With the blessings of Their Holinesses

SRI CHANDRASEKHARENDRA SARASWATHIVISWA MAHAVIDYALAYA

SCSVMV

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Accredited with "A" Grade by NAAC

DEPARTMENT OF ELECTRONICS AND INSTRUMENTATION ENGINEERING

Workshop on "Automation Using PLC" On 01.10.2024

Workshop on

"Automation Using PLC" Report

Date: 01/10/2024
Venue: Department of EIE, SCSVMV

Introduction:

The S.E.T.S Club of the Electronics and Instrumentation Engineering (EIE) Department at Sri Chandrasekharendra Saraswathi Viswa Mahavidyalaya (SCSVMV) organized a workshop on Automation through Programmable Logic Controllers (PLC) on October 1, 2024. This event was a significant initiative aimed at introducing students from various disciplines to the wide-ranging applications of automation across different industries. It was successfully conducted by final-year Mechatronics students under the guidance of faculty members.

The event was coordinated by Dr. K. Saraswathi and Dr. T. Sundar from the EIE department, and the convener Dr. T. Lakshmibai, HOD/EIE, played a pivotal role in organizing and overseeing the workshop. The primary objective of the event was to bridge the gap between academic knowledge and industry-relevant skills, with a particular focus on the use of PLCs, a crucial component in modern automation systems.

Objective:

The primary goal of the workshop was to provide participants with a comprehensive understanding of automation, focusing specifically on Programmable Logic Controllers (PLCs). These controllers are vital in automating industrial processes, enabling efficiency, reliability, and flexibility. Through the workshop, participants were introduced to the core concepts of automation, different types of PLCs, and hands-on programming using various methods, especially Ladder Logic.

Overview of Automation:

The workshop began with an introduction to the concept of Automation. Automation involves the use of control systems, including computers, robots, and PLCs, to operate machinery and processes in industries, with minimal or no human intervention. Automation offers several key advantages:

- Increased Efficiency: Automating repetitive tasks ensures improved speed and accuracy, reducing errors caused by human fatigue.
- Cost Reduction: By reducing reliance on manual labour and optimizing energy use, automation helps lower operational costs.
- Consistency and Quality: Automated systems maintain a high level of consistency and output quality over long periods, which is challenging for human operators.
- Safety Improvements: Automation can move workers away from dangerous environments, significantly reducing the risk of workplace injuries.

Conventional Automation Systems:

The next segment covered traditional automation systems used before the advent of PLCs. These included:

- **Relay-Based Systems:** Early automation relied on relays for controlling logic operations. However, these systems were limited by complexity, and the need for constant rewiring made them inefficient for large-scale operations.
- **Hydraulic Systems:** Used primarily in heavy industries, hydraulic systems move heavy loads by applying fluid pressure. While powerful, these systems were bulky and expensive to maintain.
- **Pneumatic Systems:** These systems are operated by using compressed air, providing a cleaner and faster alternative to hydraulics. Despite their advantages, pneumatic systems also had limitations, such as a lack of precision in controlling complex processes.

These conventional systems, while effective for their time, faced significant challenges in terms of flexibility, cost, and scalability. The shift towards Programmable Logic Controllers (PLCs) helped overcome these limitations, offering a more flexible and reliable approach to automation.

Introduction to PLC:

The workshop then moved into an in-depth exploration of Programmable Logic Controllers (PLCs). A PLC is a specialized computer used for automating industrial processes. It controls machinery and processes by responding to inputs (such as sensors) and sending output commands to devices (such as motors and valves). Key features of PLCs include:

- High Reliability: PLCs are designed for industrial environments, where they operate continuously without failure.
- Ease of Programming: PLCs can be programmed to meet specific automation needs using intuitive programming languages.
- Fault Diagnosis: Modern PLCs have advanced diagnostics capabilities, enabling quick identification of issues.

Types of PLCs:

The workshop introduced participants to two major types of PLCs:

- Compact PLCs: These are designed for smaller, simpler automation tasks. Their integrated components make them easy to install and use in environments with limited space.
- Modular PLCs: These provide greater flexibility, as they consist of separate modules for inputs, outputs, and processing. This allows users to tailor the system to meet more complex and larger-scale automation needs.

PLC Programming Techniques:

One of the most important sections of the workshop covered PLC programming languages. The participants were introduced to several key programming techniques that are widely used in automation:

- Ladder Logic: Resembling traditional electrical relay diagrams, Ladder Logic is the most commonly used programming language for PLCs. Its visual representation makes it easy for electricians and engineers to understand.

- Function Block Diagram (FBD): A graphical programming language that uses blocks to represent functions and processes. FBD is used in process automation for its clarity and ease of use.

- Structured Text (ST): A high-level programming language similar to conventional programming languages like C or Pascal. ST is used for complex algorithms and tasks that require more detailed control.

- Sequential Function Chart (SFC): This programming method is used for processes that involve multiple steps or sequences. It's ideal for applications where certain tasks must be completed in a defined order.

PLC Architecture and Software:

The architecture of a PLC consists of several key components:

- Processor Unit: The central brain of the PLC that interprets and executes the program.
- Input/Output Modules: These allow the PLC to interact with external devices such as sensors and motors.
- Communication Ports: Modern PLCs often include ports for network communication, allowing integration with other systems.

Different PLC manufacturers provide their software platforms for programming and monitoring PLCs. The workshop introduced participants to several popular software tools used in the industry, emphasizing the importance of choosing the right platform for specific applications.

Practical Demonstrations and Ladder Logic:

The highlight of the workshop was the practical session on Ladder Logic programming. Ladder Logic, as the most common programming method for PLCs, uses symbols and diagrams that resemble electrical relay logic. Participants were given real-life examples and challenges to solve, helping them understand the process of creating functional automation programs.

One of the example scenarios provided involved the control of multiple motors:

- Motor 1 was programmed to turn on 5 seconds after the main switch was activated.
- Motor 2 would turn on 10 seconds after Motor 1 had been activated.
- Motor 3 would start once Motor 2 was turned off.

This hands-on experience helped participants understand the practical applications of Ladder Logic in controlling industrial processes.

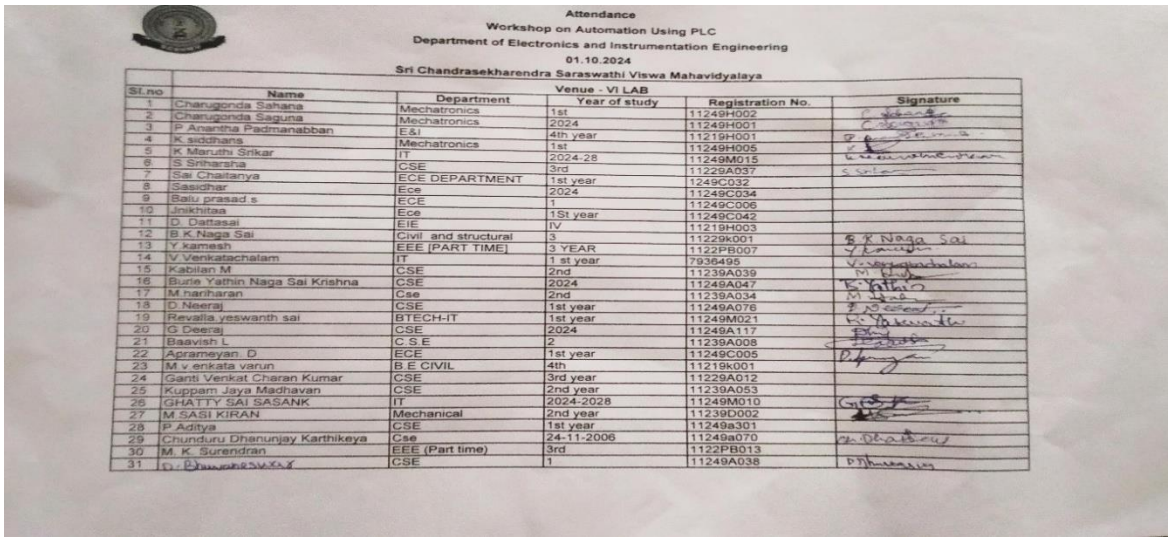
Conclusion:

The workshop on Automation Using PLC provided an extensive learning opportunity for participants, equipping them with both theoretical knowledge and practical skills. It successfully highlighted the importance of automation in modern industry and introduced PLCs as a powerful tool for achieving efficient, reliable, and safe control of industrial processes.

By focusing on key concepts such as the types of PLCs, programming techniques, and practical applications, the workshop helped participants understand how to implement automation solutions in real-world scenarios. With the guidance of experienced coordinators and a well-structured curriculum, the event played a crucial role in enhancing the technical capabilities of students and professionals alike.

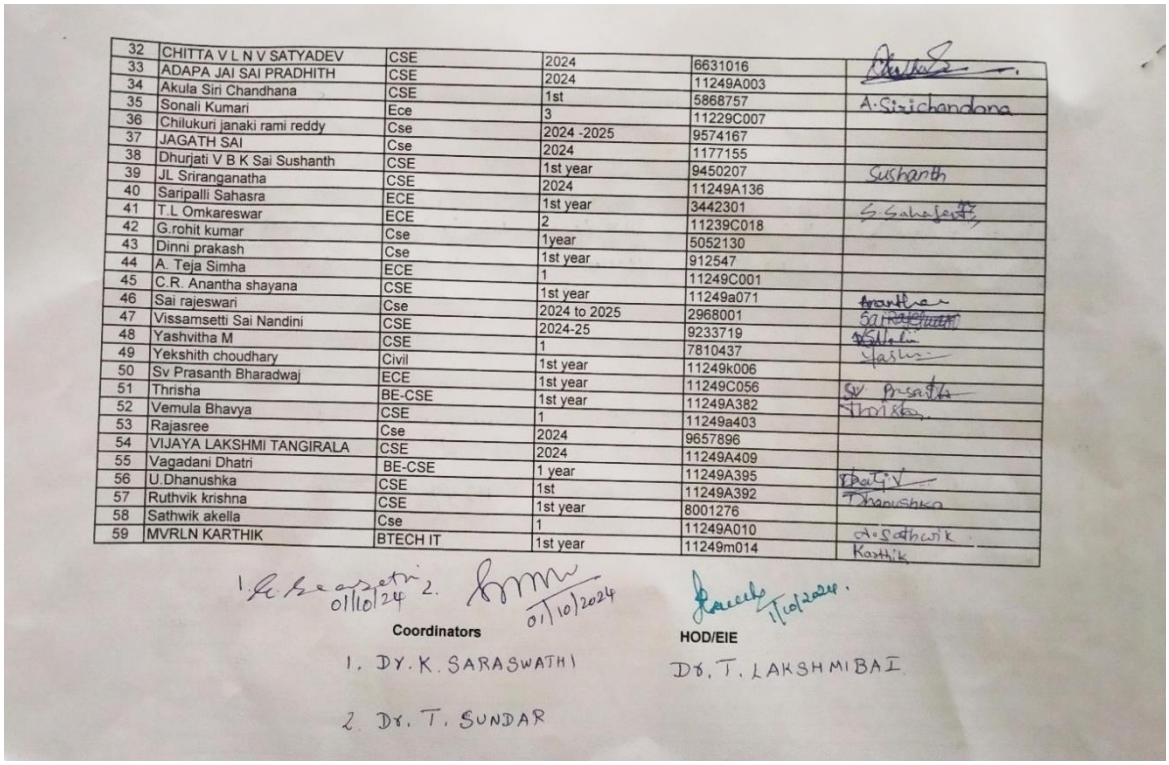
This workshop has not only expanded the participants' understanding of automation but also provided them with valuable skills that can be applied in a range of industries, from manufacturing to process control. As automation continues to evolve, events like these are essential in preparing the next generation of engineers and technicians for the challenges of the future.

List of Participants



Attendance
Workshop on Automation Using PLC
Department of Electronics and Instrumentation Engineering
01.10.2024
Sri Chandrasekharendra Saraswathi Viswa Mahavidyalaya
Venue - VI LAB

Sl.no	Name	Department	Year of study	Registration No.	Signature
1	Chanuganda Sahana	Mechatronics	1st	11249H002	
2	Chanuganda Saguna	Mechatronics	2024	11249H001	
3	P Anantha Padmanabban	E&I	4th year	11219H001	
4	K siddhans	Mechatronics	1st	11249H005	
5	K Maruthi Srikar	IT	2024-28	11249M015	
6	S Sritharsha	CSE	3rd	11229A037	
7	Sai Chaitanya	ECE DEPARTMENT	1st year	1249C032	
8	Sasidhar	Ece	2024	11249C034	
9	Balu prasad.s	ECE	1	11249C006	
10	Jnikhitaa	Ece	1St year	11249C042	
11	D. Dattasai	EIE	IV	11219H003	
12	B.K.Naga Sai	Civil and structural	3	11229k001	B K Naga Sai
13	Y.kamesh	EEE [PART TIME]	3 YEAR	1122PB007	
14	V.Venkatachalam	IT	1 st year	7936495	
15	Kabilan M	CSE	2nd	11239A039	
16	Burle Yathin Naga Sai Krishna	CSE	2024	11249A047	
17	M.hariharan	Cse	2nd	11239A034	
18	D.Neeraj	CSE	1st year	11249A076	
19	Revalla yeswanth sai	BTECH-IT	1st year	11249M021	
20	G.Deeraj	CSE	2024	11249A117	
21	Baavish L	C S E	2	11239A008	
22	Aprameyan. D	ECE	1st year	11249C005	
23	M.v enkata varun	B.E CIVIL	4th	11219k001	
24	Ganti Venkat Charan Kumar	CSE	3rd year	11229A012	
25	Kuppam Jaya Madhavan	CSE	2nd year	11239A053	
26	GHATTY SAI SASANK	IT	2024-2028	11249M010	
27	M.SASI KIRAN	Mechanical	2nd year	11239D002	
28	P Aditya	CSE	1st year	11249a301	
29	Chunduru Dhanunjay Karthikeya	Cse	24-11-2006	11249a070	
30	M. K. Surendran	EEE (Part time)	3rd	1122PB013	
31	D. Bhuvaneswar	CSE	1	11249A038	



32	CHITTA V L N V SATYADEV	CSE	2024	6631016	
33	ADAPA JAI SAI PRADHITH	CSE	2024	11249A003	
34	Akula Siri Chandhana	CSE	1st	5868757	A.Sirichandana
35	Sonali Kumari	Ece	3	11229C007	
36	Chilukuri janaki rami reddy	Cse	2024 -2025	9574167	
37	JAGATH SAI	Cse	2024	1177155	
38	Dhurjati V B K Sai Sushanth	CSE	1st year	9450207	Sushanth
39	JL Sriranganatha	CSE	2024	11249A136	
40	Saripalli Sahasra	ECE	1st year	3442301	
41	T.L Omkareswar	ECE	2	11239C018	
42	G.rohit kumar	Cse	1year	5052130	
43	Dinni prakash	Cse	1st year	912547	
44	A. Teja Simha	ECE	1	11249C001	
45	C.R. Anantha shayana	CSE	1st year	11249a071	
46	Sai rajeswari	Cse	2024 to 2025	2968001	
47	Vissamsetti Sai Nandini	CSE	2024-25	9233719	
48	Yashvitha M	CSE	1	7810437	
49	Yekshith choudhary	Civil	1st year	11249k006	
50	Sv Prasanth Bharadwaj	ECE	1st year	11249C056	
51	Thrisha	BE-CSE	1st year	11249A382	
52	Vemula Bhavya	CSE	1	11249a403	
53	Rajasree	Cse	2024	9657896	
54	VIJAYA LAKSHMI TANGIRALA	CSE	2024	11249A409	
55	Vagadani Dhatri	BE-CSE	1 year	11249A395	
56	U.Dhanushka	CSE	1st	11249A392	
57	Ruthvik krishna	CSE	1st year	8001276	
58	Sathwik akella	Cse	1	11249A010	
59	MVRLN KARTHIK	BTECH IT	1st year	11249m014	

Coordinators
1. DY. K. SARASWATHI
2. Dr. T. SUNDAR

HOD/EIE
Dr. T. LAKSHMIBAI

INVITATION

SRI CHANDRASEKHARENDRA SARASWATHI VISWA MAHAVIDYALAYA
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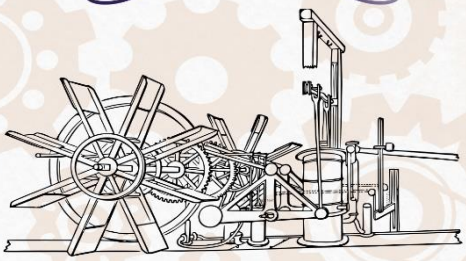
ENATHUR, KANCHIPURAM-631561, TAMIL NADU, INDIA.

DEPARTMENT OF ELECTRONICS AND INSTRUMENTATION ENGINEERING
& SETS CLUB

Invitation

WORKSHOP ON AUTOMATION (USING PLC)



CONVENOR : **Dr. T. Lakshmibai**
HOD, DEPT. OF EIE

CO-ORDINATORS : **Dr. K. Saraswathi**
ASST PROF, DEPT. OF EIE

Dr. T. Sundar
ASST PROF, DEPT. OF EIE

OCT
TUESDAY **01** 2.20 PM

VENUE:
VI LAB, EIE DEPARTMENT,
SANSKRIT BLOCK

Register here: https://forms.gle/K5J2xrdVjWS3q3PA8
Scan for Registration

For Further Contact,
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GALLERY


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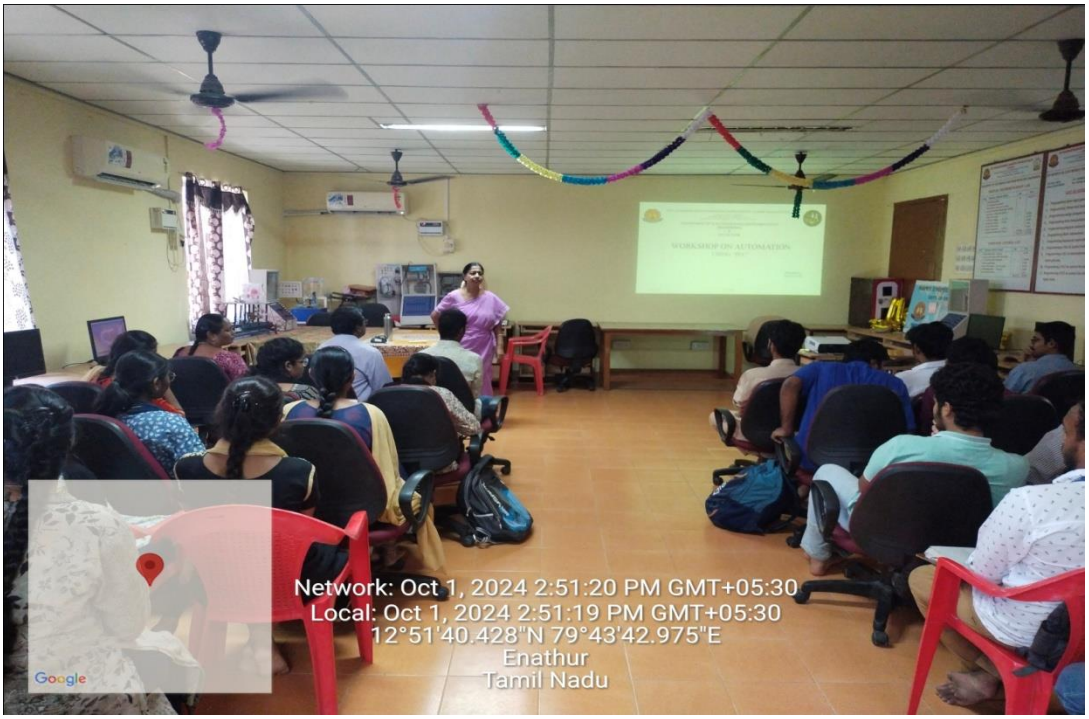
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