LCD & KEYPAD DESIGN

In this document, you will find flowchart designs for the functions of LCD and keypad which are unblocking functions.

So first I'll show what will be inside timer call back function in case if I'm working with LCD.

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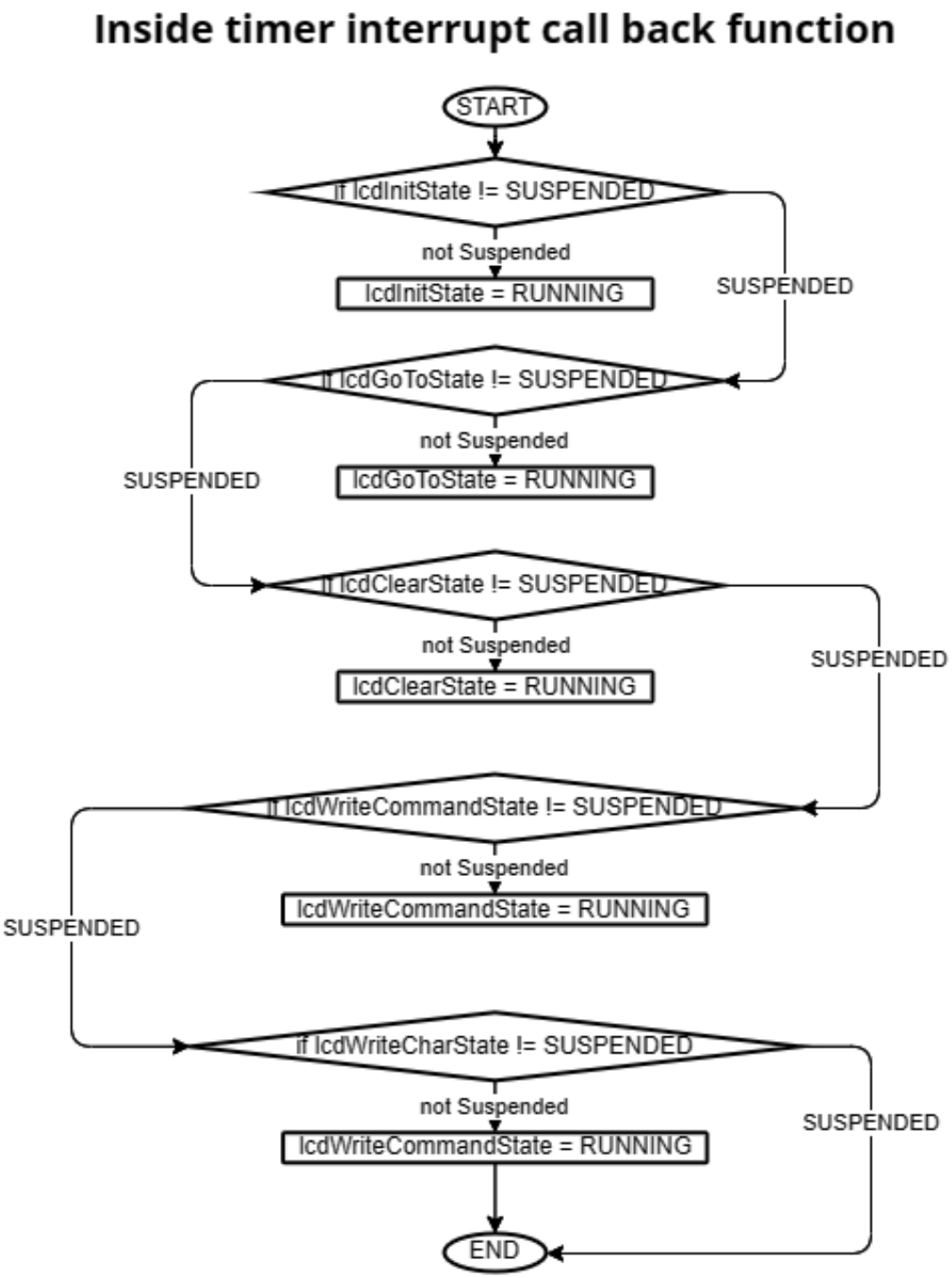
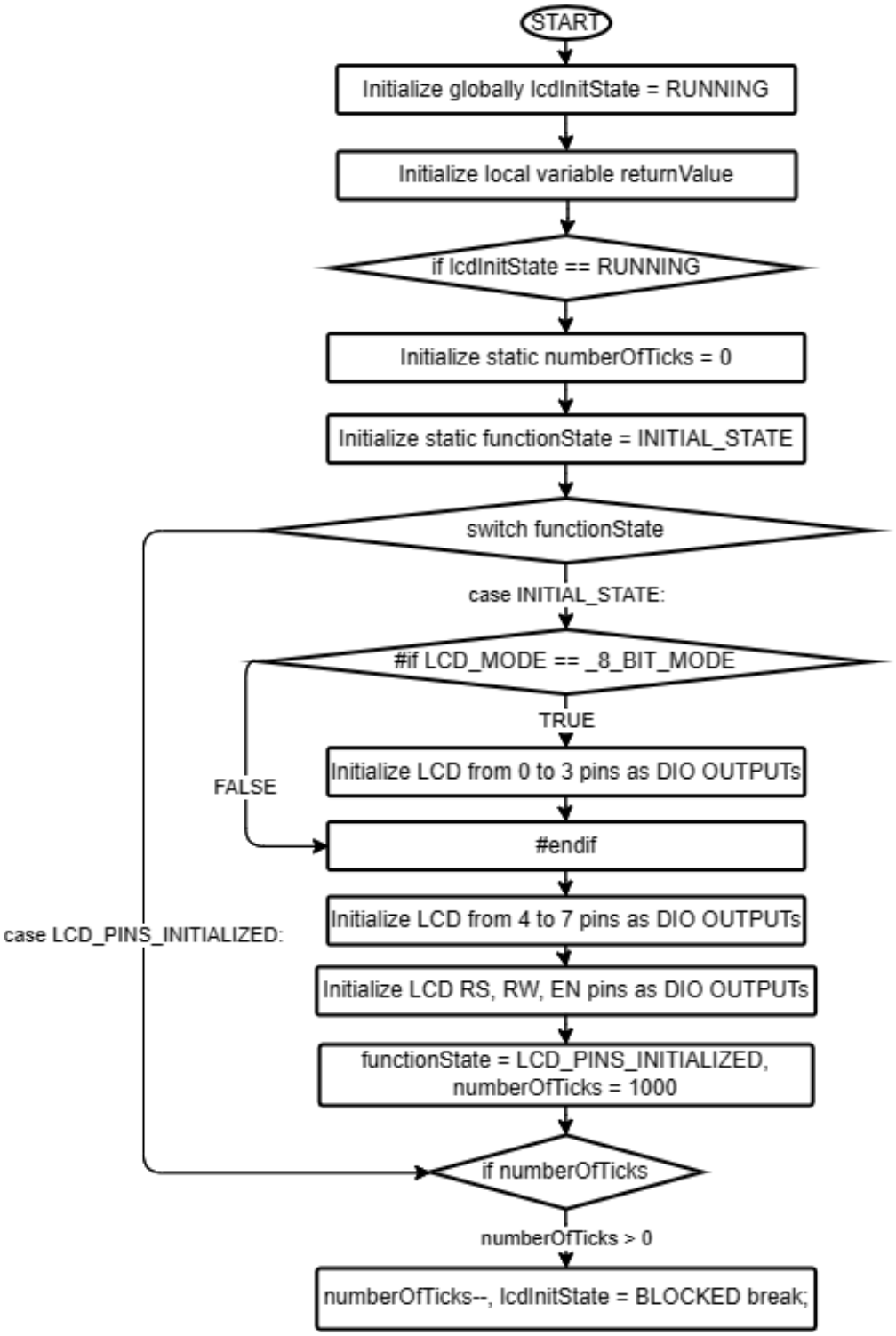
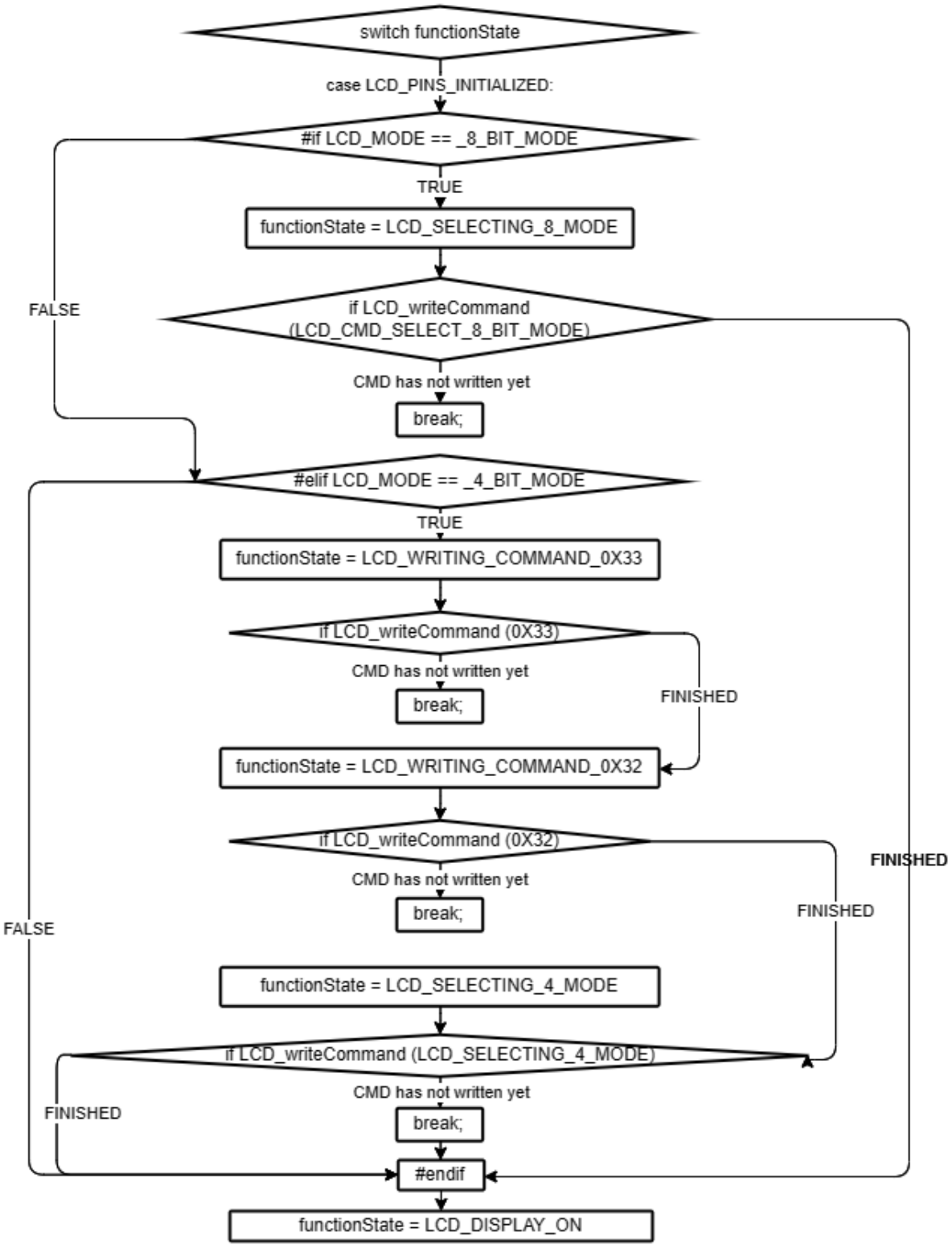
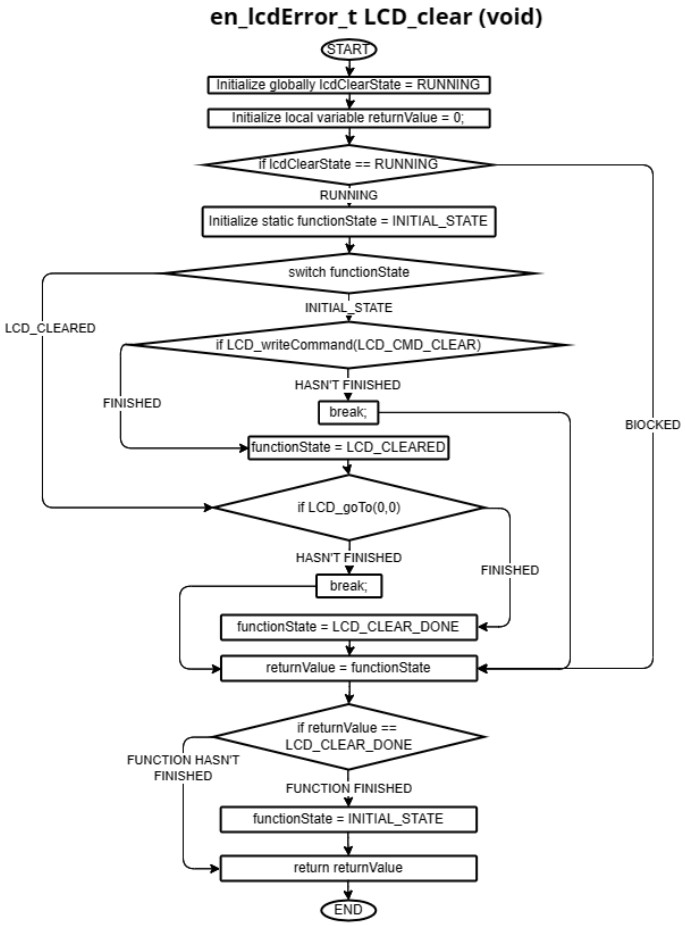


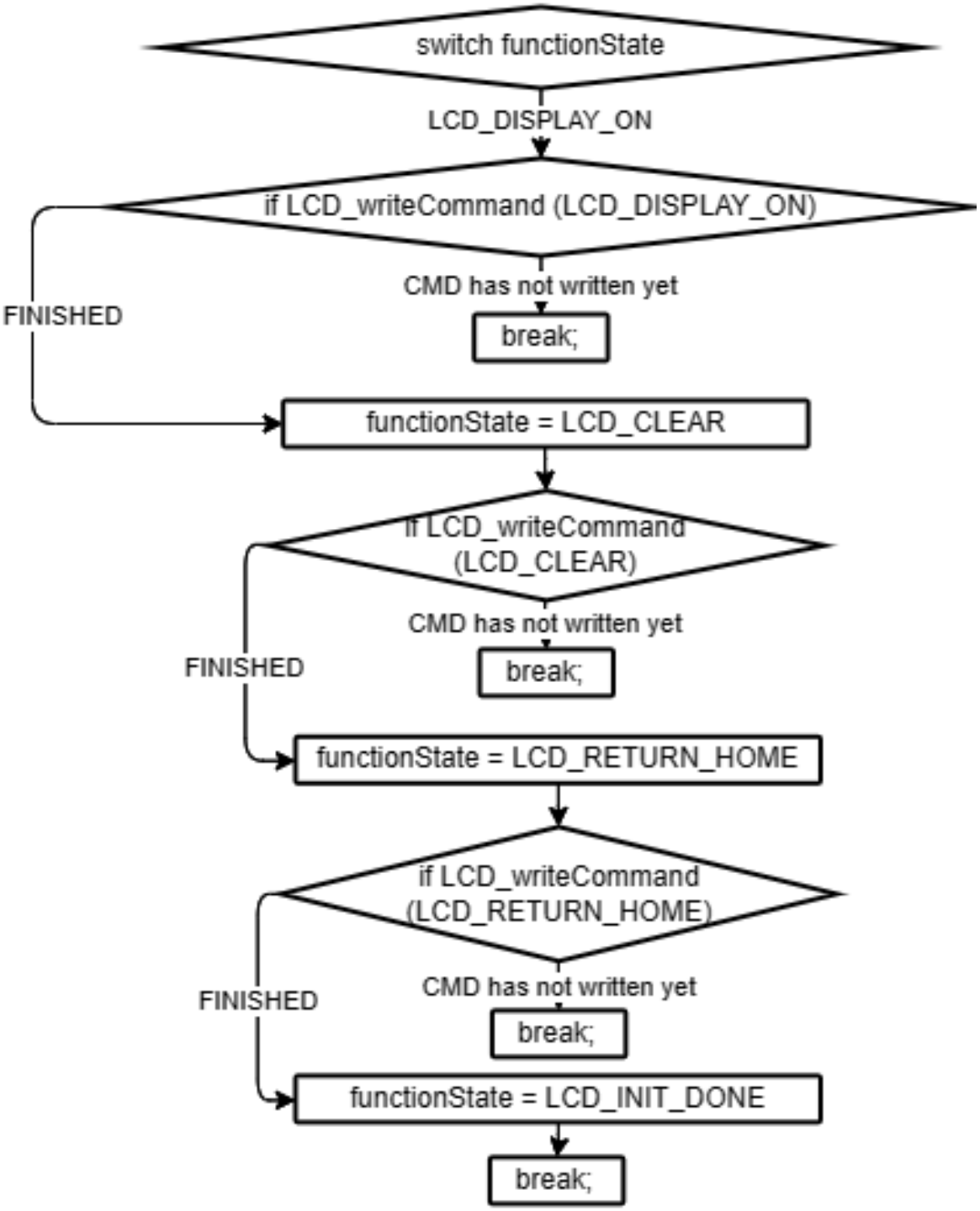
1. LCD flowcharts

Then we have here **LCD_init**

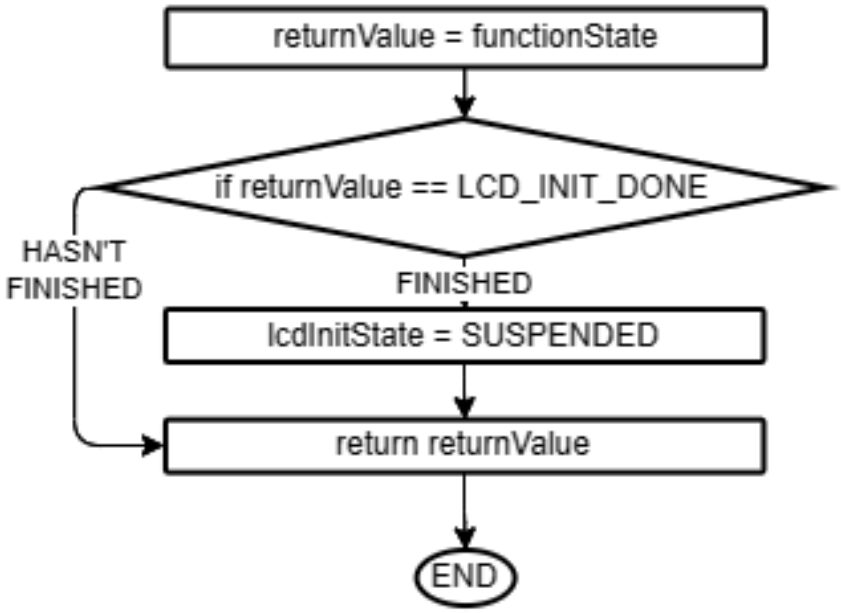



switch functionState
case LCD_PINS_INITIALIZED:
#if LCD_MODE == _8_BIT_MODE
TRUE
functionState = LCD_SELECTING_8_MODE
FALSE
if LCD_writeCommand (LCD_CMD_SELECT_8_BIT_MODE)
CMD has not written yet
break;
#elif LCD_MODE == _4_BIT_MODE
TRUE
functionState = LCD_WRITING_COMMAND_0X33
if LCD_writeCommand (0X33)
CMD has not written yet
break;
FINISHED
functionState = LCD_WRITING_COMMAND_0X32
if LCD_writeCommand (0X32)
CMD has not written yet
break;
FINISHED
FINISHED
FALSE
functionState = LCD_SELECTING_4_MODE
if LCD_writeCommand (LCD_SELECTING_4_MODE)
CMD has not written yet
break;
FINISHED
#endif
functionState = LCD_DISPLAY_ON

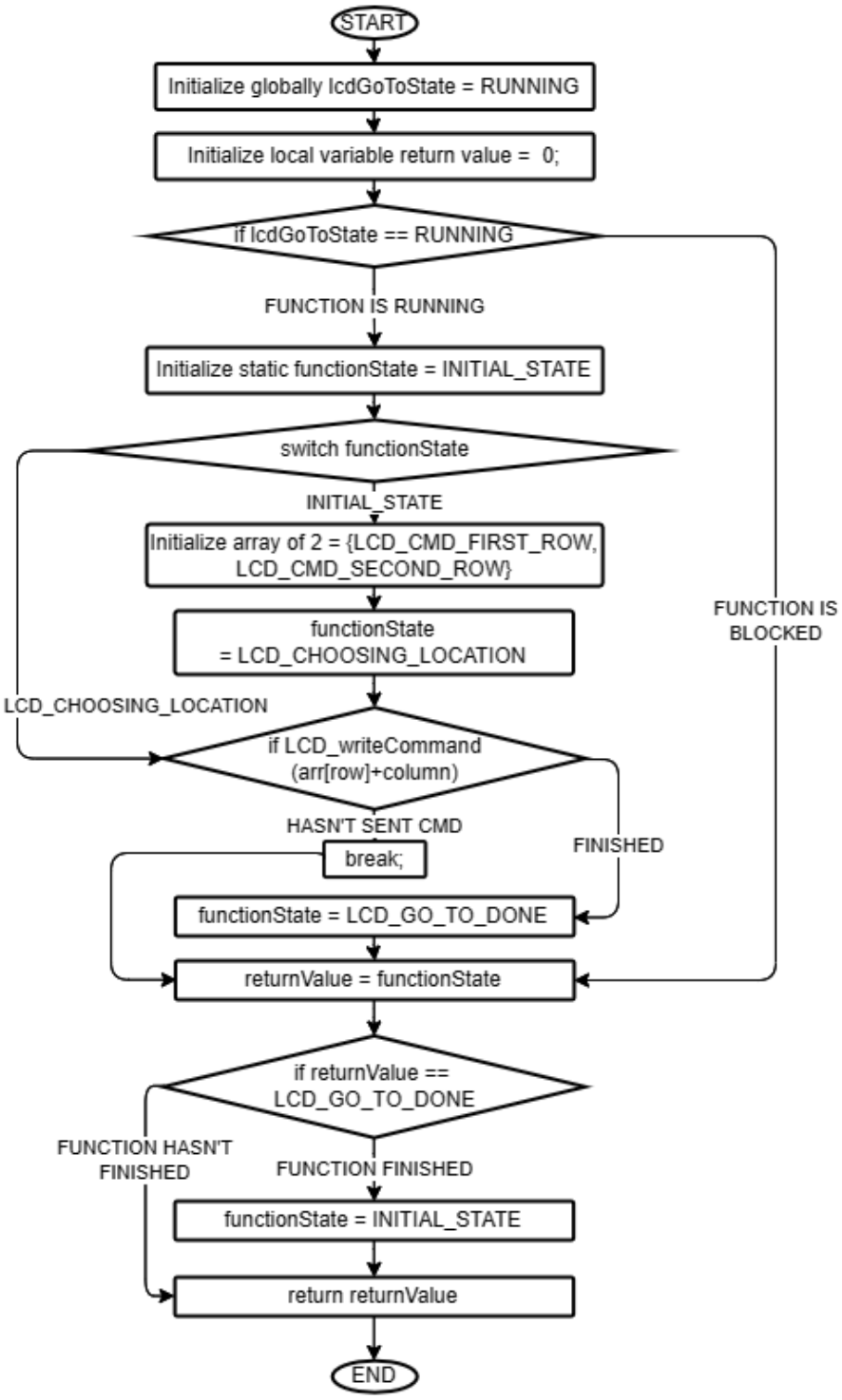

en_lcdError_t LCD_clear (void)
START
Initialize globally lcdClearState = RUNNING
Initialize local variable returnValue = 0;
if lcdClearState == RUNNING
BLOCKED
RUNNING
Initialize static functionState = INITIAL_STATE
switch functionState
INITIAL_STATE
LCD_CLEARED
if LCD_writeCommand(LCD_CMD_CLEAR)
HASN'T FINISHED
FINISHED
break;
functionState = LCD_CLEARED
if LCD_goTo(0,0)
HASN'T FINISHED
FINISHED
break;
functionState = LCD_CLEAR_DONE
returnValue = functionState
if returnValue == LCD_CLEAR_DONE
FUNCTION HASN'T FINISHED
FUNCTION FINISHED
functionState = INITIAL_STATE
return returnValue
END


switch functionState
LCD_DISPLAY_ON
if LCD_writeCommand (LCD_DISPLAY_ON)
CMD has not written yet
FINISHED
break;
functionState = LCD_CLEAR
if LCD_writeCommand (LCD_CLEAR)
CMD has not written yet
FINISHED
break;
functionState = LCD_RETURN_HOME
if LCD_writeCommand (LCD_RETURN_HOME)
CMD has not written yet
FINISHED
break;
functionState = LCD_INIT_DONE
break;

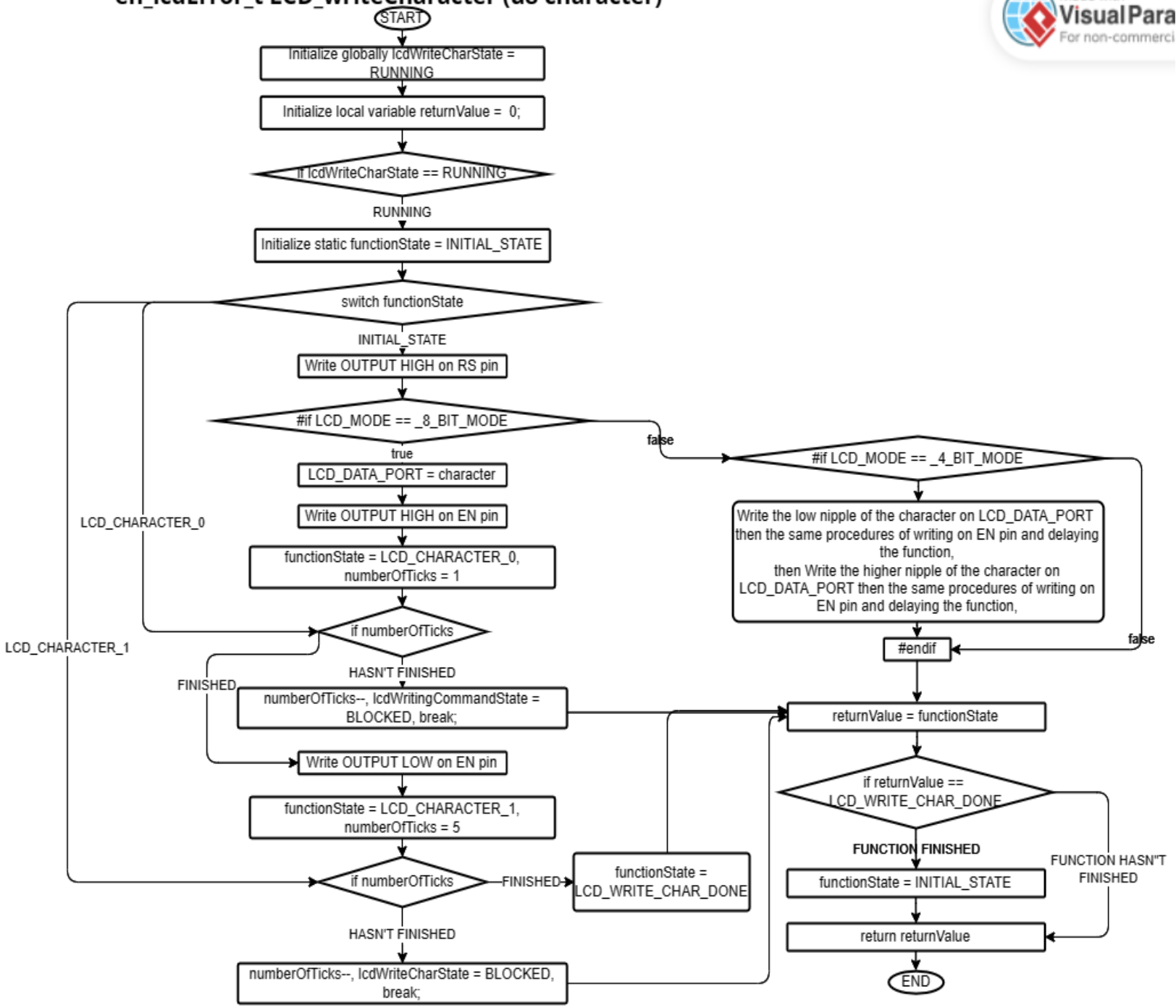
After exiting switch case



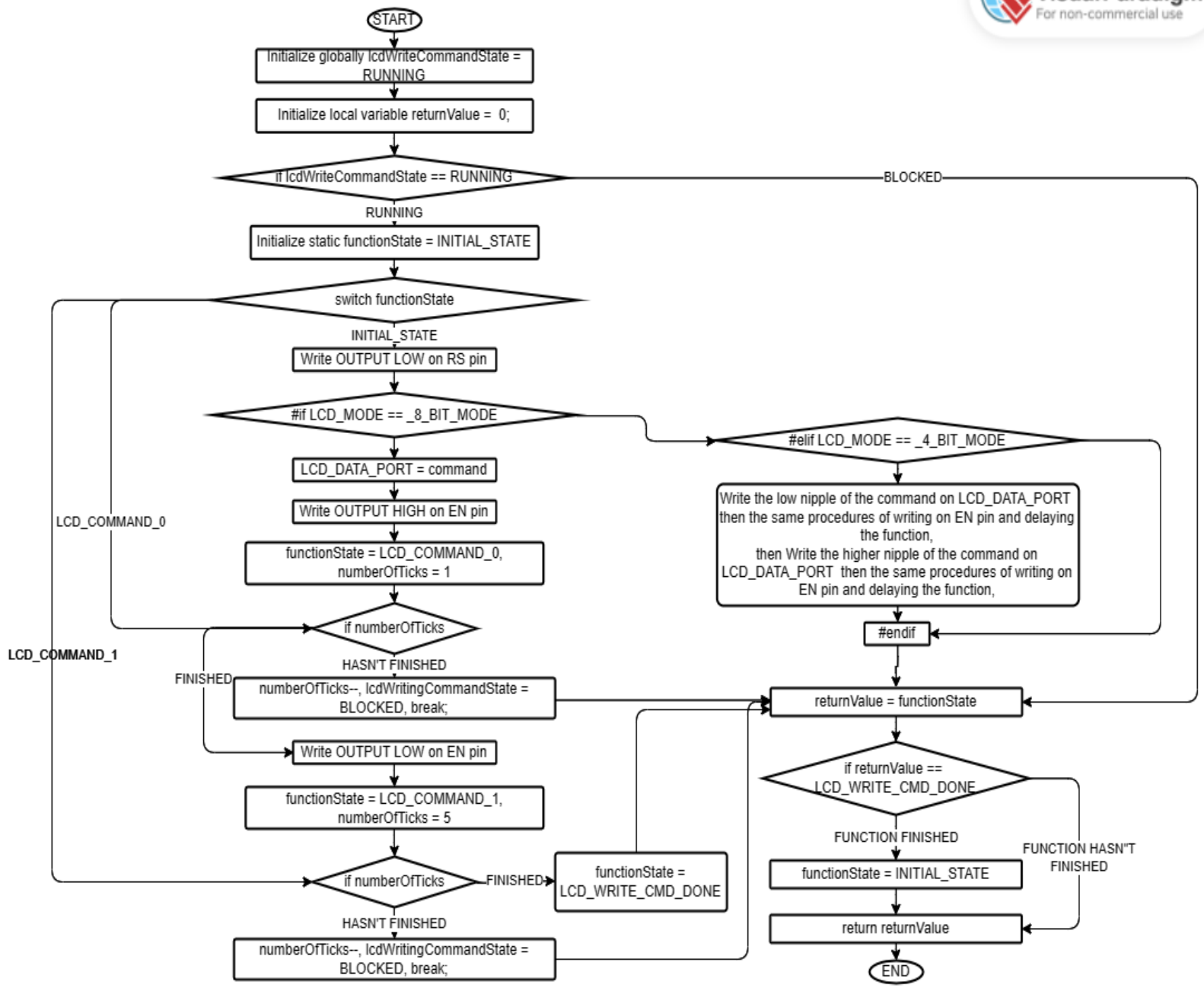
en_lcdError_t LCD_goTo (u8 rowNumber, u8 columnNumber)



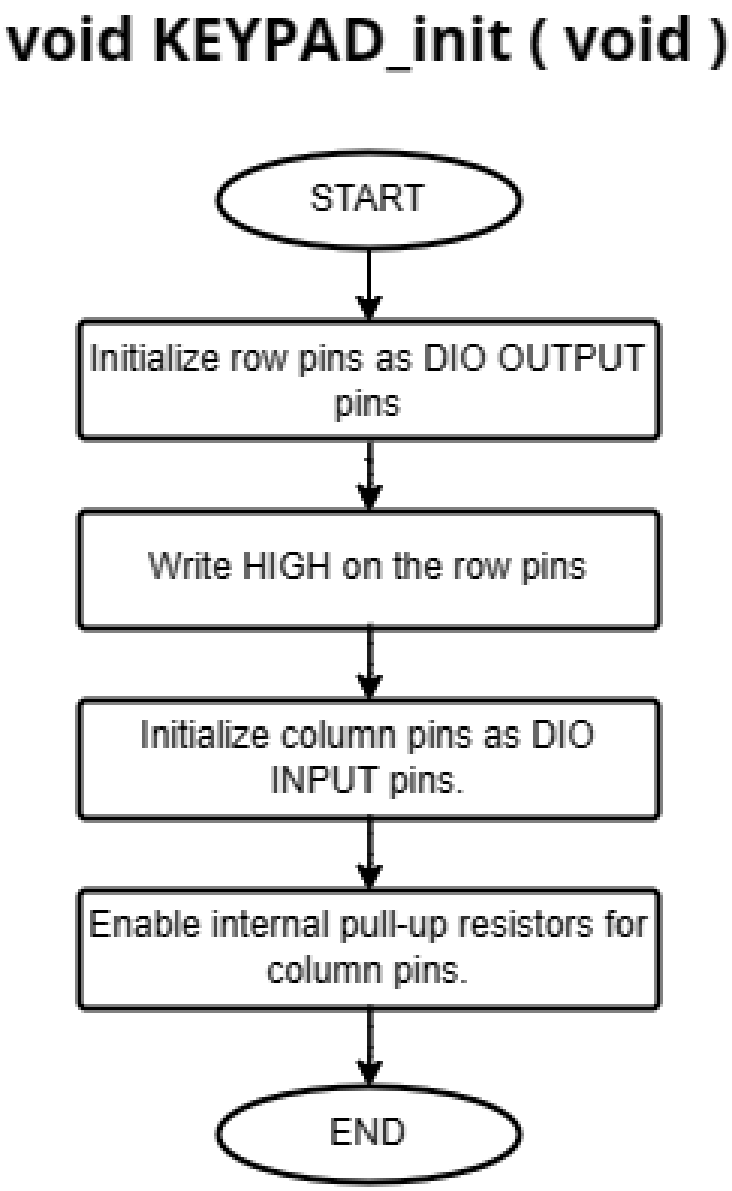
en_lcdError_t LCD_writeCharacter (u8 character)



en_lcdError_t LCD_writeCommand (u8 command)



2. KEYPAD flowcharts



u8 KEYPAD_read (u8* keypadPressed)

IMPORTANT NOTE: Initialize volatile variable keypadReadState = RUNNING,
and at the beginning of every state change it to BLOCKED and after reentering the function check on the state of the function and finally it is only changed when the timer interrupts the system to RUNNING