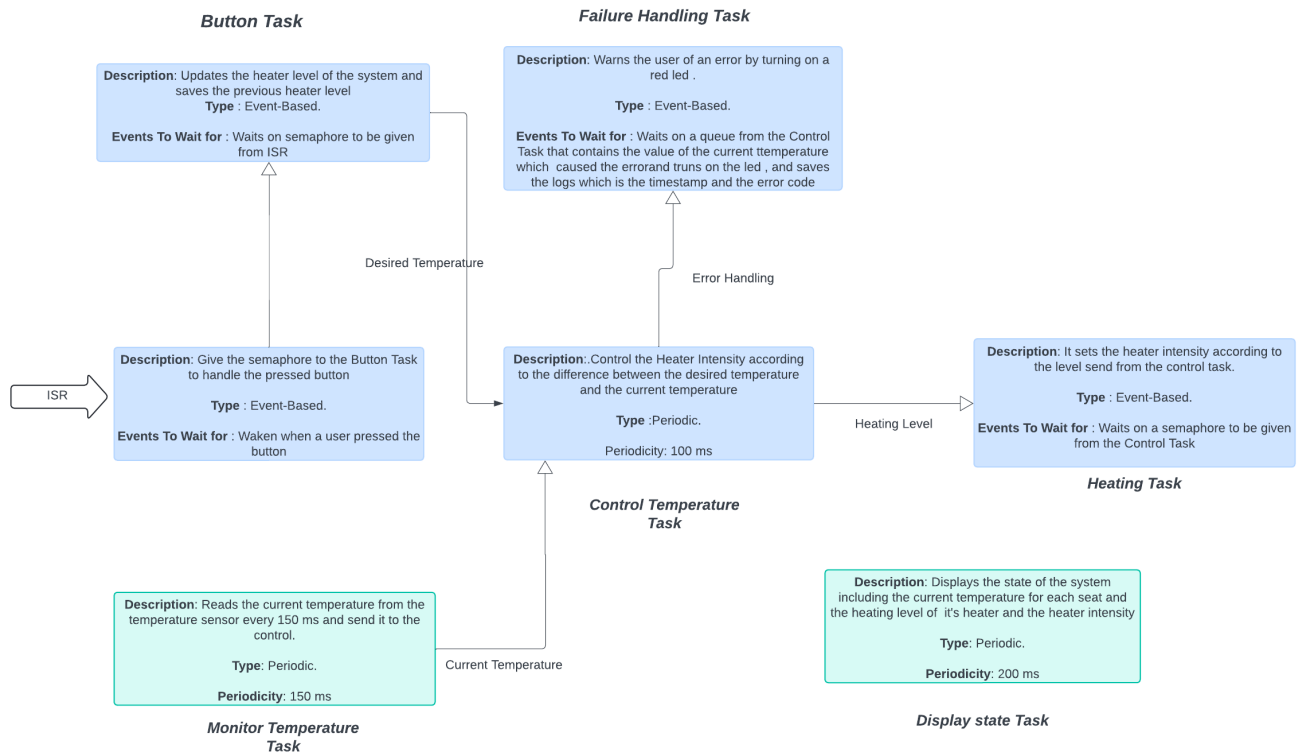


# SEAT HEATER CONTROL SYSTEM

## a. Tasks



## b. Shared Resources:

Driver seat heater level: written by Button Task, read by Control Task and Display Task, doesn't need protection

Passenger seat heater level: written by Button Task, read by Control Task and Display Task, doesn't need protection

Driver seat current temp: written by Monitor Task, read by Control Task and Display Task, doesn't need protection

Passenger seat current temp: written by Monitor Task, read by Control Task and Display Task, doesn't need protection

Driver seat heater intensity: written by Control Task and Failure Handling Task, read by Heating Task and Display Task, protected by heater\_intensity\_mutex

Passenger seat heater intensity: written by Control Task and Failure Handling Task, read by Heating Task and Display Task, protected by heater\_intensity\_mutex

UART0: shared between Driver Display Task and Passenger Display Task, protected using uart\_mutex

Diagnostics Array: shared between Passenger Failure Handling and Driver Failure Handling, protected using taskENTER\_CRITICAL API

### c. UART Messages

```
Driver Seat State:
Current Temperature: 28
Heating Level: LOW
Heater Intensity: OFF
Passenger Seat State:
Current Temperature: 36
Heating Level: LOW
Heater Intensity: OFF
Driver Seat State:
Current Temperature: 28
Heating Level: LOW
Heater Intensity: OFF
Passenger Seat State:
Current Temperature: 41
Heating Level: LOW
Heater Intensity: OFF
CPU Load is 8%
Driver Seat State:
Current Temperature: 28
Heating Level: LOW
Heater Intensity: OFF
Passenger Seat State:
Current Temperature: 43
Heating Level: LOW
Heater Intensity: OFF
Driver Seat State:
Current Temperature: 28
Heating Level: LOW
Heater Intensity: OFF
Passenger Seat State:
Current Temperature: 43
```

```
<Closed> COM17 x
Heating Level: LOW
Heater Intensity: OFF
Driver Seat State:
Current Temperature: 17
Heating Level: LOW
Heater Intensity: MEDIUM
Passenger Seat State:
Current Temperature: 44
Heating Level: LOW
Heater Intensity: OFF
Driver Seat State:
Current Temperature: 17
Heating Level: LOW
Heater Intensity: MEDIUM
Passenger Seat State:
Current Temperature: 44
Heating Level: LOW
Heater Intensity: OFF
CPU Load is 8%
Driver Seat State:
Current Temperature: 17
Heating Level: LOW
Heater Intensity: MEDIUM
Passenger Seat State:
Current Temperature: 43
Heating Level: LOW
Heater Intensity: OFF
Driver Seat State:
Current Temperature: 17
Heating Level: LOW
Heater Intensity: MEDIUM
```

#### d. Run time Measurements

Execution Time:

Button Task: 100 microsec

Monitor Task: 90 microsec

Control Task: 120 microsec

Heating Task: 100 microsec

Failure Handling Task: 100 microsec

Display Task: 30.5 millisec

CPU Load: 8%

#### e. Simso results

