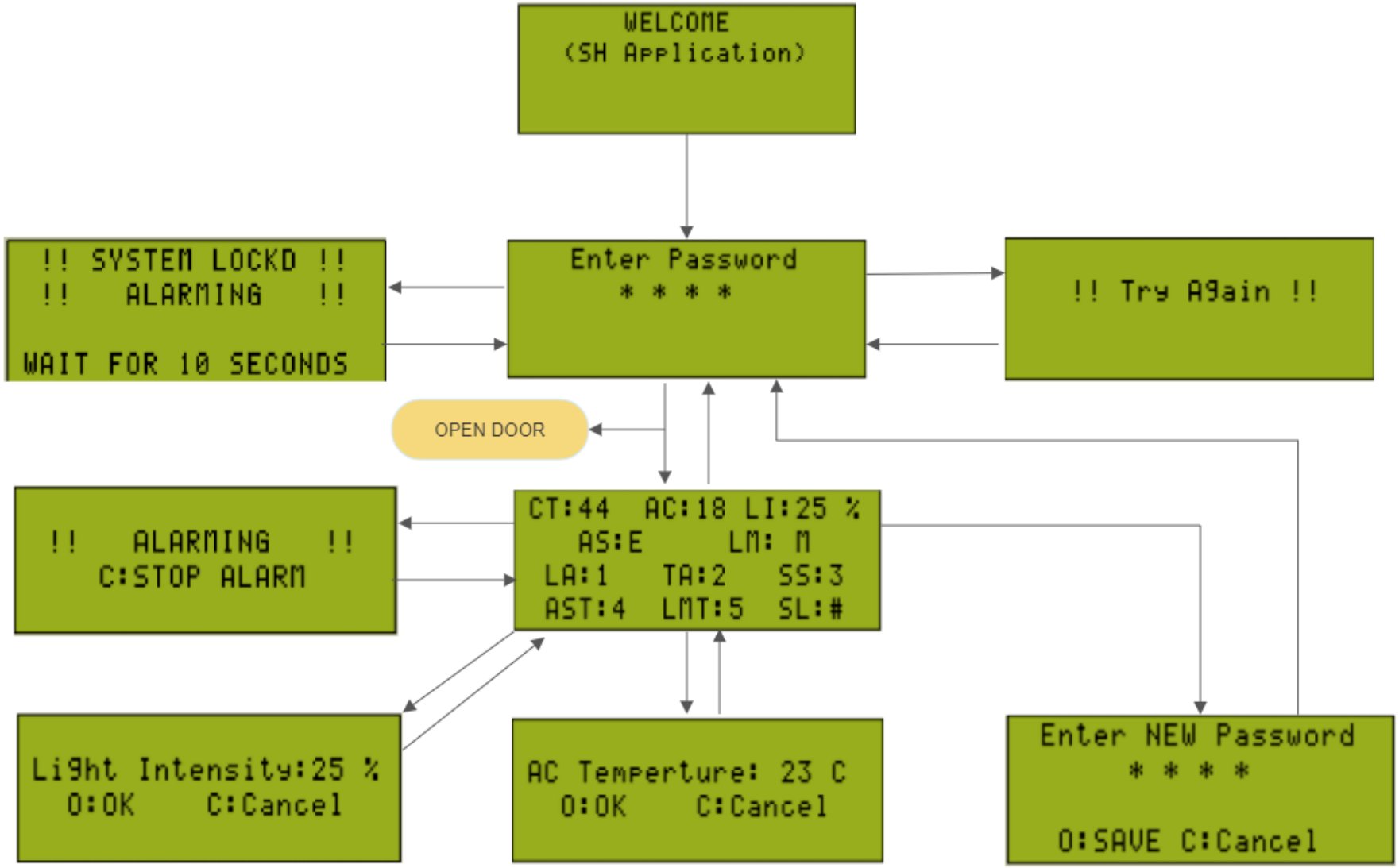
System states/screens : 8

System Guide:-

- CT: Current Temperature
- AC: AC Temperature
- LI : Light Intensity
- AS: Alarm Status
  (E: Enable | D: Disable)
- LM: Light Mode
  (M: Manual | A: Auto)

Controls Guide:-

- LA: Light Intensity Adjust
- TA: AC Temperature Adjust
- SS: System Security
  (Password change screen)
- AST: Alarm Status Toggle
- LMT: Light Mode Toggle
- SL: System Lock



System Events & Parameters :-

System parameters :12

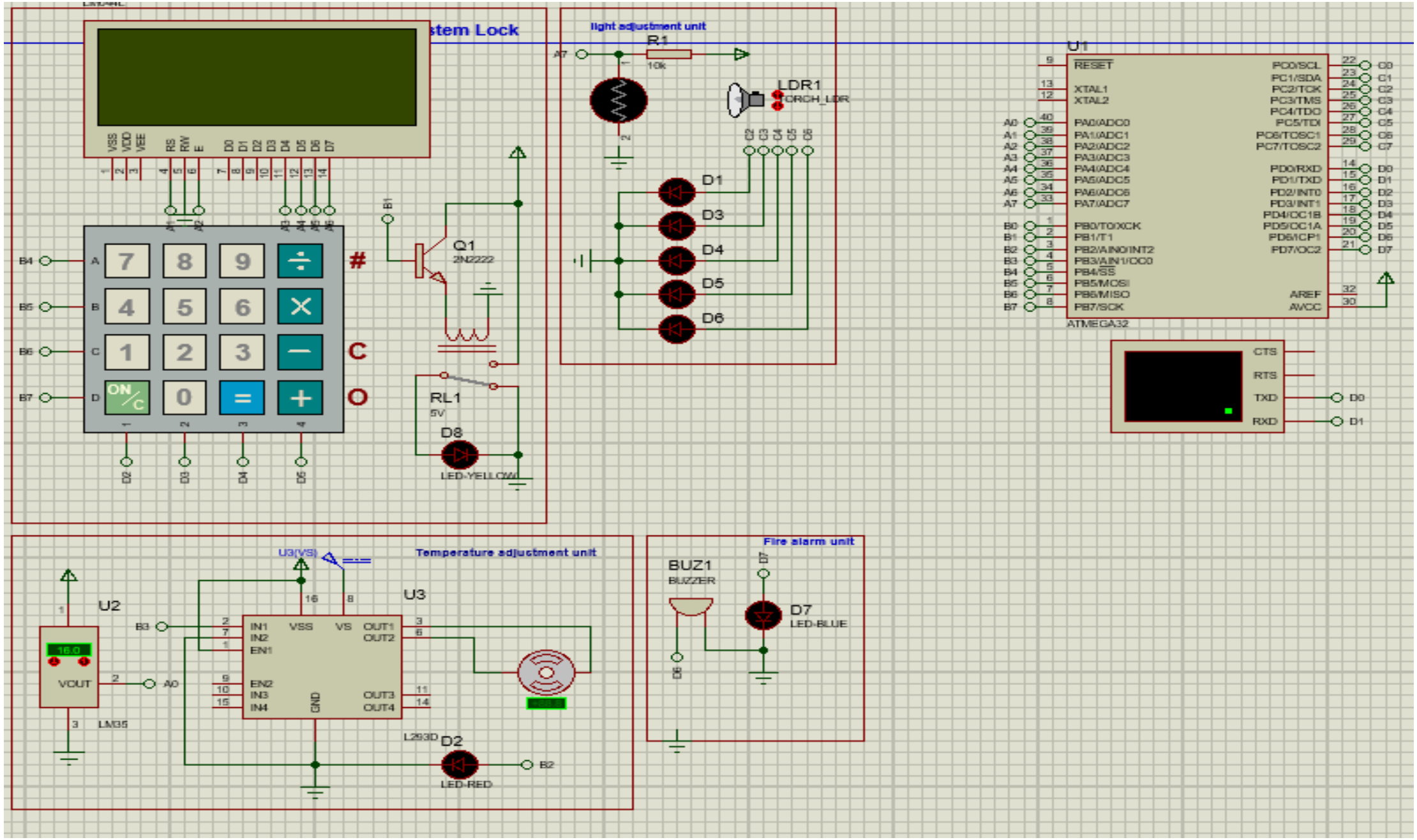
```
Password[],
NewPWLength,
digitvalue,
digitcounter,
Ctemp,
ACTemp
Alarm_Status,
Light_Intensity,
Ldr_Intensity,
Light_Mode,
SysState,
```

System Events : 23

E_CHECK_PW_SCREEN
E_WRONG_PW_SCREEN
E_DOOR_LOCKED_SCREEN
E_MAIN_SCREEN
E_LIGHT_CONFIG_SCREEN
E_ACTEMP_CONFIG_SCREEN
E_LOCK_CONFIG_SCREEN
E_ALARM_SCREEN
E_INSERT_DIGIT_DISP
E_LIGHT_MODE_UPDATE
E_LIGHT_INTENSITY_UPDATE
E_CTEMP_UPDATE
E_ACTEMP_UPDATE
E_ALARM_STATUS_UPDATE
E_PW_UPDATE
E_PW_CHECK
E_RESET_SYSTEM
E_SET_SYSTEM_MANGMENT

Appliance Events :8

E_ALARM
E_STARTFAN
E_STARTHEATER
E_ADJUSTLIHTING
E_OPEN_LOCK
E_STOPFAN
E_STOPHEATER
E_CLOSE_LOCK

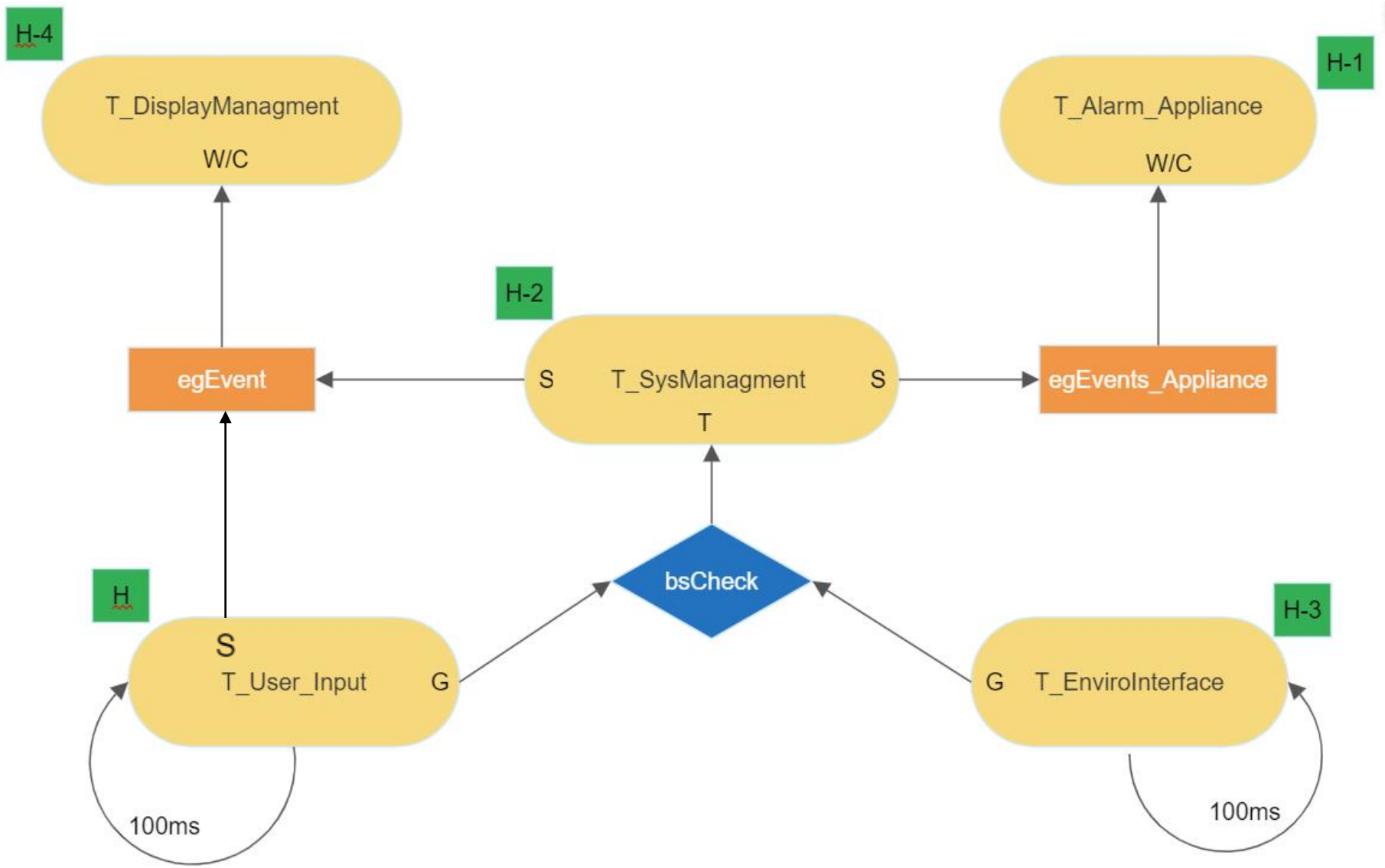

stem Lock
VSS VDD VEE RS RW E D0 D1 D2 D3 D4 D5 D6 D7
B4 B5 B6 B7
A 7 8 9 ÷
B 4 5 6 ×
C 1 2 3 −
D ON/C 0 = +
#
C
O
B1
Q1
2N2222
RL1
5V
D8
LED-YELLOW
D2 D3 D4 D5
light adjustment unit
A7
R1
10k
LDR1
LDR
C2 C3 C4 C5 C6
D1
D3
D4
D5
D6
U1
RESET
XTAL1
XTAL2
PA0/ADC0
PA1/ADC1
PA2/ADC2
PA3/ADC3
PA4/ADC4
PA5/ADC5
PA6/ADC6
PA7/ADC7
PB0/T0/XCK
PB1/T1
PB2/AIN0/INT2
PB3/AIN1/OC0
PB4/SS
PB5/MOSI
PB6/MISO
PB7/SCK
PC0/SCL
PC1/SDA
PC2/TCK
PC3/TMS
PC4/TDO
PC5/TDI
PC6/TOSC1
PC7/TOSC2
PD0/RXD
PD1/TXD
PD2/INT0
PD3/INT1
PD4/OC1B
PD5/OC1A
PD6/ICP1
PD7/OC2
AREF
AVCC
ATMEGA32
CTS
RTS
TXD
RXD
D0
D1
U3(VS)
Temperature adjustment unit
U2
16.0
VOUT
LM35
B3
A0
U3
IN1
IN2
EN1
EN2
IN3
IN4
VSS
VS
GND
OUT1
OUT2
OUT3
OUT4
L293D
D2
LED-RED
B2
Fire alarm unit
BUZ1
BUZZER
D7
LED-BLUE
D6

System Events &Parameters:-
A) egEvents:

System Events : 23	Set Tasks	Clear Tasks
E_CHECK_PW_SCREEN	T_SysManage & T_User_Input	T_Display
E_WRONG_PW_SCREEN	T_SysManage	T_Display
E_DOOR_LOCKED_SCREEN	T_SysManage	T_Display
E_MAIN_SCREEN	T_SysManage & T_User_Input	T_Display
E_LIGHT_CONFIG_SCREEN	T_User_Input	T_Display
E_ACTEMP_CONFIG_SCREEN	T_User_Input	T_Display
E_LOCK_CONFIG_SCREEN	T_User_Input	T_Display
E_ALARM_SCREEN	T_SysManage	T_Display
E_INSERT_DIGIT_DISP	T_User_Input	T_Display
E_LIGHT_MODE_UPDATE	T_User_Input	T_Display
E_LIGHT_INTENSITY_UPDATE	T_User_Input&T_Enviroment	T_Display
E_CTEMP_UPDATE	T_Enviroment	T_Display
E_ACTEMP_UPDATE	T_SysManage&T_User_Input	T_Display
E_ALARM_STATUS_UPDATE	T_SysManage&T_User_Input	T_Display
E_PW_UPDATE	T_User_Input	T_SysManage
E_PW_CHECK	T_User_Input	T_SysManage
E_RESET_SYSTEM	T_User_Input	T_SysManage
E_SET_SYSTEM_MANGMENT	T_User_Input & T_Environment	T_SysManage

System Events & Parameters:-

B) egEventsAppliances:

Appliance Events : 8	SET	CLEAR
E_ALARM	T_SysManage	T_AlarmAppliance
E_STARTFAN	T_SysManage	T_AlarmAppliance
E_STARTHEATER	T_SysManage	T_AlarmAppliance
E_ADJUSTLIHTING	T_SysManage	T_AlarmAppliance
E_OPEN_LOCK	T_SysManage	T_AlarmAppliance
E_STOPFAN	T_SysManage	T_AlarmAppliance
E_STOPHEATER	T_SysManage	T_AlarmAppliance
E_CLOSE_LOCK	T_SysManage	T_AlarmAppliance

System Tasks:-