A REPORT ON AN INDUSTRIAL VISIT

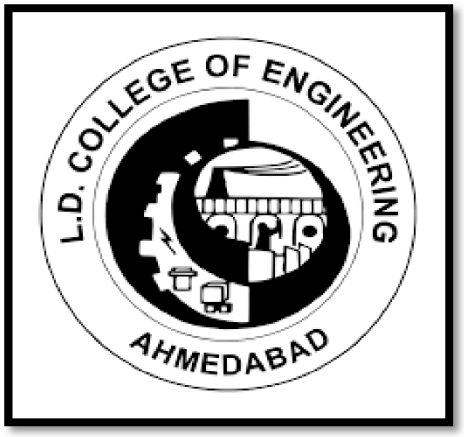
TO **Gayatri Control and Automation Private Limited**

Submitted to

L.D. COLLEGE OF ENGINEERING (AHMEDABAD)

Department of Electrical Engineering

Year: 2023-2024



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GAYATRI
Control and Automation Private Limited
Matters of pride & precision

Industrial visit to **"GAYATRI CONTROL and AUTOMATION PVT. LTD."** was done under the supervision of

Mr. Alpesh Kumar Upadhyay Associate Professor Department of Electrical Engineering L.D. College of Engineering, Ahmedabad	Mrs. Rachana Patel Assistant Professor Department of Electrical Engineering L.D. College of Engineering, Ahmedabad

INTRODUCTION

- An Industrial visit to " GAYATRI CONTROL and AUTOMATION PVT. LTD." G.I.D.C. Vatva, Ahmedabad, Gujarat was organized by the Electrical engineering department of L.D. College of Engineering on Saturday, 30th September 2023 Approx. 60 students of third year pursuing Degree in Electrical Engineering and two faculty members Mr. Alpeshkumar Upadhyay and Mrs. Rachana Patel visited " GAYATRI CONTROL and AUTOMATION PVT. LTD." Automation process like PLC(Programmable Logic Controller) & SCADA(Supervisory Control and Data Acquisition) manufacturing, Control Panel Manufacturing and System Architecture etc. To understand how actual equipment looks and how it's processing, to seelatest advancements of equipment, management in plant and safety to be followed in Automation industries. Also, to Experience the job and responsibilities of an Electrical Engineer.

COMPANY PROFILE:-

GAYATRI
Control and Automation Private Limited
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Established in 1995, Gayatri Control and Automation Private Limited in a short span has taken giant strides and carved a unique niche for itself as a leader in the world of Control Panels. An ISO 9001:2000 company since 2003, GCAPL name is today a recognised and very well established name known in the Automation Industry for its top end quality Control Panels — custom made as per the requirements and specification of different customers. Thanks to the approach of providing consistent, accurate and quality products, GCAPL has successfully developed a wide customer base not only in Gujarat and India but also overseas.

GCAPL manufactures Control Panels to meet the needs and requirements of different industries from plastic machinery to road construction machinery, rolling mills to material handling

equipment’s, air compressors to printing and packaging machinery.

Other than our standard range, we have the highest technological capabilities to offer suitable tailor made system as per specific requirements of the customer. We have the skills to offer value addition at low development lead time and cost.

WORK PLAN:-

In the morning at 10:00 a.m. we visited “GAYATRI CONTROL and AUTOMATION PVT. LTD.".

Before entry to the manufacturing area a very informative session about the company and the safety instructions to be followed in the workplace was conducted.

From 10:00 a.m. industrial visit was started, we visited to manufacturing plant, Where **MR. Jignesh Pandya** guide and give brief on Automation Unit.

Application of Machine Automation :-

Since 2003, GCAPL has developed automated solutions for manufacturers around the Globe. Today, we positioned to provide you with the equipment, skills and resources for integrating the automated systems that can keep you ahead of the rapidly evolving global marketplace. We provide solution using Programmable logic controllers to integrate with Motion control and Variable frequency drives. We design and install the machine control with single stand control using HMI's to optimize efficiency and easy going operating in less time.

Application Of Process Automation :-

A process control or automation system is used to automatically control a process such as chemical, oil refineries, paper and pulp factories. The DCS (distributed control system), which is traditionally proprietary. Process automation simplifies this with the help of sensors at thousands of spots around the plant that collect data on temperatures, pressures, flows and so on. The information is stored and analyzed on a computer and the entire plant and each piece of production equipment can be monitored on a large screen using SCADA (supervisory control and data acquisition) in a control room. GCAPL fulfills such needs with the required safety standard and process information.

Application Of Machine Vision System :-

We provide vision inspection solutions for precision applications. We offers a suite of intelligent inspection and quality assurance processes to the next level. Our learning-based technology transforms the quality assurance process by driving down operating costs, reducing risk and improving quality with unprecedented speed and accuracy. Our intelligent machine vision system improves quality control, reduce development time, drive down operating costs and increase productivity.

GAYATRI
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➢ Supervisory Control and Data Acquisition (SCADA):-

Computer based Supervisory Control And Data Acquisition that can provide complete system-wide monitoring and control from a single computer workstation. Includes data logging and reporting of all system components. Alarming capabilities.

We understand the details, features and benefits of SCADA systems and our clients benefit from our holistic approach to providing complete solutions, from concept planning to engineering, programming, commissioning, post construction technical support and training.

- **Our Team Specializes in :-**

Water treatment and supply

Steel Plant processing

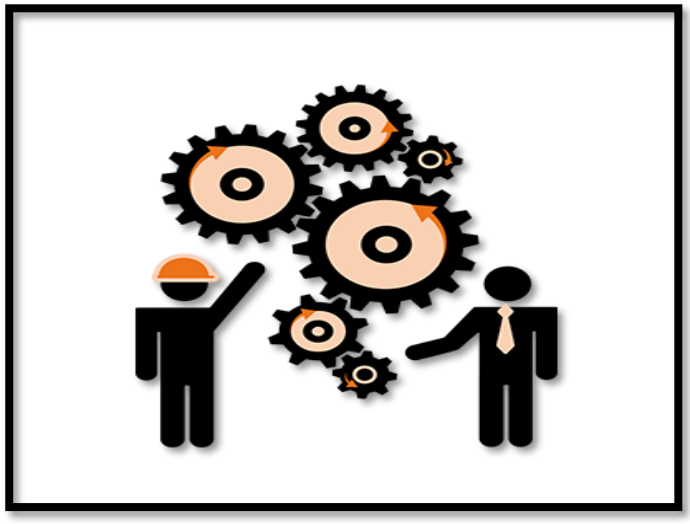
Concrete Batchmix Plant

Asphalt Batchmix Plant

Remote site monitoring

➢ Engineering & Design

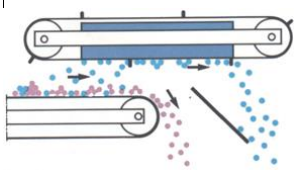
With the increasing intricacy of machinery and process systems, the importance of having well-designed, efficient and reliable control systems is essential. GCAPL offers a full array of engineering and design services with expert design software like EPLAN and AutoCAD. Engineering staff is able to provide assistance on individual elements of the design and manufacturing process or on a turn-key system solution for design through installation.



➢ Different Control Panel Devices :-

Sr.No.	Device		Description
1.	UL Listed Control Panel (UL508) 	:	UL 508A is the UL Standard for Safety of the construction of Industrial Control Panels. This includes proper component selection, wiring methods, and calculation of short circuit current ratings. UL considers an Industrial Control Panel (ICP) an assembly incorporating two or more pieces of industrial control equipment or related control circuit devices, provided with interconnecting wiring and terminals for connections in the field.
2.	DC Drive Panel 	:	GCAPL offers SCR power control DC Drives, fully engineered for high performance in hundreds of open-loops and regulated power control applications, including reversing electrocoagulation system, Industrial plating rectifiers and motor soft-starters. We offer Half converter, semi converter, full converter and dual converter type thyristor based circuits DC Drives which are used for speed control of DC motor, Customized to Your Application.

3.	Furnace & Foundry 		We provide thyristor power controller which are up-graded with advanced digital technology. With the **PID** multiloop control from Japanese Technology, we provide complete network for day-by-day heating calculation and monitoring system with reliability and stability of temperature control Thyristor Power regulator Furnace Controllers PID multi-loop Controllers Data Logger
4.	Material Handling 	:	Our frequency inverter technology provides close-loop vector control way for hoisting mechanism, open-loop vector control way for big and small cart mechanisms, which ensure hoisting mechanism does not slip at low speed and full load, big and small carts mechanisms start and brake smoothly. EOT Crane Overhead crane Tower Crane Wall Travelling Cranes Gantry Cranes JIB Cranes
5.	Minerals & Cement 	:	For such segments, there are two functions of electrical control panel: manual control and automatic control. The signal of automatic control is leading total system performance. We designed the system intelligence with signal processing and micro scanning system.

			Electro Magnetic Vibratory Feeder Motorised Vibratory Feeder Multi Roller Magnetic Separator Weighing System Cement Feeding Plant
6.	Packaging 	:	Packaging must keep products safe, fresh and hygienic, and at the same time meet criteria for appealing designs. This requires a wide variety of packaging shapes, styles and materials, in many cases for a single product. Our automation software can be used to manage a wide range of packaging functions such as filling, forming, sealing, labelling, collecting, re-packing and palletising. Bag cutting and Stitching Panel Bag Closing Systems Woven sack Machine Belt Cutting Machine Labelling Machine Forming and sealing System
7.	Shinko Controller (Shinko DCL33A) 	:	Compact 22.5mm(W) x 75mm(H) x 100mm(D) Controller can be easily installed on a DIN rail inside the control panel. Multi-input, High sampling speed Total 18 types of input and 0.25 sec of high sampling speed allow you to deal with various processes Thermocouple (10 types), RTD (2 types), DC current (2 types), DC voltage (4 types) Shinko protocol, Modbus protocol (ASCII, RTU) are selectable. Monitoring software is also provided.

8.	Shinko PC935 	:	10 steps/pattern x 10 patterns programmable Fuzzy overshoot prevention PID Fuzzy algorithms make Step changes more accurate. Multi-input, multi-function Specification setting and changes can be easily performed with multi-range input and multi-function.
9.	Shinko BCx2 Series 	:	Multi-input Thermocouple (10 types), RTD (2 types) Direct current (2 types) and DC voltage (4 types) SV1/SV2 external selection can be switched by external contact. (Optional for the BCS2) Communication function for Shinko protocol, Modbus protocol (ASCII and RTU mode) is available.
10.	Shinko PCB1 Series 	:	10-step/pattern, 10 patterns (10 steps per pattern) are available for program control. Using pattern link function, up to 100 steps of program control can be carried out. The communication options can be selected from 5 types: Shinko protocol, Set value digital transmission, Set value digital reception, Modbus ASCII mode, Modbus RTU mode. If Set value digital transmission is selected, the SV of the controller can be transmitted to the Digital indicating controllers with serial communication option.
11.	Control Panel: Plastic 	:	In most models the complete control of the machine is done with the help of a PLC based control system with an integrated operator consol on the panel displaying all relevant operation parameters and providing all necessary control elements for controlling the operation of the different components of the machine.

			Extruder Machine PVC Pipe Threading and Cutting Machine PPTQ Film Plant Compounding Plant HM-HDPE\LDPE\LLDPE Blown Film Plant Pipe Extrusion Lines
12.	Control Panel : Rubber 		GCAPL provide ample computing power for sequential control and Motion Control on a single platform. The speed is another important factor in such industries like rubber, we develop application which are highly efficient and high speed according to production requirements. Reclaim Machinery Pin Barrel Extruders Mixing Mill
13.	Control Panel : Textile 		we are manufacturing vast variety of Textile Machine Panels. These products are extensively used in different industries and are manufactured in adherence with the industry set guidelines. Further, these products are stringently tested on various parameters to ensure they are durable, efficient dimensional accuracy and high performance. Yarn twisting machine Ring Twisting Machine Con winder, Cop winders