PLC and Scada Based Security System in Ship

Divya Gaur[1], Aishwarya Lakhamade[2], Lata Bashera[3], Prof Shobha Nikam[4]
[1,2,3,4] Dept of E&TC
[1,2,3,4] AISSMS's IOIT, Pune, Maharashtra, India

Abstract- *The demand of high efficiency, automation is increasing rapidly for the controlling and monitoring purpose.Security for whole system is a big task and if manually done requires a large number of human labours. This paper demonstrates a PLC and SCADA based security system in ship. This paper deals with few of the parameters which are major issues. Fire sensor is used forfire detection as a safety parameter. The next parameter is level sensor, which is used to detect water leakage. The next major issue is regarding gas leakage, the gas sensor is used to overcome this issue. The main issue is oriented around control room, these are some restricted area where few authenticated peoples are allowed. Fingerprint machine is present outside the control room for the biometric verification and SCADA is also used for password verification.*

Keywords- PLC, SCADA, fire detection, water leakage, gas detection, fingerprint   authentication.

I. INTRODUCTION

Safety of people plays a vital role. Accurate fire detection & controlling in ship becomes a difficult task due to harsh environments. The combination of heat, fumes etc. inside ship accounted for most false alarms. Fire sensor is used in the ships to get the surrounding effects. The temperature may suddenly rise due to some unwanted circumstances. Keeping all this things in mind security is necessary. Fire sensors are used to detect the smoke or fire which can affect the ship badly. We are providing biometricsecurity and password security through SCADA. Only the authorised person will be able to enter the room. We are using 3 sensors to cover entire ship. Building a system with a gas sensor is not as easy as it could appear. Gas sensor is used to detect the presence of natural gases. Whenever gas leakage, the sensors used in the circuit will detect it. This will provide the immediate aid to the situation occur. The next sensor which is adding the security to the ship is level sensor. The main problem with the ships is they get sink in the water if water is over loaded in the ships. To overcome this problem level sensor is used so that if the water enters into the ship, buzzer will be in action and the certain action regarding safety measures can be taken.

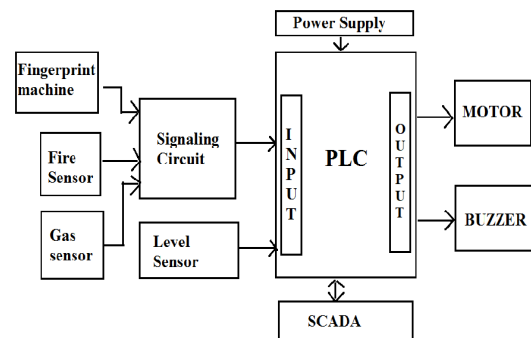## II. BLOCK DIAGRAM AND WORKING PRINCIPLE

A) Block diagram

Fig 1.Block Diagram

B) Block Diagram Explanation

1. Programmable Logic Controller is a digital computer used for the automation of various electro-mechanical processes in industries. These controllers are specially designed to survive in harsh situations and shielded from heat, cold, dust, and moisture etc. PLC consists of a microprocessor which is programmed using the computer language. A visual programming language known as the Ladder Logic was created to program the PLC.
2. Memory, Input/Output, Power supply unit, and programming device.
3. Sensor signalling circuit
    In this circuit, we are using ARDUINO UNO kit which contains ATMEGA 328P microcontroller. We are interfacing fire sensor module, gas sensor and fingerprint machine to this ARDUINO UNO kit.
4. Fingerprint machine
The fingerprint machine is used to provide biometric security to the control room where only authenticated people are allowed to enter.
5. Fire sensor
In ship fire is one of the major issues. To overcome this issue we are using fire sensor module which uses IR sensor.
6. Gas sensor
The gas sensor is used to detect gas leakage in the ship.
7. Level sensor
The level sensor is used to detect water leakage.

8. Motor

Motor is used to open and close door, whenever the fingerprint and password through SCADA matches.

9. Buzzer

We are using buzzer to get the indication whenever any sensor is high.

10. SCADA

SCADA screen is used to provide password and monitoring to the system.
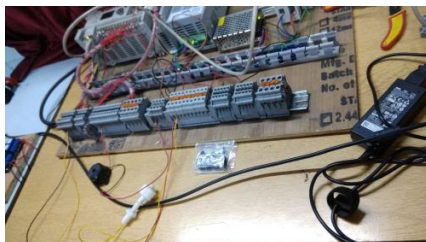
Results

Fig 2.working of system

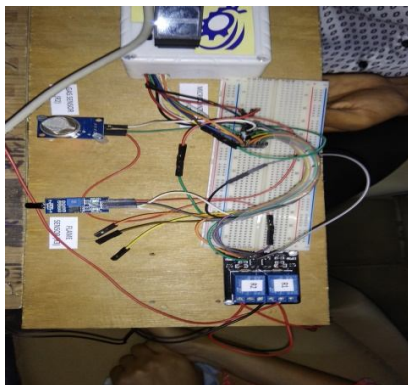Fig 3.Testing of level sensor and buzzer

Fig 4.working of Sensor signalling circuit

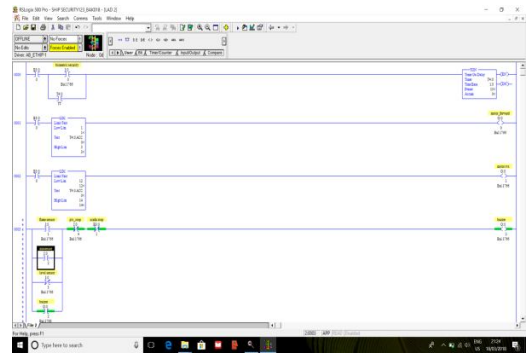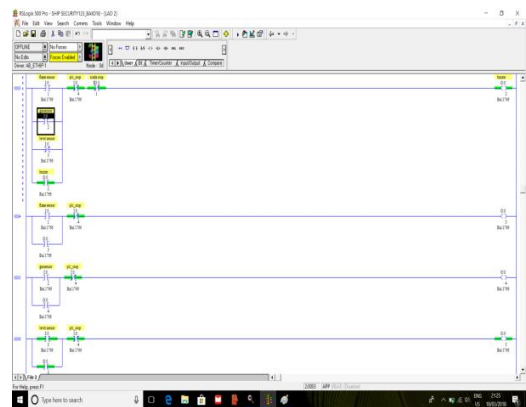## IV. SOFTWARE IMPLEMENTATION

Fig 5. Ladder diagram

Fig 6. Ladder diagram

V. CONCLUSION

In this paper, we have proposed the design of security system in ship. The objective behind this project is to provide safety and security in ship.

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detect the smoke and thermocouple to measure the temperature in the engine room.

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