ANDHRA LOYOLA COLLEGE

AUTONOMOUS :: VIJAYAWADA - 520 008

Established : 1954
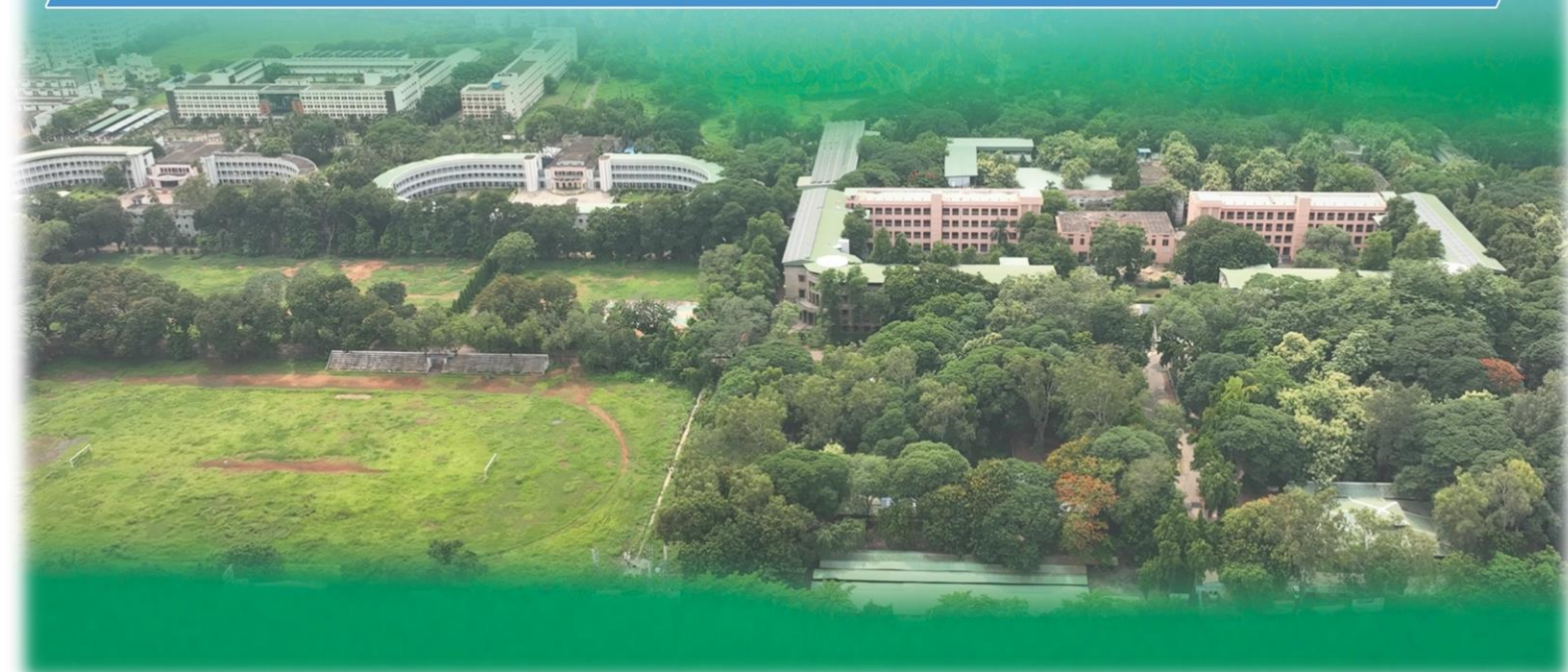
A CHRISTIAN MINORITY COLLEGE WITH CONSTITUTIONALLY PROVIDED RIGHT OF ADMISSION
(AN ISO 14001 : 2015 INSTITUTION)
THE ONLY COLLEGE IN BOTH THE TELUGU STATES TO HAVE BEEN RANKED AMONG
THE TOP 150 COLLEGES BY NIRF SINCE THE INCEPTION OF THE RANKING IN 2017
SELECTED UNDER THE STAR COLLEGE SCHEME OF DBT AND FIST PROGRAMME OF DST, GOVT.OF INDIA
SELECTED FOR ENHANCEMENT OF QUALITY AND EXCELLENCE UNDER RUSA BY MHRD, GOVT.OF INDIA

1.3: Curriculum Enrichment

A College Dedicated to All-Round Development of its Students

Andhra Loyola College
(Autonomous)
VIJAYAWADA-520 008.
Accredited in III Cycle at A⁺ Grade with a CGPA of 3.66 / 4.00
Web: www. andhraloyolacollege.ac.in   e-mail: contactalc@gmail.com

STD	: 0866
Main Off.	: 2476082
Inter	: 2476965
Degree	: 2481907
P.G.	: 2474902
CoE	: 2473251
Fax (Principal)	: 2474531
Fax (Correspondent)	: 2486084

1.3.3: Relevant information in institutional in institutional website as part of public disclosure

Course Structure

Proof from HEI Website

2022-23

https://www.andhraloyolacollege.ac.in/naac/IVCycle/CS/COURSE%20STRUCTURE-2022-2023.pdf

2021-22

https://www.andhraloyolacollege.ac.in/naac/IVCycle/CS/COURSE%20STRUCTURE-2021-2022.pdf

2020-21

https://www.andhraloyolacollege.ac.in/naac/IVCycle/CS/COURSE%20STRUCTURE-2020-2021.pdf

2019-20

https://www.andhraloyolacollege.ac.in/naac/IVCycle/CS/COURSE%20STRUCTURE-2019-2020.pdf

2018-19

https://www.andhraloyolacollege.ac.in/naac/IVCycle/CS/COURSE%20STRUCTURE-2018-2019.pdf

Project List

Proof from HEI Website

2022-23

https://www.andhraloyolacollege.ac.in/naac/student_support/projects/PROJECTS-2022-2023.pdf

2021-22

https://www.andhraloyolacollege.ac.in/naac/student_support/projects/PROJETCS-2021-2022.pdf

2020-21

https://www.andhraloyolacollege.ac.in/naac/student_support/projects/PROJECTS-2020-2021.pdf

2019-20

https://www.andhraloyolacollege.ac.in/naac/student_support/projects/PROJECTS-2019-2020.pdf

2018-19

https://www.andhraloyolacollege.ac.in/naac/student_support/projects/PROJECTS-2018-2019.pdf

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1.3.2: Program and Course contents having element of field projects/research projects/internships as approved by BOS

Course Structure

Proof from HEI Website

2022-23

https://www.andhraloyolacollege.ac.in/naac/IVCycle/CS/COURSE%20STRUCTURE-2022-2023.pdf

2021-22

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2020-21

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2019-20

https://www.andhraloyolacollege.ac.in/naac/IVCycle/CS/COURSE%20STRUCTURE-2019-2020.pdf

2018-19

https://www.andhraloyolacollege.ac.in/naac/IVCycle/CS/COURSE%20STRUCTURE-2018-2019.pdf

BoS Meetings Scanned copies

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2022-23

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2020-21

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2019-20

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2018-19

https://www.andhraloyolacollege.ac.in/naac/IVCycle/BSM/BOS-2018-2019.pdf

Certificate Of Internship

We proudly present this Certificate to

LAKSHMAN BISTA

in appreciation for your successful work as an intern at

STYRAX INSTRUMENTS INDIA PVT LTD.

The internship was conducted between **24.01.2022** and **31.05.2022**

31.05.2022

Signed Date

Ram Bandi

Managing Director

Date: 31/05/2022.

To,

Mr. Lakshman Bista,

Roll No: 193740,

Department of Electronics,

Andhra Loyola College,

Vijayawada.

Subject: Internship Appreciation

Dear Mr. Lakshman Bista,

I am writing this letter on behalf of Styrax Production Department in order to thank you and appreciate your performance during the internship. You joined us on 24/01/2022 and have worked with us for a period of 4months. I have been watching you closely and examining the work you put in. I am glad to tell you that I am rather impressed.

This internship is challenging, with a heavy workload. Not many are able to perform well. However, you have done quite well so far, especially taking into consideration the fact that this was your first internship. You have been very responsible, hard-working and very dependable. You have turned in good quality work. Also, another thing about you that caught our attention was that in the case of crisis, you always managed to come up with feasible solutions. We appreciate the efforts that you have put in.
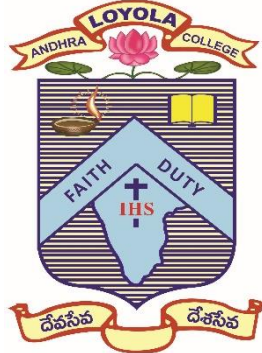
Thanking You,

Authorized Signature.

A.Vara Prasad
Production - Head

ANDHRA LOYOLA COLLEGE
(AUTONOMOUS)
VIJAYAWADA-520 008

"A COLLEGE WITH POTENTIAL FOR EXCELLENCE"- UGC

ACCREDITED at A$^+$GRADE WITH 3.66/4.00 POINTS- IN III CYCLE by NAAC
All India 34th Rank by NIRF, MHRD, GOVT. OF INDIA
(Affiliated to Krishna University)

"A STUDY ON AIR SHOWER INTERLOCKING SYSTEM AND DOOR INTERLOCKING SYSTEM"

AN INDUSTRY INTERNSHIP REPORT

Submitted to the Department of Electronics in partial fulfillment for the award of undergraduate degree in Electronics Technology
B.Sc. ELECTRONICS Technology course - 2019-2022
by

CHENNUBOYINA RAVI BABU
(Regd. No.:193744)
Under the guidance of
Sri. B. BALAJI BHANU, M.Sc., MCA, MTech., M.Phil., NET
Head, Department of Electronics

In collaboration with

STYRAX INSTRUMENTS INDIA Pvt. Ltd.
Hyderabad

Certificate Of Internship

We proudly present this Certificate to

CH. RAVI BABU

in appreciation for your successful work as an intern at

STYRAX INSTRUMENTS INDIA PVT LTD.

The internship was conducted between **24.01.2022** and **31.05.2022**

31.05.2022

Signed Date

Ram Bandi

Managing Director

STYRAX INSTRUMENTS INDIA PVT LTD

H.No. 2-77, Gajulramaram Village, Shapurnagar,
Qutbullapur Mandal, Medchal Dist.,
Telangana State - 500 055, INDIA

Mobile : +91 99 8922 2456
           +91 96 4044 7474
www.styraxinstruments.com
E-mail: sales@styraxinstruments.com

Date: 31/05/2022.

To,

Mr. Ravi Babu. CH,

Roll No: 193744,

Department of Electronics,

Andhra Loyola College,

Vijayawada.

Subject: Internship Appreciation

Dear Mr. Ravi Babu. CH,

I am writing this letter on behalf of Styrax Production Department in order to thank you and appreciate your performance during the internship. You joined us on 24/01/2022 and have worked with us for a period of 4months. I have been watching you closely and examining the work you put in. I am glad to tell you that I am rather impressed.

This internship is challenging, with a heavy workload. Not many are able to perform well. However, you have done quite well so far, especially taking into consideration the fact that this was your first internship. You have been very responsible, hard-working and very dependable. You have turned in good quality work. Also, another thing about you that caught our attention was that in the case of crisis, you always managed to come up with feasible solutions. We appreciate the efforts that you have put in.
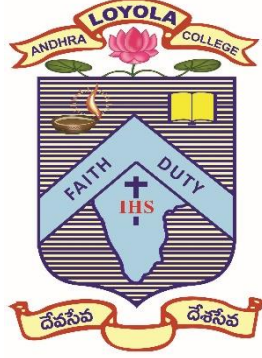
Thanking You,

Authorized Signature.

A.Vara Prasad
Production - Head

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(AUTONOMOUS)
VIJAYAWADA-520 008

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All India 34th Rank by NIRF, MHRD, GOVT. OF INDIA

(Affiliated to Krishna University)

CERTIFICATE

This is to certify that CHENNUBOYINA RAVI BABU (193744) has satisfactorily completed his 'INTERNSHIP TRAINING' and submitted the report to the department of Electronics, Andhra Loyola college in partial fulfillment of the award of undergraduate degree in Electronics Technology, B.Sc. course during the academic year 2019-2022.

Head of the department

(Mr. B. Balaji Bhanu)

Examiner-1   Examiner-2

DECLARATION

I do here by declare that the Industrial Training and project report entitled "**A STUDY ON AIR SHOWER INTERLOCKING SYSTEM AND DOOR INTERLOCKING SYSYEM"** is prepared basing upon the data and information gathered during internship period of four months (January 24th 2022 to May 31st 2022) as an **INTERN** (project trainee) at **STYRAX INSTRUMENTS INDIA Pvt. Ltd.,** Gajularamaram, Hyderabad. This project report is submitted in partial fulfillment of the award of undergraduate degree in Electronics Technology, BSc, course during the academic year 2019-2022 and was compound by me under the guidance of Sri. B. BALAJI BHANU, M.Sc., MCA, MTech., M.Phil., NET, Head, Department of Electronics.

Signature of the student

CH. RAVI BABU

(193744)

Department of Electronics

Andhra Loyola College (Autonomous)

VIJAYAWADA – 520 008

ACKNOWLEDGMENT

CH. RAVI BABU (193744)

INTRODUCTION ABOUT COMPANY

1.1Organisation

Styrax Instruments India Pvt. Ltd., has been one of the prominent manufacturers and suppliers of Process Measure and Control Systems, Clean room Interlocking Systems, Automation Solutions and hi-tech security and access control systems.

Styrax systems and products are engineered with excellent application options and implementations. Having established our credentials in the domestic and international market. We possess the capability of catering to the diverse requirements across multifarious industries.

Styrax founder Mr. Ram Bandi has been the visionary under whose expertise this company has flourished and achieved such success. It is his ongoing effort to maintain the high level of products and services to our customers and propel our company to even greater heights. Styrax Instruments India Pvt. Ltd., is an R&D focused company with over 10+ years of experience in designing and manufacturing components and systems for different applications.

Styrax also leverages its capabilities to design products and systems to suit customer specific requirements.

Product cost comprehensiveness, short implementation times, and ruggedness to withstand different conditions.

All designs pass through internal validation and verification before being release for the field trails and commercial operations.

With highly skilled technical team design engineers, and corporate financial commitment to reinvest up to 20% revenue into R&D activities, continuous product improvement and new product innovation is an evergoing activity at Styrax.

Styrax Instruments India Pvt. Ltd., at Hyderabad in India, is spread with over 13,500 sq.ft. built-up space housing various labs. Centre is equipped with the latest tools and testing facilities to support product development and manufacturing.

We are committed to designing products that meet and often exceed our customer's requirement. We promise to use the best of the engineering talent in our research and development efforts and to use technology as a means to designing a useful product and not as an end in itself.

1.2 Team

The level of service and products we provide to our clients would have been impossible without the proficient support of our talented workforce. Their expertise in management of production processes has contributed in a very substantial way to achieve the present level of success. Our engineers and technicians are well versed with Process measure control systems and other systems thereby giving valuable inputs regarding client's expectations and our ability to fulfill them.

1.3 Commitments

Secret of Styrax Instruments India Pvt. Ltd., success lies in our customer's satisfaction. Since our inception, we built a reputation with our customers for our research, design and development, quality, and service capabilities. Today, our commitments to our customers are in these areas.

1.4 Quality

We are committed to providing products with the highest quality. We adhere to Quality Assurance System as per ISO 9001:2015(QMS) at every step of product creation.

1.5 Customer Service

We are committed to providing the best customer service, focusing on the areas of service, product support and customer training. All our customer service functions are handled by our specially trained team of Marketing Executives and Service Engineers.

1.6 Work Culture

Work Culture emphasizes:

- ➢ Freedom to experiment
- ➢ Continuous learning and training
- ➢ Transparency
- ➢ Quality in all aspects of work
- ➢ Rewards based on performance and potential

1.7 Training

Human Resources Department believes that Quality is the hallmark of any successful venture. Quality Training and Development of Human Resources is realized through: Identifying

training needs within the Organization and designing and implementing those need based training programs to bring about continuous up-gradation of knowledge, skills and employee attitudes.

1.8 VISION & MISSION

VISION

Styrax Instruments India Pvt Ltd shall be professionally managed and committed to total customer satisfaction and enhancing value. Styrax Instruments India Pvt Ltd shall be an innovative entrepreneurial and empowered team constantly creating value and attaining benchmarks. Styrax Instruments India Pvt Ltd shall foster a culture of caring trust and continuous learning while meeting expectations of employees, stake holders and society.

MISSION

To achieve excellence in the field of Engineering, Procurement and Manufacturing through world class practice and standards in quality, Safety and Project Management.

2. WHERE I WAS

How I was work o**n** air shower interlocking system and door interlocking system in styrax in different stages.

At first assembling members will assemble the 80% -90% of the main PCB. They assemble the parts like resistors, capacitors, latches, IC base connectors and some of the diodes and IC's and bug pins, LED's etc. The required parts like relays, single core wires, keypads, ss plate, acrylic sheets, and Ms box for air shower interlocking system.

2.1 CODE DUMPING

After gathering all the components on the PCB of air shower interlocking system, we clean the PCB board using IP solution to avoid the unwanted lead particles and dust in the PCB board. The controller having 48 pins(F020) for this we have to provide +5volts VCC. To the IC and by using debugger we will dump the code to the IC by using silicon lab application and also debugger. The will help to converts the code into numerical bits. And after completion of code dumping we will start doing initial testing for the main PCB by connecting all the required power supply, EM locks and DPM.

Fig 2.1a: IC F020

Debug Adapter

A debug adapter is a standalone executable that typically talks to a real debugger and translates between the abstract CDP and the concrete protocol of the debugger.
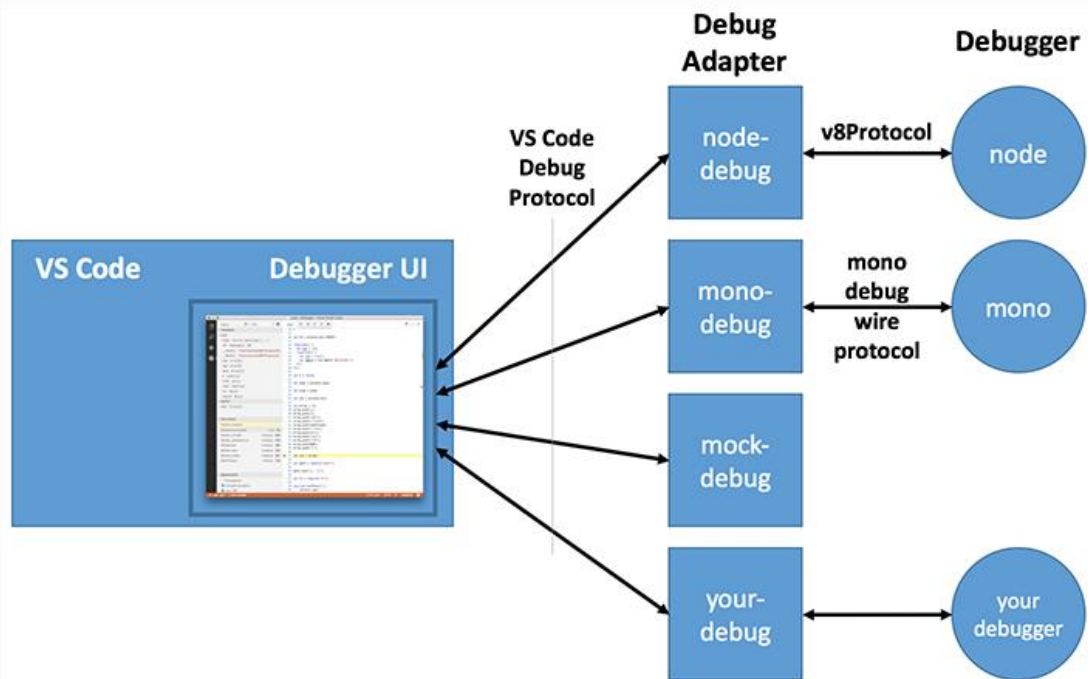
In order to avoid problems with local firewalls, VS Code talks to the adapter through stdin/stdout instead of using a more sophisticated communication mechanism.

Fig 2.1b: Debug Adapter

2.2 Fitting

After completion the air shower display module membrane keypad height adjust the height by pressing membrane key for the display module and then soldering the keypad by adjust height on the display module. And now place the acrylic sheet to the ss plate and fix it to the display module. And now fix all the required parts like MCB's, Concactor, Line filter, Snubber circuit, SMPS AND PCB BOARD. By using screw's with help of screw drivers on MS box.

Fig 2.2 Air shower MS box with fitting

2.3 Burning

The hole process is completed in production department the Air Shower interlocking System is taken in to the burning stage. In burning stage the several air showers is connected individual loop and we let them in ON state for minimum 24 hr's . And now check that the Air shower controller will ON or not. And some of the problems are occur we have to identify and troubleshoot it and again start initial testing and place it again burning.

2.4 Trouble shooting

After the completion of burning stage then we go to final testing. If any of the problem occurs. The Air Shower will send to the production and trouble shoot it. By using the schematic

diagram and by using bare board we will trouble shoot the air shower controller. Most of the problems are occur on the ctrl and some of the switching problems: then we have to check the ctrl and then go to latches and optocouplers and the reference resistors and capacitors. And some of the shortages in   controller board we have to clear by using the soldering iron. And again start the initial testing and again place in on burning.

AIR SHOWER INTERLOCKING SYSYEM
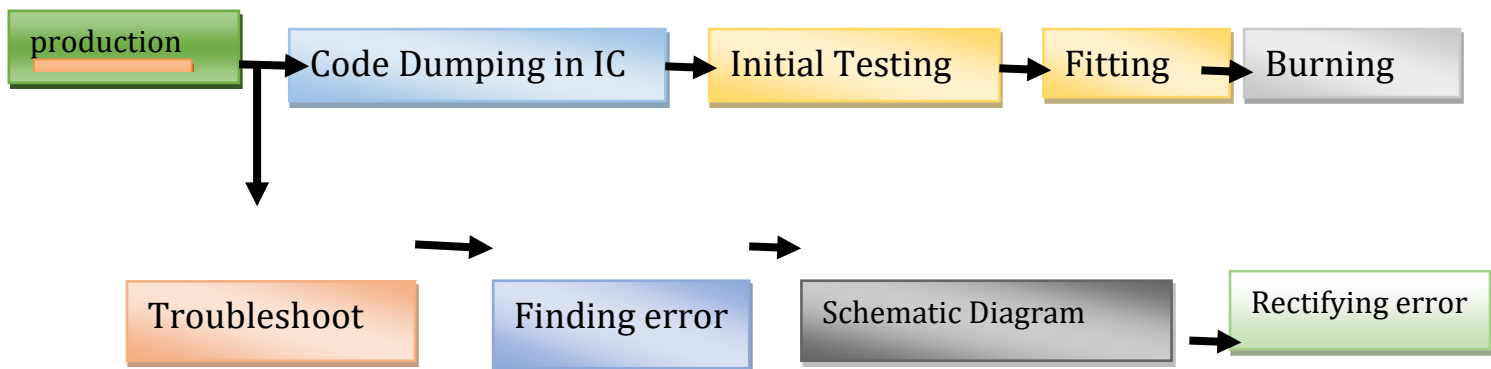
3. THE END PRODUCTS I INVOLVED

3.1 BRIEF INTRODUTION OF PROJECTS

The air shower is a supporting device for the clean workshops and the assembly clean room, is used to blow the dusts attached to the surfaces of the people and objects entering the clean workshop, and also functions as an air brake to prevent non-purified air from entering the clean area. It is an effective device to clean up the surfaces of the persons and the objects and to prevent the outdoor air from invading the clean area. It has strong versatility, can be used along with all clean rooms and clean workshops, and is an ideal choice to establish a dust-free workshop.

Fig no.3.1a Air Shower Controller

The Air Shower system controls the sequential locking and release of the doors, and controls the Blower. The two doors are interlocked such that two doors cannot be open at the same time, to prevent pressure losses and cross contamination.

Our Air Shower interlocking system achieve this by preventing simultaneous access of door by ensuring that when one door for a Air Shower interlocking system is open then other door is closed, before opening of door.

1. When any one of the Door is opened the display on the other doors will indicate "WAIT" & person access the door by pressing push button.

2. All Doors are provided with EM Locks.

Fig .3.1b Air Shower Display Module

3.2 INSTRUMENT OPERATING SEQUENCE

Unlike conventional air showers which are delivered with a fixed operating sequence, the Esco Cleanroom Air Shower's operating sequence may be selected from three pre-programmed sequences:
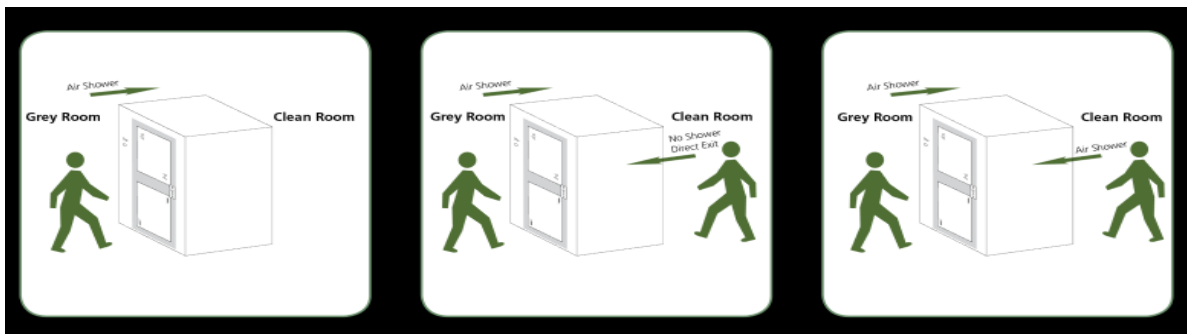
Fig: left illustration   Fig: Two-way One illustrations   Fig: Two illustration

Air Shower Operating Sequences

One-Way

(Left Illustration): Personnel may enter the controlled environment but not exit through the air shower. At the idle state, the clean side door is locked while the grey side is unlocked. This mode of operation is useful for controlling traffic patterns in and out of the controlled environment.

Two-Way One-Way

(Middle Illustration): Personnel may enter or exit the controlled environment through the air shower. The air shower program is able to detect if the person is entering or exiting the controlled environment via door sensors and a time-sequenced control.

Two-Way

(Right Illustration): Personnel may enter or exit the controlled environment through the air shower. In both directions, the air shower is activated. This mode of operation is useful in pharmaceutical and lab animal research applications to prevent the egress of hazardous substances and allergens from the controlled environment.

3.3 INSTRUMENT OPERATIONAL FLOW CHART

- The Air Shower Control and monitor system is based on a microcontroller interface and together forms an embedded system. The block diagram shows the flow of the system that is implemented for the functioning and utilization of the Cleanroom.

- The air shower operates two magnetic door that are being controlled by the prompts given from the microcontroller and the doors can be controlled using a push switch that has been incorporated in the design.

- To enter the cleaning room, the User has to press the switch which prompts the MCU to send an acknowledgement signal and hence the door is opened as the receptive pulse

is received.

- This is basically controlled by the code which sends a signal to the pin on which the functionality has been assigned. When the User enters the Door 1 the door will close without pressing the push switch and certain Functions are performed as follows.

- We have incorporated a Status Display in the cleaning room such that when any function is happening, it shall be displayed on the same.

- After the Door 1 has closed, timer- based fans will start functioning for 15 to 20 seconds, please note that the intensity of the fans can be increased/decreased by the User as need be.

- These fans are powerful enough to blow-off the micro dust particles that the human body carries as clothing and such sorts. As the timer ticks, the fans are turned off, during this, both theDoor1and 2 are closed.

- Once the blowing is finished, the Door 1 opens for the User to passthrough. As the User has now access through the Door 2, they are Particle-free at this instant and are safe to enter the area of work.
- After the operation of the cleaning room is finished, the User can leave from Door 2 which was closed the entire time the blowing was going on.

- The Door here gets the signal prompts with a push button hence after every use it becomes necessary to use the push button to open/close the Cleaning Room Doors.

For Entering Cleanroom

```
        ┌──────────┐
        │  Start   │
        └────┬─────┘
             ▼
      ┌────────────┐
      │ Push Switch│
      └─────┬──────┘
            ▼
   ┌──────────────┐
   │Open the door 1│
   └──────┬───────┘
          ▼
  ┌─────────────────┐
  │Enter the air shower│
  └───────┬─────────┘
          ▼
    ┌────────────┐
    │Close door 1│
    └─────┬──────┘
          ▼
     ┌─────────┐
     │ Fan on  │
     └────┬────┘
          ▼
  ┌────────────────┐
  │Timer 20 second │
  └───────┬────────┘
          ▼
     ┌─────────┐
     │ Fan off │
     └────┬────┘
          ▼
  ┌───────────────┐
  │Open the door 2│
  └───────┬───────┘
          ▼
  ┌────────────────┐
  │Exit the air shower│
  └───────┬────────┘
          ▼
   ┌────────────┐
   │Close door 2│
   └─────┬──────┘
         ▼
   ┌──────────┐
   │   Stop   │
   └──────────┘
```

3.4 DISPLAY MODULE KEY INDICATIONS IN THE BELOW:

The air shower display module consists of different of units and each unit having different functions.

- SET: - The set key is useful to show the functions of the display than only we have to aces display.

- INCREMENT: -The increment key is useful for increment the values from the range 0 to 255 in the display modules.

- DECREMENT: - The decrement key is useful for decrement the values from the range 255 to 0 in the display.

- EMERGENCY: - The emergency key is useful in emergency situations. By pressing the key the doors will open in air shower.

- ENTER: - The enter is useful after completion we have save the data by using this enter key in display module.

- MODE: - The mode is a key in the display module which we have to select that it should be in MAN mode or AUTO mode.

Features:

- Advanced Micro controller based.
- Supports Maximum of 3 doors
- Supports Electromagnetic locks/Electric strikers
- Door status indication with high intensity Bar LEDs
- Status indication: GO, WAIT on push button station.
- Digital Display with soft touch Membrane keypad/Capacitive Touch button.
- Status indication: OPEN (Exit door open), Mode of operation: MAN, AUTO on digital display module.
- Password protected configuration menu.

- User programmable Blower ON time variable from 0–999 Sec.
- Buzzer output for exit door is open.
- Air shower controller controls blower through overload protection relay
- MCB provided to control ON/OFF Air shower Controller.

3.5   INITIAL   TESTING   PROCEDURE   OF   AIRSHOWER INTERLOCKING SYSTEM

- In this initial testing procedure that we observer two conditions are in the air shower interlocking system.
- The two conditions are Normally open conditions and Normally closed condition.
- Here that the assemble printed circuit board is taken for the initial testing by adding relays and connecting wires to the PCB board.
- Dumping the code using debugger to the IC f020.
- Now start the initial testing to the printed circuit board.

NORMALLY CLOSE CONDITION:

- Connect the PCB board to SMP contain +24v and +5volts.
- Connect the eml1 positive to the +24 volts positive in the PCB board.
- Now connect the eml2 positive to the +24 volts positive in the PCB board.
- Connect the feedback1 wire to the PCB board.
- Connect the feedback2 wire to the PCB board.
- Connect the eml1 and eml2 to GND to the PCB board.
- Place the door1 push buttons to the PCB board have the positions like pb, +24, GND, LED, BUZ.
- Place the door2 push button to the PCB board as same as door1 push button.
- Connect power card to the PCB board contains 230 volts AC.
- Place the jumper at j6 in the PCB board.
- Now switch ON the power supply.
- Press the door1 push button and unlock the door1 and wait for the buzzer.

- the door1 push button indicate GO condition and door2 to will be WAIT condition in that time we does not unlock the door2.
- After 2min the buzzer will ON that time we will close the door1.
- Now CF and BLOWER will ON condition and the timer will run in the Display module in that time the two doors will be WAIT condition.
- After completion of the time door2 will be unlock and BLOWER will be OFF and CF is ON condition once the door2 will open and close the CF will be OFF.
- Now check the voltages using multimeter we are getting +24 volts and +230, +5v in the PCB board.
- Now set the timer in the display module using set key and increment, Decrement, MAN mode, Auto mode, and enter.
- We can set the time up to 999 seconds in the display module.
- And now press emergency in the display module the doors will be toggle in the push buttons and indicate GO and WAIT.

NORMALLY OPEN CONDICTION:

In this normally open condition push buttons cannot be switching it can be useful for indications purpose.

- Connect the PCB board to SMP contain +24v and +5volts.
- Connect the eml1 positive to the +24 volts positive in the PCB board.
- Now connect the eml2 positive to the +24 volts positive in the PCB board.
- Connect the feedback1 wire to the PCB board.
- Connect the feedback2 wire to the PCB board.
- Connect the eml1 and eml2 to GND to the PCB board.
- Place the door1 push buttons to the PCB board have the positions like pb, +24, GND, LED, BUZ.
- Place the door2 push button to the PCB board as same as door1 push button.
- Connect power card to the PCB board contains 230 volts AC.
- Remove the jumper at j6 in the PCB board.
- Now switch ON the power supply.

- Press the door1 push button and unlock the door1 and wait for the buzzer.
- the door1 push button indicate GO condition and door2 to will be WAIT condition in that time we do not unlock the door2.
- After 2min the buzzer will ON that time we will close the door1.
- Now CF and BLOWER will ON condition and the timer will run in the Display module in that time the two doors will be WAIT condition.
- After completion of the time door2 will be unlock and BLOWER will be OFF and CF is ON condition once the door2 will open and close the CF will be OFF.
- Now check the voltages using multimeter we are getting +24 volts and +230, +5v in the PCB board.
- Now set the timer in the display module using set key and increment, Decrement, MAN mode, Auto mode, and enter.
- We can set the time up to 999 seconds in the display module.
- And now press emergency in the display module the doors will be toggle in the push buttons and indicate GO and WAIT.

4. INTERLOCKING SYSTEM

4.1 BRIEF INTRODUCTION OF INTERLOCKING SYSTEM

Door interlock controller achieve this by preventing simultaneous access of door /Room by ensuring that when one door for a room is open then other door is closed. Push buttons are available for door access. Emergency stations are available for opening for all doors. Delay between each door openings to maintain required pressure. Door status can read by any master system connected over RS485 network. This door interlocking system shall interface with Fire Alarm System.

Door interlocking system also display door delay timer by using pushbutton with Timer display and these push button can interface to controller through RS485

Fig: 3-door interlocking   Fig: Door Interlocking system

FEATURES

- Microcontroller based Door Interlocking System.

- Door interlocking systems supports maximum of 16doors.

- User can configure Normally Closed mode or Normally Open mode.

- Configurable door closure time interval for 4 to 16 door interlocking systems.

- **Mode of Operation:** NC or NO.

- **Door delay time:** Pre -programmed as per requirement.

- Pushbutton Inputs based on Doors maximum 16 Doors.

- Door Feedback Inputs based on doors maximum 16.

- Door Control Outputs based on doors maximum 16.

- LED Indications for push buttons: GO/WAIT.

- 3-digit 0.3" 7-Segment display to display door delay timer.

- Door delay timer can interface to control unit through RS485.

4.2 INITIAL TESTING PROCEDURE OF DOOR INTERLOCKING SYSYEM

LOGIC

When one door is in open state then the remaining doors will be in wait state

- In this initial testing procedure that we observer two conditions are in the Door interlocking system.
- The two conditions are Normally open conditions and Normally closed condition.
- Here that the assemble printed circuit board is taken for the initial testing by adding relays and connecting wires to the pcb board.
- Dumping the code using debugger to the IC AT89S52.
- Now start the initial testing to the printed circuit board.

NORMALLY CLOSE CONDITION:

- Connect the PCB board to SMP contain +24v and +5volts.
- Connect the eml1 positive to the +24 volts positive in the PCB board.
- Now connect the eml2 positive to the +24 volts positive in the PCB board.
- Connect the eml3 positive to the +24 volts positive in the PCB board.
- Connect the feedback1 wire to the PCB board.
- Connect the feedback2 wire to the PCB board.
- Connect the feedback3 wire to the PCB board.
- Connect the eml1, eml2, eml3 to GND to the PCB board.
- Place the door1 push buttons to the PCB board contain the positions like pb, +24, GND, LED, BUZ.
- Place the door2 push buttons to the PCB board contain the positions like pb, +24, GND, LED, BUZ.
- Place the door3 push buttons to the PCB board contain the positions like pb, +24, GND, LED, BUZ.
- Connect the emergency push button
- Connect power card to the PCB board contains 230 volts AC.
- Place the jumper at j4 J6 J5, J9, J14, J16 in the PCB board.
- Now switch ON the power supply.
- Press the door1 push button and unlock the door1 and wait for the buzzer.
- the door1 push button indicate GO condition and door2 door3 will be WAIT condition in that time we cannot unlock the door2 and door3.
- After 2min the buzzer will ON that time we will close the door1.
- After 2min the buzzer will ON that time we will close the door2.
- After 2min the buzzer will ON that time we will close the door3.
- Check the fire case by using a loop and short the fire and GND.
- Now check the voltages using multimeter we are getting +24 volts and +5v in the PCB board.
- Now check the emergency buzzer by pressing emergency push button.
- Now the door 1, door2, and door3 push buttons indications will toggle.

NORMALLY OPEN CONDITION:

In this normally open condition push buttons cannot be switching it can be useful for indications purpose. But the voltages should be 0volts.

- Connect the PCB board to SMP contain +24v and +5volts.
- Connect the eml1 positive to the +24 volts positive in the PCB board.
- Now connect the eml2 positive to the +24 volts positive in the PCB board.
- Connect the eml3 positive to the +24 volts positive in the PCB board.
- Connect the feedback1 wire to the PCB board.
- Connect the feedback2 wire to the PCB board.
- Connect the feedback3 wire to the PCB board.
- Connect the eml1, eml2, eml3 to GND to the PCB board.
- Place the door1 push buttons to the PCB board contain the positions like pb, +24, GND, LED, BUZ.
- Place the door2 push buttons to the PCB board contain the positions like pb, +24, GND, LED, BUZ.
- Place the door3 push buttons to the PCB board contain the positions like pb, +24, GND, LED, BUZ.
- Connect the emergency push button
- Connect power card to the PCB board contains 230 volts AC.
- Place the jumper at j4 J6 J5, J9, J14, in the PCB board.
- Now remove the jumper J16 in the PCB.
- Now switch ON the power supply.
- Press the door1 push button and unlock the door1 and wait for the buzzer.
- the door1 push button indicate GO condition and door2 door3 will be WAIT condition in that time we cannot unlock the door2 and door3.
- After 2min the buzzer will ON that time we will close the door1.
- After 2min the buzzer will ON that time we will close the door2.
- After 2min the buzzer will ON that time we will close the door3.
- Check the fire case by using a loop and short the fire and GND.
- Now check the voltages using multimeter we are getting +24 volts and +5v in the PCB board.

- Now check the emergency buzzer by pressing emergency push button.

- Now the door 1, door2, and door3 push buttons indications will toggle.

4.3 THE WIRING DIADRAM OF INTERLOCKING SYSTEM
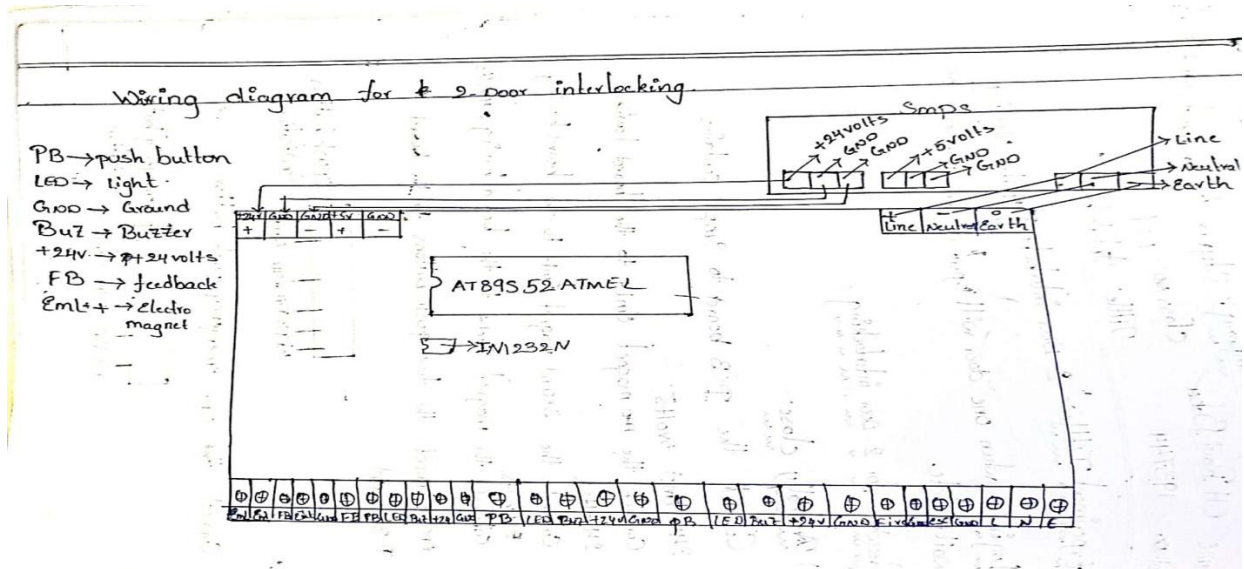
Fig: wiring of interlocking system

5. LIST OF COMPONENTS

Components used in the air shower interlocking system

- Microcontroller
- 7-segment display
- Contactor
- Power supply
- MCB
- Key pad
- Line filter
- Snubber circuit
- EM locks

5.1 MICROCONTROLLER

Microcontroller C8051F020 contains code memory or program memory 4K so that is has

4KB Rom and it also comprise of data memory (RAM) of 128 bytes. Bus: Fundamentally Bus is a group of wires which functions as a communication canal or mean for the transfer Data. These buses comprise of 8, 16 or more cables.

Low-power, high-performance CMOS 8-bit microcontroller with 8KB of ISP flash memory. The device uses Microchip high-density, nonvolatile memory technology and is compatible with the industry-standard 80C51 instruction set and pin-out. On-chip flash allows the program memory to be reprogrammed in-system or by a conventional nonvolatile memory programmer. This powerful microcontroller is suitable for many embedded control applications.

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5.2 7-SEGMENT LED DISPLAY

The seven segment displays are the oldest yet one of the efficient types of display used in embedded applications. This display has nothing more than 8 LED inside it. These 8 LEDs are separated into each segment which can be named as a, b, c, d, e, f, g, DP as shown in the picture above. These entire 8 segment LEDs have one end of their pins pulled out of the module as shown above and the other ends are connected together and pulled out as the Common pin. So make an LED of a particular segment glow we just have to power common pin along with the segment pin. This way we can power more than one segment at a time to represent the numeric number 0-9 and also few Alphabets as shown on the graphic image below. We also have an option to show a decimal point using the DP pin.

Common Cathode (CC) 7 Segment Display

The common cathode display is commonly called CC display. In this type the common pin on the 7-segment display is connected to all the eight Cathode pins of the LEDs. So In order to make this type of seven segment display to work we should connect he Com pin to the Ground pin and power the other pins with VCC (+5V typically).

Common Cathode 7 segment Display
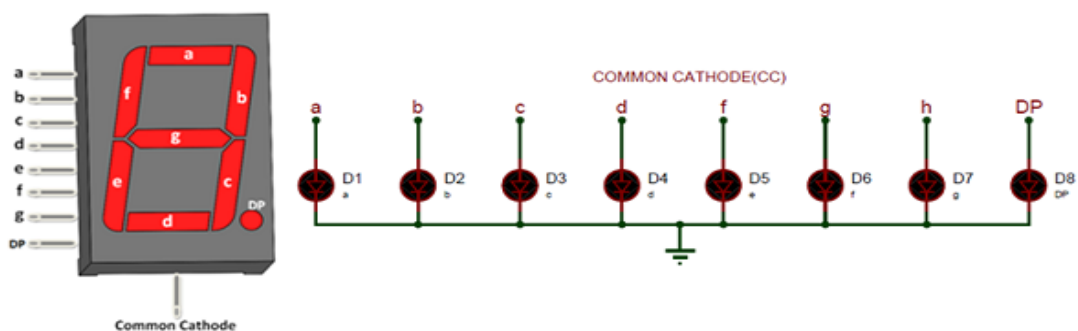
Common Display Anode (CA) 7 Segment

The common anode display is commonly called CA display. In this type the common pin on

the 7-segment display is connected to all the eight Anode pins of the LEDs. So In order to make this type of seven segment display to work we should connect he Com pin to the VCC (+5V typically) and ground the required segment pin to turn it on.

Common Cathode 7 Segment Display
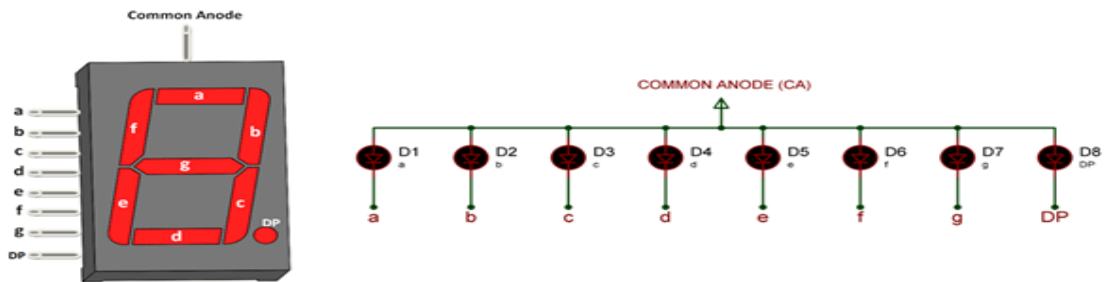
5.3 POWER SUPPLY

Switched Mode Power Supply also known as **Switching Mode Power Supply**. SMPS is an electronic power supply system that makes use of a switching regulator to transfer electrical power effectively. It is a PSU (power supply unit) and is usually used in computers to change the voltage to the appropriate range for the computer. An SMPS adjusts output voltage and current between different electrical configurations by switching the basics of typically lossless storage such as capacitors and inductors. Ideal switching concepts determined by transistors controlled outside of their active state that have no resistance when 'on' and carry no current when 'off.' It is the idea why switches with an ideal function will operate with 100 per cent output, that is, all input energy is provided to the load; no power is wasted as dissipated heating. In fact, such ideal systems do not exist, which is why a switching power source cannot be 100 per cent proficient, but it is still a vital improvement in effectiveness over a linear regulator.

Fig.4.3 Switch mode power supply

5.4 MCB Miniature Circuit Breaker

A **Miniature Circuit Breaker** (**MCB**) is an automatically operated electrical switch used to protect low voltage electrical circuits from damage caused by excess current from an overload or short circuit. MCBs are typically rated up to a current up to 125 A, do not have adjustable trip characteristics, and can be thermal or thermal-magnetic in operation.

Working Principle of Miniature Circuit Breaker

There is two arrangements of operation of a miniature circuit breaker. One due to the thermal effect of over current and other due to electromagnetic effect of over current. The thermal operation of the miniature circuit breaker is achieved with a bimetallic strip whenever continuous overcurrent flows through MCB, the bimetallic strip is heated and deflects by bending. This deflection of the bimetallic strip releases a mechanical latch. As this mechanical latch is attached to the operating mechanism, it causes to open the miniature circuit breaker contacts.

But during short circuit conditions, the sudden rising of current causes electromechanical displacement of plunger associated with tripping coil or solenoid of MCB. The plunger strikes the trip lever causing the immediate release of the latch mechanism consequently open the circuit breaker contacts. This was a simple explanation of the **miniature circuit breaker working principle**.

5.5 POWER LINE FILTER

Power line filters offer multiple levels of protection to reduce the effects of electrical noise or power anomalies on electric/electronic equipment. Devices available include power line EMI/RF filters with surge protection, drive-rated power line EMI/RF filters, general-purpose power line EMI/RF filters, and power entry modules.
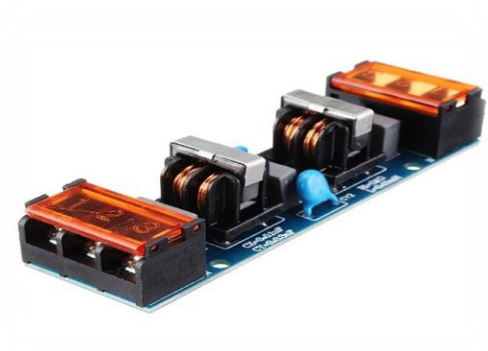
Fig.4.5 Power Line filter

5.6 KEY PAD

Membrane Keypad:

This membrane key pad is useful for switching the fuctions under the display module for increment, decrement, enter, emergency, set, and like, man mode and auto mode .
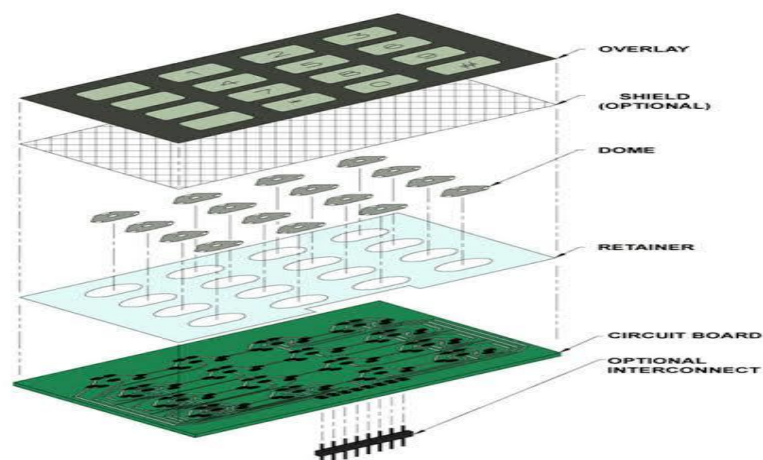
Membrane keypad structure
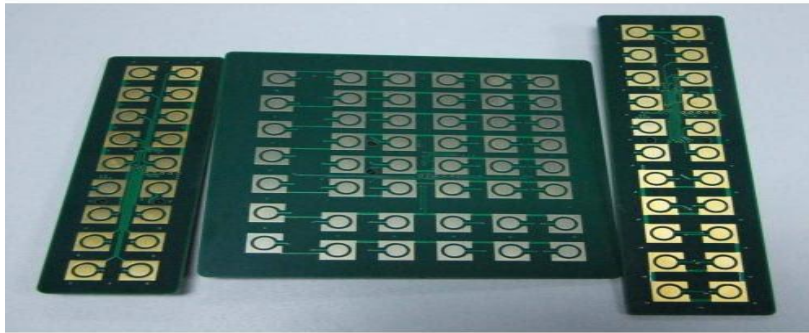
5.7 CONTACTOR

I used this contactor in air shower interlocking system for electrically controlled switching devices which are used for switching electrically. The basic operation of this is similar to a relay, but the only difference is that contractors can carry large current compared to relay up to 12500A. They cannot provide short circuit or overload protection but can break the contact when coil excites.

Fig: Contactor

5.8 Snubber circuit

A snubber is a circuit that is used in semiconductor devices for protection and performance enhancements. They have many different purposes, namely the reduction of power dissipation in power electronic switching networks. Due to the availability of alternative solutions, snubbers are less common today than they once were. In modern power electronics, they are commonly found to reduce ringing.

Fig: snubber circuit

A snubber circuit limits or stops (snubs) switching voltage amplitude and its rate of rise, therefore reducing power dissipation. In its simplest form, a snubber circuit basically consists of a resistor and capacitor connected across the thyristor.

5.9 EM LOCKS

Electro-Magnetic Door Lock (EM Lock) An electromagnetic lock, magnetic lock, or maglock is a locking device that consists of an electromagnet and an armature plate. There are two main types of electric locking devices. Locking devices can be either "fail safe" or "fail secure".
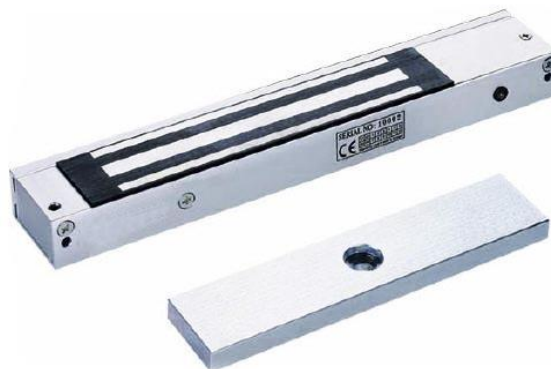
Fig: Electromagnetic Door Locks

These EM Locks help in restricting the person's access. RFID cards can be issued to people to whom you want to grant access. These cards help people in entering the door by showing their cards in front of the lock. Drop bolt lock glass door is used for frameless glass doors.

5.10 LIST OF TOOLS USED FOR TESTING PURPOSE: -

MULTIMETER

The multimeter is useful to check the voltages and continuity of the tracks at PCB boards during the troubleshooting time. And to check the values of the resistance and current.

5.11 IP (Isopropyl Alcohol) for PCB's Cleaning

I used this IP solution after Soldering or **assembly of PCB Boards**, a strong residue, dirt and small solder balls stays in the soldering place of the circuit board. This is merely a dangerous situation as this could lead to failure of the circuit as well as the PCB looks too dirty and it becomes difficult to find errors in the PCB.

This PCB cleaner uses **IP (Isopropyl Alcohol)** based solution to **remove dirt,** flux residue from PCB. It is a strong PCB cleaner solution which is useful for any type of PCB cleaning related issues.

Cleans hard rosin and bad fluxes with ease. As this is spray type solution, it is easy to clean the fluxes in the PCB where you do not need droppers or additional tools to provide the solution to the PCB.

Fig: IP (Isoporopyl Alcohol)

5.12 Screwdriver

I used the screwdriver for tightening or loosening the screw in the PCB board.

5.13 Track wire

I used this track wire on a PCB is a conductive path of copper that runs all over the circuit board, they act as a connection between two points on the PCB. The conductive path will be connecting two different components in the PCB.

5.14 IC Remover

This tool is useful to remove the IC in the PCB board   and for extracting the chip in the PCB boards.

Fig.13 IC remover

6. Overall Benefits I Gained From Internship

6.1 Introduction: -

Internship is the beginning of the road that will take me to the point I want to be at after my graduation. Internship is a practice I need to perform, because it prepares me for the professional life that I aim at.

6.2 Practical Skill: -

The Internship will have the opportunity to connect classroom theory with current industry challenges, and have exposure to the latest technologies. Opportunities to converse and interact with a large pool of talented experienced department members will provide a deeper insight to the overall operation, as well as provide a valuable pool of resources to assist in completion of internship program. This internship program was exactly what I needed to nurture the lack of practical skills I had. I would acquire practical experience to complement the theoretical content of my studies.

6.3 Theoretical Knowledge: -

During my internship period in Styrax Instruments India Pvt Ltd, upgrade my theoretical knowledge, when I have been learned the course of electronic components in the class room.

6.4 Interpersonal Communication Skills: -

During my internship period the Interpersonal skills, which are the life skills I use every day to communicate and interact with other people, individually and in groups are good for me. Not only how I communicate with others, but also I got confidence and my ability to listen and understand. Problem solving, decision making and personal stress management are also considered interpersonal skills. Through this internship, I found that I matured and I gained many new perspectives, such as problem solving skill, diversity, effective communication, teamwork and service recovery, attention to detail, time management, personal empowerment, self-confidence, responsibility and cultural sensitivity. My supervisor was so kind to answer with patience and teach me much that made this internship so enjoyable. I had gotten a wonderful internship that spent such a happy moment with all of them. Though, still

have so much to learn, I think this challenge was what should include in my career. This helped much on my future planning.

6.5 Team Playing Skills: -

In the section of the company i had been working, most of the time I had work with my supervisor though gained in terms of improving my team playing skill during my internship period in Styrax Instruments India Pvt Ltd, Production Floor is most valuable.

6.6 Leadership Skills: -

Leadership skills are the tool, behaviors, and capabilities that a person needs in order to be successful at motivating and directing others. Yet true leadership skills involve something more; the ability to help people grow in their own abilities. It can be said that the most successful leaders are those that drive other to active their own success. I gained leadership skills from my supervisor during the internship period which include managing time, motivating individuals, giving feedback and building teams.

6.7 Work Ethics Related Issue: -

An internship is an opportunity to learn the skills and behaviors along with the work values that are required for success in the workplace. Workplace ethics are established codes of conduct that reflect the values of the organization or company where you are employed. I have seen possess a willingness to work hard from my supervisor during my internship period. In addition to working hard it is also important to work smart. This means I acquired the most efficient way to complete tasks and finding ways to save time while completing daily assignments. It's also important to care about my job and complete all projects while maintaining a positive attitude.

7. Conclusion: -

As an undergraduate of the Andhra Loyola College, I would like to say that this internship training program is an excellent opportunity for me to get to the ground level and experience the things that we would have never gained through going straight into a job. I am grateful to the Andhra Loyola College and Styrax Instruments India Pvt. Ltd. for giving me this wonderful opportunity.

The key learning i have gained from this program are:

- o To manage the work and maintain the calm during stressful situations in work area.
- o Time Management.
- o Understanding the ground level reality and business case scenarios.
- o How to apply my institutional knowledge in the industrial world while handling real world projects.

- o How well we can work in a team environment.

8.AMOUNT I RECEIVED FROM STYRAX INSTRUMENTS India Pvt. Ltd., HYDERBAD

Month	AMOUNT I RECEIVED IN Rs.
JANUARY 2022	1,032/-
FEBUARY 2022	3,957/-
MARCH 2022	4,000/-
APIRL 2022	3,480/-
MAY 2022	3,300/-
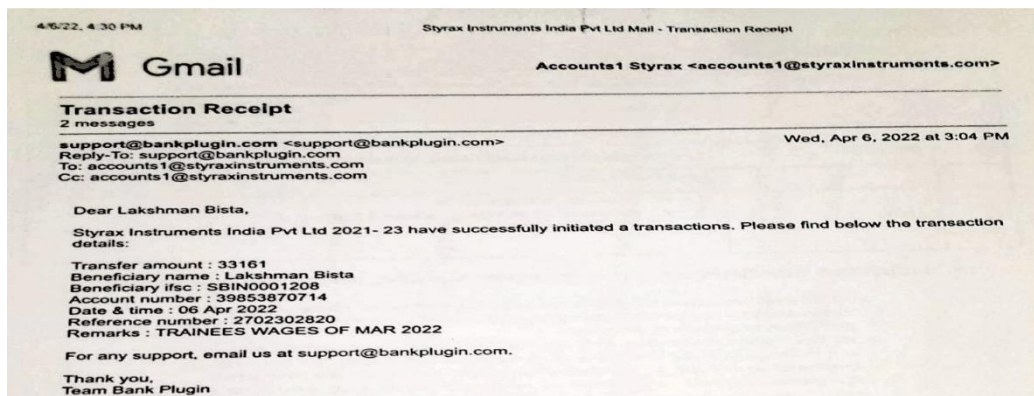
	Trainees wages for the month of Mar 2022									
S.No	Name Of The Employee	EMP ID	D O J	Total Month Days's	Total Present Days	Total Absence Days	Per Month	Per Day	Total Amo	Receiver Signature
1	S. Praveen Kumar	193704	24/01/2022	31	15	16	4000	129	1,935	
2	A. Durga Ram	193706	24/01/2022	31	29	2	4000	129	3,742	
3	T. Manikanta Sri Sai Teja	193718	24/01/2022	31	31	0	4000	129	4,000	
4	P. Tejesh Reddy	193723	24/01/2022	31	31	0	4000	129	4,000	
5	Ch. Vamsi	193727	24/01/2022	31	31	0	4000	129	4,000	
6	K. Chaitanya Vamsi	193738	24/01/2022	31	27	4	4000	129	3,484	
7	Lakshman Bista	193740	24/01/2022	31	31	0	4000	129	4,000	
8	Ch. Ravi Babu	193744	24/01/2022	31	31	0	4000	129	4,000	
9	V. Naga Sai	193754	24/01/2022	31	31	0	4000	129	4,000	
									33,161	

27-02-2022	28-02-2022	T. Working Days	T.OD Days	T. Sundays	T. SS	T. Leaves	Total Present Days	Total Absence Days	Per Month	Per Day	wage Amount	OT Amount	Total Amo	Rec
P	P	23	0	3	2	0	28	0	4000	143	4,000	157	4,157	
S	P	13	9	4	2	0	28	0	4000	143	4,000	0	4,000	
P	P	21	0	3	2	0	26	2	4000	143	3,714	157	3,871	
S	P	5	17	3	1	0	26	2	4000	143	3,714	572	4,286	
P	P	20	0	2	1	0	23	5	4000	143	3,286	157	3,443	
P	P	20	0	3	2	0	25	3	4000	143	3,571	100	3,671	
S	P	5	18	3	0	0	26	2	4000	143	3,714	572	4,286	
P	P	22	0	3	2	0	27	1	4000	143	3,857	100	3,957	
P	P	17	0	3	2	0	22	6	4000	143	3,143	100	3,243	
											33,000	1,915	34,915	
													29915	
													5,000	

Trainees wages for the month of Feb 2022

S.No	Name Of The Employee	EMP ID	D O I	Total Month Days's	Total Working Days	Total Present Days	Total Absence Days	Per Month	Per Day	wage Amount	OT Amount	Total Amo	Receiver Signature
1	S. Praveen Kumar	193704	24-01-2022	28	28	23	5	4000	129	3,355	157	3,512	S.Praveen lakshman
2	A. Durga Ram	193706	24-01-2022	28	28	13	15	4000	129	3,355	0	3,355	
3	T. Manikanta Sri Sai Teja	193718	24-01-2022	28	28	21	7	4000	129	3,097	157	3,254	Tejasiteja Tejesh
4	P. Tejesh Reddy	193723	24-01-2022	28	28	5	23	4000	129	3,226	572	3,798	Vamsi
5	Ch. Vamsi	193727	24-01-2022	28	28	20	8	4000	129	2,839	157	2,996	lakshman
6	K. Chaitanya Vamsi	193738	24-01-2022	28	28	20	8	4000	129	2,968	100	3,068	K. chaitanya
7	Lakshman Bista	193740	24-01-2022	28	28	5	23	4000	129	3,355	572	3,927	
8	Ch. Ravi Babu	193744	24-01-2022	28	28	22	6	4000	129	3,226	100	3,326	Ch.RaviBabu
9	V. Naga Sai	193754	24-01-2022	28	28	17	11	4000	129	2,581	100	2,681	V.Naga Sai
										28,000	1,915	29,915	

Jon + Feb 2022 = 39076/-