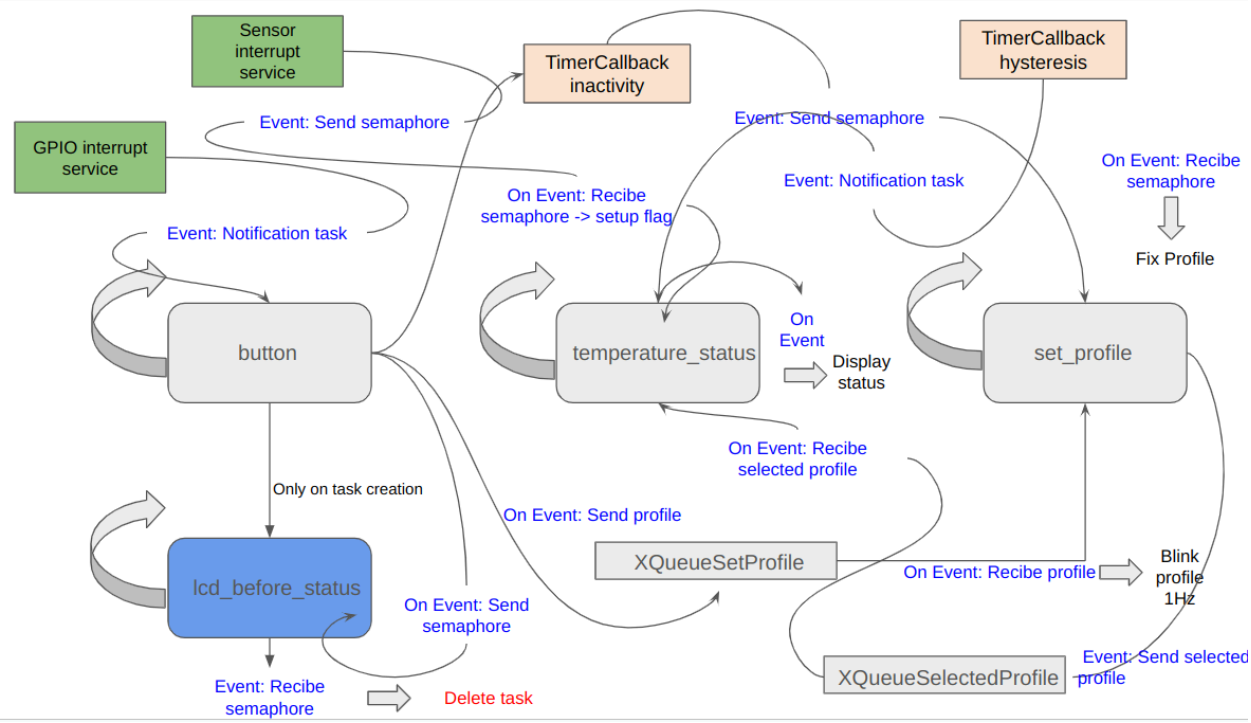
FW CHALLENGE B SOLUTION

1. **Considerations:**
   - Firmware development using an event-driven approach through the utilization of Real Time Operating System.

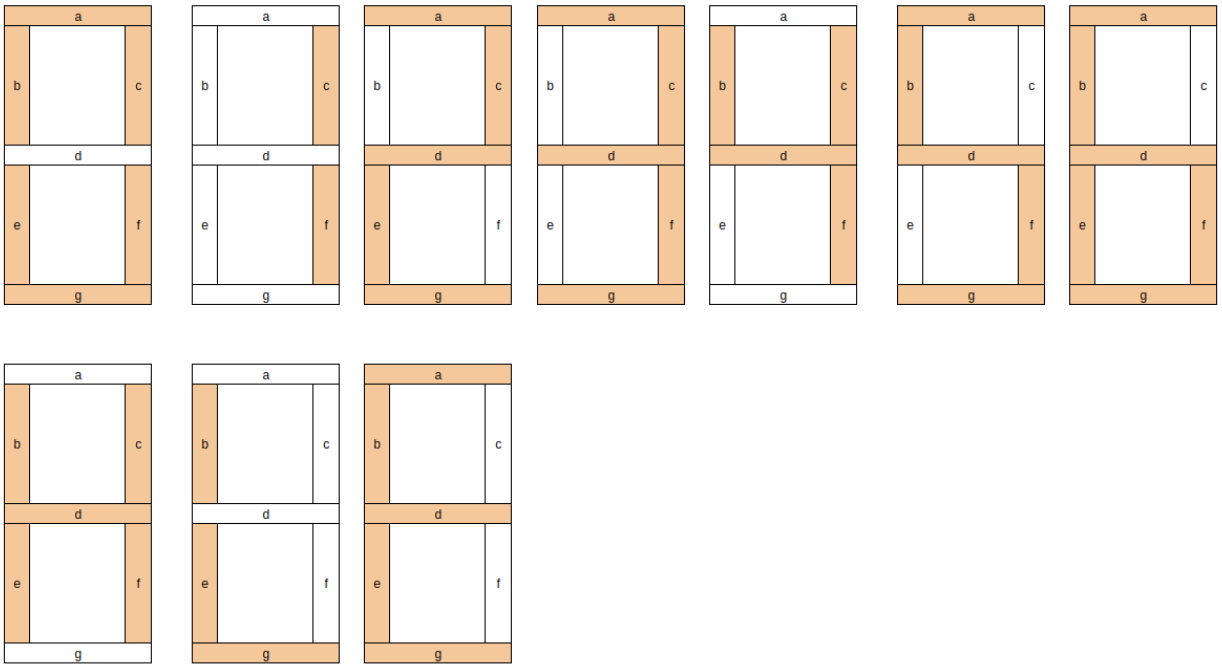
   - All the Task and synchronization mechanisms were tested in a development board(based on another 32 bit microcontroller), keeping in mind that the RTOS design goes across hardware platforms.

2. **Solve Questions:**

   A) I designed the following flowchart that attempt the requirements:



Also for the LCD i used the following table:



Digit	a	b	c	d	e	f	g
0	1	1	1	0	1	1	1
1	0	0	1	0	0	1	0
2	1	0	1	1	1	0	1
3	1	0	1	1	0	1	1
4	0	1	1	1	0	1	0
5	1	1	0	1	0	1	1
6	1	1	0	1	1	1	1

letter	a	b	c	d	e	f	g
H	0	1	1	1	1	1	0
L	0	1	0	0	1	0	1
E	1	1	0	1	1	0	1

B) Implemented in the code.
C) Implemented in the code.
D) Implemented in the code.
E) Implemented in the code. I followed this principles to improve the efficiency of the code and energy consumption:
   - Events to avoid sequential poolings.
   - Less global variables and only restricted to 2 tasks to avoid the overwrite.

3. Future Improvements:

- Improve the code organization, following the modularization principle, each module represents a separation of concerns(SoC) . I already did that with the lcd and configuration but could be applied to the temperature sensor and the interrupts.
- Implementing event groups could be potentially efficient for the temperature profile states, avoiding the semaphores implementation.