Članovi tima :

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Datumi sastanka :

- 24.12.2020. u 13:00
- 28.12.2020. U 17:00

Formalna specifikacija(Tim 3)

Protivpožarni sistem

std_critical_temp = 65

TEMP_SENSOR

curr_temp?: ℚ
temp_critical_level: ℚ
temp_critical_min = 45.0
temp_critical_max = 100.0
temp_sensor_active: {true, false}

---

temp_critical_min <= curr_temp? <= temp_critical_max
temp_critical_min <= temp_critical_level<= temp_critical_max
temp_sensor_active ⇔ curr_temp?>= temp_critical

TEMP_SENSOR_INIT

ΔTEMP_SENSOR

---

temp_critical_level' = std_critical_temp

SET_CRITICAL_TEMP

ΔTEMP_SENSOR
new_critical_temp?: ℚ

---

temp_critical_min <= new_critical_temp? <= temp_critical_max
temp_critical_level' = new_critical_temp?

SMOKE_SENSOR

smoke_sensor_active: {true, false}

def_co_target_1 = 50

def_co_target_2 = 100

CO_SENSOR

curr_co_level: $\mathbb{N}$
co_target_1: $\mathbb{N}$
co_target_2: $\mathbb{N}$
co_sensor_active: {true, false}
co_level: {low, med, high}

---

co_level = low $\Leftrightarrow$ 0 >= curr_co_level >=co_target_1
co_level = med $\Leftrightarrow$ co_target_1 > curr_co_level >= co_target_2
co_level = high $\Leftrightarrow$ curr_co_level > co_target_2

CO_SENSOR_INIT

ΔCO_SENSOR

---

co_target_1' = def_co_target_1
co_target_2' = def_co_target_2

SET_CO_TARGET_1

ΔCO_SENSOR
new_co_target_1?: $\mathbb{N}$

---

0 < new_co_target_1? < co_target_2
co_target_1' = new_co_target_1?

SET_CO_TARGET_2

ΔCO_SENSOR
new_co_target_2?: $\mathbb{N}$

---

co_target_1 < new_co_target_2?
co_target_2' = new_co_target_2?

LIFT_SENSOR

lift_floor?: $\mathbb{Z}$
lift_occupied?: {true, false}

FRONT_DOOR

locked = {true, false}

SET_LIFT_OVERRIDE

ΔLIFT_SENSOR
lift_override_active: {true, false}

---

lift_floor $\neq$ 0 $\wedge$ lift_occupied = true $\wedge$ lift_override_active= true $\Rightarrow$ lift_floor' = 0 $\Leftrightarrow$
lift_override_active' = false

WATER_SENSOR

water_level_percent: ℚ
min_water_level_percent: ℚ
water_critical = {true, false}

---

min_water_level_percent= 15.0
0.0 <= water_level_percent<= 100.0
water_critical = water_level_percent <= min_water_level_percent

MAIN_POWER_SENSOR

main_pow_active: {true, false}

AUX_POWER_SENSOR

ΔMAIN_POWER_SENSOR
aux_pow_level_percent: ℚ
aux_critical_level: ℚ
aux_pow_active: {true, false}
aux_pow_critical: {true, false}

---

aux_pow_active = true ⇔ main_pow_active = false
aux_critical_level= 15.0
aux_pow_critical = true ⇔ aux_pow_level_percent <= aux_critical_level
0.0 >= aux_pow_level_percent >= 100.0

VENT_SYSTEM

vent_active: {true, false}

SPRINKLERS_SYSTEM

sprinklers_active: {true, false}

SET_SPRINKLERS_ACTIVE

ΔSPRINKLERS_SYSTEM
ΞTEMP_SENSOR
ΞSMOKE_SENSOR

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sprinklers_active = true ⇔ smoke_sensor_active = true ∧ temp_sensor_active = true

ALARM_LIGHT

light_active = {true, false}

def_temp_alarm_sound = 1

def_co_alarm_sound = 2

def_smoke_alarm_sound = 3

def_combined_alarm_sound = 4

def_alarm_single_intensity = 5

def_alarm_combined_intensity = 10

ALARM

alarm_armed: {true, false}
alarm_active: {true, false}
alarm_single_intensity : {1..10}
alarm_combined_intensity: {1..10}
alarm_sound: {1..8}
number_of_active_alarms: ℕ

---

alarm_armed = false ⇒ alarm_active = false

MANUAL_ALARM_ARMING

ΔALARM
arm_switch_position: {up, down}
arm_alarm_switch?: {up, down}

---

alarm_armed = true ∧ arm_alarm_switch ≠ arm_switch_position ⇒ alarm_armed = false ∧
arm_switch_position' = arm_alarm_switch

alarm_armed = false ∧ arm_alarm_switch ≠ arm_switch_position⇒ alarm_armed = true ∧
arm_switch_position' = arm_alarm_switch

MANUAL_ALARM_ACTIVATION

ΔALARM
alarm_switch_position: {up, down}
activate_alarm_switch?: {up, down}

---

alarm_active = true ∧ activate_alarm_switch ≠ alarm_switch_position ⇒ alarm_active = false ∧
alarm_switch_position' = activate_alarm_switch

alarm_active = false ∧ activate_alarm_switch ≠ alarm_switch_position ⇒ alarm_active = true ∧
alarm_switch_position' = activate_alarm_switch

ALARM_INIT

ΔALARM

---

alarm_armed = true
alarm_active = false
alarm_single_intensity = def_alarm_single_intensity
alarm_combined_intensity= def_alarm_combined_intensity
number_of_active_alarms = 0

ALARM_SOUNDS

temp_alarm_sound: {1..5}
co_alarm_sound: {1..5}
smoke_alarm_sound : {1..5}
combined_alarm_sound : {1..5}
water_alarm_sound = 6
aux_power_alarm_sound = 7
pri_to_aux_alarm_sound = 8

ALARM_SOUNDS_INIT

ΔALARM_SOUNDS

temp_alarm_sound = def_temp_alarm_sound
co_alarm_sound= def_co_alarm_sound
smoke_alarm_sound = def_smoke_alarm_sound
combined_alarm_sound = def_combined_alarm_sound

SET_ALARM_SINGLE_INTENSITY

ΔALARM
new_alarm_intensity?: ℕ

1 >= new_alarm_intensity > alarm_combined_intensity
alarm_single_intensity = new_alarm_intensity?

SET_ALARM_COMBINED_INTENSITY

ΔALARM
new_alarm_intensity?: ℕ

alarm_single_intensity > new_alarm_intensity >= 10
alarm_combined_intensity = new_alarm_intensity?

ACTIVATE_ALARM

ΔALARM
ΔALARM_LIGHT
ΔFRONT_DOOR

SET_LIFT_OVERRIDE
locked' = false;
alarm_active' = true
light_active' = true

CHECK_TEMP

ΔALARM
ΞALARM_SOUNDS
ΞTEMP_SENSOR

temp_sensor_active = true ⇔ alarm_sound' = temp_alarm_sound

number_of_active_alarms > 1 ⇔ alarm_sound' = combined_alarm_sound

alarm_active' = true

CHECK_SMOKE

ΔALARM
ΞALARM_SOUNDS
ΞSMOKE_SENSOR

smoke_sensor_active = true ⇔ alarm_sound' = smoke_alarm_sound

number_of_active_alarms > 1 ⇔ alarm_sound' = combined_alarm_sound

alarm_active' = true

CHECK_WATER_LEVEL

ΔALARM
ΞWATER_SENSOR
ΞALARM_SOUNDS

---

water_critical = true ⇔ alarm_sound' = water_alarm_sound ∧ number_of_active_alarms' = number_of_active_alarms + 1

number_of_active_alarms > 1 ⇔ alarm_sound' = combined_alarm_sound

alarm_active' = true

CHECK_CO_LEVEL

ΔALARM
ΞALARM_SOUNDS
ΞCO_SENSOR
ΔVENT_SYSTEM

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co_level = high ⇔ alarm_sound' = co_alarm_sound ∧ vent_active' = true

number_of_active_alarms > 1 ⇔ alarm_sound' = combined_alarm_sound

alarm_active' = true

CHECK_POWER_LEVEL

ΔALARM
ΞALARM_SOUNDS
ΞMAIN_POWER_SENSOR
ΞAUX_POWER_SENSOR

---

main_pow_active = false ⇔ alarm_sound' = pri_to_aux_alarm_sound
aux_pow_critical = true ⇔ alarm_sound' = aux_power_alarm_sound

number_of_active_alarms > 1 ⇔ alarm_sound' = combined_alarm_sound

alarm_active' = true

LOGS

unix_time?: ℕ1
temp_logs : seq (ℕ1 × ℤ)
co_logs : seq (ℕ1 × ℤ)

LOGS_INIT

ΔLOGS

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temp_logs = <>
co_logs = <>

LOGS_APPEND_TEMP

ΔLOGS
ΞTEMP_SENSOR

---

temp_logs' = temp_logs ∩ <(unix_time, curr_temp)>

LOGS_APPEND_CO

ΔLOGS

ΞCO_SENSOR

co_logs' = co_logs ∩ <(unix_time, curr_co_level)>

FIRE_PREVENTION_SYSTEM

CHECK_TEMP ∨ CHECK_SMOKE ∨ CHECK_CO_LEVEL ∨ CHECK_WATER_LEVEL ∨ CHECK_POWER_LEVEL ∨ LOGS_APPEND_TEMP ∨ LOGS_APPEND_CO