

SMART GREENHOUSE

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2006A022

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1906A033



WHY THE SMART GREENHOUSE?



-  Consistent production
-  Efficient use of resources
-  Saving time
-  Preventive measures

SYSTEMS

Disinfection



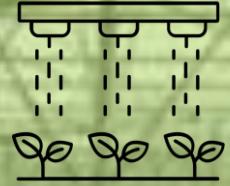
Ventilation



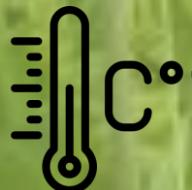
Lighting



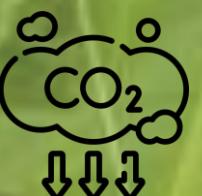
Irrigation



Temperature



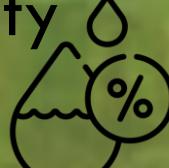
CO₂ Control



Fire



Humidity



Tank



Fertilization



Security



PLC SELECTION AND EXTENSION MODULES



FX5U-8AD
Mitsubishi FX series



FX5U-32MT/ES-A
Mitsubishi FX series

24V

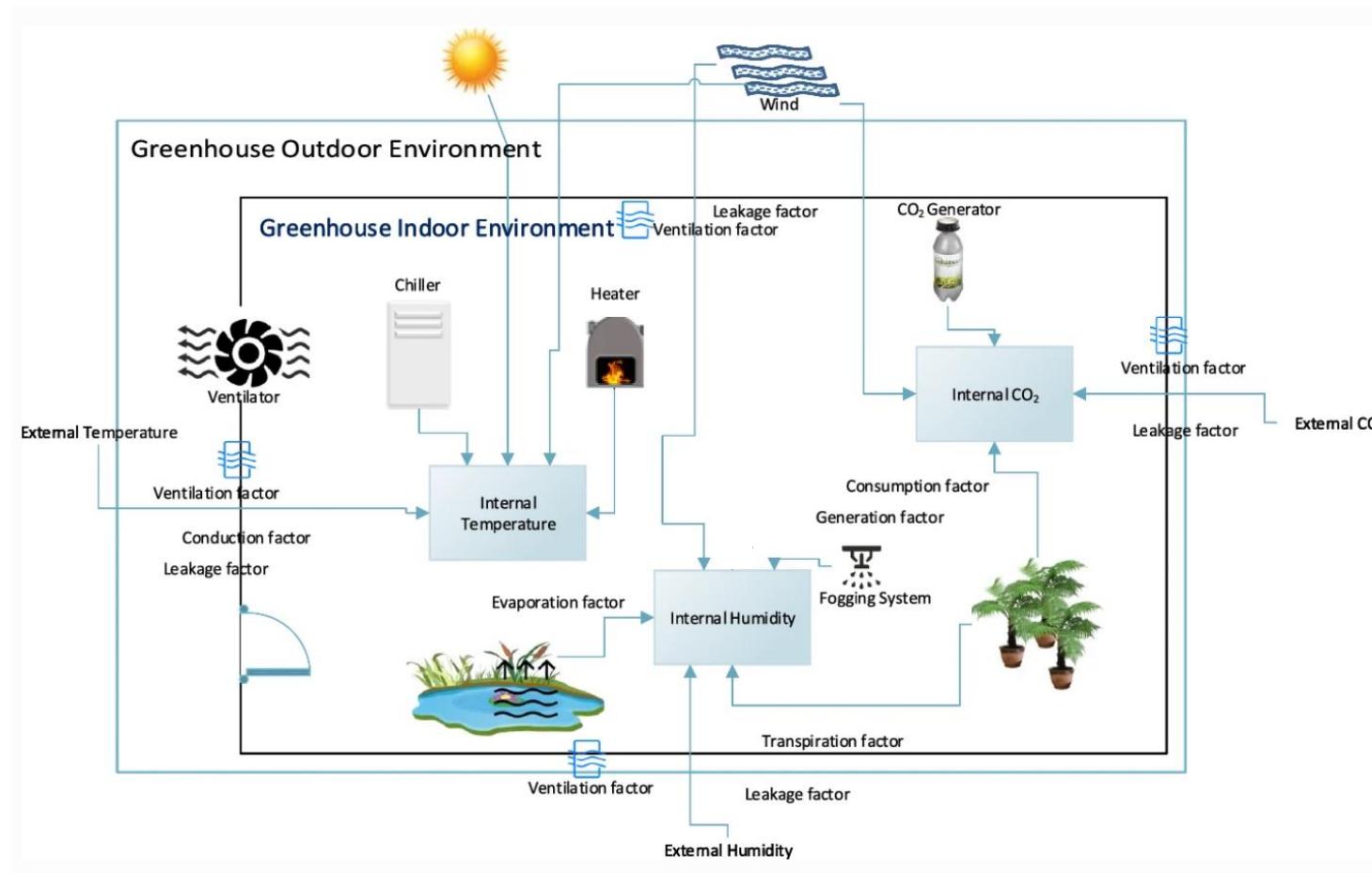
	Analog Input	Digital Input	Output
Our System	12	27	40
Our Choice	12	40	40

VENTILATION SYSTEM



Timed air circulation

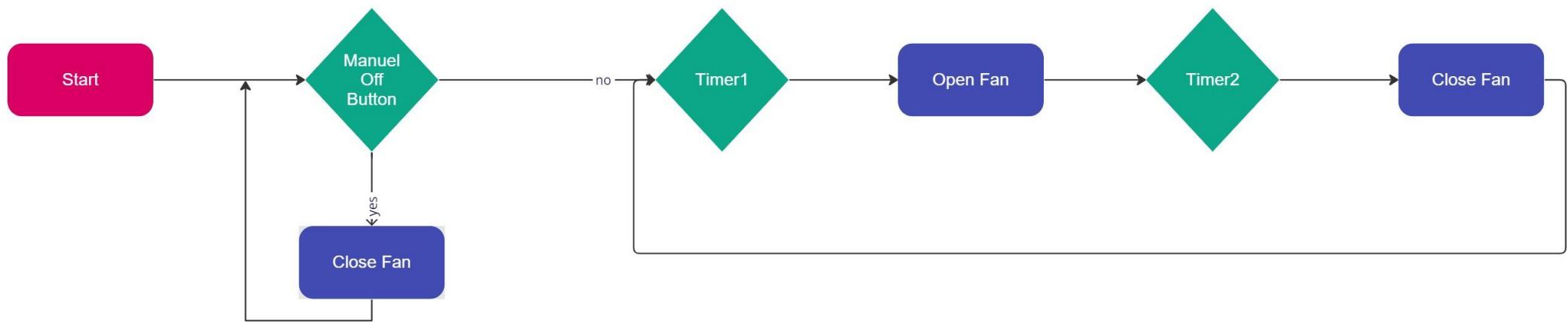
EQUIPMENTS



Fan



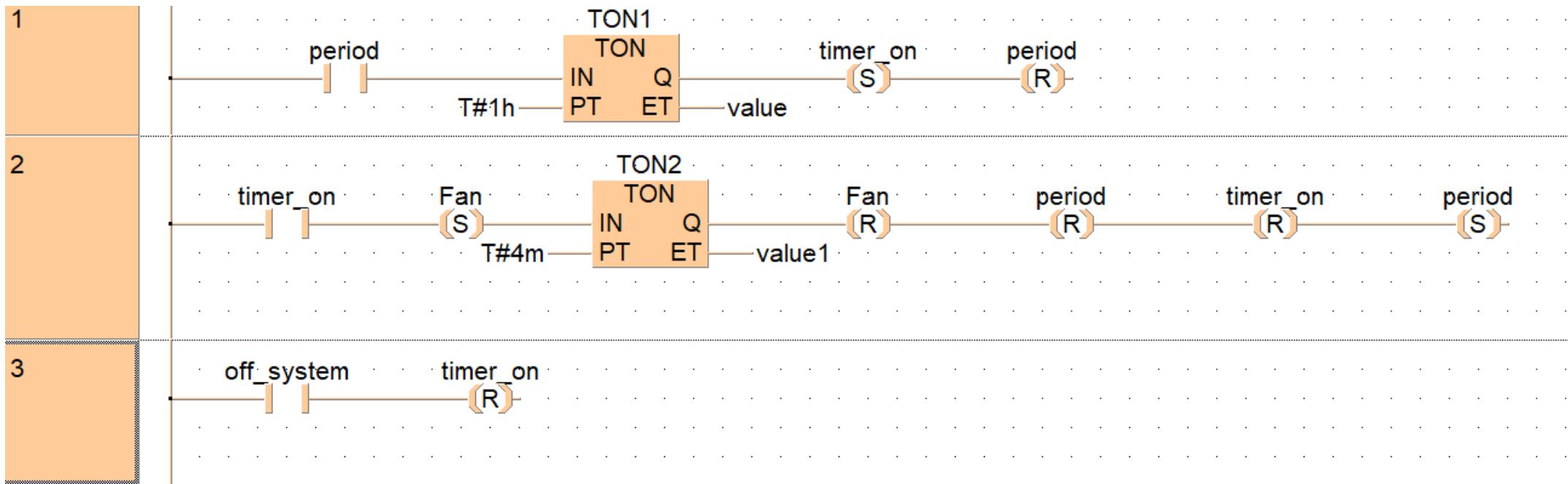
FLOWCHART



miro



PLC FUNCTION BLOCK

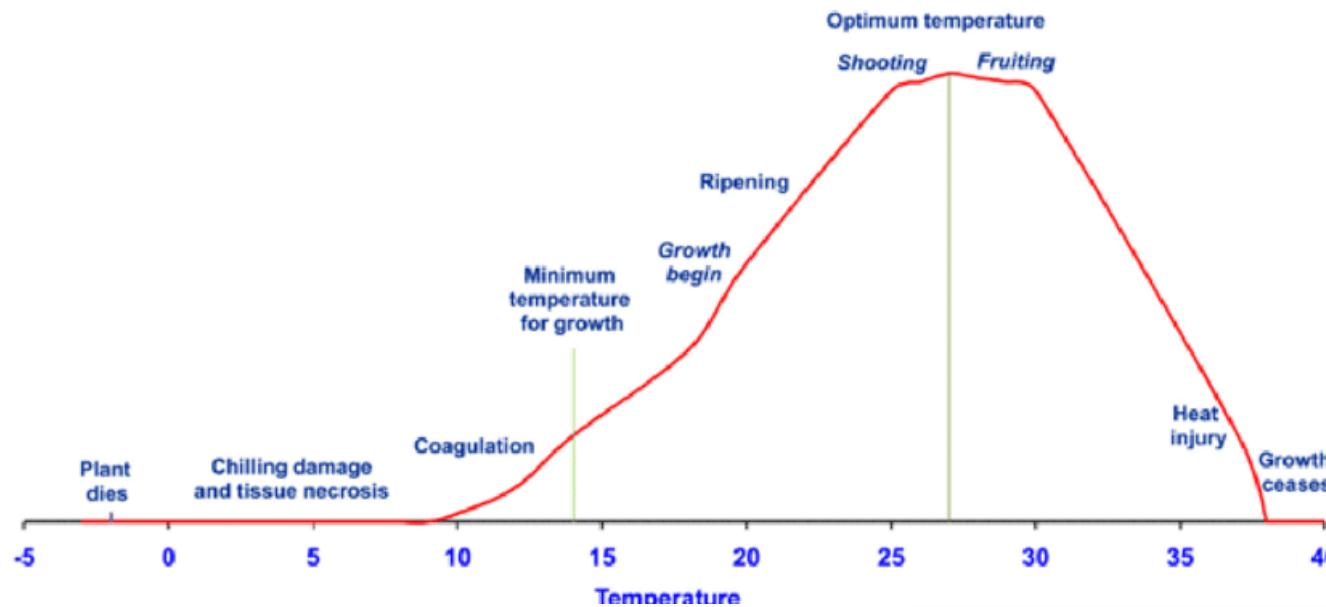


TEMPERATURE CONTROL SYSTEM



Keeps the temperature in optimal arrange

EQUIPMENTS



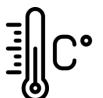
Temperature sensor [The AD590]



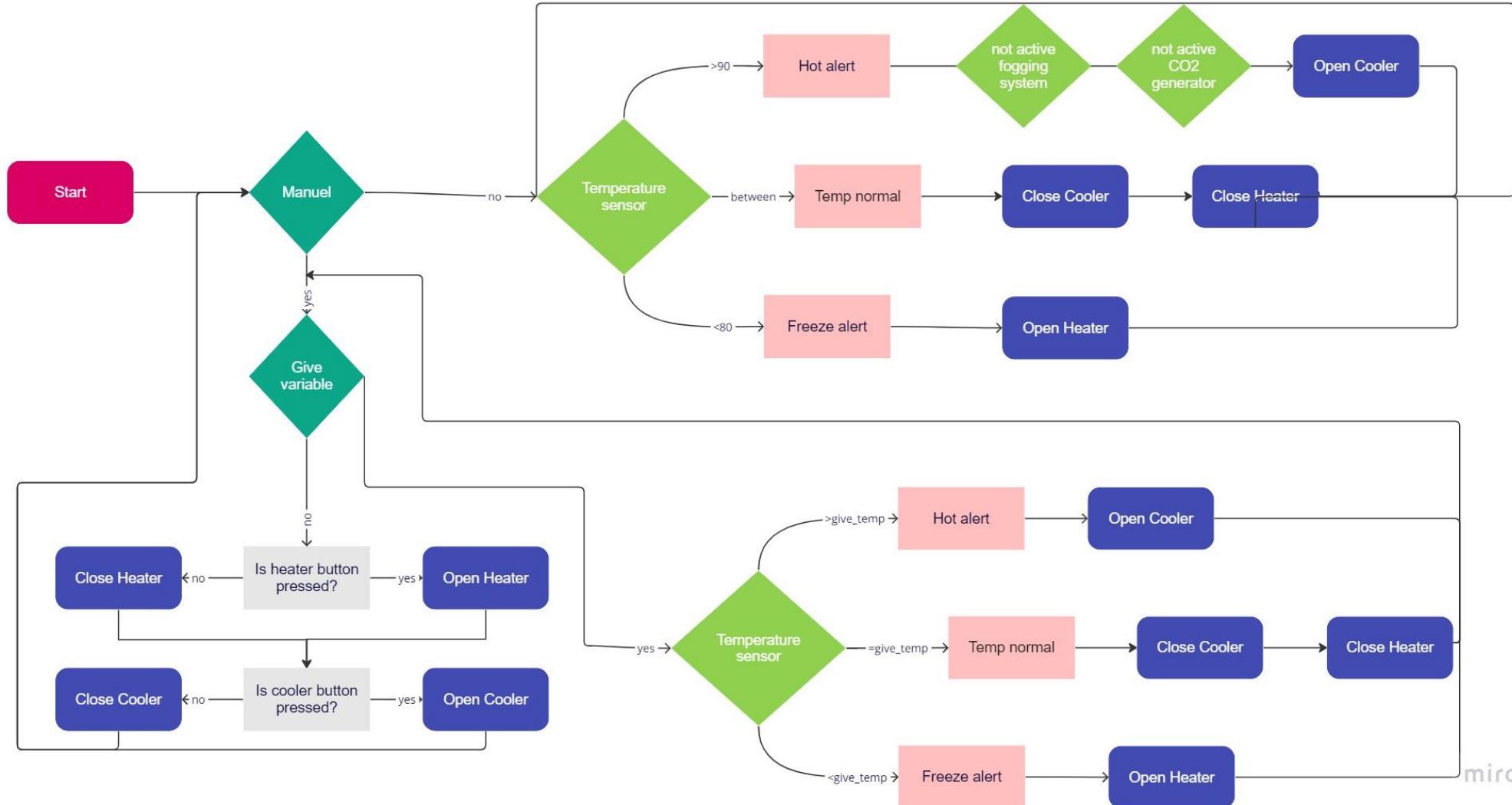
Heater



Cooler

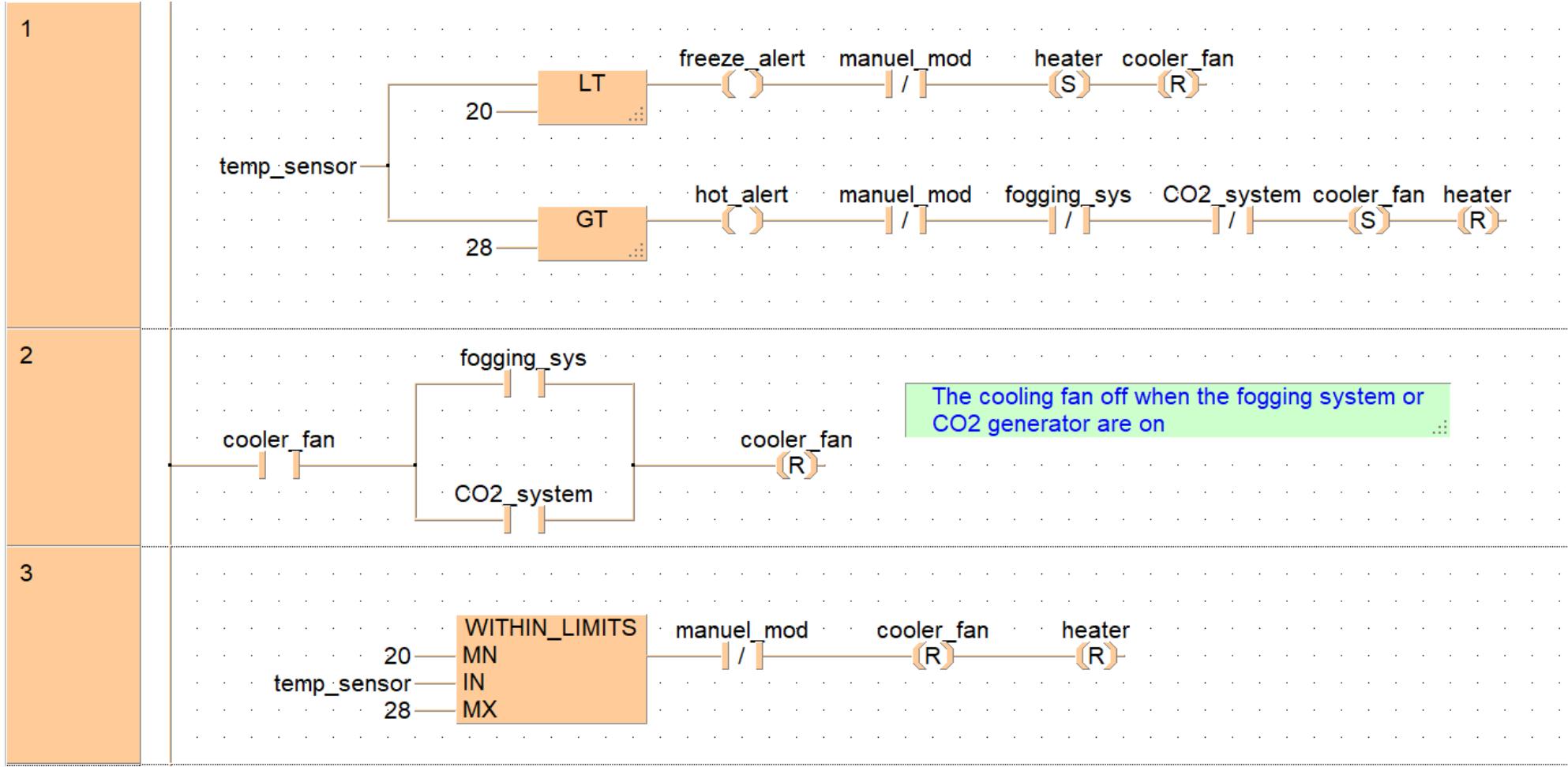


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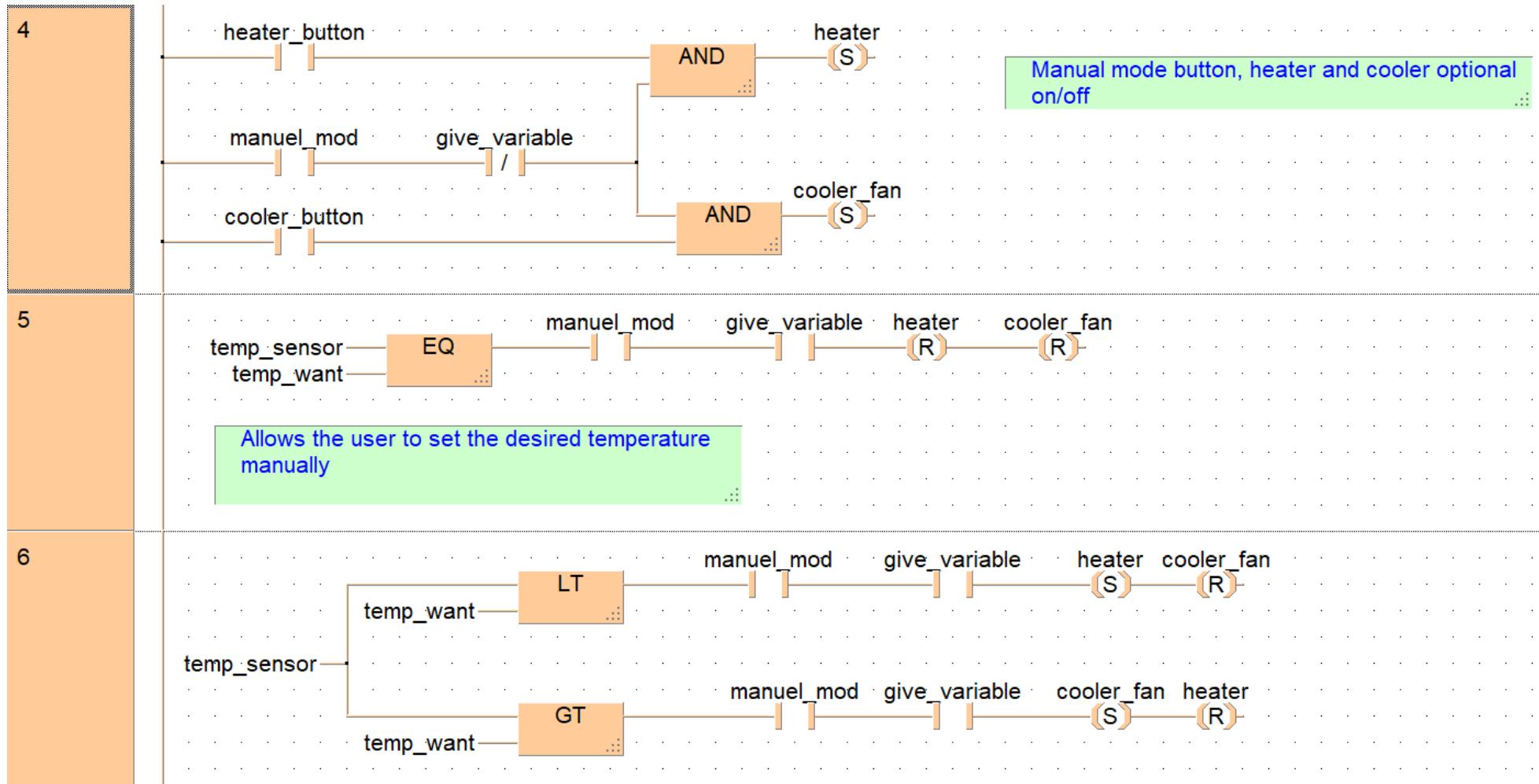


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PLC FUNCTION BLOCK



PLC FUNCTION BLOCK

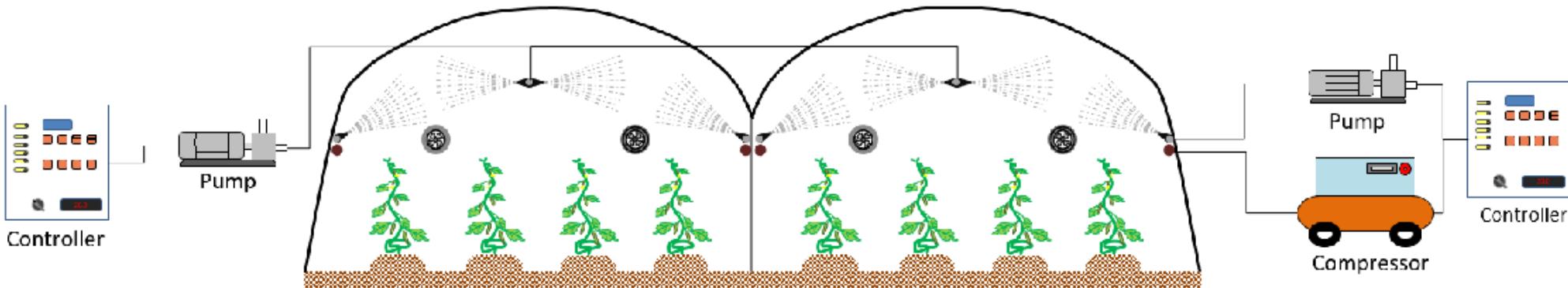


HUMIDITY CONTROL SYSTEM



With the help of fogging humidity is kept in the optimal range

EQUIPMENTS



Humidity Sensor

[The HS1101]



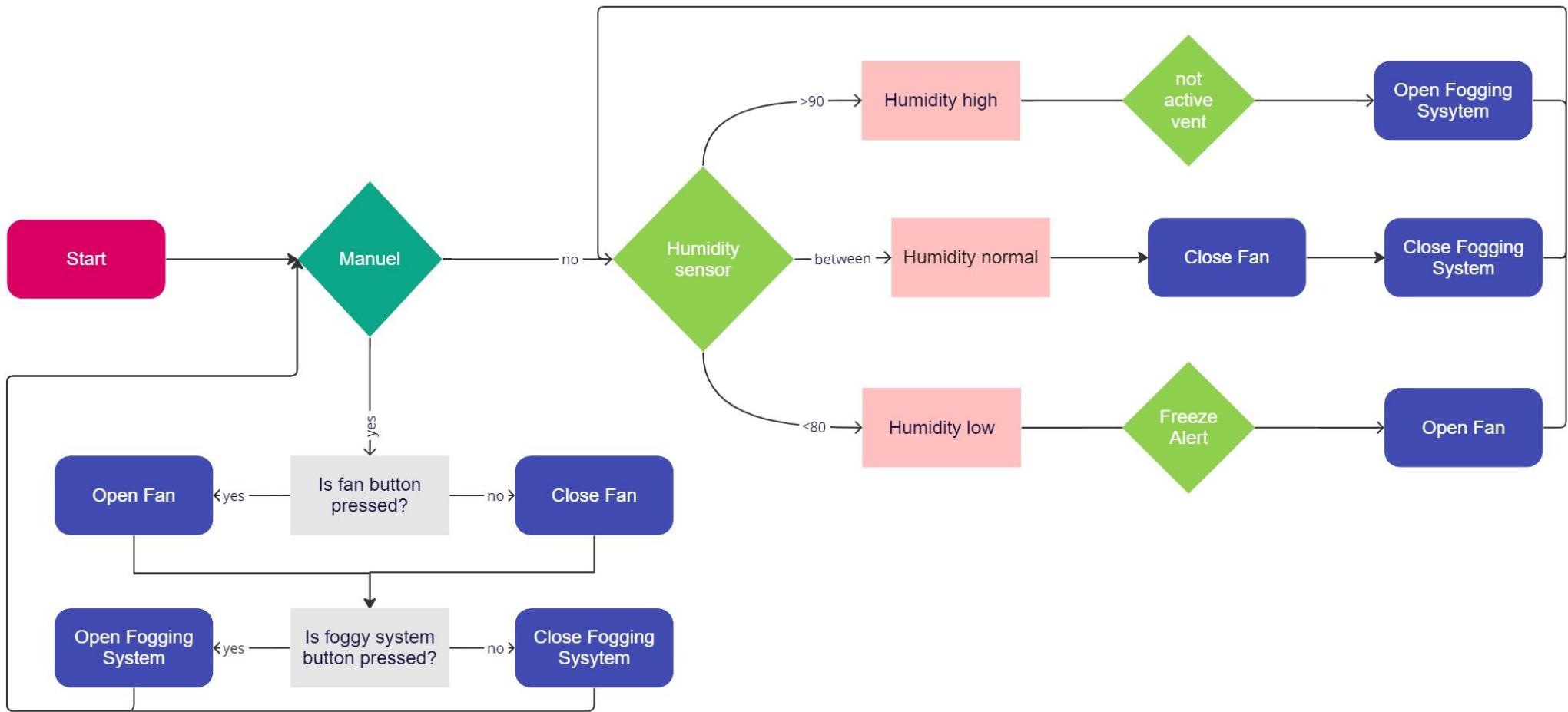
Humidifier



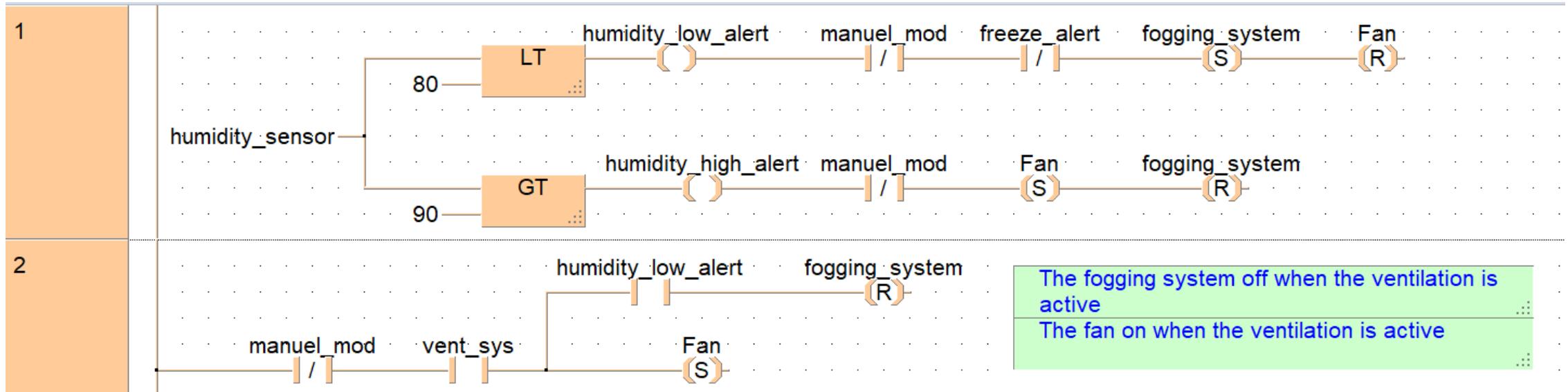
Fan



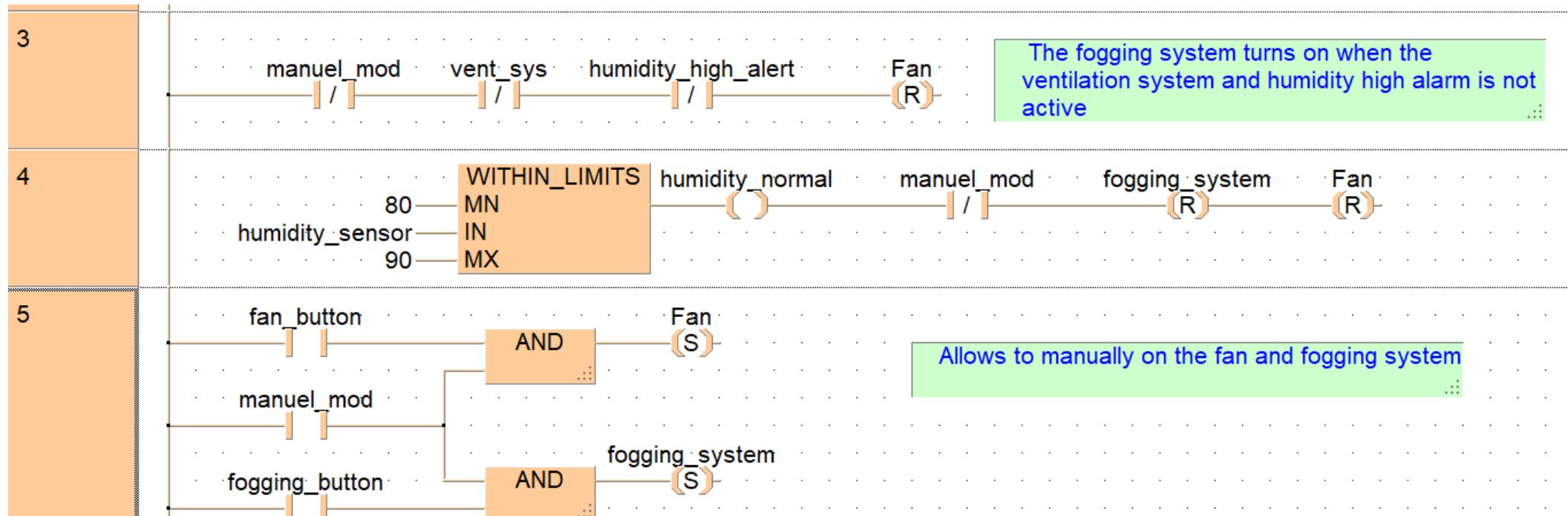
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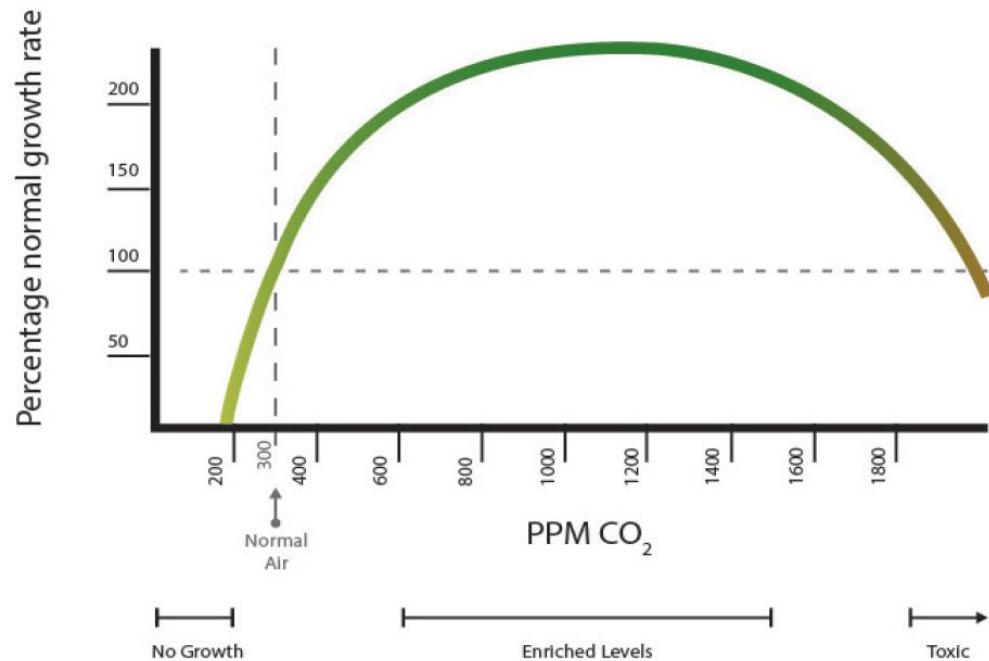
PLC FUNCTION BLOCK



PLC FUNCTION BLOCK



CO₂ CONTROL SYSTEM

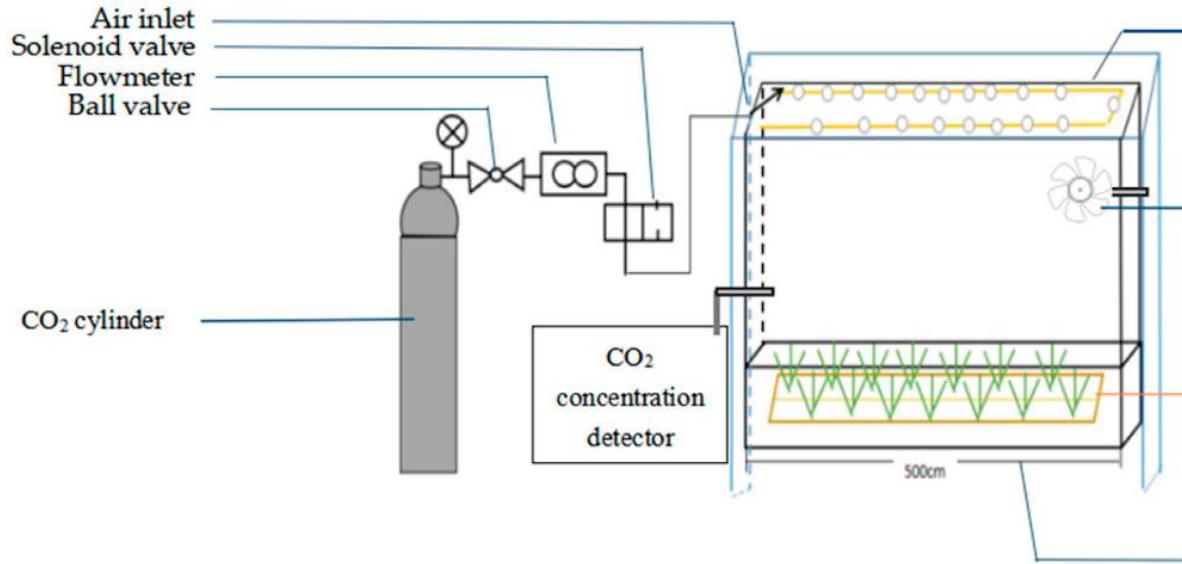


Liquid CO₂



For plant growth the CO₂ should be increased

EQUIPMENTS



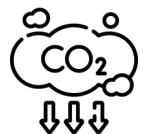
CO₂ System Kit



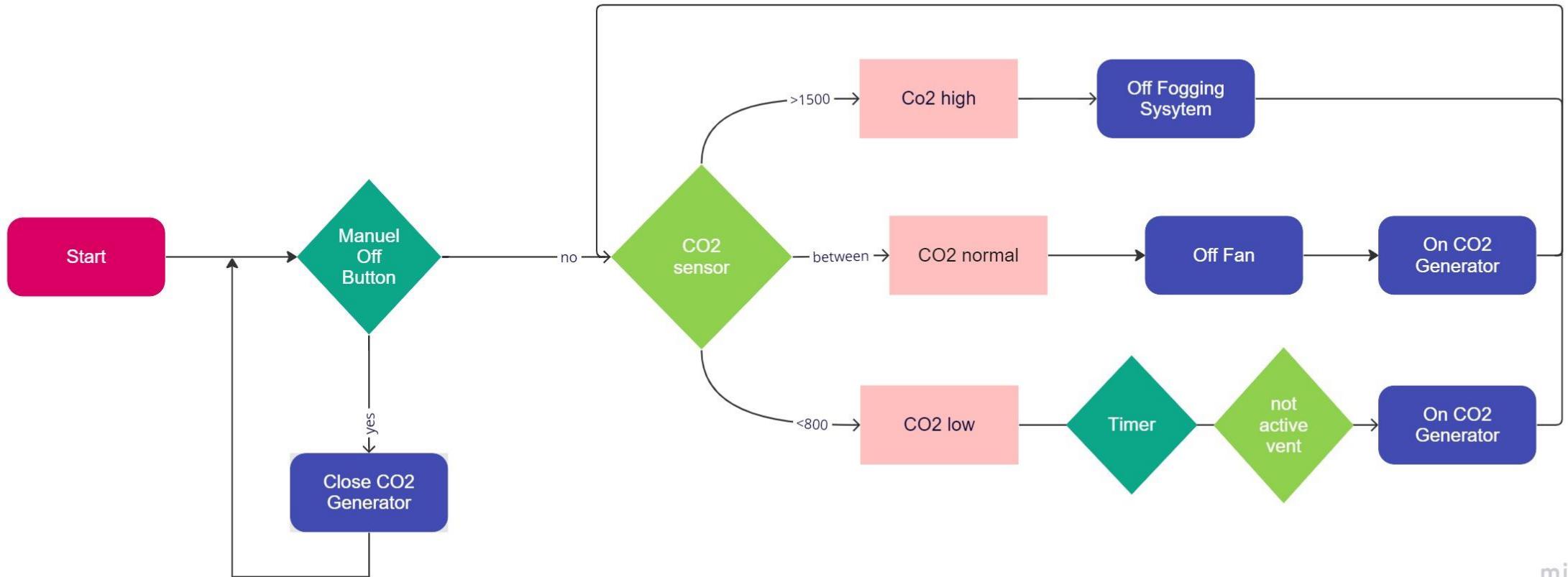
Fan



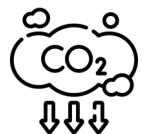
CO₂ sensor
[The B-530 sensor]



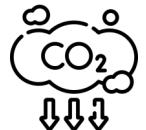
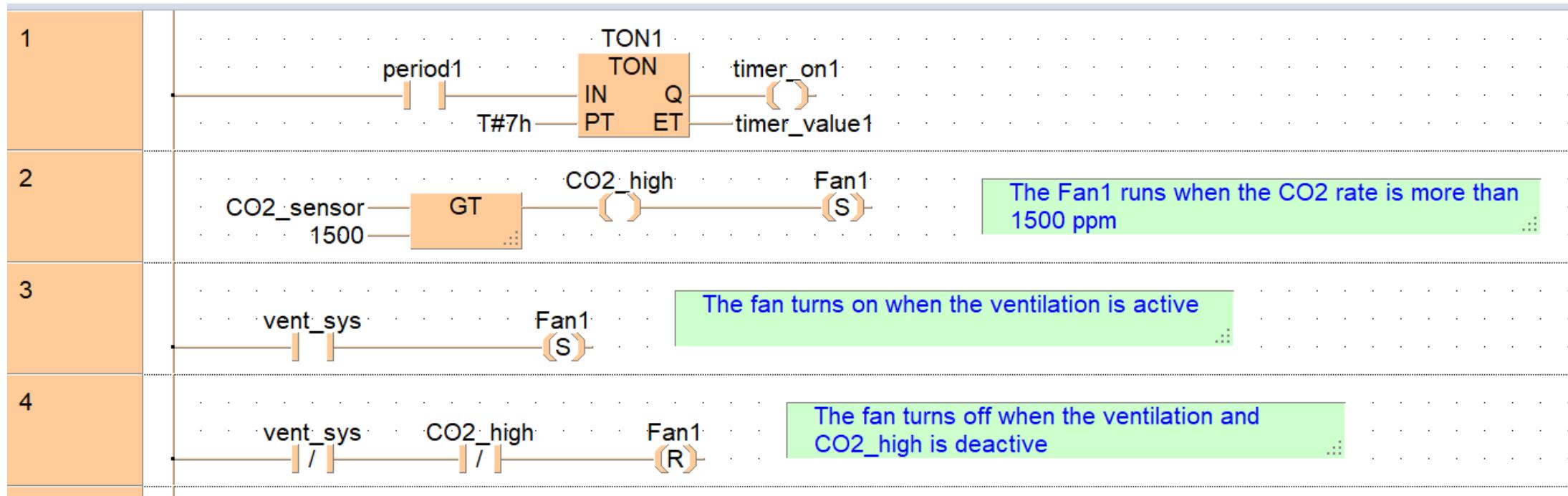
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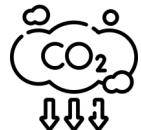
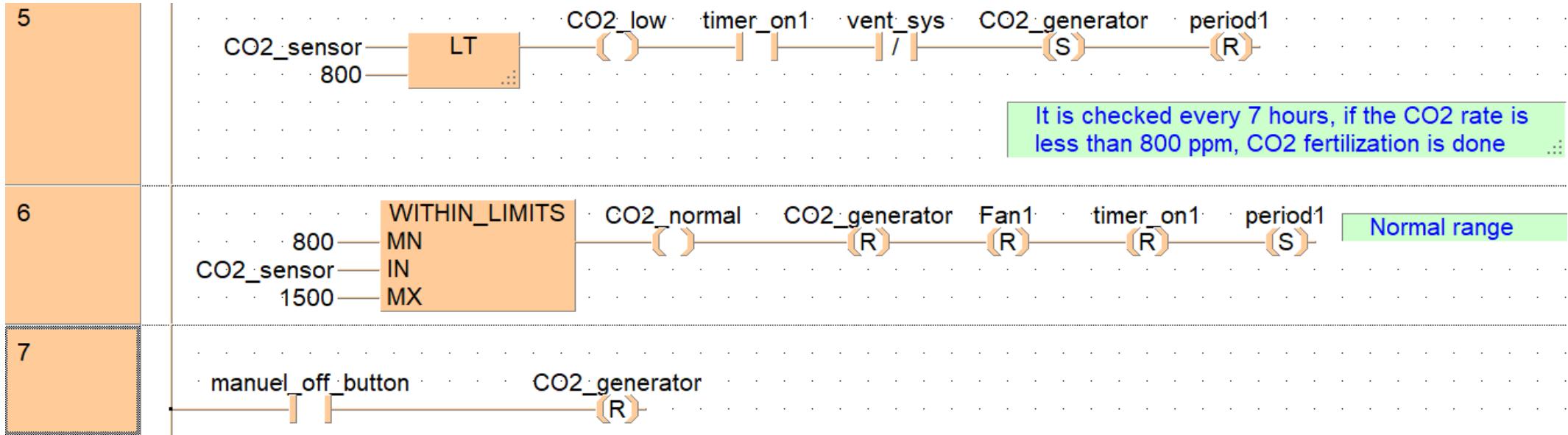
miro



PLC FUNCTION BLOCK



PLC FUNCTION BLOCK

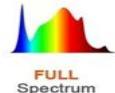
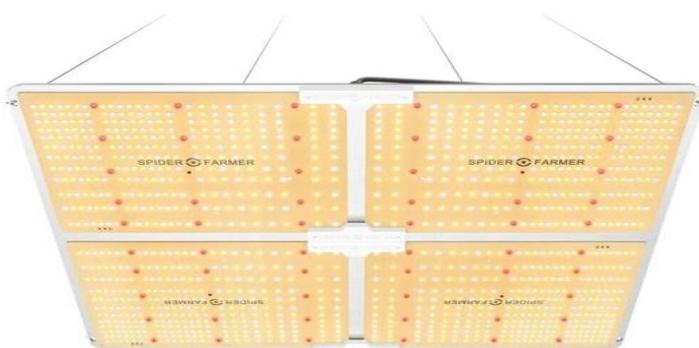
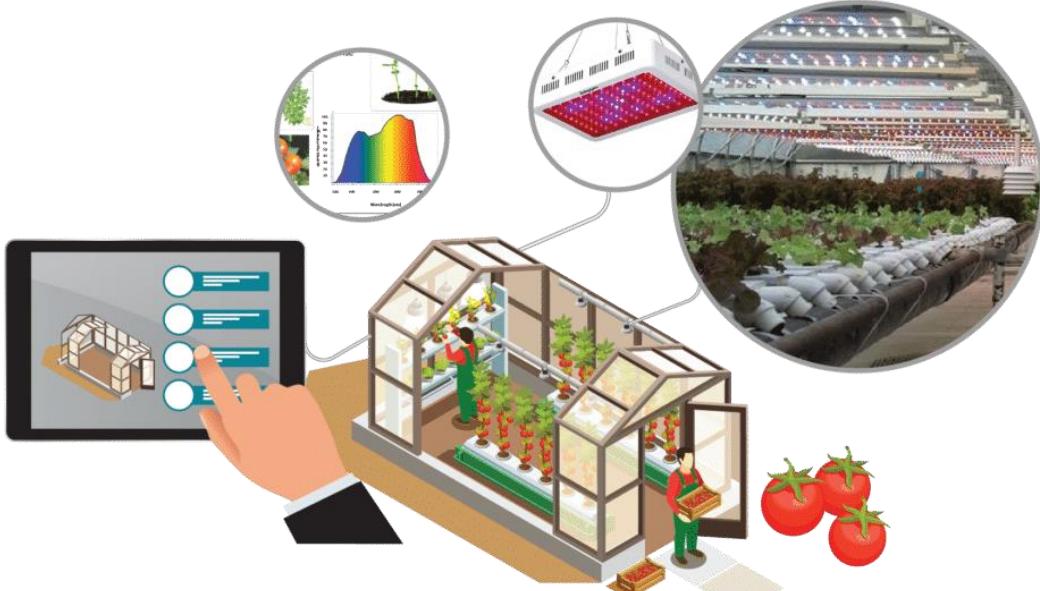


LIGHTING SYSTEM

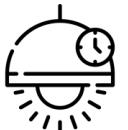
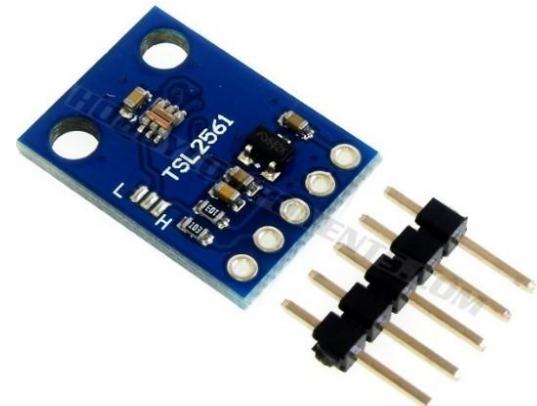


Lighting optimization to achieve full efficiency

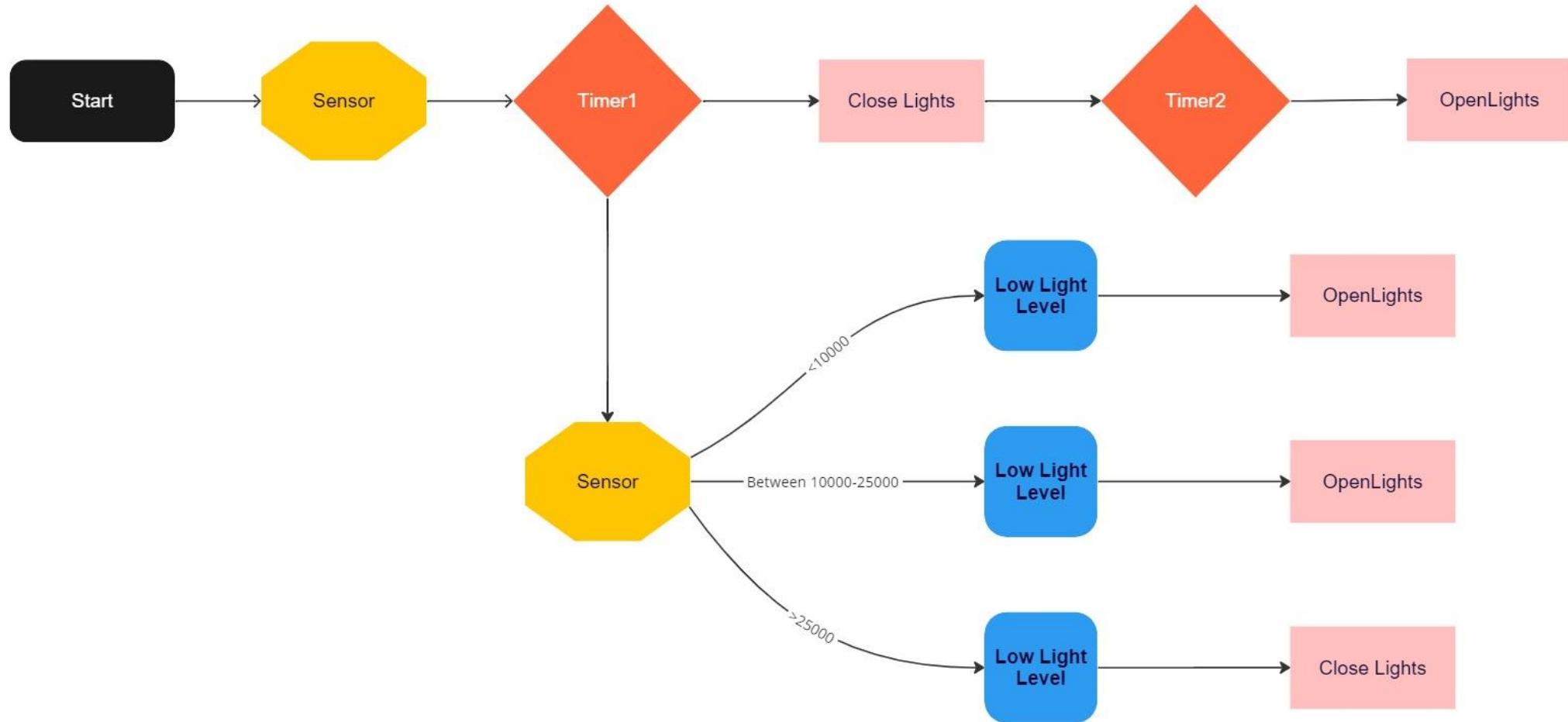
EQUIPMENTS



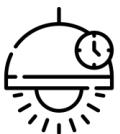
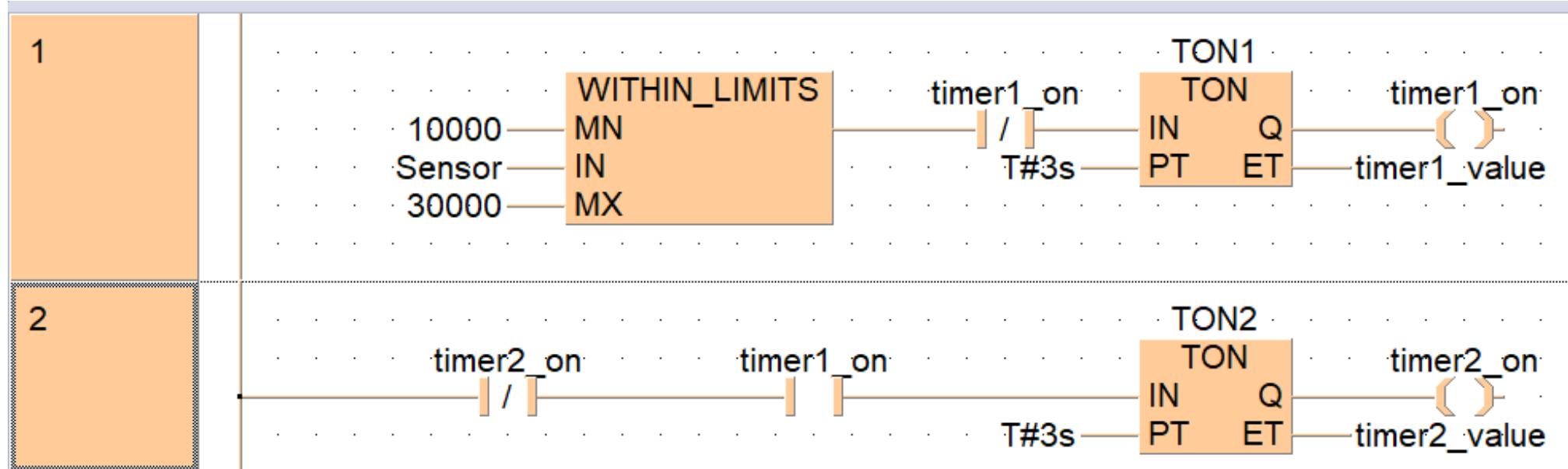
Light sensors



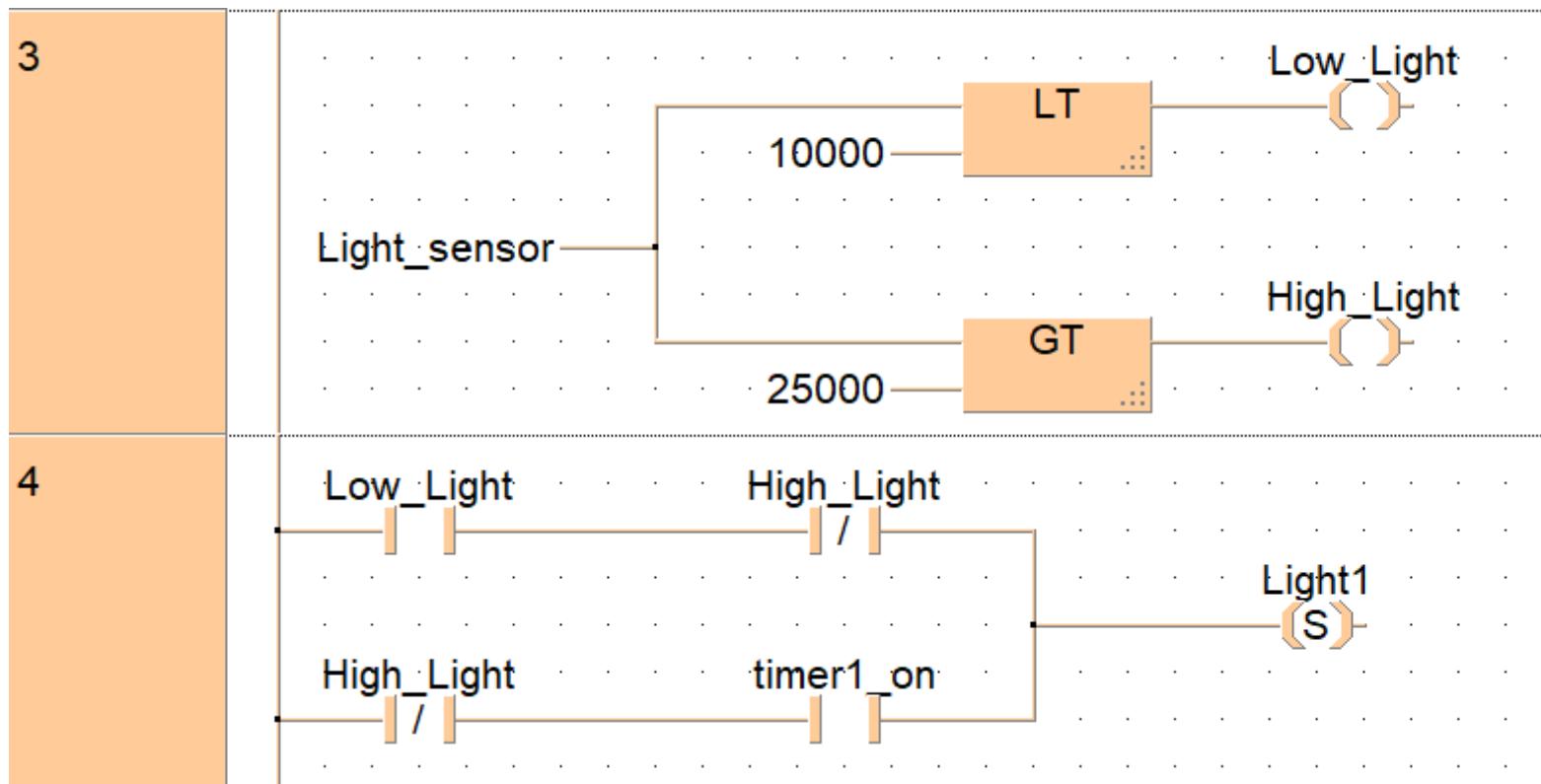
FLOWCHART



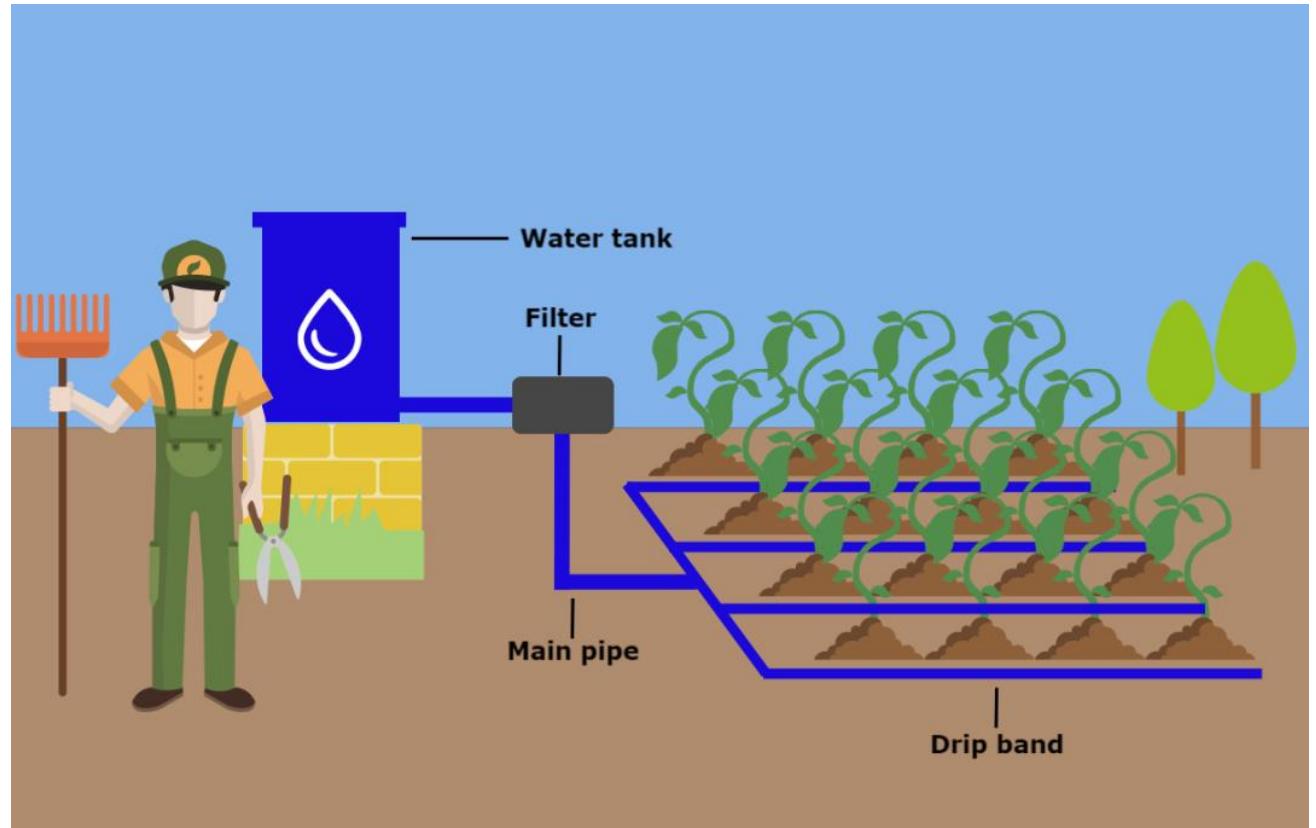
PLC FUNCTION BLOCK



PLC FUNCTION BLOCK



WATER STORAGE SYSTEM



Further integration with other green houses via pool/reservoir

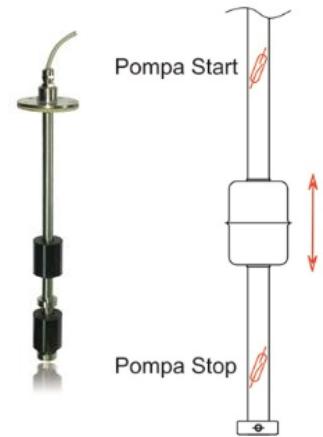
EQUIPMENTS



Water Tank



Reservoir Level
Sensor

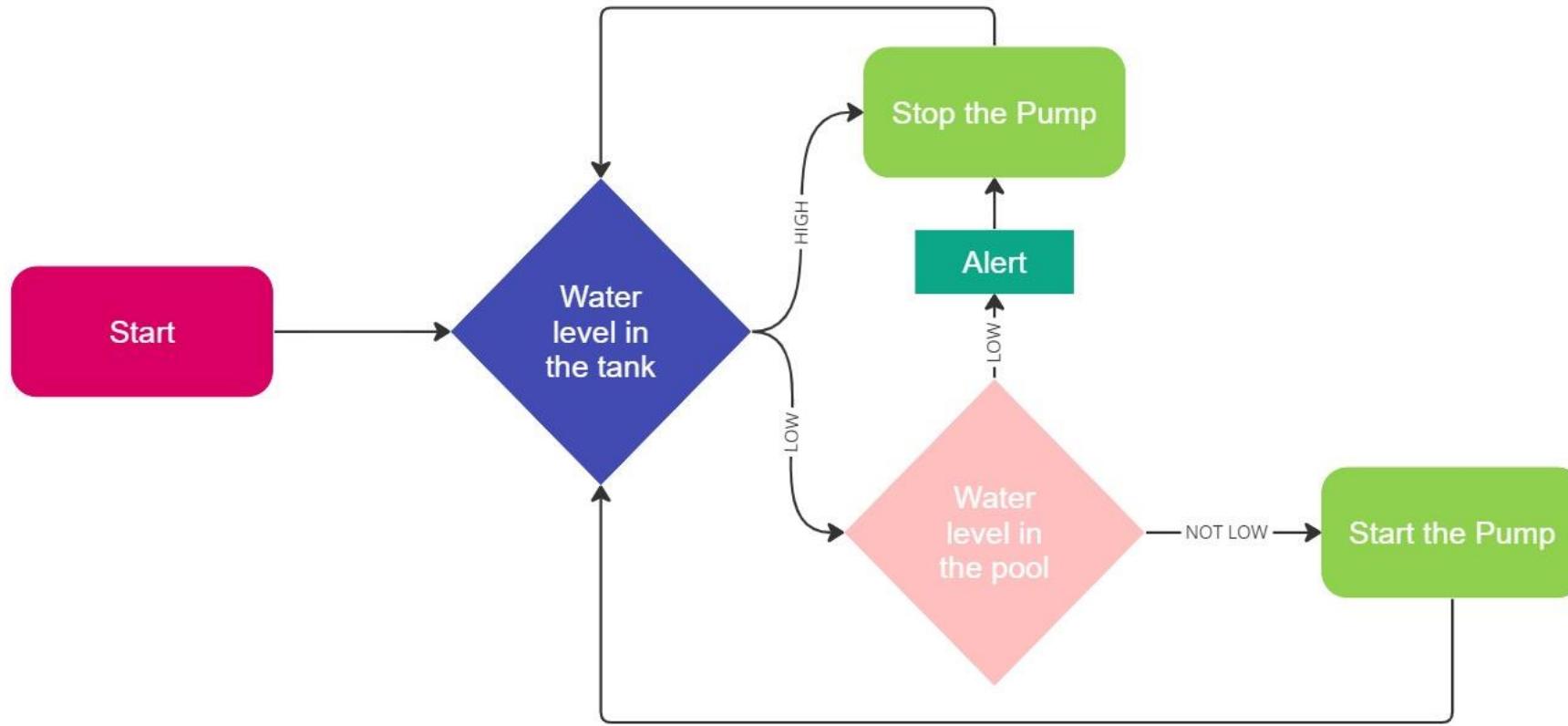


Water Tank
Level Sensor



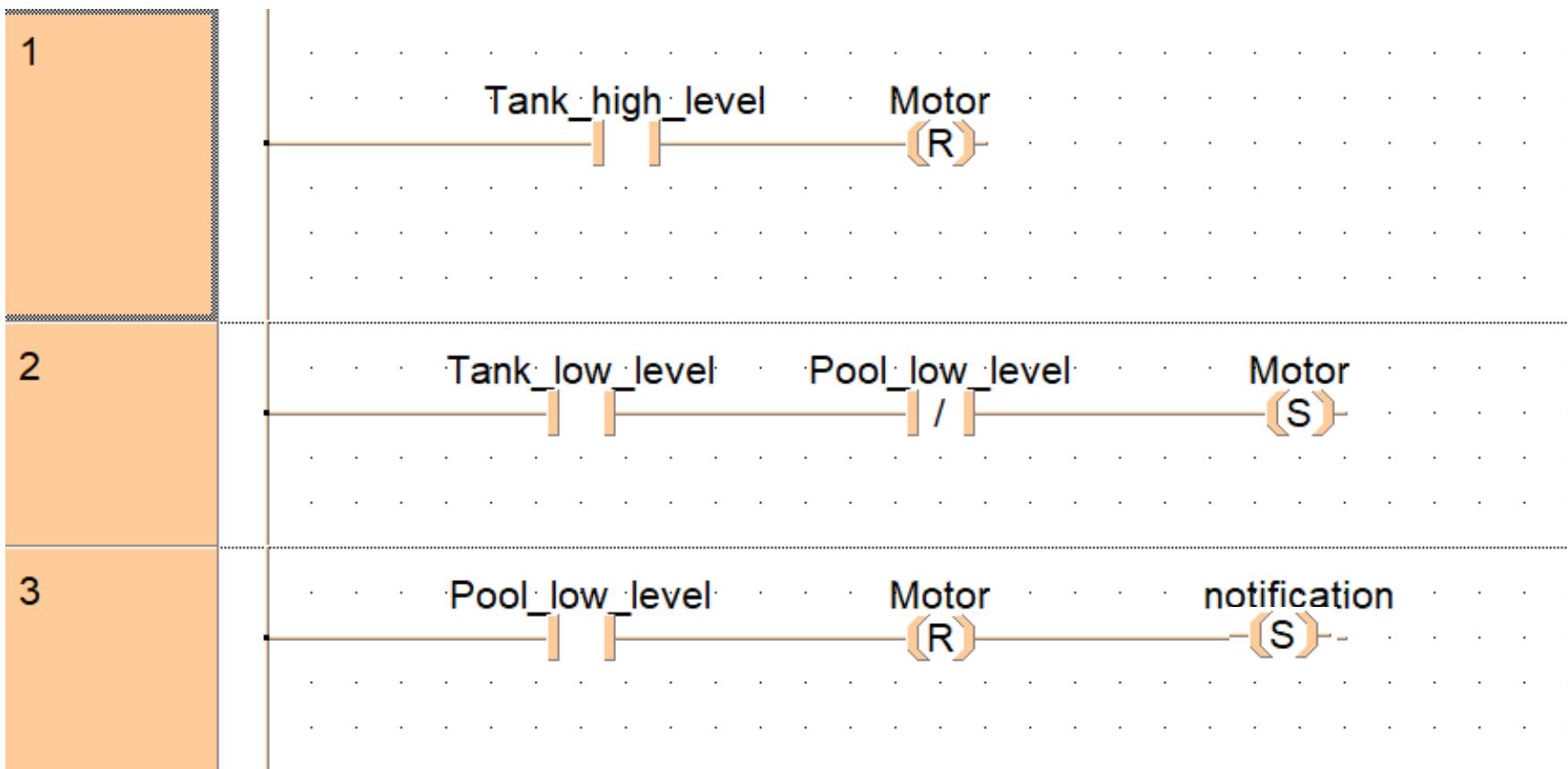
Motor Pump

FLOWCHART



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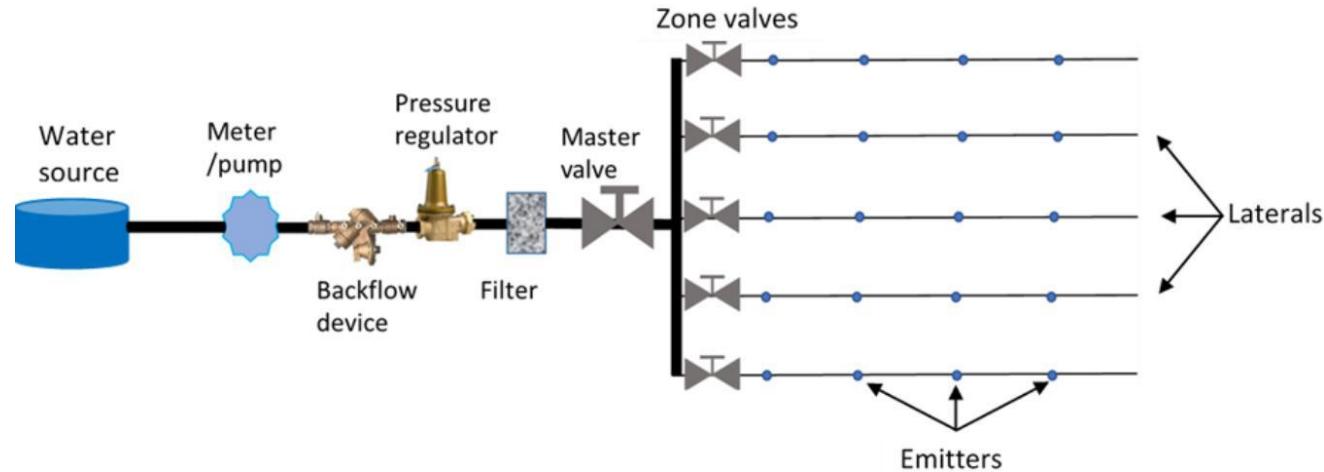
PLC FUNCTION BLOCK



IRRIGATION SYSTEM



🍌 Drip Method



EQUIPMENTS



Pressure Booster Pump



Capacitive Moisture Sensors



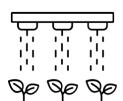
Polyethylene (PE) tubing



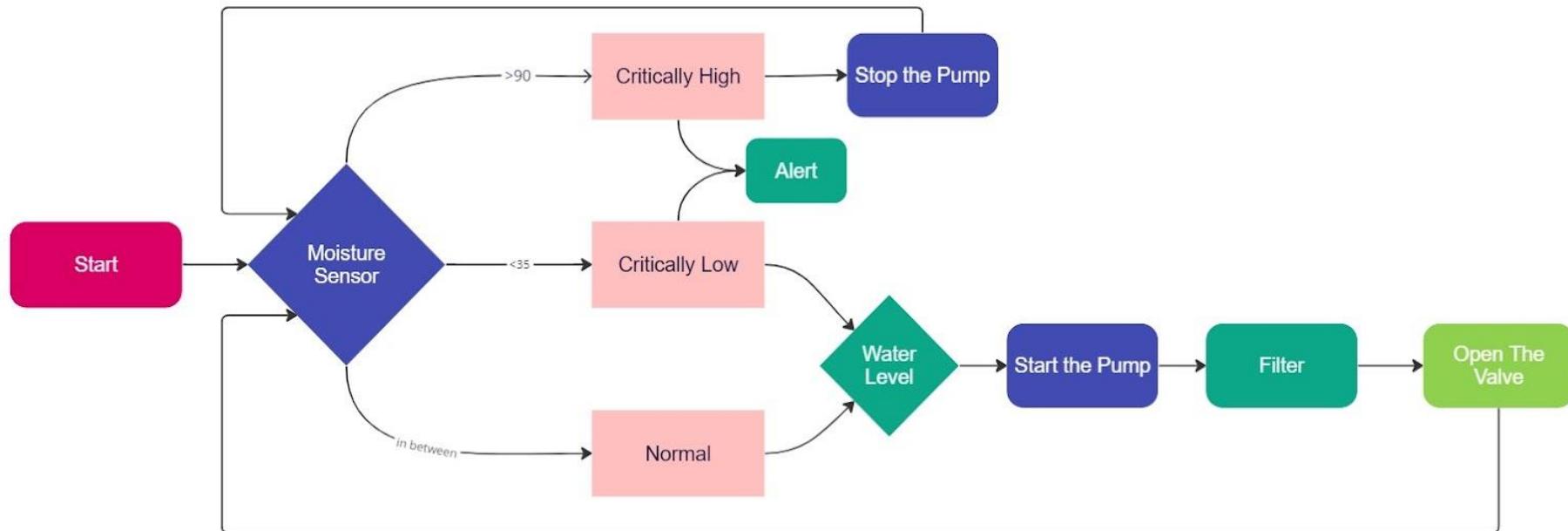
Filter



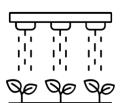
Control Valve



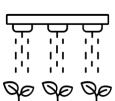
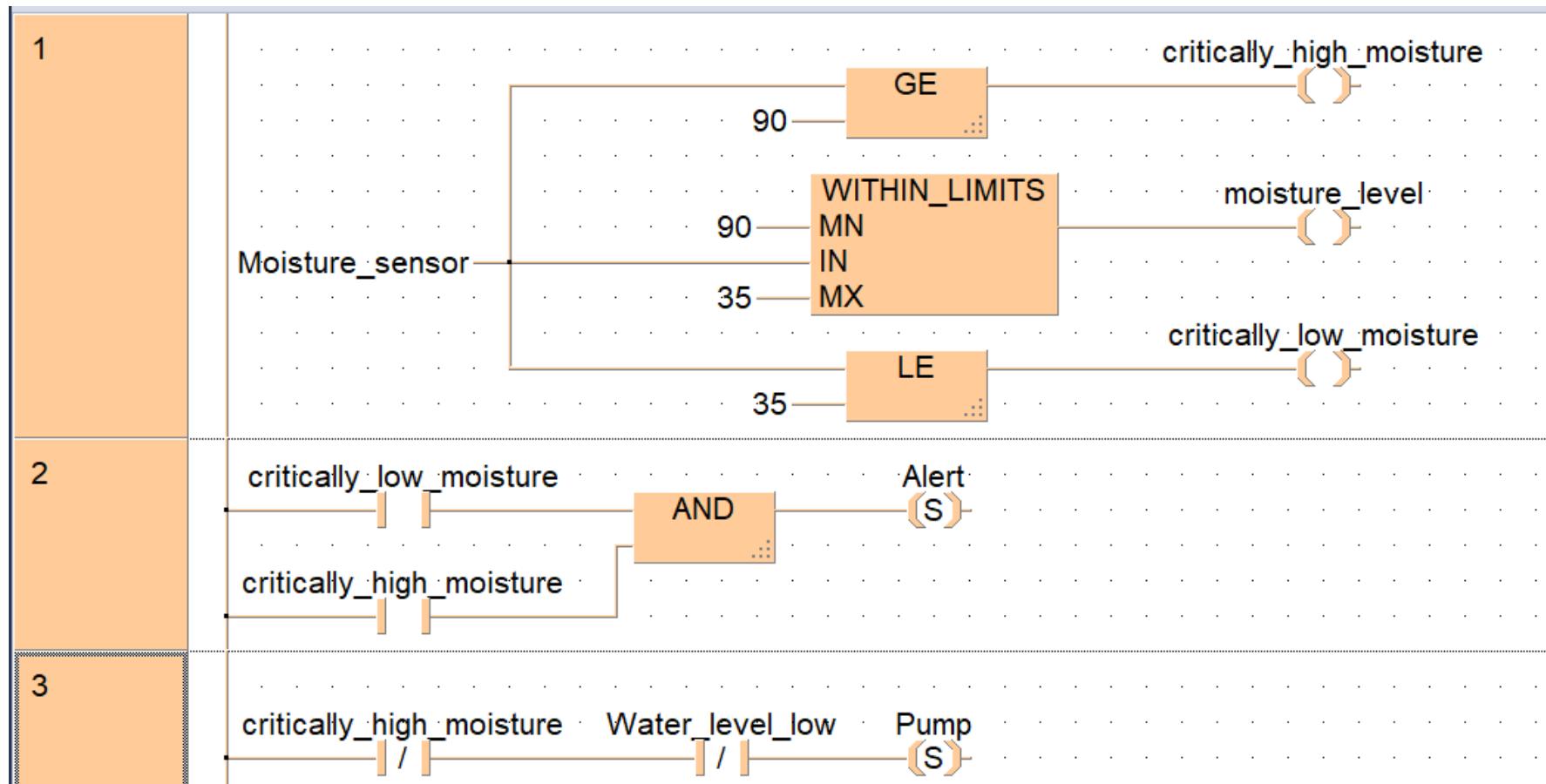
FLOWCHART



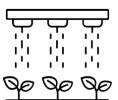
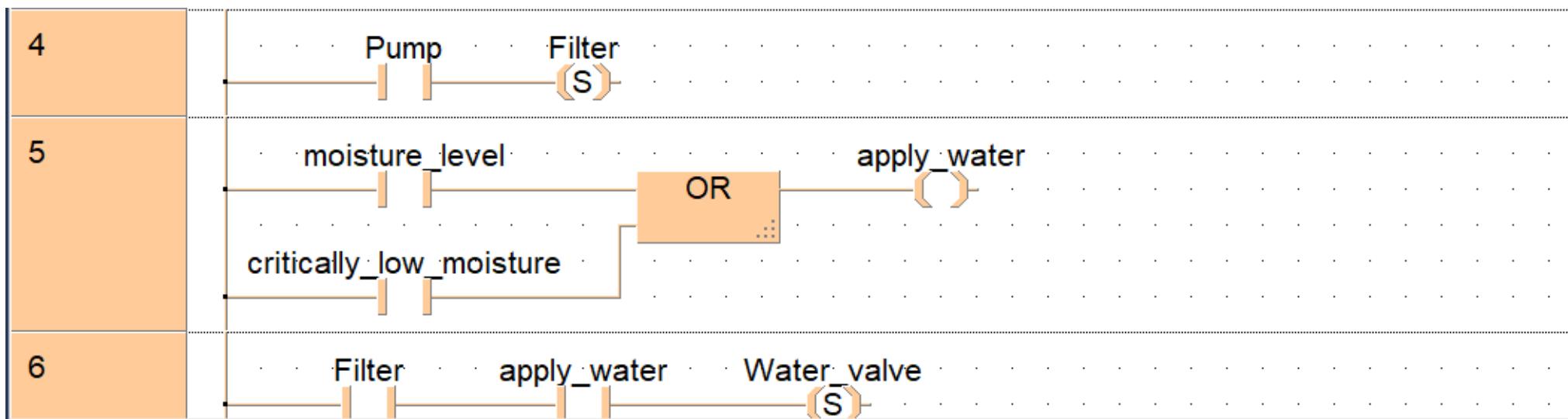
miro



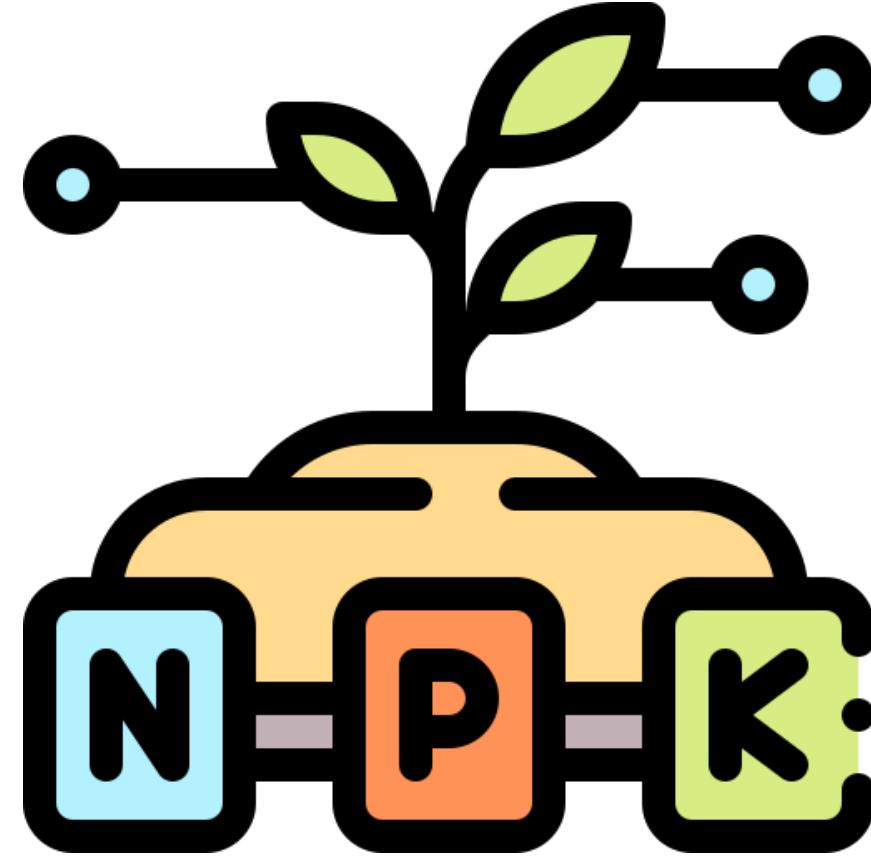
PLC FUNCTION BLOCK



PLC FUNCTION BLOCK



FERTILIZATION SYSTEM

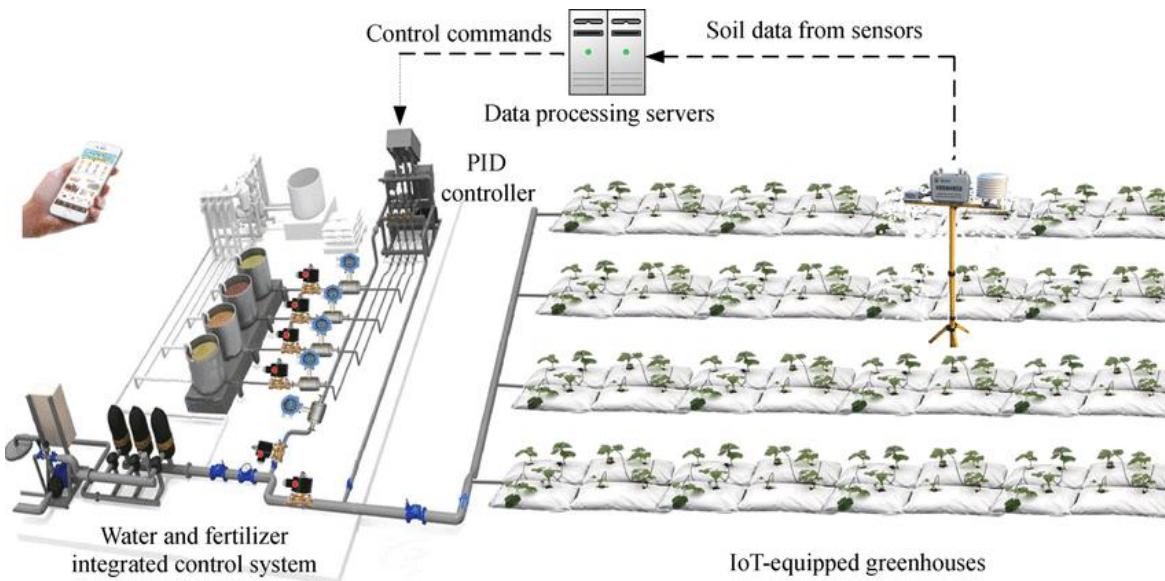


Three tanks: one for N-P-K, one for adjustments, one for acid



Separate piping to prevent overclogging

EQUIPMENTS



N-P-K Tank



Adjustment Tank



Acid Storage Tank



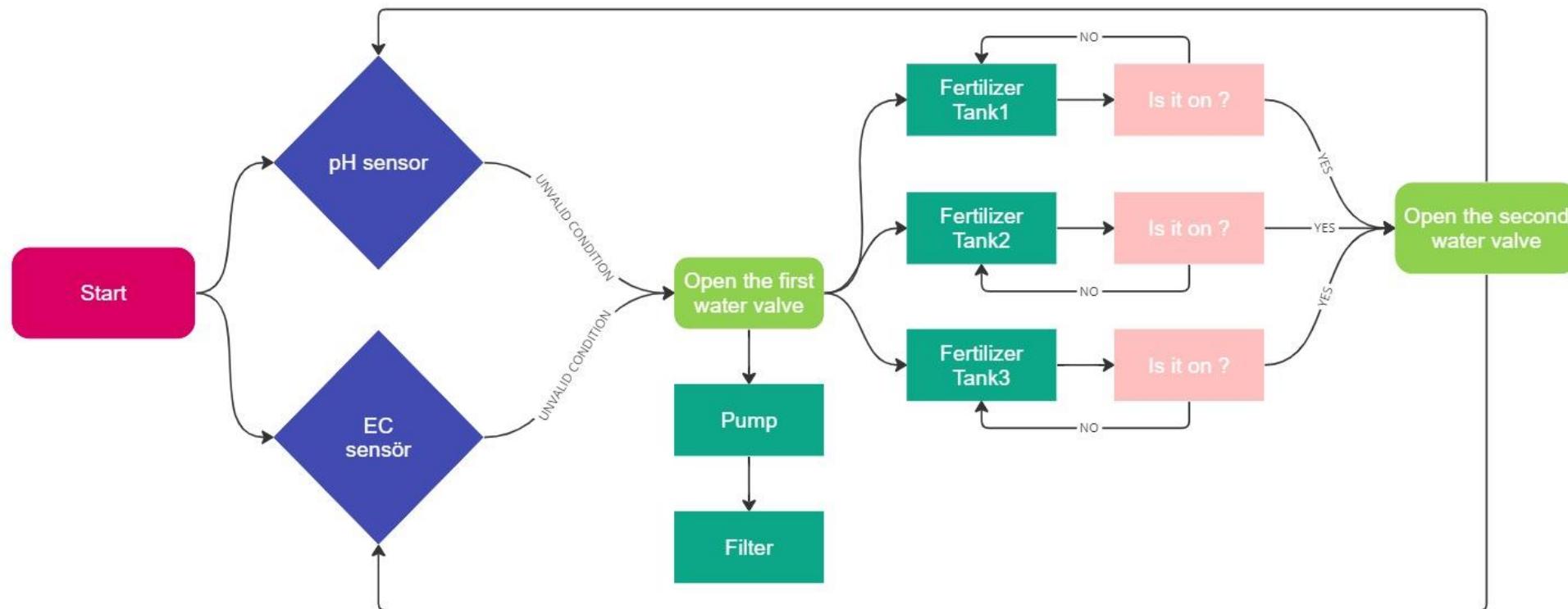
EC Sensor



pH Sensor

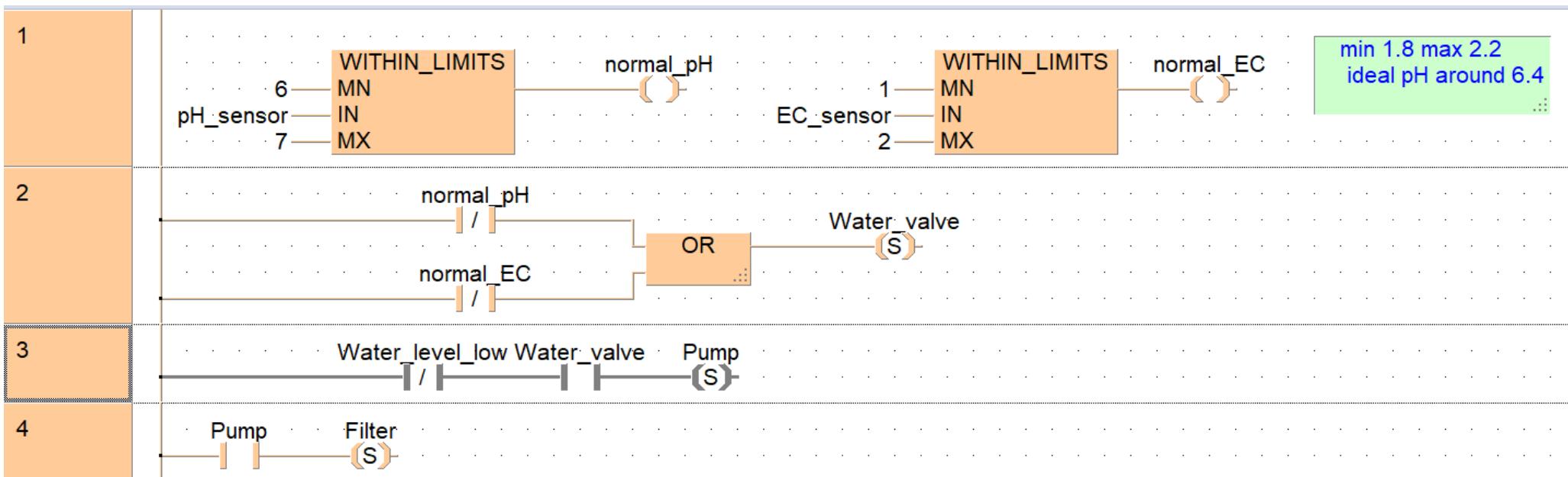


FLOWCHART

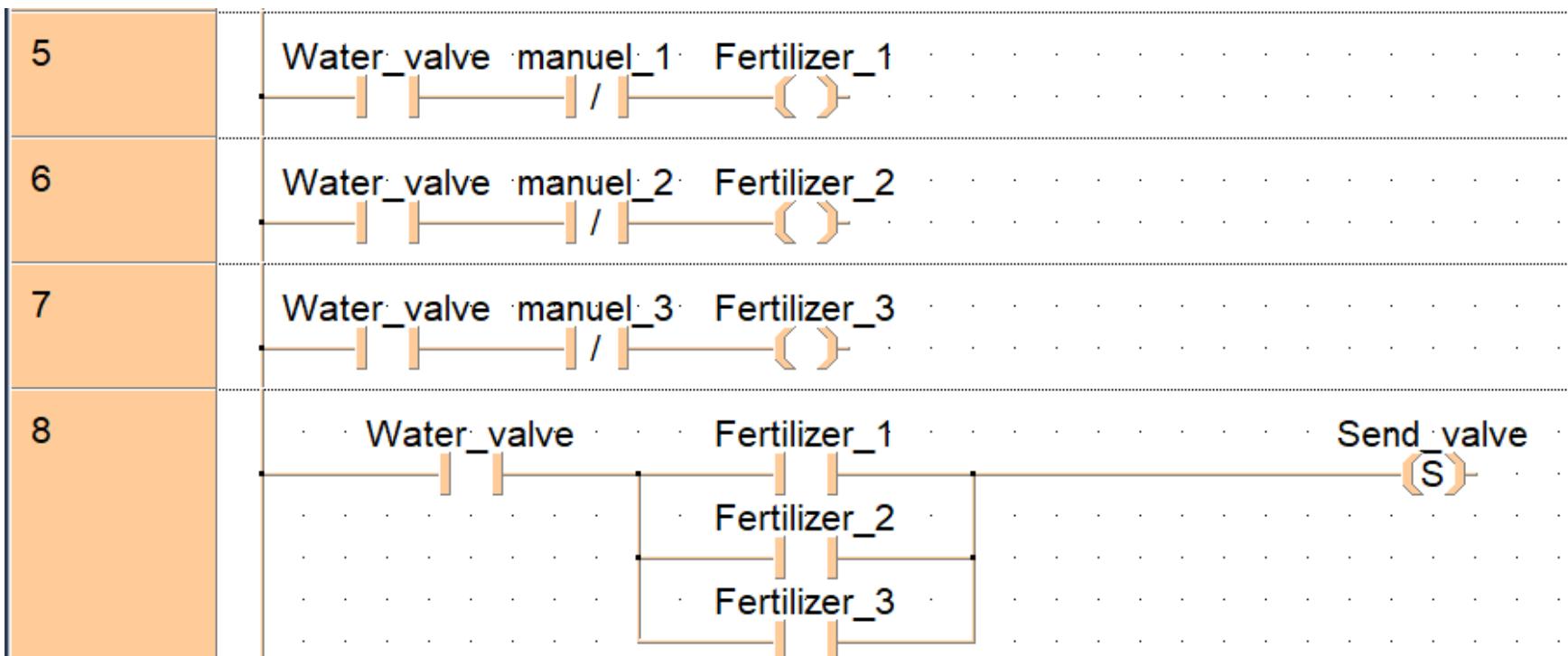


miro

PLC FUNCTION BLOCK



PLC FUNCTION BLOCK



DISINFECTION SYSTEM



Drip method



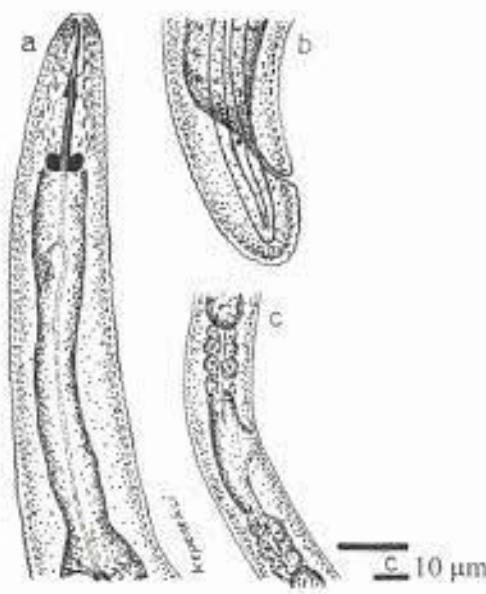
Root diseases

EQUIPMENTS

Root Diseases



Nematode disease



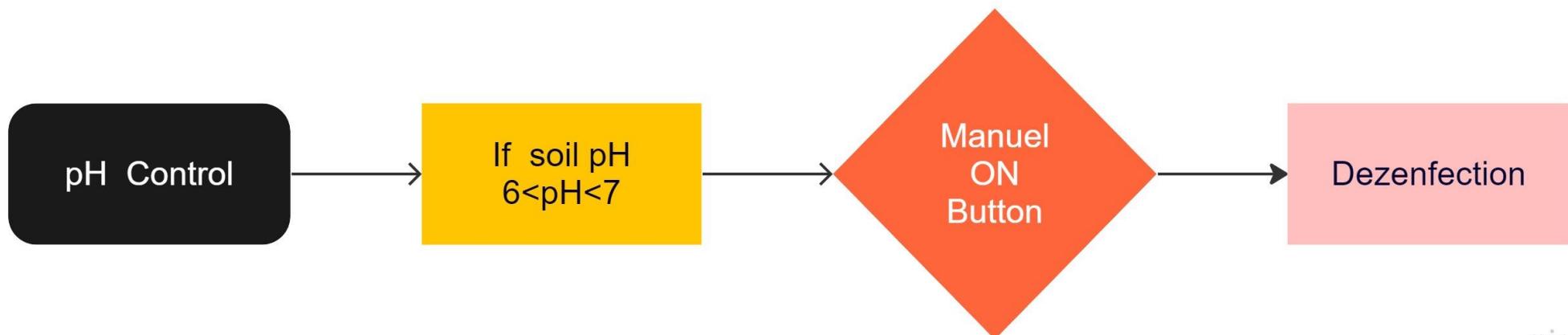
pH Sensor
[Atlas scientific ezo]



Polyethylene (PE)
tubing



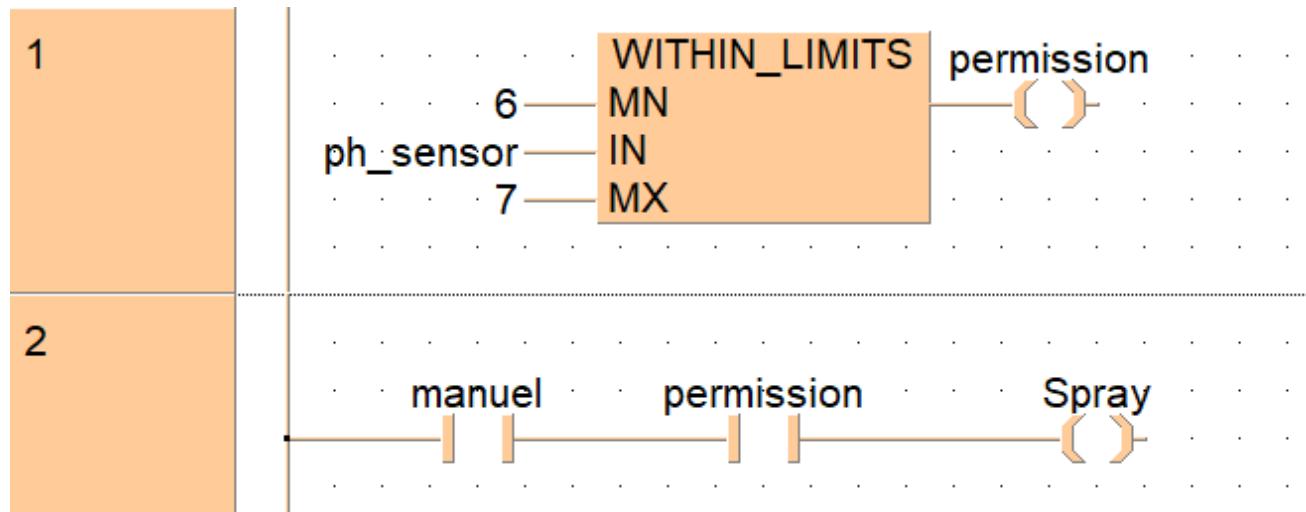
FLOWCHART



miro



PLC FUNCTION BLOCK

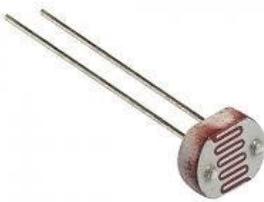
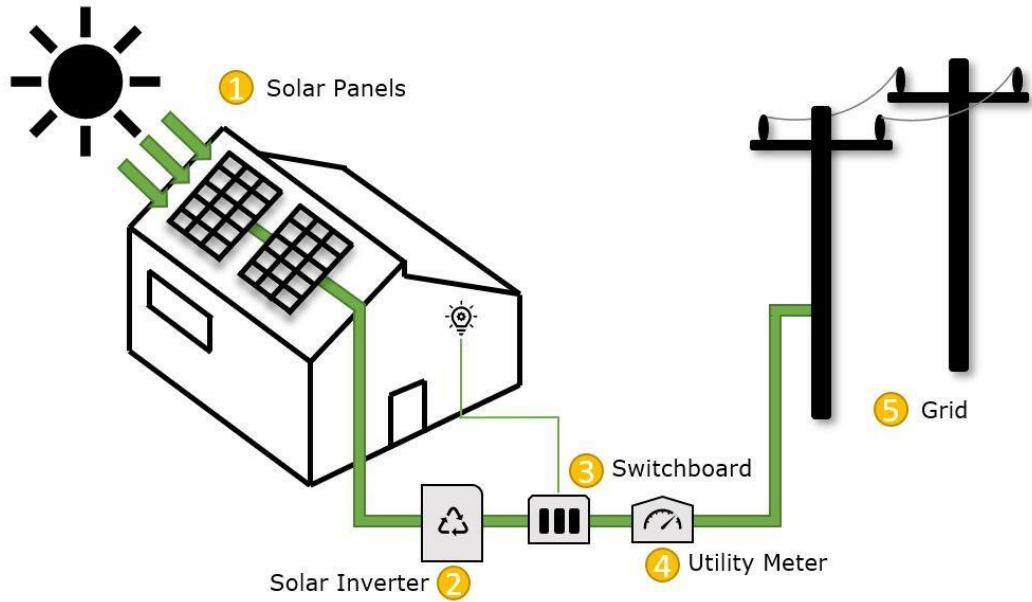


SOLAR PANEL SYSTEM



Adjustable to achieve maximum performance

EQUIPMENTS



LDR sensor

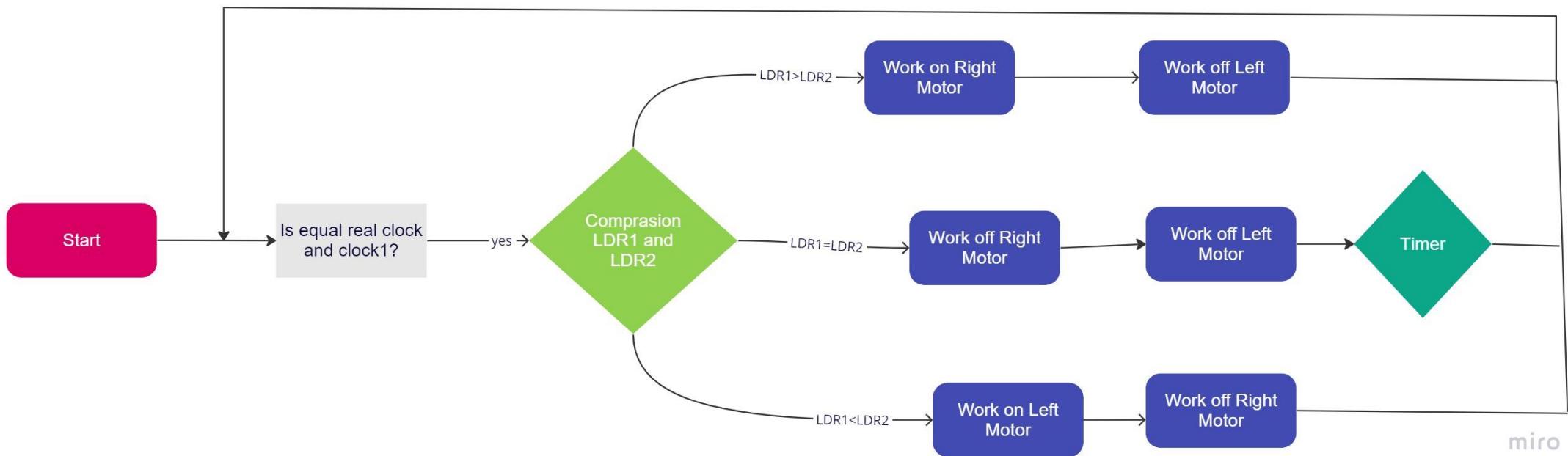


Servo motor
[MG996R]

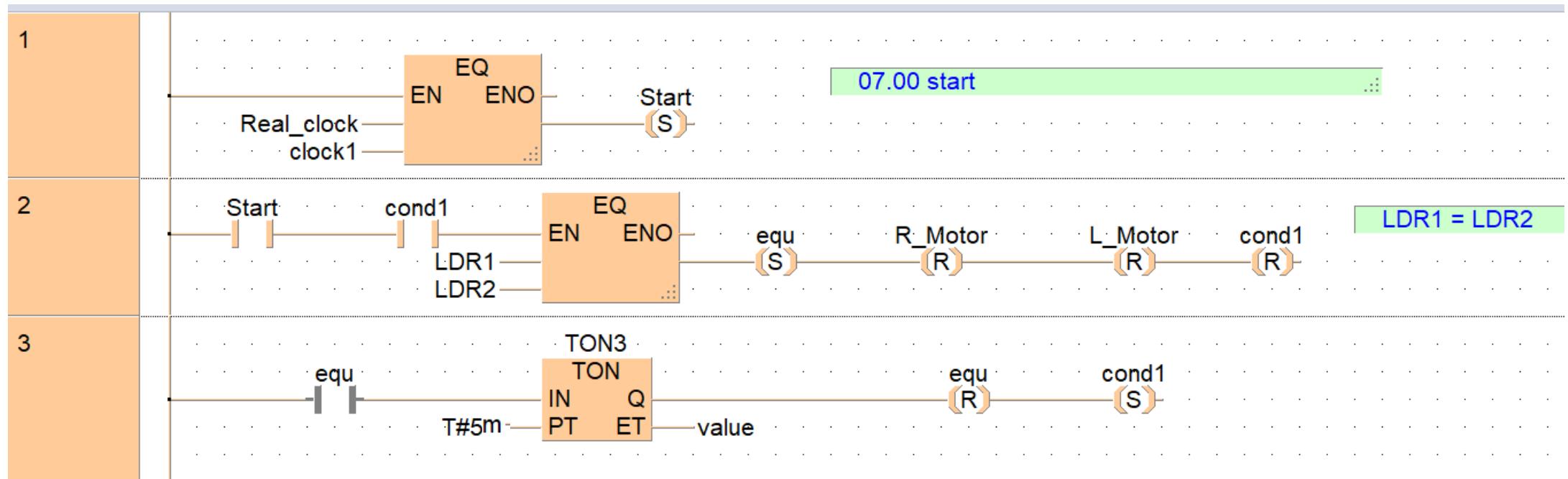


Solar panel

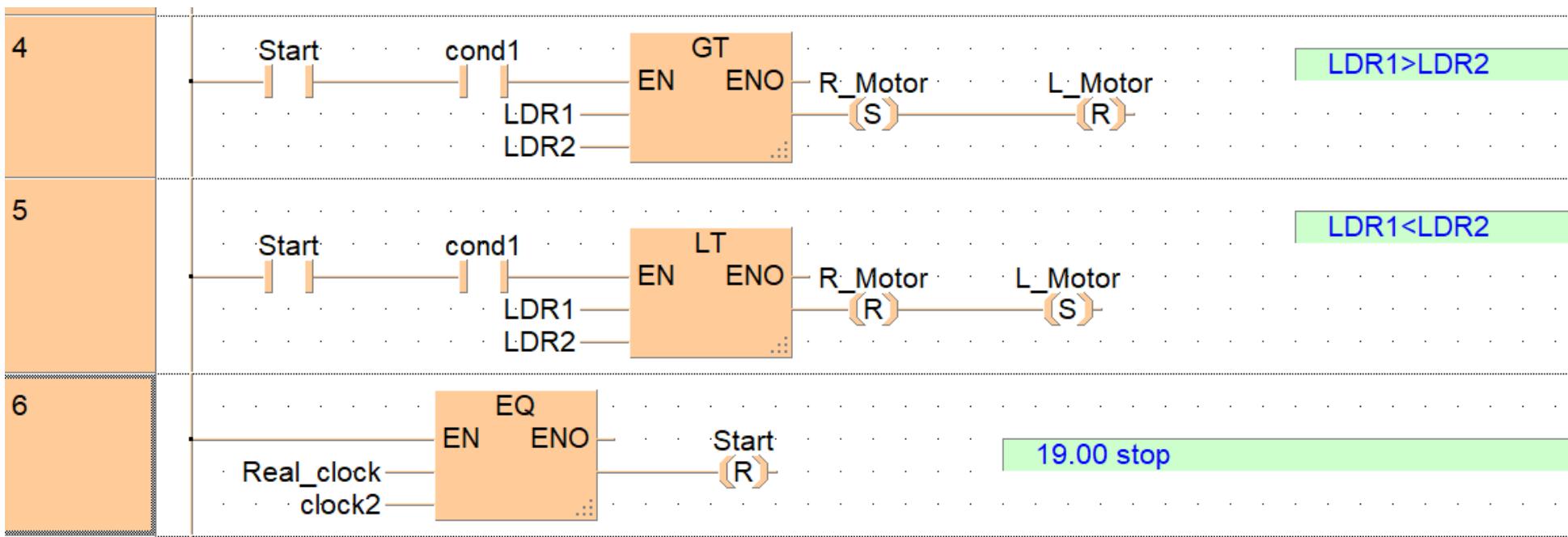
FLOWCHART



PLC FUNCTION BLOCK



PLC FUNCTION BLOCK

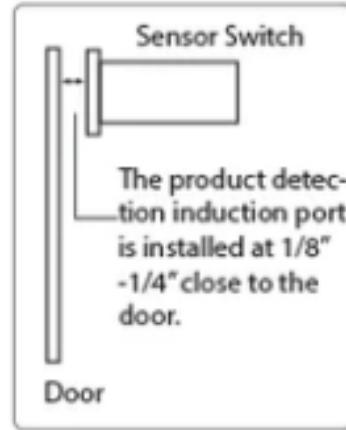


SECURITY SYSTEM



Integrated door and security system

EQUIPMENTS



Motion sensor
[Cata CT-9188]



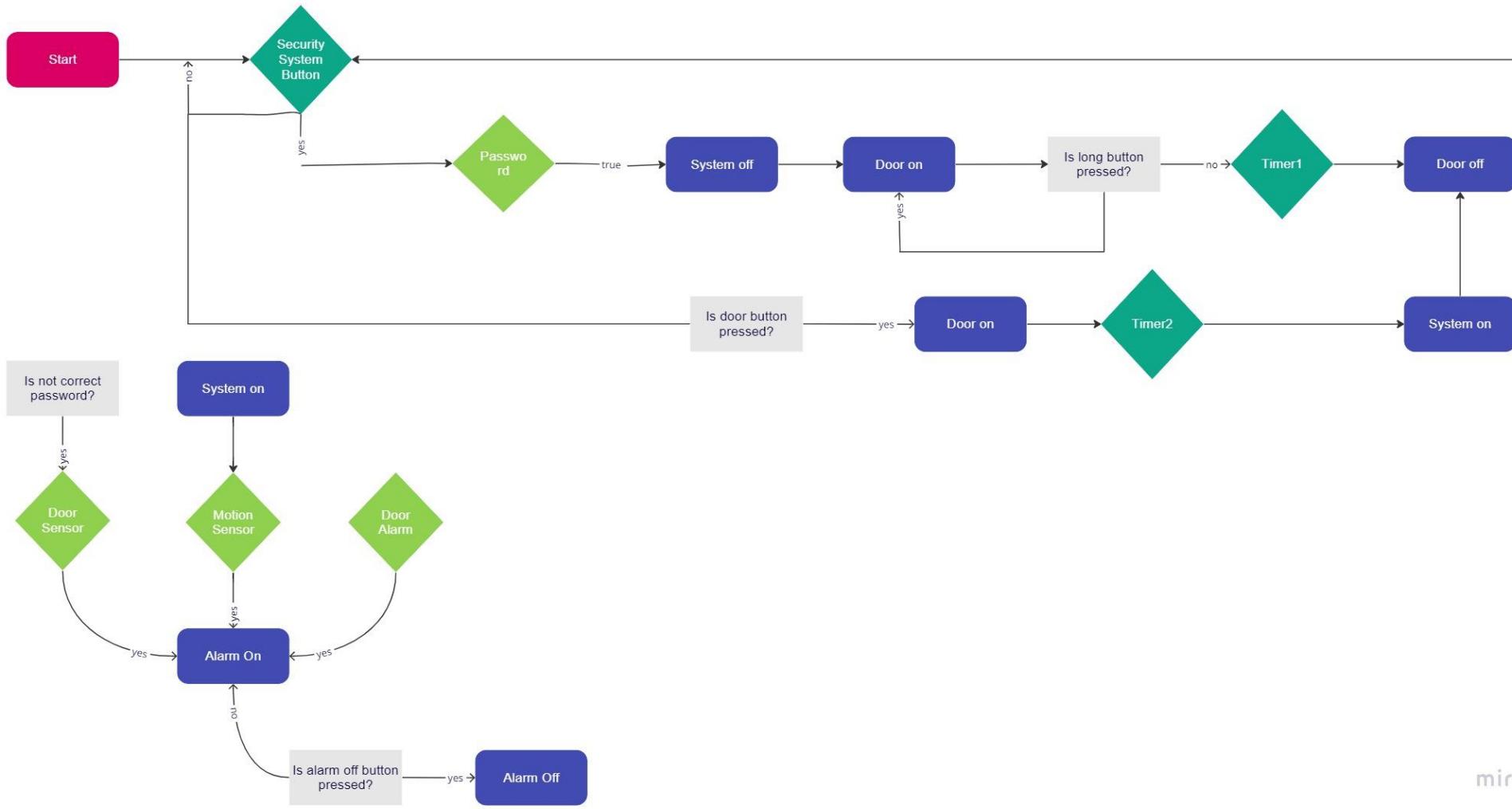
Door Window Sensor
[DS01-W]



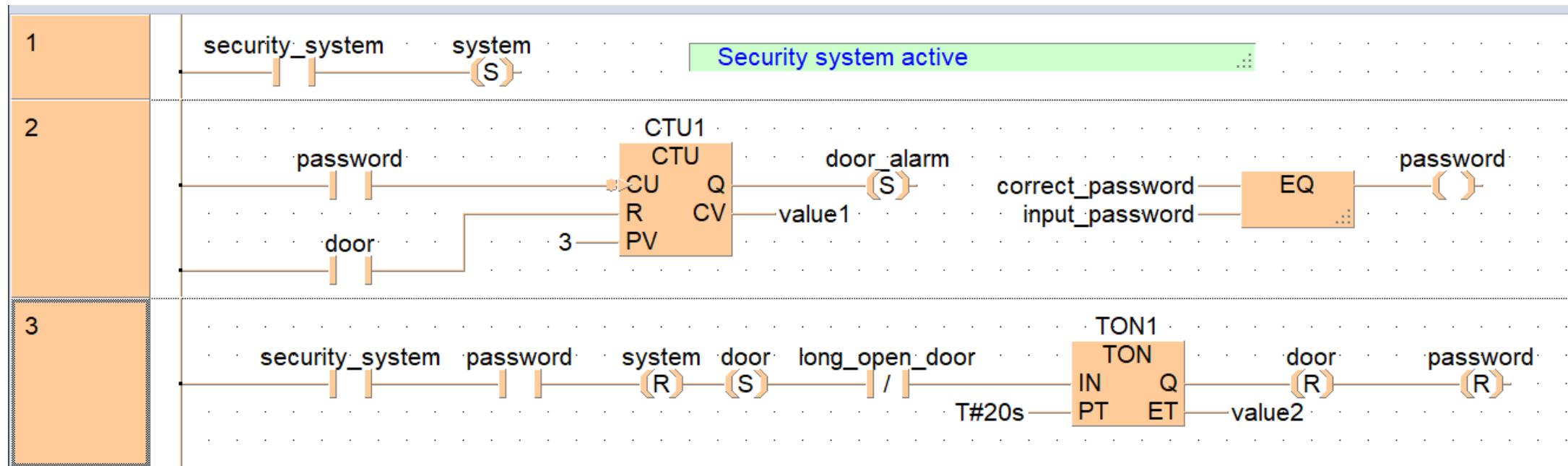
Password keypad



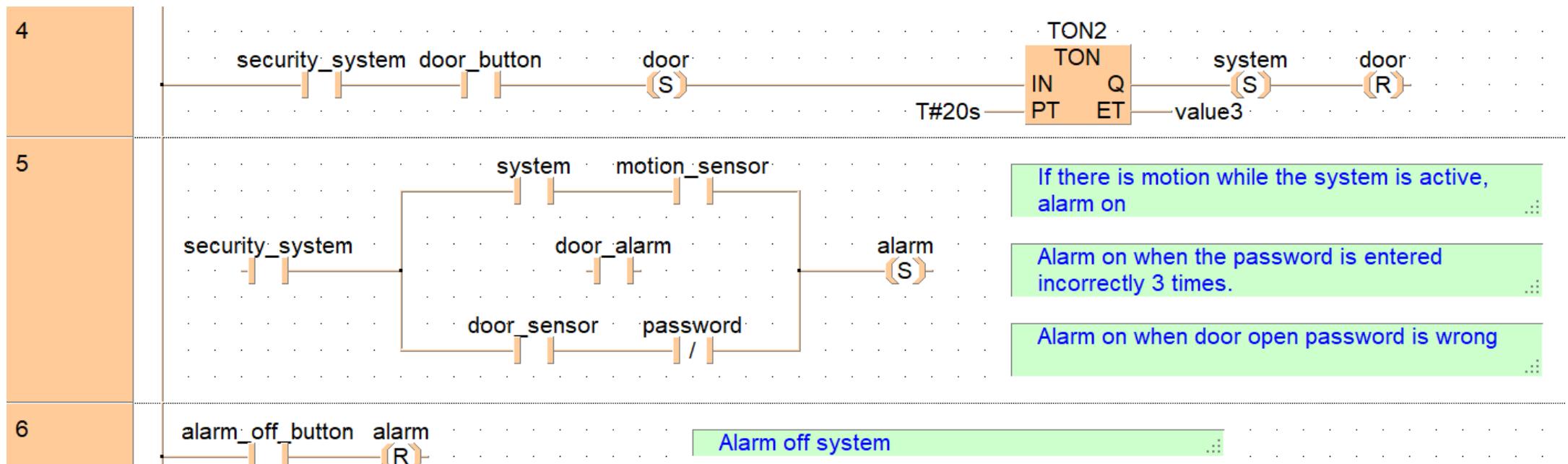
FLOWCHART



PLC FUNCTION BLOCK



PLC FUNCTION BLOCK



FIRE ALARM SYSTEM

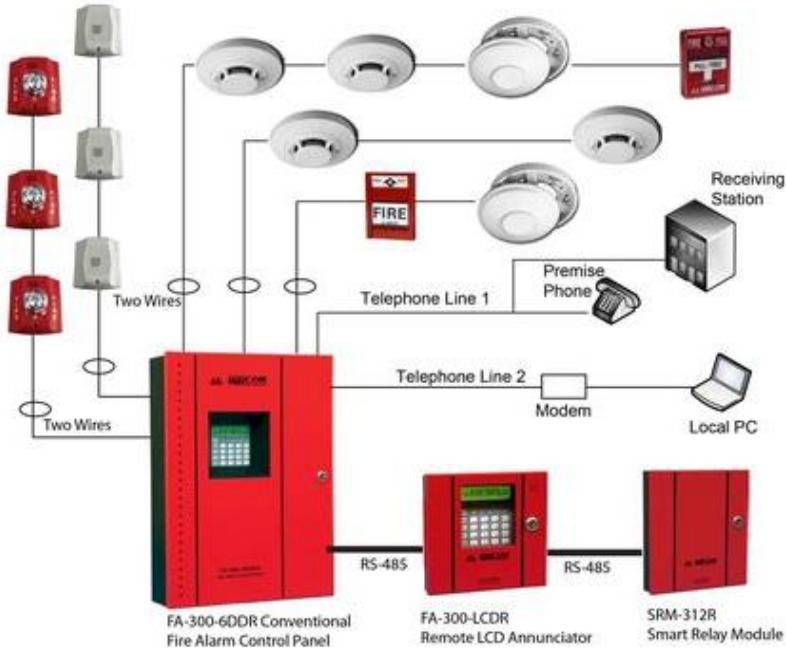


EN-54 Standards



Smoke detector control

EQUIPMENTS



Fire alarm



Fire sprinkler



Smoke detector



Heat detector



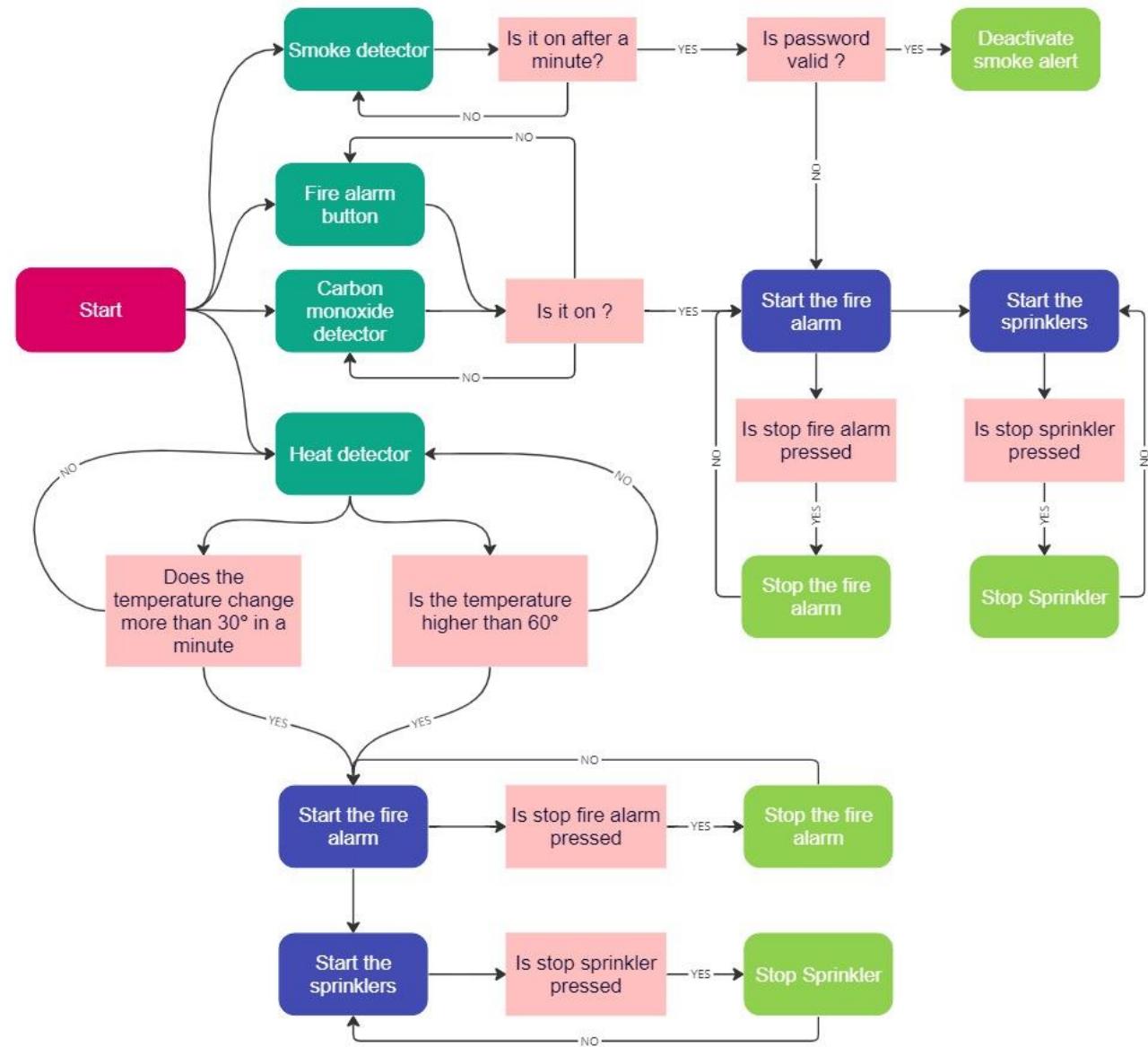
Carbon Monoxide
detector



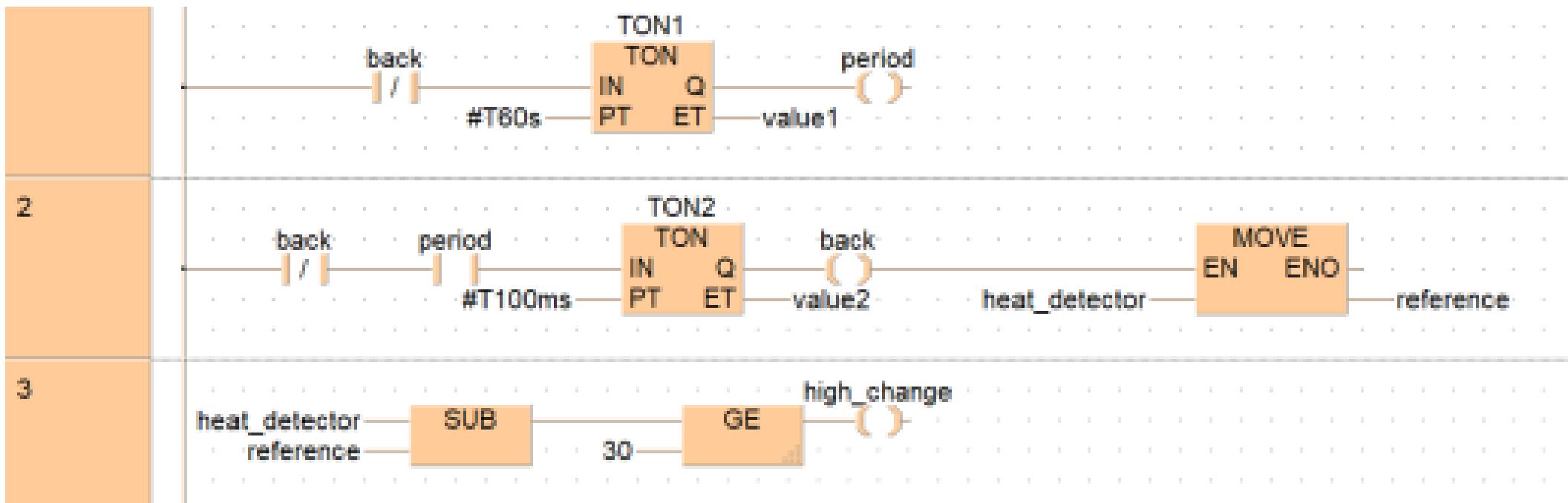
Call point



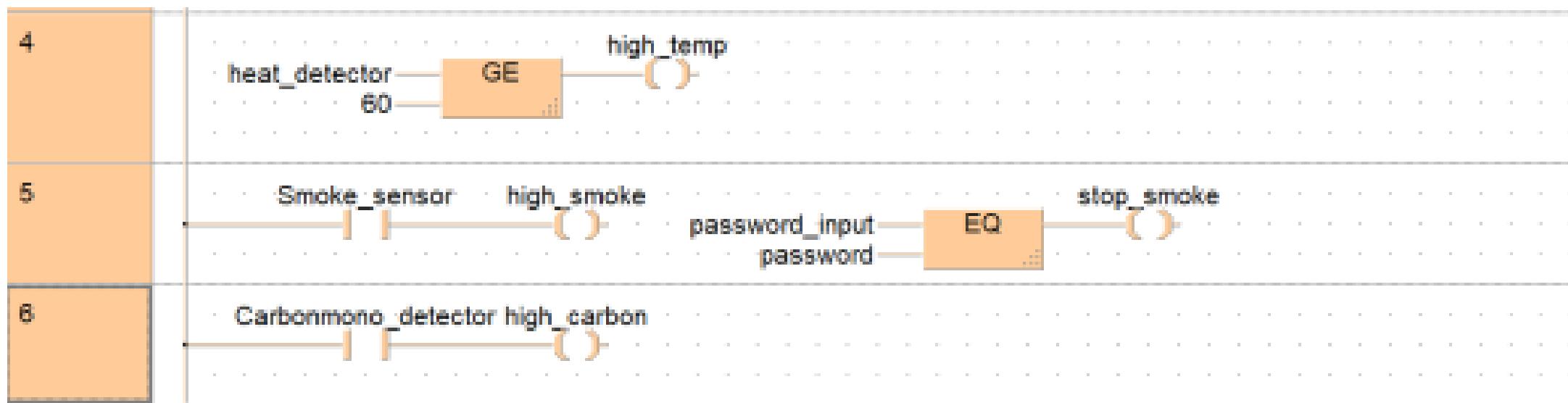
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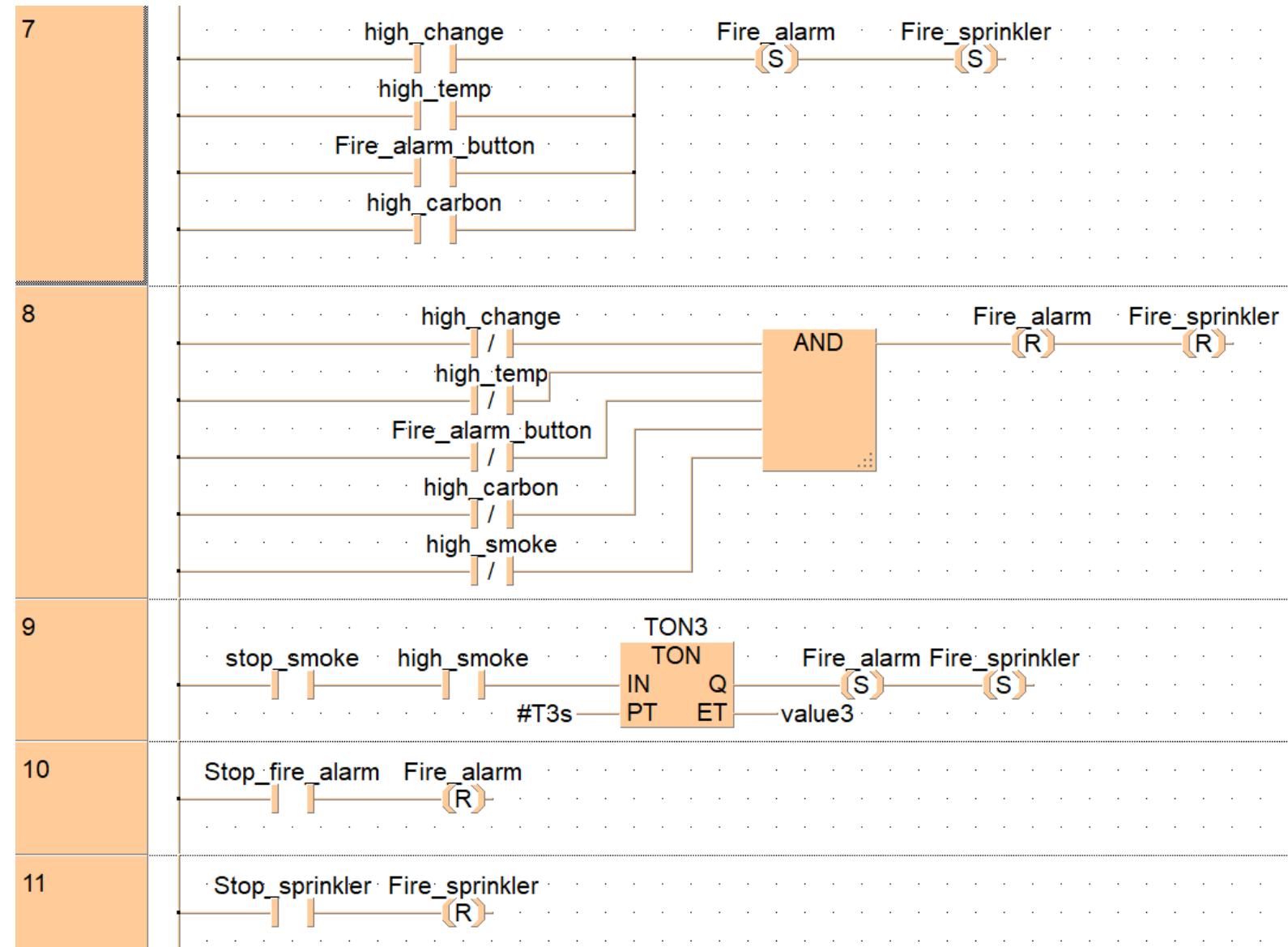
PLC FUNCTION BLOCK



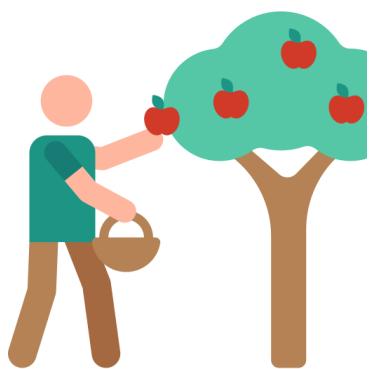
PLC FUNCTION BLOCK



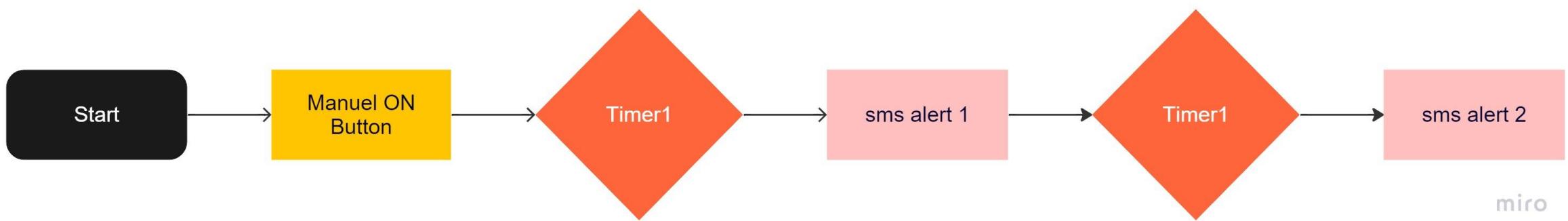
PLC FUNCTION BLOCK



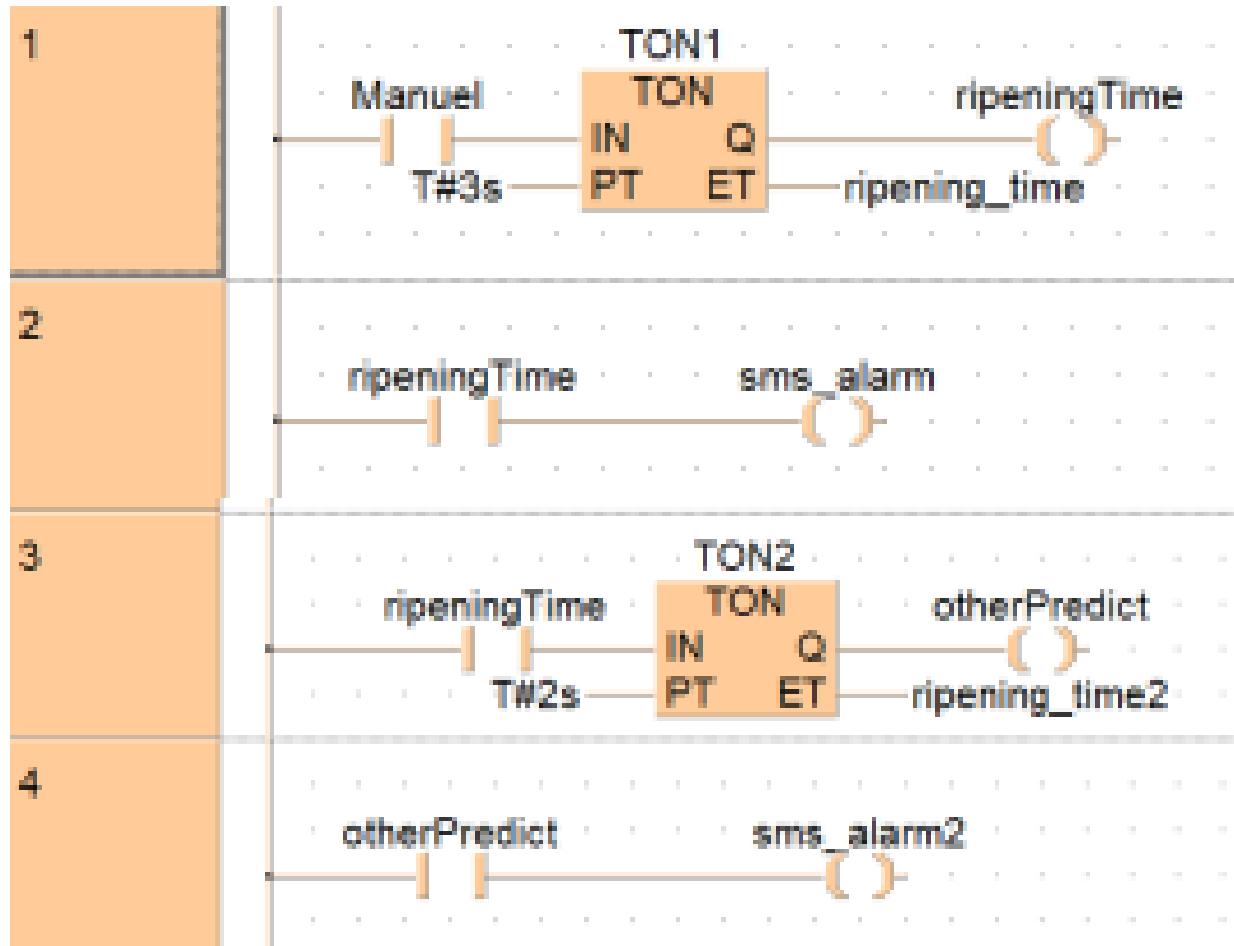
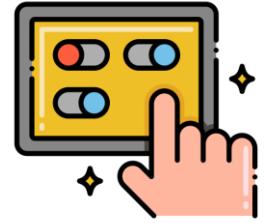
HARVEST TIME

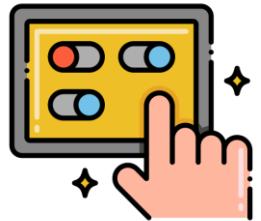


BQ100 GSM Control and Warning Device



PLC FUNCTION BLOCK





HUMAN MACHINE INTERFACE

GTWIN PRO

SYSTEMS MENU

- Fire System
- Heat System
- Humidity System
- Fertilization System
- Door System
- Other Systems - 1
- Other Systems - 2

PLC



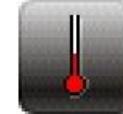
HEAT SYSTEM CONTROL



HEATER



COOLER



29°C



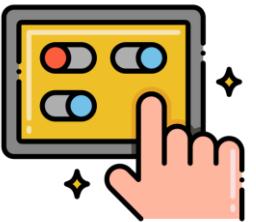
High
Alert



Low
Alert



HUMAN MACHINE INTERFACE



HUMIDITY SYSTEM CONTROL



FERTILIZER SYSTEM CONTROL



FAN



Foggy System



High
Humidity
Alert Low
Humidity
Alert

TANK-1



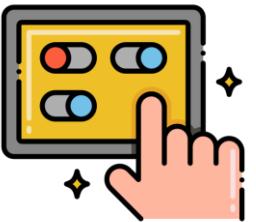
TANK-2



TANK-3



HUMAN MACHINE INTERFACE



CONTROL PANEL OF OTHER SYSTEMS – 2



Close
Fan
System

Dezenfection
Button

Ripening
Timer
Start



Ripening
Time



CONTROL PANEL OF OTHER SYSTEMS



Irrigation
Error

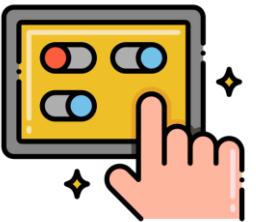
Reservoir
Level
Drop

CO₂
System
Alert

CO₂
System



HUMAN MACHINE INTERFACE



DOOR SYSTEM CONTROL



Security
Button



Long Open
Button



Alert



Close
Alert



Door Security
Password

1234



FIRE SYSTEM CONTROL



Smoke
Alert



SPRINKLER
OFF



ALARM
OFF



1234
Smoke Detector
Password



FIRE SYSTEM CONTROL



Smoke
Alert



SPRINKLER
OFF



ALARM
OFF



1234
Smoke Detector
Password





WATER AND IRRIGATION
MANAGEMENT



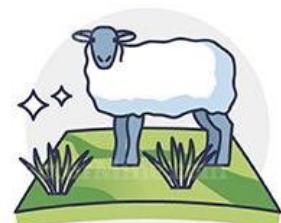
EROSION
MANAGEMENT



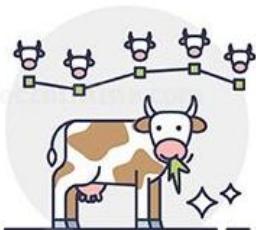
POST HARVEST
LOSSES MANAGEMENT



NUTRIENTS AND SOIL
FERTILITY MANAGEMENT



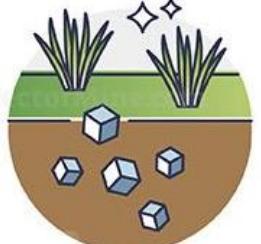
PASTURELANDS
MANAGEMENT



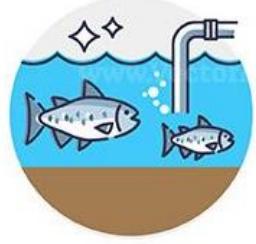
LIVESTOCK
MANAGEMENT

CONCLUSION

Through further implementations of other areas of production and different crops, we can create a more sustainable agriculture for the future



SOIL SALINITY
MANAGEMENT



FISHERY AND AQUACULTURE
MANAGEMENT



ENERGY
MANAGEMENT



WETLANDS
MANAGEMENT



INTEGRATED PESTS
MANAGEMENT

THANK YOU FOR YOUR
ATTENTION