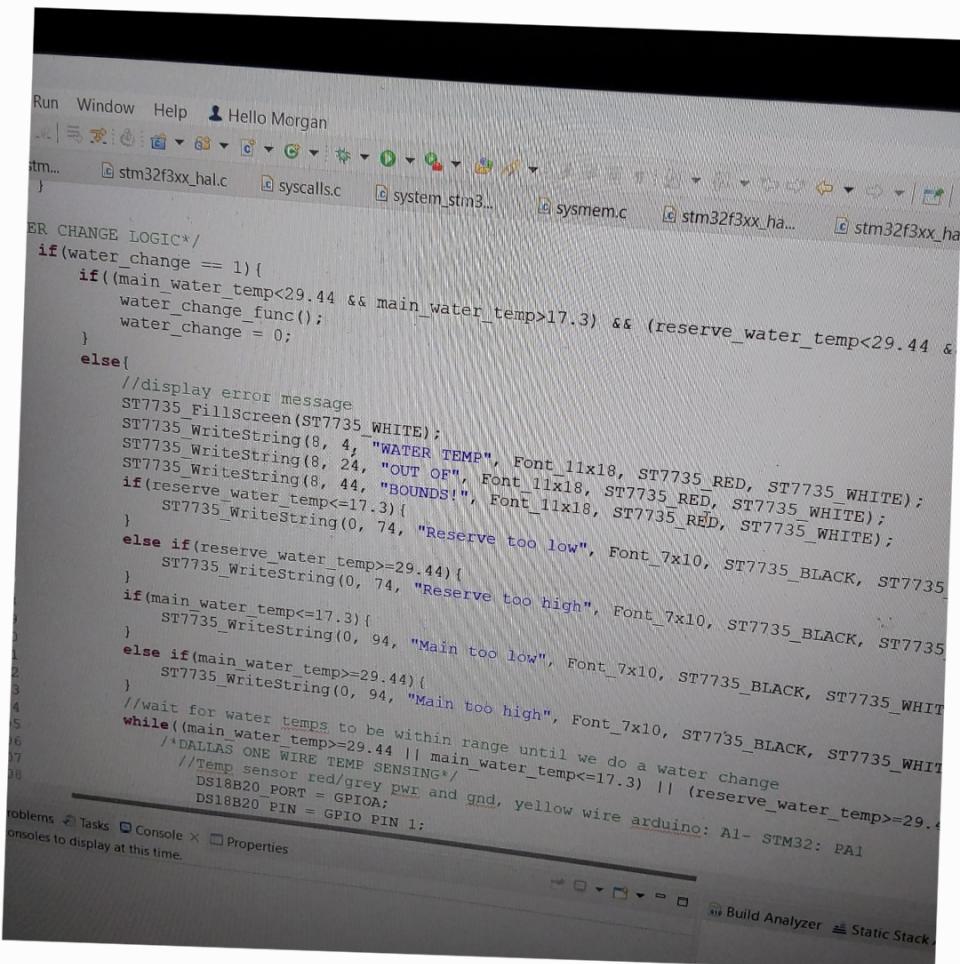


Code was added today to block water changes with temperature sensors.

This logic is pretty easy, we just while loop to wait for temperatures to balance while running the screen

This allows us to fulfill a part of our R. And V and add another features



The screenshot shows a code editor window with a C++ file open. The code is a function named 'water\_change\_logic' that handles water temperature changes. It uses the ST7735 library to display messages on a screen. The code checks if the water change is 1, then it checks if the main water temp is between 29.44 and 17.3. If so, it calls 'water\_change\_func()' and sets water\_change to 0. Otherwise, it displays an error message. It then checks if the reserve water temp is less than or equal to 17.3, and if so, displays a message. It also checks if the reserve water temp is 29.44, and if so, displays a message. It then checks if the main water temp is less than or equal to 17.3, and if so, displays a message. It also checks if the main water temp is greater than or equal to 29.44, and if so, displays a message. Finally, it waits for the water temps to be within range until a water change occurs. The code includes comments for Dallas One Wire Temp Sensing and the DS18B20 sensor setup.

```
ER CHANGE LOGIC*/  
if(water_change == 1){  
    if((main_water_temp<29.44 && main_water_temp>17.3) && (reserve_water_temp<29.44 &  
    ) water_change_func();  
    water_change = 0;  
}  
else{  
    //display error message  
    ST7735_FillScreen(ST7735_WHITE);  
    ST7735_WriteString(8, 4, "WATER TEMP", Font_11x18, ST7735_RED, ST7735_WHITE);  
    ST7735_WriteString(8, 24, "OUT OF", Font_11x18, ST7735_RED, ST7735_WHITE);  
    ST7735_WriteString(8, 44, "BOUNDS!", Font_11x18, ST7735_RED, ST7735_WHITE);  
    if(reserve_water_temp<=17.3){  
        ST7735_WriteString(0, 74, "Reserve too low", Font_7x10, ST7735_BLACK, ST7735_WHITE);  
    }  
    else if(reserve_water_temp==29.44){  
        ST7735_Writestring(0, 74, "Reserve too high", Font_7x10, ST7735_BLACK, ST7735_WHITE);  
    }  
    if(main_water_temp<=17.3){  
        ST7735_Writestring(0, 94, "Main too low", Font_7x10, ST7735_BLACK, ST7735_WHITE);  
    }  
    else if(main_water_temp>=29.44){  
        ST7735_WriteString(0, 94, "Main too high", Font_7x10, ST7735_BLACK, ST7735_WHITE);  
    }  
    //wait for water temps to be within range until we do a water change  
    while((main_water_temp>29.44 || main_water_temp<=17.3) || (reserve_water_temp>=29.44 || reserve_water_temp<=17.3)) {  
        /*DALLAS ONE WIRE TEMP SENSING*/  
        //Temp sensor red/grey pwr and gnd, yellow wire arduino: A1- STM32: PA1  
        DS18B20 PORT = GPIOA;  
        DS18B20 PIN = GPIO_PIN_1;  
    }  
}
```

The water change function is based on the one Trisha and morgan wrote approximately two weeks ago.

I also added an exception to keep updating the temperatures while we are on the lock out screen and added a timing parameter

```
if(hrs<10){  
    sprintf(hval, "0%d", (int)hrs);  
}  
else{  
    sprintf(hval, "%d", (int)hrs);  
  
if(mins<10){  
    sprintf(mval, "0%d", (int)mins);  
}  
else{  
    sprintf(mval, "%d", (int)mins);  
  
sprintf(time_buf, "%s:%s:%s:%s", wval, dval, hval, mval)  
ST7735_WriteString(0, 4, "Statistics", Font_11x18, ST7735  
ST7735_WriteString(0, 24, "Light: ", Font_7x10, ST7735_BLACK)  
ST7735_WriteString(42, 24, light_buf, Font_7x10, ST7735_BLACK)  
ST7735_WriteString(0, 36, "Main Temp: ", Font_7x10, ST7735_BLACK)  
ST7735_WriteString(77, 36, main_water_temp_buf, Font_7x10, ST7735_BLACK)  
ST7735_WriteString(0, 48, "Res Temp: ", Font_7x10, ST7735_BLACK)  
ST7735_WriteString(70, 48, reserve_water_temp_buf, Font_7x10, ST7735_BLACK)  
ST7735_WriteString(0, 60, "Init TDS: ", Font_7x10, ST7735_BLACK)  
ST7735_WriteString(63, 60, initial_tds_buf, Font_7x10, ST7735_BLACK)  
ST7735_WriteString(0, 72, "PPM: ", Font_7x10, ST7735_BLACK),
```

Items Tasks Console Properties

I also made some minor LCD adjustments . Morgan made a system stop and start but I just added the color locking