**High level components**

Sensor processes

| | | |
|---|---|---|
| Sensor 1 | temperature - 32 bit float (IPC) | |

FAN Control Process

write uint_32 → Fan 1 Register
write uint_32 → Fan 2 Register

Sensor 2 → temperature - 32 bit float
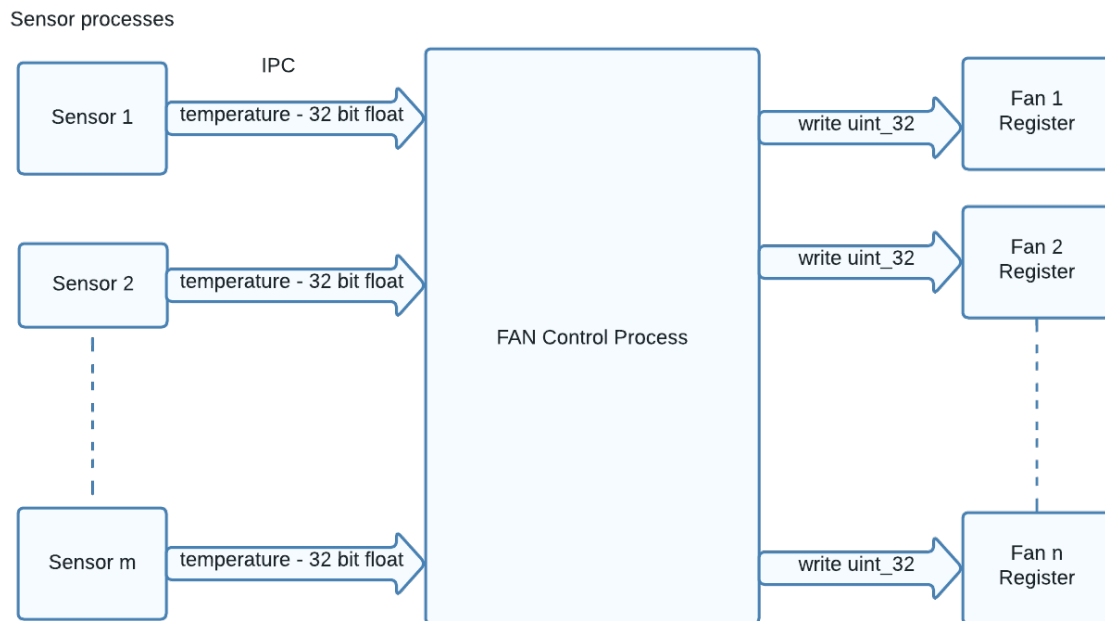
Sensor m → temperature - 32 bit float

write uint_32 → Fan n Register

**Fan Control App requirements**

Configuration requirements
1. Number of input sensors and fans are independent of each other and should be configurable independently.

2. PWM count to duty cycle relationships for fans (given as PWM count for 100% duty cycle) are independent of each other and should be configurable for each fan.

Functional requirements
1. Collect and maintain the most recent temperatures from all IPC communications and calculate maximum among all temperatures.
2. Decide the single desired duty cycle for all fans based on below logic

| Max Temp reading t-max | Duty Cycle | Explanation |
|---|---|---|
| $<= 25^\circ$ | 20 % | |
| $>= 75^\circ$ | 100 % | |
| 25 < t-max < 75 | 20 + ((t-max-25)*1.6) | 80 % duty cycle change should be linearly interpolated between $25^\circ$ and $75^\circ$ . This means in that range every degree |

| | | increase will correspond to 80%/(75°-25°) = (80/50) = 1.6 duty cycle/ degree change. |
|---|---|---|

3. Convert the desired duty cycle to PWM value for each fan based on its PWM count value for 100% duty cycle and write to its hardware register.

Example : Duty cycle to PWM count conversion

| Max PWM count | PWM/duty cycle ratio | Register value for 25% duty cycle | Register value for 50 % duty cycle | Register value for 100 % duty cycle |
|---|---|---|---|---|
| 10 | 10 / 100 = 0.1 | 25 * 0.1 = 2.5 | 5 | 10 |
| 60000 | 600 | 600 * 25 = 15000 | 30000 | 60000 |