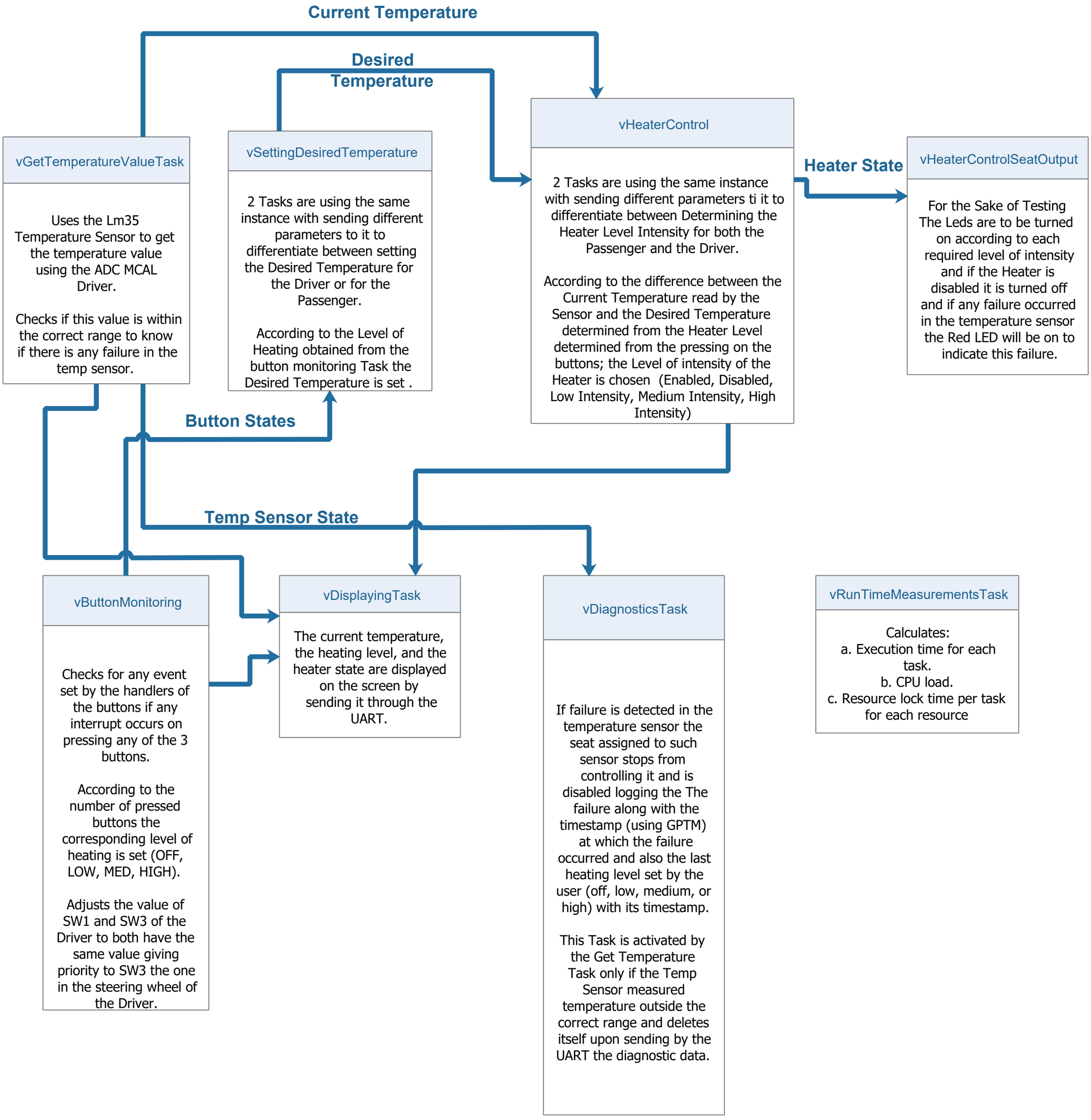
Current Temperature
Desired Temperature
vGetTemperatureValueTask
Uses the Lm35 Temperature Sensor to get the temperature value using the ADC MCAL Driver.
Checks if this value is within the correct range to know if there is any failure in the temp sensor.
vSettingDesiredTemperature
2 Tasks are using the same instance with sending different parameters to it to differentiate between setting the Desired Temperature for the Driver or for the Passenger.
According to the Level of Heating obtained from the button monitoring Task the Desired Temperature is set .
vHeaterControl
2 Tasks are using the same instance with sending different parameters ti it to differentiate between Determining the Heater Level Intensity for both the Passenger and the Driver.
According to the difference between the Current Temperature read by the Sensor and the Desired Temperature determined from the Heater Level determined from the pressing on the buttons; the Level of intensity of the Heater is chosen (Enabled, Disabled, Low Intensity, Medium Intensity, High Intensity)
Heater State
vHeaterControlSeatOutput
For the Sake of Testing The Leds are to be turned on according to each required level of intensity and if the Heater is disabled it is turned off and if any failure occurred in the temperature sensor the Red LED will be on to indicate this failure.
Button States
Temp Sensor State
vButtonMonitoring
Checks for any event set by the handlers of the buttons if any interrupt occurs on pressing any of the 3 buttons.
According to the number of pressed buttons the corresponding level of heating is set (OFF, LOW, MED, HIGH).
Adjusts the value of SW1 and SW3 of the Driver to both have the same value giving priority to SW3 the one in the steering wheel of the Driver.
vDisplayingTask
The current temperature, the heating level, and the heater state are displayed on the screen by sending it through the UART.
vDiagnosticsTask
If failure is detected in the temperature sensor the seat assigned to such sensor stops from controlling it and is disabled logging the The failure along with the timestamp (using GPTM) at which the failure occurred and also the last heating level set by the user (off, low, medium, or high) with its timestamp.
This Task is activated by the Get Temperature Task only if the Temp Sensor measured temperature outside the correct range and deletes itself upon sending by the UART the diagnostic data.
vRunTimeMeasurementsTask
Calculates:
a. Execution time for each task.
b. CPU load.
c. Resource lock time per task for each resource