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Automation India

Magazine

India's Automation Magazine

PARA Tech Expo defines Industrial Automtion

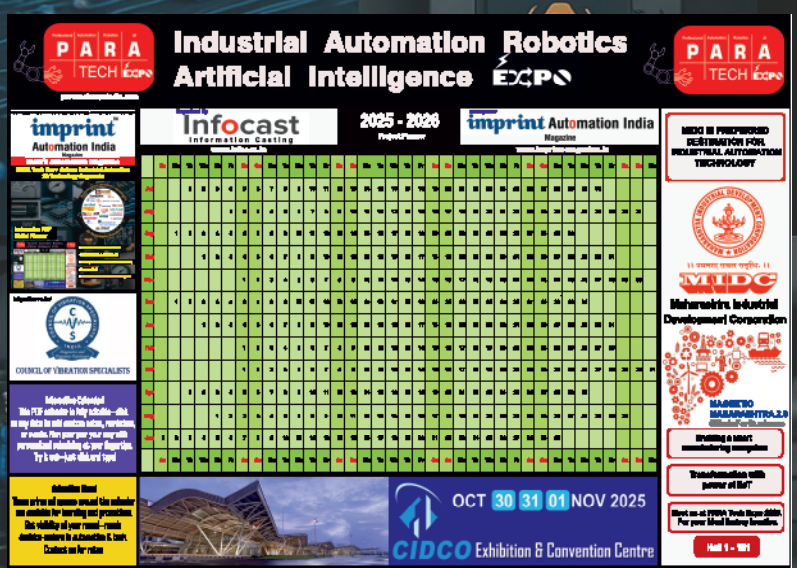
23 Technology Segments

Automation product spotlight

ACME ELECTRONICS, ONEDATA, Accelus Robotics, ACT Sensor Private Limited, acrobot, ADATA, Airoll, FANUC Robotics, UTE GROUP, ADAGE, AG, ADVANCE, ecosys, ADARSH, AMTECH, AVALON CONSOLES, APEX DYNAMICS, INC., AMBETRONICS, ALSTRUT

20 Reputable Solutions

Ineteractive PDF
Digital Planner



- ABB Gofa Cobats' Ultre Precision
- Eaton Bright Layer Intelligence
- Dr.Reddy's Automation in Pharma Manufacturing
- Acronyms Part II
- Indian Pharma Automation Market Intelligence

Welcome To PARA Tech Expo 2026

Factory Automation and Robotics in manufacturing is translaed with emphasis on Intelligent Manufacturing and Smart Production. The concept of Intelligent or Advanced Manufacturing, Smart Production or Industrial Automation is the key to establishing a strong and smart country. In the era of Artificial Intelligence 'efficiency' is the basic underline. India is on the precipice of creating the worlds best technologies. With one goal. Viksit Bharat - beter than the best. PARA Tech Expo is on a mission.

- Industrial Automation
- Factory Automation
- Intelligent Manufacting
- Smart Manufacturing
- Smart Production
- Robotics

Mantra 1: Industrial automation leads to excellence.

Mantra 2: March of automation in manufacturing.

- PARA Tech Webinars
- PARA Tech Technical Seminars
- PARA Tech Conference
- PARA Tech CEO Round Table Conclave
- PARA Tech Awards
- Industry Associations

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Connect Your Future with Business

Professional Automation Robotics AI
PARA TECH EXPO

April 08 09 10 2026

- 23 Exhibitor Segment
- 13 Product Spotlight

Engage with automation projects from high-potential product sectors

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Exhibitor Booking

Exhibitor Prospectus

CIDCO Exhibition & Convention Centre
Vashi, Navi Mumbai

PARA Tech's Technology Segments

Anil Chopra

Anup Wadhwa

I visited IIT Delhi and met Anup Wadhwa. A very self-assured tech protagonist quietly immersed in assisting automation companies at the FSM lab in IIT Delhi. AIA association headed by Anup Wadhwa is doing real work at IIT Delhi with the Foundation for Smart Manufacturing (FSM). FSM helps, supports, and develops Smart Manufacturing concepts for Indian Industry to witness, ideate, and try out in their own plants. FSM also aimed at developing a holistic educational curriculum and skill-building program through a vibrant incubation and administrative environment.

FSM Skills

FSM Skills is a holistic platform for providing immersive training experience through Live lectures, Online learning, Live demonstrations, Live Labs and Self-paced exercises on remotely accessible actual hardware. Anup Wadhwa is an Alumnus of IIT Delhi from where he completed his Bachelor degree in Technology. His passion for Digital Electronics started in college and later took him to an exciting career in the field of Industrial Automation. Staying largely in the corporate sector, he successfully navigated his professional career between engineering, marketing and business management roles. Currently he is serving as the Director of the Automation Industry Association (AIA) where he has been the architect of AIA's Campus Connect and Skills Enhancement Initiatives. Very passionate about promoting innovation and system thinking amongst Indian SME enterprises, Anup is translating that vision via a Not-for-Profit Technology initiative; the IITD-AIA Foundation for Smart Manufacturing.

FSM
Smart Manufacturing Simplified

Samarth Udyog

He is a member of an Expert Committee set up by Department of Heavy Industry to advise on the Indian roadmap for an Industry 4.0 national platform, bringing ecosystem partners from Government, Industry, R&D and Academia to foster Samarth Udyog. He is also a member of an Expert Committee advising NIFFT Board to elevate their infrastructure to make it a Center of Excellence in Advanced Manufacturing. Anup devotes significant time to nurturing and elevating natural values of peace, joy and fulfillment. A regular volunteer with the Tej Gyan Foundation, he has organized book launches and collaborative events involving leaders from different faiths. I visited the FSM lab and was struck with the work going on. In development was a live 3D visualization of automation process that is fully connected displaying all readings of various production parameters. This is real Industry 4.0.

AIA

The Automation Industry Association (AIA) serves as a platform representing leading manufacturers, software developers, system integrators, and solution providers in the industrial automation space. With a strong membership that includes both global technology leaders and specialized domestic players, AIA plays a pivotal role in advancing factory and process automation across product sectors. The association not only provides its members with critical market intelligence and networking opportunities but also acts as a catalyst for digital transformation by helping manufacturers discover and implement cutting-edge automation technologies. As India's manufacturing sector embraces smarter, more connected operations, AIA continues to bridge the gap between technology providers and industry users, driving the nation toward a more productive and competitive future.

AIA
AUTOMATION INDUSTRY ASSOCIATION

Industry 4.0?

Anup Wadhwa explained in a calm sure manner as his assistant was explaining he had used gaming visualization software. That Industry 4.0 was originally a German concept of remote monitoring of factory automation. Emphasis On Remote; Naturally via internet. Period. Now no one understands what Industry 4.0 stands for. Everyone uses the term loosely for all industrial automation. Even AI is confused! ChatGPT says Industry 4.0 is AI in automation!!

PARA Tech's Technology Segments

So anyway. India first needs to go crazy on factory automation. Then we progress to Industry 4.0. To get things straight this issue Cover story is 'PARA Tech Defines Industrial Automation Technology Segments'. These 23 segments dissect the contributing technologies that deliver industrial automation and design. This will guide your company to participate in PARA Tech 2026.

ABB and Eaton

Imprint's mantra is to inform on the hot new technologies offered by high knowledge-quotient companies. So, we have ABB Unveils Ultra Accuracy Feature for GoFa™ Collaborative Robots (page 12) and Eaton's Role in the Future of Industrial Automation: Innovations & Trends (page 30).

Acronyms

This issue features a second Acronyms article. Our editorial is fixated on smartening up pros in the field with smart ready reckoners that help in getting the facts straight. Rely on imprint regularly to get these gems. PARA Tech Webinars kickstarts with the first edition – Imperatives of Automation in Pharma Manufacturing. Three top notch speakers. (page 26).

PARA Tech Webinar

Imprint identified Pharma manufacturing as having good potential to adopt automation since pharma sector presently in India is not upto speed with robotics and automation. This sector is chosen for focus of the first webinar. On Oct 9 we have three eminent personalities on the webinar that will be a treasure for all professionals to learn their path forward in adopting critical automation. We have K Kulbhushan, Global Head & Vice President – Operations Strategy, Excellence & Digital, Dr. Reddy's Laboratories sharing Dr Reddy's Automation in Pharma Manufacturing on (page 34).

Anup Wadhwa

Imprint is a media partner of the World AI Conference in Dubai . This conference deliberations included AI in machine learning, machine vision, and other industrial automation (IA) segments. Future issues will feature the specific sessions and speakers. Yeah! Imprint will introduce you to the intelligentsia of the automation industry. Stay tuned.

All India Council of Robotics and Automation-AICRA

AICRA
All India Council For Robotics & Automation
https://www.aicra.org/.

India has woken. Ministry of Heavy Industry is interested in establishing an automation and robotics expo with AICRA- All India Council of Robotics and Automation. Suddenly there is emphasis of exhibitions on industrial automation and robotics. Is this in response to demand for automation? Or is this opportunistic? Or is this on account of lack of sincerity of existing exhibition platforms disconnecting with actual industry-driven needs? Is this the reason of activation of government bodies; rising to organize expos on factory automation and robotics? Evidently the need for automation is genuine, emergent and imperative.

Yes, the writing is on the wall. This is a response to immediate demand for automation. Yes, its opportunistic but a valid and good response from the government.

AICRA- All India Council of Robotics and Automation, a not-for-profit organization is the apex body, setting up standards in Robotics & Automation and as well as helping over 35,00+ members organizations and professionals to solve difficult technical problems. AICRA also assists in education contributing to career development of professionals in robotics and automation. It is providing support systems to institutions such as quality assurance, information systems and train-the-trainer (TTT) academies either directly or through partnerships. To strengthen supplementary skill development, AICRA focuses on fostering private sector led efforts that include both non-profit and for-profit initiatives with the goal of building models that are scalabl. Definitely Imprint Automation India Magazine position is that alternate expos are the need of the hour. The nexus driven existing exhibition will not serve the interest of either heavy industry or oil and gas or fertilizer or pharma and packaging. We need a more dynamic connect for adoption of automation. PARA Tech Expo is one such vision.

Automation Ecosystem

Stay connected with India's growing automation ecosystem through the official social media channels of Imprint Automation India Magazine and PARA Tech Expo. Across platforms, we share curated content designed to educate, inform, and connect the automation industry.

Imprint Automation India Social Media

Our channel features technical interviews, product explainer videos, and coverage of major expos and seminars from across India. We regularly post new product spotlights, magazine updates, and event photos featuring exhibitors and innovators. A professional hub for editorial articles, industry news, and engagement with automation leaders and companies.

PARA Tech Expo Social Media

PARA Tech Expo has its own Social Medias and OTT channel which have Updates being regularly posted. These posts includes everyday posting of new product spotlights,segmets and more.

Cheers!

Anil Chopra
Editor

Professional Automation Robotics AI
PARA TECH EXPO

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PARA TECH EXPO STRUCTURED EXHIBITOR SEGMENTS

Professional | Automation | Robotics | Artificial Intelligence

PARA Tech Expo Segments: A Structured Approach to Industrial Automation Imprint.Automation India Magazine engaged the Exhibition Director of PARA Tech Expo 2025 to gain insights into how the expo and conference is structured to cater to the dynamic and evolving industrial automation landscape. Automation technologies are rapidly transforming manufacturing processes. PARA Tech Expo has strategically categorized its 23 exhibitor segments to provide a clear and comprehensive roadmap for industry professionals.The expo's segmentation is designed to help attendees navigate the range of automation solutions on display, ensuring a seamless experience for manufacturers, technology providers, and solution seekers alike."We have meticulously classified exhibitor segments under seven overarching categories, which reflect Automation Ecosystem Domains. These domains provide
a structured framework that reflects complimentary technologies whose integration results in innovative solutions". In this article, we take a closer look at the 23 exhibitor segments, categorizedunder these seven domains, offering a glimpse into the diverse and cutting-edge smart solutions that will be showcased at PARA Tech Expo 2025.

"AUTOMATION ECOSYSTEM DOMAINS"

The Seven are the overarching categories. Each domain reflects the structured organization of technologies and solutions within industrial automation. The Categorization of technologies and their functional

grouping is as follows:

1. Core Technologies,
2. Advanced Automation
3. Components and Hardware
4. Safety and Quality Assurance
5. Energy and Sustainability
6. Material Handling and Production
7. Integration and Efficiency.

EXHIBITOR SEGMENTS

1. Control Systems and Process Automation
2. Sensors and Instrumentation
3. IoT and IIoT Solutions
4. HMI and SCADA
5. Software and IT Solutions
6. Embedded Systems
7. Robotics
8. AI (Artificial Intelligence)
9. Machine Vision
10. Integrated PLM and Virtual Simulation
11. Additive Manufacturing
12. Vision Systems and Imaging
13. Electrical and Electronic Components
14. Motion Control
15. Power Electronics and Drives
16. Pneumatics and Hydraulics
17. Mechatronics
18. Safety Systems
19. Testing and Measurement
20. Energy Management and Power System
21. Conveyor Systems and Material Handling
22. Automation for Packaging and Logistics
23. Manufacturing Execution Systems (MES)

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PARA Tech Expo Segments

Control Systems and Process Automation | Core Technologies | 1/23

This segment involves the use of advanced control systems to manage and optimize industrial processes. Technologies such as Distributed Control Systems (DCS) and Programmable Logic Controllers (PLC) are central to this domain. DCS integrates multiple controllers distributed throughout a system, providing centralized supervision and decentralized control, which enhances reliability and scalability. PLCs are specialized computers designed to execute control functions by processing inputs from sensors and delivering outputs to actuators, ensuring precise control over machinery and processes. Implementing these systems leads to improved process efficiency, reduced operational costs, and enhanced product quality by minimizing human intervention and errors.

Sensors and Instrumentation | Core Technologies | 2/23

Sensors are critical components that detect physical parameters such as temperature, pressure, flow, and level within industrial environments. Instrumentation refers to thedevices and systems used to measure, monitor, and control these parameters. Accurate sensing and instrumentation are vital for maintaining process stability, ensuring safety, and achieving high-quality outputs. Advancements in sensor technology, including the development of smart sensors with integrated processing capabilities, have enabled real-time data acquisition and analysis,facilitating predictive maintenance and process optimization.

Robotics | Advanced Automation | 5/23

Robotics in industrial automation refers to the use of programmable machines to perform tasks traditionally carried out by humans. Industrial robots are employed for various applications,including assembly, welding,painting, and material handling. These robots offer high precision,repeatability, and the ability to operatein hazardous environments,thereby improving safety and productivity. The adoption of collaborative robots, or cobots, has further expanded the scope of robotics by enabling safe and efficient human-robot collaboration on the factory floor.

IOT AND IIOT SOLUTIONS |Core Technologies | 3/23

The Internet of Things (IoT) and its industrial counterpart, the Industrial Internet of Things (IIoT), involve connecting devices and systems to the internet to collect and exchange data. In industrial automation, IIoT enables seamless communication between machinery, sensors,and control systems, leading to enhanced monitoring, analytics, and decision-making capabilities. By leveraging IIoT, industries can implement predictive maintenance strategies, optimize resource utilization, and improve overall operational efficiency. The integration ofIIoT solutions also supports the development of smart factories,where interconnected systems operate autonomously to adapt to changing production demands.

Artificial Intelligence (AI) | Advanced Automation | 6/23

AI encompasses technologies that enable machines to performtasks requiring human intelligence, such as learning,reasoning, and problem-solving.In industrial automation, AI is utilized for predictive analytics, quality control, and process optimization. Machine learning algorithms analyze historical and real-time data to identify patterns and anomalies, facilitating proactive maintenance and reducing downtime. AI-driven systems can also adapt to changing conditions, continuously improving their performance over time

Software and IT Solutions | Core Technologies | 4/23

Software solutions in industrial automation encompass a range of applications, including process control software, data analytics platforms, and enterprise resource planning (ERP) systems. These solutions enable the integration of various processes, facilitate real-time monitoring and control, and support decision-making through data analysis. The adoption of cloud computing and edge computing has further enhanced the capabilities of industrial software, providing scalability, flexibility, and improved data accessibility

Embedded Systems | Core Technologies | 7/23

Embedded systems in industrial automation refer to specialized computing units integrated into machines and equipment to control specific functions. These systems comprise microcontrollers, processors, and sensors that operate systems enable functionalities such as machine diagnostics, process monitoring, and data communication within industrial environments. They are widely used in robotics, automotive systems, and smart manufacturing applications. The growing trend of IoT and edge computing has enhanced the capabilities of embedded systems, allowing for faster decision-making and improved process efficiency.

ADVANTECH
Enabling an Intelligent Planet

Machine Vision | Advanced Automation | 8/23

Machine vision is a specialized branch of vision systems focused on enabling machines to interpret visual data and make automated decisions. It combines hardware components like cameras, lenses, and lighting with software algorithms to perform tasks such as pattern recognition, surface inspection,and dimension measurement. Machine vision plays a critical role in industries requiring precision, such as semiconductor manufacturing and packaging. Advances in deep learning and edge computing have empowered machine vision systems to analyze complex visual data in real-time, allowing for faster and more accurate defect detection and process optimization. By integrating machine vision, manufacturers can enhance productivity, ensure compliance with industry regulations,and minimize operational costs.

KEYENCE

Human-Machine Interface (HMI) and SCADA | Core Technologies |10/23

HMIs are user interfaces that allow operators to interact with machinery and processes, providing visual representations of system status and controls. Supervisory Control and Data Acquisition (SCADA) systems are used to monitor and control industrial processes, collecting data from sensors and equipment across large-scale operations. SCADA systems enable centralized
monitoring and control, facilitating quick responses to process deviations and enhancing overall system reliability.

EMERSON

Integrated PLM and Virtual Simulation | Advanced Automation |11/23

PLM systems provide end-to-end management of a product's lifecycle, from concept and design to production and disposal. They facilitate collaboration across various departments, ensuring data consistency and efficient workflow. Virtual simulation technologies,consistency and efficient workflow. Virtual simulation technologies,consistency and efficient workflow. Virtual simulation technologies,with automation technologies to ensure seamless production planning, resource allocation, and compliance management. By adopting PLM and virtual simulation, manufacturers can enhance innovation, sustainability, and operational excellence.

ptc

Additive Manufacturing | Advanced Automation | 12/23

Additive manufacturing, commonly known as 3D printing, is transforming industrial automation by enabling the rapid prototyping and production of complex components with minimal material waste. This technology allows manufacturers to create customized products,material waste. This technology allows manufacturers to create customized products,optimize design iterations, and reduce lead times. Additive manufacturing techniques, such as selective laser sintering (SLS) and fused deposition modeling (FDM), are widely used in aerospace, healthcare, and automotive industries. The integration of automation in additive manufacturing processes enhances precision, repeatability, and scalability. As materials and printing technologies advance,additive manufacturing continues to play a significant role in modern production strategies.

stratasys

Electrical and Electronic Components | Components and Hardware | 9/23

This segment includes essential components such as circuit breakers, relays, switches, and connectors that form the backbone of industrial automation systems. These components ensure the safe and efficient distribution and control of electrical power within industrial facilities. Advancements in electronic components, including the development of solid-state devices and microcontrollers, have contributed to more compact, reliable, and energy-efficient automation solutions.

Schneider Electric

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Vision Systems and Imaging | Advanced Automation | 13/23

Vision systems in industrial automation utilize cameras, sensors, and advanced image processing algorithms to inspect, identify, and guide manufacturing processes. These systems enhance quality control by detecting defects, verifying assembly accuracy, and ensuring product consistency. Imaging technologies, such as 2D and 3D vision, are widely used in applications like object recognition, barcode reading, and robotic guidance. The integration of artificial intelligence and machine learning in vision systems has further improved their accuracy and adaptability. These systems help manufacturers achieve higher efficiency, reduce human errors, and comply with stringent quality standards. With the increasing demand for automation in industries such as automotive, electronics, and pharmaceuticals, vision systems are becoming an indispensable component in smart manufacturing environments.

COGNEX

Motion Control | Components and Hardware | 14/23

Motion control involves the use of devices like motors,drives, and controllers to manage the movement of machinery and equipment. Precise motion control is crucial in applications such as CNC machining, robotics, and conveyor systems, where accurate positioning and speed regulation are required. Modern motion control systems incorporate feedback mechanisms and advanced algorithms to achieve high levels of precision and responsiveness, enhancing product quality and production efficiency.

YASKAWA

Testing and Measurement | Safety and Quality Assurance | 15/23

Testing and measurement systems ensure product quality, performance, and compliance with industry standards by assessing various physical and functional attributes. These systems include tools for dimensional analysis, load testing, vibration analysis, and electrical testing. Automated testing solutions provide high accuracy, repeatability, and speed, enabling manufacturers to detect defects early in the production process. Advanced data analytics and cloud-based monitoring solutions allow for real-time insights and predictive quality control. Industries such as aerospace, automotive, and electronics heavily rely on sophisticated testing and measurement systems to maintain product reliability and customer satisfaction.

Pneumatics and Hydraulics | Components and Hardware | 16/23

Pneumatic and hydraulic systems use compressed air and pressurized fluids, respectively, to transmit and control energy. These systems are widely used in industrial automation for tasks requiring high force and rapid movement, such as clamping, lifting, and actuating mechanisms. Pneumatics offers advantages like cleanliness and simplicity, making it suitable for industries like food processing, while hydraulics provides higher power density for heavy-duty applications.

FESTO

Energy Management and Power Systems|Energy and Sustainability | 17/23

Energy management and power systems play a crucial role in industrial automation by optimizing energy consumption, ensuring
uninterrupted power supply, and enhancing operational efficiency. These systems encompass a wide range of technologies, including smart meters, energy monitoring software, power distribution units (PDUs), and renewable energy integration. Effective identifying inefficiencies, and implementing strategies to reducecosts and environmental impact.Industrial facilities rely on power management solutions such as automated load balancing, demand response systems, and power factor correction to maintain stableand efficient operations. Advanced power management systems integrate with Industrial Internet of Things (IIoT) platforms andcloud-based analytics to provide actionable insights, predictive maintenance, and energy forecasting. With rising energy costs and sustainability goals, industries are increasingly adopting smart energy solutions to reduce their carbon footprint while maintaining- productivity. Energy management involves tracking energy usage in real time, By implementing compr hensive energy management and power systems, manufacturers can achieve regulatory compliance,lower operational expenses, and improve their overall energy efficiency

General Electric

Safety Systems | Safety and Quality Assurance | 18/23

Safety systems are designed to protect personnel, equipment, and the environment from hazards associated with industrial processes. These systems include safety relays, emergency stop devices, and safety interlock mechanisms that ensure machinery operates within safe parameters. Compliance with safety standards and regulations is essential to prevent accidents and ensure a safe working environment. The integration of safety systems into automation solutions not only safeguards human life but also minimizes downtime and liability risks.

PILZ
THE SPIRIT OF SAFETY

Power Electronics and Drives | Components and Hardware | 19/23

Power electronics involves the control and conversion of electrical power using devices such as inverters,converters, and rectifiers. Drives, particularly variable frequency drives (VFDs), are used to control the speed and torque of electric motors. By adjusting motor operation to match process requirements, VFDs contribute to significant energy savings and improved process control. Advancements in power semiconductor technology have led to more efficient and compact power electronic systems, facilitating their widespread adoption in industrial automation.

Conveyor Systems and Material Handling | Material and Production | 21/23

Conveyor systems and material handling solutions are essential for optimizing logistics and workflow within manufacturing facilities. These systems transport raw materials, components, and finished products efficiently, reducing manual labor and operational costs. Automated conveyor systems, equipped with sensors and control mechanisms, enable precise sorting, routing, and tracking of materials. Common types of conveyors include belt, roller, and chain conveyors, each suited for specific industrial applications. Integration with robotics and automated storage systems further enhances the flexibility and scalability of material handling operations. These solutions improve production efficiency, reduce downtime,and contribute to lean manufacturing practices.

Mechatronics | Components and Hardware | 20/23

Mechatronics is an interdisciplinary field that integrates mechanical engineering, electronics, computer science, and control systems to create intelligent automated solutions. Mechatronic systems, such as robotic arms, CNC machines, and automated guided vehicles (AGVs), combine mechanical components with electronic sensors and software for precise operation. These systems enhance manufacturing flexibility, efficiency, and customization capabilities. With the advent of Industry 4.0, mechatronics is evolving to incorporate AI, IIoT, and cloud computing, enabling smart and connected automation solutions. By leveraging mechatronic systems, industries can achieve higher productivity, reduced downtime, and enhanced product quality.

Automation for Packaging and Logistics | Material Handling and Production | 22/23

Automation in packaging and logistics streamlines operations by integrating smart machines, robotic solutions, and software for efficient product handling and distribution. Automated packaging systems include filling, sealing, labeling, and palletizing solutions that enhance speed and consistency while reducing waste. Logistics automation involves warehouse management systems (WMS), automated guided vehicles (AGVs), and autonomous mobile robots (AMRs) to optimize material movement and inventory management. These solutions contribute to higher throughput, reduced operational costs, and improved supply chain visibility. As e-commerce and demand for customized packaging grow, automation in this sector continues to evolve rapidly.

Manufacturing Execution Systems (MES) | Integration and Efficiency | 23/23

Manufacturing Execution Systems (MES) bridge the gap between enterprise resource planning (ERP) systems and the shop floor by providing real-time monitoring, control, and data tracking of manufacturing processes. MES solutions facilitate production scheduling, resource allocation, and quality management, ensuring optimal operational performance. They enable manufacturers to track workin-progress, identify bottlenecks, and maintain compliancewith industry standards. Integration with IoT and cloudbased technologies allows MES to provide actionable insights,enabling proactive decision-making and continuous process improvement. By implementing MES, manufacturers can achieve greater transparency, traceability, and efficiency across their production lines.

Infocast Team

Critically focused and highly motivated team of automated humanoids with one aim and mission to create PARA Tech Expo on Pro Automation Robotics and Artificial Intelligence. This team also publishes Imprint Automation India Magazine defining smart product, innovation and technology in Industrial Automation.

Founder Infocast and Editor Imprint Automation India Magazine, Anil Chopra (sixth from left); Managing Director Infocast and Exhibition Director PARA Tech Expo, Chaitanya Chopra (to his right). From Left, Surekha Bendure, Hospitality and Housekeeping; Achal Bendure, Circulation and Data; Varun Jagtap, Web Developer; Vidhi Dhumal, Graphics Designer; Suvidhya Bhure, Accounts; (Extreme right) Riya Sewatkar, Digital Marketing and Editorial content.

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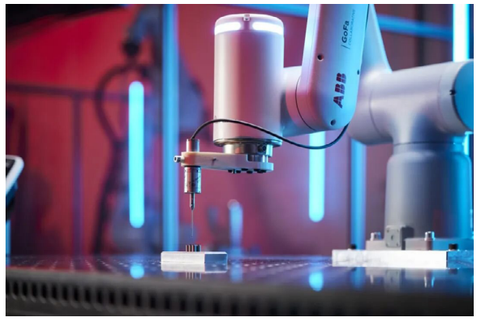
ABB Unveils Ultra Accuracy Feature for GoFa™ Collaborative Robots: Game-Changer in Precision Automation

The industrial automation landscape is undergoing a transformation with the latest advancements in robotics technology. ABB, a global leader in automation and robotics, has once again set a new industry benchmark with the introduction of its Ultra Accuracy feature for the GoFa™ collaborative robot (cobot) family. This revolutionary enhancement offers a tenfold improvement in path accuracy, unlocking new potential for precision-dependent applications such as electronics assembly, laser welding, and 3D printing. With this development, ABB continues to reinforce its position as an innovation leader, ensuring that businesses can maximize productivity while maintaining unparalleled precision.

The GoFa™ Cobot: A Brief Overview



ABB's GoFa™ cobots have already established themselves as versatile and efficient automation solutions, enabling safe and effective collaboration between robots and human workers. Unlike traditional industrial robots that operate in isolated environments, GoFa™ cobots are designed to work alongside human operators, performing delicate tasks with minimal supervision. Their intuitive programming, flexible deployment, and advanced safety features make them ideal for a variety of industries, including automotive, healthcare, electronics, and manufacturing. The new Ultra Accuracy feature enhances this existing platform, addressing the growing demand for high-precision automation in industries that require intricate and repetitive processes.

Breaking Down the Ultra Accuracy Feature

The Ultra Accuracy enhancement is designed to provide manufacturers with an unprecedented level of precision, ensuring that each movement and action is executed with micrometer accuracy. Below are some key aspects of this groundbreaking feature:

1. Superior Path Accuracy

- The Ultra Accuracy feature improves path accuracy by over ten times compared to other collaborative robots in the market. It ensures smooth and consistent motion, significantly reducing deviations from the intended trajectory.
- This improvement enables applications that require ultra-fine precision, such as placing electronic components, intricate laser cutting, and micro-welding.

2. Advanced Motion Control Algorithms

- ABB has integrated state-of-the-art motion control algorithms that enhance trajectory planning and execution.
- These algorithms continuously monitor and adjust the robot's movements in real time, compensating for minor deviations and external disturbances.
- The result is a seamless and fluid motion that maintains accuracy even at high speeds.

3. Optimized Sensor Integration

- ABB's precision sensor technology allows the GoFa™ cobots to respond to the slightest changes in position and force.
- These sensors help in detecting and correcting positional inaccuracies, making the cobots capable of performing micro-assembly tasks with surgical precision.

4. Adaptive Learning and AI-driven Enhancements

- ABB has incorporated machine learning capabilities to enable the GoFa™ cobots to improve their precision over time.
- Through AI-driven analytics, the robots can learn from past performance, continuously refining their movements for enhanced efficiency and reliability.

Applications and Industry Impact

The introduction of the Ultra Accuracy feature has far-reaching implications for multiple industries, particularly in sectors where precision is critical. Below are some key applications:

1. Electronics Manufacturing

The miniaturization of electronics requires extreme precision in chip placement, soldering, and wire bonding.
The GoFa™ cobots with Ultra Accuracy can assemble circuit boards, place microchips, and handle delicate electronic components with minimal error margins.

2. Laser Welding and Cutting

Precision welding is crucial in industries such as aerospace and medical device manufacturing.
The enhanced path accuracy ensures consistent and flawless welds, reducing material wastage and increasing durability.

3. 3D Printing and Additive Manufacturing

The feature allows consistent layering and deposition of materials in additive manufacturing.
This is particularly beneficial for medical implants, prototyping, and high-performance engineering applications where accuracy dictates product integrity.

4. Medical and Pharmaceutical Industry

The Ultra Accuracy feature can enhance the precision of robots used in surgical instrument assembly, lab automation, and pharmaceutical packaging.
It ensures that sensitive medical devices are manufactured with high accuracy, improving their reliability and performance.

ABB's Commitment to Future-Ready Automation

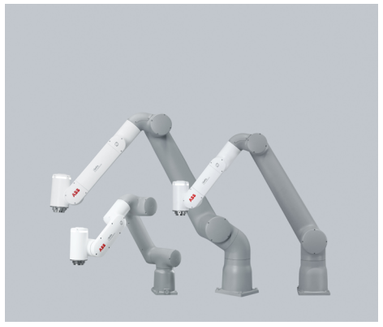


ABB has always been at the forefront of robotic innovation, and the Ultra Accuracy feature for GoFa™ is yet another testament to its commitment to advancing automation technology. With AI-driven learning, enhanced motion control, and sensor integration, this latest development aligns with the broader industry shift towards Industry 4.0.
Furthermore, ABB is actively working on integrating cloud-based monitoring and predictive maintenance solutions into its robotic ecosystem, ensuring that businesses can achieve maximum uptime and efficiency.

Conclusion: The Future of High-Precision Robotics

The Ultra Accuracy feature for GoFa™ cobots marks a significant leap in precision automation, enabling manufacturers to achieve levels of accuracy previously unattainable with traditional cobots. As industries continue to adopt smart manufacturing practices, ABB's latest innovation provides a scalable, flexible, and cost-effective solution to meet evolving market demands.
For manufacturers looking to enhance productivity, minimize errors, and unlock new possibilities in precision engineering, the GoFa™ with Ultra Accuracy is a game-changer that sets a new standard in collaborative robotics.
Stay Ahead with ABB
To learn more about ABB's latest advancements and explore how the GoFa™ Ultra Accuracy feature can transform your manufacturing processes, visit global.abb or connect with ABB's automation experts at Automation Expo 2025.

GoFa™ Ultra Accuracy: when precision meets perfection

ACME ELECTRONICS AES SERIES LINEAR WINDING MACHINES

The AES series, built on PLC and servo motor technology, provides a custom-designed solution for both simple and complex winding pitching tasks. With pitch accuracy of 0.001mm and turns accuracy of 0.1mm, this series supports a variety of winding modes and features a user-friendly touch screen HMI.

They are designed for precise pitch control, offering wide variable pitch values within a single coil layer, ideal for applications such as LVDT, heaters, sensors, and more. Customizable to meet specific customer needs, these machines feature a servo-based system with an HMI interface for accurate pitch adjustments. With a maximum winding length of 1000mm (standard 150mm), they support wire diameters ranging from 0.02 to 1.00 mm, with winding widths of 150mm or 450mm. Capable of speeds up to 1000/3000 RPM, the AES Series ensures high-performance and reliability for intricate winding tasks.

AES winding machines offer precise pitch control, for LVDT, heaters,and sensors.

https://www.acmeengg.com/

3ONEDATA PROFINET INDUSTRIAL ETHERNET SWITCH

- Support 4 Gigabit fiber ports (SFP slot) and 16 100M copper ports
- Support PROFINET RT real-time communication and meet the requirements of consistency category CC-B
- Support PROFINET MRP network redundancy, improve network reliability, reconfiguration time ≤200ms
- Adopt SW-Ring patented technology, support single ring, coupling ring, chain, Dual-homing, automatic recovery time of network failure < 20ms
- Support dual power supply, input voltage: 12~48VDC
- Support-40~75 wide operating temperature range.

IES6200-PN-16T4GS-2P48 is 20-port 100M/Gigabit layer 2 managed PROFINET industrial Ethernet switch, which supports PROFINET RT real-time communication and conforms to the consistency category CC-B. This product provides 100M copper ports, Gigabit SFP slots and other interfaces, and it adopts DIN-Rail mounting which can meet the requirements of different scenes.

The network management system supports various network protocols and industry standards, such as PROFINET, STP/RSTP/MSTP, ERPS, MRP, 802.1Q VLAN, QoS function, IGMP static multicast, SNMP, LLDP, RMON, DHCP, NTP, etc. It has perfect management functions, support port configuration, access control, network diagnosis, rapid configuration, online upgrade, etc.; It can support CLI, WEB, Telnet, SNMP and other access methods; Provide GSD equipment description file, and realize simple and consistent configuration STEP 7 or TIA Portal configuration tool. Network management system could bring you great user experience through its friendly interface design and easy and convenient operation.

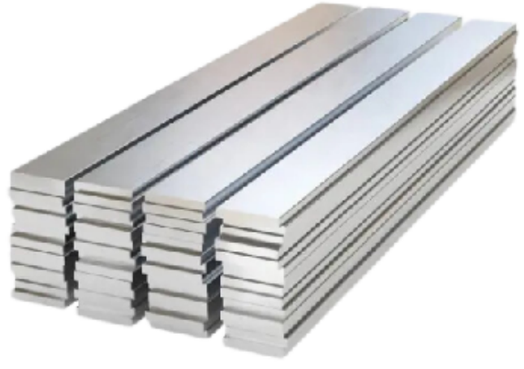
Onedata IES6200-PN-16T4GS-2P48 – 20-port PROFINET switch built for real-time communication and industrial reliability.

https://www.3onedata.com/

Fabrik CARBON STEEL PLATE

Fabrik specializes in reliable and efficient supply chains, serving diverse sectors with steel products. Operating six electric arc furnace (EAF) steel mills and value-added coating facilities, the company ships approximately 13 million tons of steel annually. With a focus on sustainability, Fabrik follows a circular manufacturing model that uses recycled ferrous scrap as the primary input, reducing carbon emissions. This approach positions Fabrik as a leader in EAF steelmaking and sustainable manufacturing, driven by innovative teams advancing climate change initiatives and high-quality production standards.

https://fabrik.vamtam.com/



CARBON STEEL PLATE- Fabrik specializes in reliable and efficient supply chains, serving diverse sectors with steel products.

Fabrik offers high-quality carbon steel plates, produced using advanced Electric Arc Furnace (EAF) technology. This method utilizes recycled ferrous scrap, resulting in lower carbon emissions and aligning with sustainable manufacturing practices

Key Features:

Versatile Applications: Suitable for construction, automotive, energy, and industrial sectors.

Sustainable Production: Manufactured using recycled materials, reducing environmental impact.

Reliable Supply Chain: Supported by multiple EAF mills and coating operations, ensuring consistent quality and timely delivery

ACCELUS ROBOTICS MC7 MOTION CONTROLLER

The MC7 Motion controller offers dual -motor control ,encoder support, and a touch display, ideal for robotics and automation system

It is designed for precise dual-motor control, featuring 16 NPN inputs and 12 NPN outputs for seamless integration with various devices. It supports external encoders or Manual Pulse Generators (MPG) for accurate positioning and offers RS422/RS485 communication protocols for flexible connectivity. The controller includes a 7-inch capacitive touch display for user-friendly interaction and is suitable for applications in robotics, CNC machinery, and automation systems.

It is designed for precise dual-motor control, featuring 16 NPN inputs and 12 NPN outputs for seamless integration with various devices. It supports external encoders or Manual Pulse Generators (MPG) for accurate positioning and offers RS422/RS485 communication protocols for flexible connectivity.

https://accelusrobotics.com/

The controller includes a 7-inch capacitive touch display for user-friendly interaction and is suitable for applications in robotics, CNC machinery, and automation systems.

It is a high-performance 7-axis motion controller with an integrated EtherCAT master, engineered for precision control in automation, robotics, and CNC applications.

Download

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ACROBOT ROBO INSPECTION

Robo inspection uses advanced robotic systems with sensors and AI to conduct precise, real-time quality checks in industries like manufacturing and aerospace.

It involves using advanced robotic systems to conduct thorough and precise inspections across various industries. Equipped with sensors, cameras, and AI algorithms, these robots can detect defects, measure dimensions, and assess quality in real-time. They are utilized in sectors such as manufacturing, aerospace, and infrastructure, where precision is critical. Robo inspection enhances accuracy, speed, and safety, reducing the need for human intervention in hazardous environments. By automating routine checks, these systems ensure consistent quality control and help prevent costly errors, making them an integral part of modern industrial processes.

As industries evolve toward smarter manufacturing, robo inspection is emerging as a game-changer in industrial quality assurance. Leveraging the power of advanced robotics, AI algorithms, and high-precision sensors and cameras, these systems conduct real-time inspections with unmatched accuracy and consistency.

From manufacturing floors to aerospace assembly lines and infrastructure projects, robo inspection ensures critical parameters like defect detection, dimensional accuracy, and surface integrity are met — every time. By automating routine and hazardous inspection tasks, these robots not only improve safety but also significantly reduce downtime and human error.

As industries prioritize zero-defect manufacturing, robo inspection is no longer a futuristic concept — it's an essential pillar of modern Industry 4.0 practices.

acrobot

https://acrobot.in/

ACT SENSORS AS30 SERIES- MASS AIR FLOW SENSOR

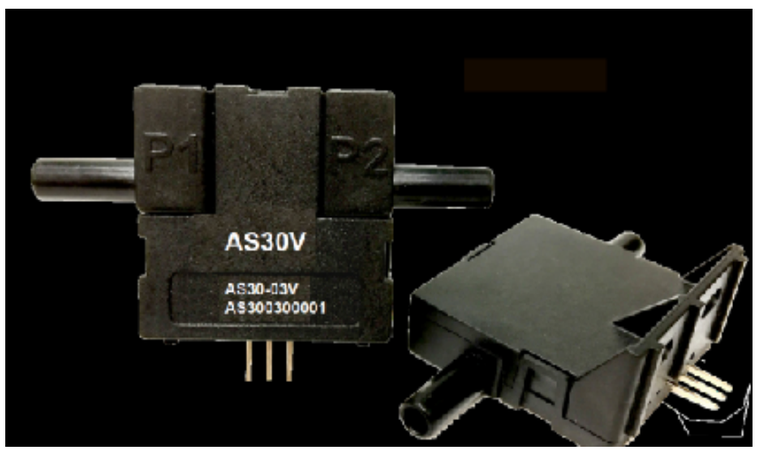
ACT Sensors introduces the AS30 Series, a line of thermal mass air flow sensors designed for high-precision gas flow measurement. Utilizing third-generation microfabricated thermal flow die technology, these sensors employ thermopiles to detect temperature gradients caused by mass flow, ensuring excellent signal-to-noise ratio and repeatability. The solid-state thermal isolation structure eliminates the need for surface cavities or fragile membranes, making the sensors resistant to clogging and pressure shocks.

FEATURES:

- Unsurpassed performance in a robust and cost effective package.
- "Solid state" sensing core (no surface cavity or fragile membrane) resistant to clogging and pressure shock.
- Highly accurate (4% reading typ.)
- Fast response time (5 ms typ.)
- Linear output and temperature compensation.
- Long-term stability with minimal null drift.

APPLICATIONS:

- Oxygen concentrators
- Nebulizers
- CPAP equipment
- Leak detection
- Spectroscopy
- Mass flow controller
- Fuel cell control
- Environmental monitoring



AS30 SERIES- mass air flow sensor AS-30 features third-generation thermal flow die, benefiting from the latest innovations

ACT Sensors Private Limited

https://www.actsensor.net/index.html

ADAGE INTEGRATED SOLUTION- HVAC FOR HAZARDOUS AREAS

ADAGE Integrated Solution Analyzer Shelters for Zone 1 & Zone 2 applications with HVAC In-house Design and Manufacturing facility for SS316 /304.

Analyzer Shelters for Zone 1 & Zone 2 applications with HVAC
In-house Design and Manufacturing factility for SS316 /304 .CRCA painted analyzer shelters for Hazardous areas for Zone 1 /Zone2 and GP . Experience of building 18 mtr x 7.5 mtr x 2.7 mtr Analyzer House with HVAC. These analyzer shelters are integral for industries requiring precise gas analysis and monitoring, such as oil and gas, petrochemical, and chemical sectors. The integration of advanced HVAC systems ensures that analytical instruments operate within their optimal environmental conditions, thereby enhancing accuracy and longevity.

ADAGE

https://www.adage-automation.com/

AG ELECTRONICS ULTRASONIC SENSORS

AG Electronics offers ultrasonic sensors in various sizes to cater to diverse industrial applications. These sensors are designed for non-contact measurement, utilizing high-frequency sound waves to detect objects and measure distances accurately.

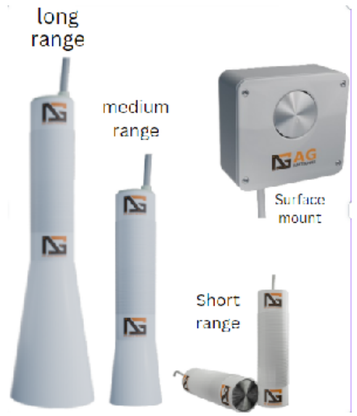
Product Range:
Short-Range Sensors:
Sensing Range: Up to 5 meters
Applications: Ideal for precise level measurement in tanks, open water resources, and reservoirs.
Mounting Board Size: Compact design for easy installation; specific dimensions not specified.

Medium-Range Sensors:
Sensing Range: Up to 7 meters
Applications: Suitable for applications requiring accurate measurements at moderate distances.
Mounting Board Size: Compact design for easy installation; specific dimensions not specified.

Key Features:
Non-Contact Measurement: Utilizes ultrasonic waves for accurate distance and level detection without physical contact.
Environmental Resilience: Designed to perform reliably in various industrial conditions.
Versatile Outputs: Offers multiple output options, including analog current (4-20mA), analog voltage (0-5V & 0-10V), NPN/PNP (ON/OFF Signal), and serial communication (TTL, RS-485, RS-232).

Long-Range Sensors:
Sensing Range: Up to 10 meters
Applications: Best for scenarios needing precise measurements over greater distances.

Mounting Board Size: Compact design for easy installation; specific dimensions not specified.



AG Electronics offers ultrasonic sensors in various sizes to cater to diverse industrial applications.

AG ELECTRONICS

MAKE IN INDIA

https://www.agelectronics.in/

STAINLESS STEEL GAUGES

Adarsh Industries' stainless steel pressure gauges are engineered for durability and precision in corrosive and demanding environments. Featuring SS316 wetted parts and an IP65-rated SS304 case, these gauges are ideal for industries such as pharmaceuticals, chemicals, oil & gas, and food & beverages. Available in various dial sizes, they offer options for dry or liquid-filled configurations to suit applications with vibrations. Enhance your operational reliability with Adarsh's robust pressure measurement solutions.

ADARSH

http://www.adarshpressuregauge.com/

The ADATA R100 Magnetic Power Bank—a sleek and powerful charging solution designed for modern devices.

ADATA R100 MAGNETIC POWER BANK

The ADATA R100 Magnetic Power Bank—a sleek and powerful charging solution designed for modern devices. With a 10,000mAh capacity, it offers ample power to keep your gadgets running throughout the day. The magnetic wireless charging feature ensures effortless alignment and charging for MagSafe-compatible iPhones and Qi-enabled Android devices, delivering up to 15W of wireless power. Additionally, the USB-C and USB-A ports support up to 20W fast charging, allowing you to charge multiple devices simultaneously. Its compact design includes a foldable stand for hands-free viewing, making it a versatile companion for your on-the-go lifestyle.

ADATA

https://www.adata.com/

The ADATA R100 Magnetic Power Bank—a sleek and powerful charging solution designed for modern devices.

Advance cable's

Empowering the Future of Electric Mobility with Advance Cable's EV Solutions.
Advance Cable is revolutionizing EV charging infrastructure with innovative, reliable, and efficient solutions tailored for modern electric vehicle needs.
Premium EV Charging Cables: Engineered to meet international standards, our charging cables deliver exceptional durability, safety, and performance, ensuring seamless compatibility with diverse EV models.
State-of-the-Art Connectors: Designed for optimal reliability and ease of use, our connectors guarantee a smooth and hassle-free charging experience.
Comprehensive Charging Solutions: From residential charging setups to commercial and public installations, our solutions are crafted to meet the evolving demands of electric mobility.
Commitment to Sustainability: Combining advanced technology with environmental stewardship, we empower businesses and individuals to embrace greener transportation solutions confidently.
Elevate your EV charging infrastructure with Advance Cable's trusted expertise.
As India accelerates towards a sustainable transportation future, Advance Cable Technologies (ACT) stands at the forefront, delivering cutting-edge solutions tailored for the electric vehicle (EV) ecosystem. With a commitment to innovation and quality, ACT offers a comprehensive range of products designed to meet the diverse needs of the EV industry.
Key Offerings:
Coiled (Spiral) Charging Cables: Ergonomically designed to connect charging stations to vehicles, these cables are space-efficient and available with 16A or 6A Indian or European plugs, AC-CCS type plugs, or AC-GBT plugs.
Cable Harnesses & Interconnects: Manufactured for various vehicle categories, including 2-wheelers, 3-wheelers, passenger vehicles, and commercial vehicles. ACT's facilities boast crimping capabilities up to 16 tons and pull force testing for cables up to 120 sqmm, ensuring durability and reliability.

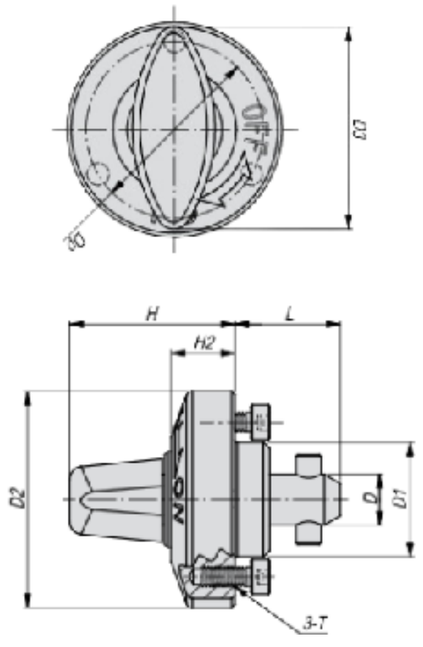
Quality Assurance: Every harness undergoes rigorous testing to verify all parameters, ensuring optimal performance and safety.

Advance Cable is revolutionizing EV charging infrastructure with innovative, reliable, and efficient solutions tailored for modern electric vehicle needs.

ADVANCE CABLE TECHNOLOGIES (P) LTD
EMPOWERING CONNECTIVITY

https://www.advancecable.in/index.html

AIROLL SERIES 100 GRAVITY CONVEYOR ROLLERS



The AIROLL Series 100 Gravity Conveyor Rollers are ideally suited to be fitted in light duty and medium duty roller conveyors. It has a very free running bearing which means that very small and lightweight products can still be conveyed easily by gravity. It can also be used in belt conveyors as support roller.

Product Features and Options –

In Series 100 Gravity Conveyor roller Deep Groove Ball Bearing permanently sealed in Polymer Bearing Housing
These Rollers can bear maximum impact load on it.
Bearings are protected from dust
Material Option: Mild Steel | Stainless Steel
Various Tube & Shaft Options.

airoll®

https://www.airoll.in/

The AIROLL Series 100 Gravity Conveyor Rollers are ideally suited to be fitted in light duty and medium duty roller conveyors.

PARA Tech Product Spotlight

STREAMLINE YOUR INDUSTRIAL OPERATIONS WITH INVT PLC HMI!

INVT PLC HMI combines advanced Programmable Logic Control (PLC) with an intuitive Human Machine Interface (HMI) to deliver unmatched efficiency, precision, and performance in industrial automation.

Key Features :

Seamless Integration: Combines PLC control with HMI for real-time monitoring and control.

User-Friendly Interface: High-resolution touchscreen for smooth operation.

Robust Performance: Built to withstand demanding industrial environments.

Customizable Solutions: Tailored for manufacturing, energy, and automation industries.

Enhanced Connectivity: Supports Modbus, Ethernet, and other protocols for smarter control.

Applications:

Manufacturing | Energy Management | Automotive | Oil & Gas | Food Processing

Ecosys Efficiencies brings you a reliable, cost-effective, and smart solution to take your industrial automation to the next level.

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AUTOMATION OF FZBRIC FORMING MACHINES

A.T.E. Enterprises Private Limited offers comprehensive automation upgrades for aging fabric forming machines, addressing challenges like low production efficiency, high power consumption, frequent breakdowns, and inconsistent warping lengths.

Key Features:

Electrical System Overhaul: Upgrading outdated electrical components with modern technology to enhance reliability.

ATE Group

PLC and Drive Replacement: Substituting obsolete PLCs and drives with the latest versions to improve control and performance.

Customized Operations: Enabling tailored functionalities for machines utilizing embedded cards.

Panel Work and Logic Modification: Implementing new process integrations and modifying logic to suit specific production needs.

Benefits:

Enhanced Productivity: Significantly increasing machine efficiency and allowing operations at higher speeds.

ATE Group

Reduced Maintenance: Lowering maintenance requirements and simplifying troubleshooting processes.

User-Friendly Interface: Incorporating intuitive IPC (SCADA) designs for easier operation.

ATE Group

Machine Revival: Bringing old or non-operational machines back into productive use.

By modernizing existing equipment, A.T.E. empowers textile manufacturers to boost productivity and extend the lifespan of their machinery.

Old fabric forming machines have a number of problems such as low production, efficiency, high power consumption, frequent breakdowns unequal length of warping, and the like.

A.T.E.'s automation upgrade for old fabric forming machines improves machine efficiency and productivity, allowing a machine to be run at higher speeds. Even old/stopped machines can be put back into production.

A.T.E.'s automation upgrade for old fabric forming machines improves machine efficiency and productivity, allowing a machine to be run at higher speeds.

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Hall 1 - 101

RADIAL COMPLIANT DEBURRING TOOL FOR ROBOT(TRG30)

RadialCompliantDeburringToolforRobot(TRG30) isusedtoremovethethickerburrsoncurvededges.

product information:
Weight: 0.5 (in Kg)
TRG30
Deburring Tool For Robot, Compliant type : Radial, Applications: Curved edge, Used to remove the thicker burrs on curved edges. Suitable for plastic, die-casting and machined workpieces.

Features:
-Used to remove the thicker burrs on curved edges.
-Suitable for plastic, die-casting and machined workpieces.
-Good for large burrs on complex curved edges.
-Compact design with strong compliance force, utilizing pneumatic control to handle ultra-small gaps. Supports highly sensitive radial compliance, ensuring precise surface finishing.
-Applicable material: Aluminum, copper, steel.

INNOVATION PARTNER
AMAL CONTROLS

https://www.amalcontrols.com/

ROLLER CONVEYORS ARE IDEALLYSUITED

Roller Conveyors are ideally suited for moving products in a manufacturing line or warehouse, that otherwise may not be handled on a Belt Conveyor.

Roller Conveyors are ideally suited for moving products in a manufacturing line or warehouse, that otherwise may not be handled on a Belt Conveyor. Roller conveyors are extremely rugged and ideal for extreme handling. Various types of Roller Conveyors can be designed and implemented depending on the requirements.

One of the most commonly used roller conveyors is the Gravity Roller Conveyor- for economical non-pauperized transfer of material. Such conveyors rely on the operator pushing the product on the conveyor- or- the product moving down an inclined conveyor due to gravity.

Powered Roller Conveyors are conveyors where the rollers are powered and power transmitted to each of the roller through a chain. This is ideal for moving heavy boxes and more demanding applications.

The Roller Conveyors can be custom designed in different lengths & widths. Roller type can also be customized to different diameters / special coatings depending on the application. Accessories such as sensors, speed control devices, pneumatic stoppers may be fixed on the conveyor as per requirement.

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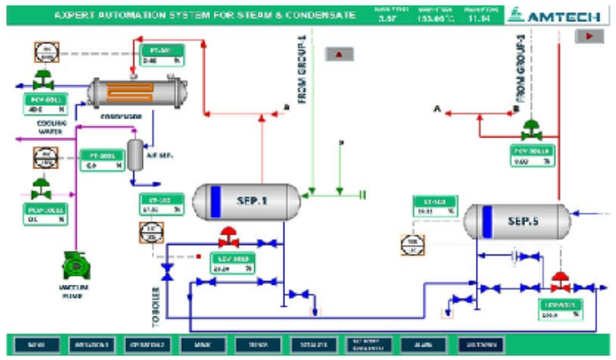
www.infocast.in
PARA Tech Product Spotlight

The JET MOVE 6XX SERVO MOTOR CONTROLLERS



Designed for industrial automation and motion control, The JetMove 6XX- Servo Motor advanced controllers ensure seamless operation and enhanced productivity.

Experience precision and efficiency with Amtech Electronics' Servo Motor Controllers!
Designed for industrial automation and motion control, our advanced controllers ensure seamless operation and enhanced productivity. From real-time position control to customizable settings, these controllers are built to meet the demands of modern engineering and manufacturing.

Direct axis programming and parameterization within the controller's application program.
Coordination of multiple axes and specialized axis functions.
Individually parameterizable and disable digital current, speed, and position controllers.
Compatibility with resolver or sine-cosine feedback mechanisms.

AMTECH

https://ambetronics.com/

ONLINE IoT DATA CONVERTERS FOR DATA TRANSMISSION - AMBETRONICS.

In the realm of industrial safety, Ambetronics proudly presents our IoT-based Online Data Converter, a cutting-edge solution designed for Wireless IoT Data Transmission in industries and factories. Tailored to meet the diverse needs of the Industrial Automation Engineers, this converter series promises seamless data communication with utmost efficiency.

FEATURES:
Flexibility and High Performance
Adaptable to various applications with advanced technology for optimal performance.
Thorough Quality Control
Products undergo rigorous quality control and testing before reaching customers.
Extended Communication Range
RS-232 to RS-485 Converter extends communication distances up to 1200 meters.
Isolated Connectors
Dedicated connectors for RS232 and RS485 signals, ensuring secure and isolated connections.LoRa Technology
RS-485 to Wireless Transceiver utilizes LoRa technology for long-range wireless communication.
Secure Data Encryption
Incorporating an extra layer of security, Ambetronics' Online Data Converter series ensures secure data encryption.

In the realm of industrial safety, Ambetronics proudly presents IoT-based Online Data Converter, a cutting-edge solution designed for Wireless IoT Data Transmission in industries and factories.

AMBETRONICS

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PARA TECH WEBINAR

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< IMPERATIVES OF AUTOMATION IN PHARMA MANUFACTURING >

OCTOBER 9, 2025

12:00 to 1:30pm

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Synopsis: Dependency on Automation in Pharma manufacturing. Necessity of Automation in pharma production. Importance of chemical ingredient precise accuracy. Efficiency, Productivity, Profitability Criteria.
Pharmaceutical manufacturing now runs on automation. Regulatory scrutiny and round-the-clock demand make automated systems an absolute necessity in daily production. Meanwhile, real-time analytics, robotics, and paperless workflows lift efficiency, productivity, and profitability from formulation through packaging and logistics.

Scope & Learning Objectives

State-of-the-art automation is critical to every pharma process and packaging line, and the pace of technology innovation is accelerating daily. No matter whether a plant is small, medium, or large, automated platforms are now the fastest way for a Pharma Unit to achieve economies of scale.Breakthrough formulations, process novelties, and bio-chemical research deliver real value only when they are executed under strict, fully automated, cGMP-compliant conditions. Sophisticated digital dosing guarantees sub-milli-gram accuracy for every chemical ingredient, protecting efficacy and patient safety.

Today's regulatory climate demands traceability, paperless batch records, and 24 × 7 remote monitoring; modern MES, IIoT sensors, and advanced software deliver exactly that. Robotics has moved from pilot cells to the mainstream, handling everything from aseptic transfers to high-speed cartoning with unmatched consistency.Automation doesn't stop at the reactor — secondary packaging, cold-chain warehousing, and end-to-end supply-chain control now rely on the same digital backbone for speed and accura-cy. Global sustainability goals — zero-liquid-discharge, lower emissions, reduced energy use — are achievable only with intelligent, closed-loop process control and data-driven optimisation.

Even the smallest tablet- or capsule-manufacturing unit benefits: automated feeders and weight checks secure micro-gram accuracy, while clean-in-place sequences cut down-time and contamination risk. Liquid bottling lines showcase the payoff — sterile, drip-free fills and neck-banding precision that manual systems simply cannot match. Real-time dashboards convert raw sensor data into actionable analytics, lifting efficiency, productivity, and profitability across the enterprise.Routine system updates keep plants aligned with evolving FDA, EMA, and CDSCO guidance, safeguarding market access and brand reputation. Join the PARA Tech Expo: Pharma Automation Webinar — it will give you an edge in your business and future strategy.

Speaker

Ravi Kalla

CIO – IT & Digital Automation,
Athem Biosciences Pvt Ltd.

Speaker

K.Kulbhushan

Global Head & Vice President –
Operations Strategy, Excellence & Digital
Dr. Reddy's Laboratories

Speaker

Satish Pathak

Founder & Executive Director,
Samiep Technology Innovations Pvt. Ltd.

Moderator

Anil Chopra

Editor & Publisher, Imprint Automation India Magazine
• Founder, PARA Tech Expo.

FANUC ROBOT CRX SERIES

FANUC Collaborative Robot CRX Series includes a variety of models with the payload from 5kg to 30kg. CRX is recognized for being simple to install and operate. Besides having an immediate contact stop feature for safety, motions can be taught easily with the direct teaching method, where the robot's arm is directly held and moved according to the desired motion. By using a tablet, CRX can be used immediately even by first time users. Food grade variant and paint variant are also supported.

FANUC Collaborative Robot CRX is recognized for being simple to install and operate.

FANUC Robotics

https://www.fanuc.com/

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Apex Dynamics Smart Lubrication System is an ultimate solution for maintaining optimal performance in industrial machinery.

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Eaton's Role in the Future of Industrial Automation: Innovations & Trends

Powering the Next Industrial Revolution Introduction

The industrial automation landscape is evolving rapidly, with Industry 4.0 driving the integration of smart technologies, artificial intelligence (AI), and the Industrial Internet of Things (IIoT) into manufacturing and power management. Eaton, a global leader in power management solutions, is at the forefront of this transformation. With its intelligent automation systems, predictive maintenance capabilities, and energy-efficient solutions, Eaton is reshaping how industries operate.

1. Smart Power Management for Industrial Automation

One of the most critical aspects of Industry 4.0 is intelligent power distribution and management. Eaton's Brightlayer Industrial IoT Suite is a game-changer, offering AI-driven insights into energy usage, predictive failure analysis, and real-time power monitoring. Key innovations include:

Digital Twin Technology: Eaton integrates digital twin simulations for predictive analytics, allowing industries to test automation processes before implementation.
Smart Circuit Protection: Eaton's Power Defense MCCBs (Molded Case Circuit Breakers) provide data-driven protection by continuously analyzing electrical faults and preventing downtime.
Energy Optimization: Eaton's Power Xpert energy monitoring software enables businesses to track energy consumption, ensuring efficiency and compliance with sustainability goals.

2. Intelligent Motor Control Solutions for Smart Factories

Industrial automation relies heavily on motors, and Eaton is revolutionizing motor control with AI-driven, IoT-enabled variable frequency drives (VFDs) and soft starters. These technologies help industries optimize motor efficiency, reduce wear and tear, and prevent costly failures. Eaton's advancements in this area include:

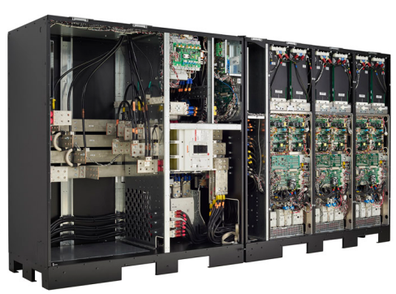
Eaton PowerXL DG1 & DE1 VFDs: These drives integrate remote diagnostics and predictive maintenance, reducing downtime in industrial operations.
Soft Starters with IoT Connectivity: Eaton's S811+ and S611 soft starters enable seamless control and real-time data monitoring, ensuring smooth operations in heavy industries.
Intelligent Contactors & Relays: Eaton's XTCE contactors and ELC programmable relays offer energy-efficient switching solutions, ensuring long-term sustainability.

Eaton 9PX Series UPS Reliable, versatile and efficient backup power for IT equipment, including Cisco switches and servers

3. Digital Twin Technology: Enabling Predictive Automation

Eaton is driving digital twin adoption in industrial automation by integrating AI, IoT, and real-time analytics to improve efficiency and reduce operational costs. Some of Eaton's key digital twin innovations include:

Eaton Twin Model Simulation Suite: A real-time digital modeling tool that replicates physical automation processes to predict failures and optimize workflows.
Predictive Maintenance Integration: Eaton's Brightlayer Predictive Analytics leverages digital twin technology to anticipate equipment failures before they occur.
Industrial System Testing & Optimization: Eaton's Xcelerator Digital Engineering Platform allows manufacturers to simulate automation processes, enhancing productivity and reducing errors.



The Eaton 9395 UPSs provide industry-leading efficiency and scalable battery runtimes in a small footprint

www.paratechexpoindia.com

4. Eaton's Industrial IoT (IIoT) and Edge Computing Innovations

Industrial IoT and edge computing are transforming the automation sector, and Eaton is leading the way with solutions that enhance connectivity and operational efficiency.

Brightlayer Industrial Edge: Eaton's industrial edge computing platform enables real-time data analytics, ensuring better decision-making in production plants.
Eaton PredictPulse: A cloud-based predictive monitoring system integrated with Eaton's UPS, circuit breakers, and power distribution units for real-time diagnostics.
Connected PLCs & SCADA Systems: Eaton's EasyE4 programmable logic controllers (PLCs) and iQ Works SCADA solutions help industries achieve greater automation and efficiency.
Smart Sensors & Controllers: Eaton's IoT-enabled E67 long-range proximity sensors and C441 motor protection relays continuously monitor industrial machinery, identifying potential failures before they occur.

5. Future Trends: What Lies Ahead?

Eaton's forward-looking approach ensures that industrial automation will continue to evolve. Some key trends in Eaton's roadmap include:

AI-Powered Industrial Robotics: Integration of machine learning algorithms in robotic automation to enhance precision and efficiency.
Autonomous Factory Management Systems: Eaton is developing fully automated, AI-driven manufacturing systems that self-optimize processes.
Enhanced Digital Twin Capabilities: Eaton is working on next-generation digital twin technology to provide even more accurate real-time asset monitoring and optimization.

Eaton's PowerXL DM1 micro variable frequency drives are engineered for today's demanding commercial and Machinery OEM applications

Conclusion: Leading the Automation Revolution

Eaton's technological innovations are shaping the future of industrial automation by making industries smarter, more efficient, and highly sustainable. With AI-driven predictive maintenance, intelligent motor control, IIoT connectivity, and robust digital twin solutions, Eaton is helping businesses transition into the next phase of Industry 4.0 and beyond. As the demand for smart factories and real-time industrial optimization grows, Eaton continues to be a key player in driving the future of industrial automation.

Eaton's Xintegra ensures system level performance and integrity at every lifecycle stage within your data centre

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Indian Pharma Automation Market Intelligence

Imprint Automation India Magazine presents research on prospects and potential growth and business opportunity in Indian Pharma Automation. As a catalyst Imprint and PARA Tech are doing a webinar- Imperatives of Automation in Pharma Manufacturing . Clearly the market demands strong focus on developing appropriate solutions in pharma automation aimed at Indian Pharma manufacturing. This market intelligence report speaks for green lighting investment and product development.

Global Market Size & Growth

Total pharmaceutical manufacturing automation market—which includes equipment, software, and services—is expected to grow significantly to USD 25.50 billion by 2031. At a CAGR of 10.8%.

Market for Pharma 4.0 solutions has projected to reach USD 73.00 billion by 2034 at a CAGR of 19%.

Market for manufacturing-execution systems (MES) in the life sciences sector is also experiencing notable growth. It is projected to reach USD 10.00 billion by 2034, at a CAGR of around 12%.

Key Equipment Segments

Pharma robots used in manufacturing, quality assurance (QA), will rise upto USD 206.1 million by 2033, growing at a CAGR of 8.7%. Picking and Packaging cobots share is USD 246.40 Million.

Total USD 458 million.

Automated visual-inspection systems are witnessing steady growth, with market value increase till 1.9 billion by 2033, reflecting a CAGR of 7.9%.

Packaging-equipment automation, which includes fill/finish systems, cartoners, case packers, and serialization units, is growing to over USD 13 billion by 2030, with a CAGR of 6.3%. Robot Density trends will reach 322 robots per 10000 employees from to 188 robots per 10000 employees by 2025.

Robot Density will reach 322 robots per 10000 employees.

India Market

Indian Pharma robots will grow to USD 5.6 million by 2030 at a CAGR of 16.2%.

Indian Industrial-automation market in all sectors will grow to USD 14.8 billion by 2030 at a 9.7%.

65 % of new pharma line automation concentrated in top five metro regions Mumbai, Hyderabad, Bangalore, Chennai, and Pune. Beacon Examples are Cipla Indore & Dr Reddy's Hyderabad globally recognised for advanced automation adoption.

Indian Pharma Automation Market is majorly for hardware and software solutions which is 86% of the market. Pharma Automation services accounts for 14%.

Global Share of Pharma is extremely small which is only 4.0%. Evidently the growth prospects and potential are tremendous in Pharma Automation. Hence Indian Companies developing specific pharma automation robotics and automation including data driven solutions will enjoy a global market and exports for India.

Several companies are leading the way in pharmaceutical automation, focusing on areas like robotics, AI, and process optimization. Some of the top companies include Rockwell Automation, Siemens, ABB, and Yokogawa Electric, along with specialists like Essert Robotics and FANUC. Additionally, companies like Anthem Biosciences, Dr. Reddy's Laboratories and Samiep Technology Innovations are also making significant strides in digital innovation and automation within the pharmaceutical industry. The pharmaceutical sector is similarly poised for substantial growth, with the Indian pharmaceutical market estimated to reach USD 130 billion by 2030, driving increased automation adoption in manufacturing processes, quality control, and supply chain management. The integration of Industry 4.0 technologies is further enhancing the capabilities of these sectors. The technology adoption rate in Indian manufacturing has reached unprecedented levels, positioning India at the forefront of smart manufacturing implementation globally. Indian manufacturers are investing significantly in technology modernization, allocating 35% of their operating budgets to technology implementation, substantially higher than the global average of 23%. This increased focus on technological advancement is driving the adoption of sophisticated automation solutions, including robotics, artificial intelligence, and machine learning applications across manufacturing processes, leading to enhanced operational efficiency and productivity.

Imprint research by Anil Chopra (anil.chopra@imprint-magazine.in) Riya Sewatkar (riya.sewatkar@imprint-magazine.in)

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Dr. Reddy's

Dr. Reddy's Automation in Pharma Manufacturing

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K. Kulbhushan began his career with General Electric (GE), where he earned his Master Black Belt in Lean Six Sigma and led global operational excellence from 1996 to 2003. He then headed supply-chain and business-excellence roles at Jubilant Life Sciences, served as SVP & Global Head at Max Life Insurance, and later led Operations Excellence at Sun Pharma (2017–2018). Since August 2018, he has been with Dr. Reddy's Laboratories as Global Head & VP – Operations Strategy, Excellence and Digital. He further enhanced his strategic leadership through the Global Advanced Management Program at Kellogg School of Management, Northwestern University. K. Kulbhushan is a visionary leader in pharmaceutical operations, steering global transformation as Head of Operations Strategy, Excellence & Digital at Dr. Reddy's. With over two decades of experience, he has driven major initiatives including

Lean Manufacturing Excellence: Pioneering lean practices across Dr. Reddy's global plants to streamline workflows, bolster compliance, and enhance quality control.

Digital Transformation Champion: Led adoption of AI, machine learning, and digital twin simulations, modernizing manufacturing and supply-chain systems for increased resilience and compliance.

Quality Leadership: Recognized as one of India's Top 50 Quality Professionals, underscoring his unwavering commitment to operational excellence.

Awards & Accolades: His strategic direction contributed to Dr. Reddy's winning the Express Pharma Excellence Award 2025 and multiple accolades in Operational and Manufacturing Productivity
Excellence.

Industry Thought Leader: A sought-after speaker at premier events like FlyPharma Europe, Pharma Manufacturing & Automation Conventions, and the Future of Manufacturing Summit, where he discusses lean automation, Industry 5.0, and evidence-based process innovation. He is also part of the Elite Jury for the Future of Manufacturing Awards 2025.

Strategic Outlook: Kulbhushan emphasizes critical thinking and data-driven decision-making as essential tools to reduce waste, improve cost efficiency, and accelerate speed to market.

K. Kulbhushan
Global Head & Vice President – Operations Strategy, Excellence & Digital
Dr. Reddy's Laboratories

Manufacturing Automation

MES-DCS Integra on for Life Sciences

Seamless Control, Compliance & Efficiency with Rockwell Automa on

In pharmaceutical and biotech manufacturing, the need for precision, traceability, and compliance is paramount. Rockwell Automation addresses these demands with a purpose-built integration of its **PharmaSuite MES** and modern **Distributed Control Systems (DCS)**—empowering manufacturers with a unified digital thread from recipe execution to process control.

Why It Matters

In traditional setups, MES and DCS operate in silos, requiring manual data transfers, duplicate entries, and increasing the risk of transcription errors. This slows down batch release and exposes plants to compliance risks under global regulations like **21 CFR Part 11.**

What Rockwell Delivers

- **Bi-direc onal Data Flow**: Automates parameter exchange between MES & DCS
- **Electronic Batch Records (EBR)**: Generated in real-me, reducing documenta on lag
- **Devia on Detec on**: Alerts operators instantly across both systems
- **Built-in Compliance**: Validated templates and audit trails ready for FDA/EMA requirements
- **Scalable Architecture**: Adapts to con nuous or batch processes with ease

Rockwell Automa on's PharmaSuite MES and modern DCS form a proven platform for compliant, efficient, and future-ready life sciences operations.

With **MES-DCS integration,** life sciences manufacturers can accelerate batch release, enhance data integrity, reduce manual interventions, and stay audit-ready—while building a foundation for **realtime release testing** and **digital manufacturing maturity.**

Unlocking Industrial Intelligence with AVEVA™ PI System

Empowering Opera onal Agility Through Real-Time Data Infrastructure

In today's competitive industrial environment, the ability to transform raw operational data into realtime insights has become essential. The AVEVA™ PI System stands at the forefront of this transformation, serving as a powerful data infrastructure that connects the entire enterprise—edge to cloud. Trusted globally across sectors like pharmaceuticals, power, oil & gas, and manufacturing, it enables seamless data collection, contextualization, and visualization to drive smarter, faster decisions.

What sets the PI System apart is its ability to unify disparate data sources across complex facilities. It securely collects high-frequency data from SCADA systems, PLCs, sensors, and IoT devices, and archives decades of high-fidelity time-series data without loss of granularity. This data is not just stored—it is contextualized using AVEVA's Asset Framework, which links process values to physical assets like pumps, reactors, or production lines. This turns raw values into actionable intelligence.

The system's built-in visualiza on layer, AVEVA PI Vision, empowers users to build dynamic dashboards that reflect the real-me status of opera ons. For deeper analysis, PI DataLink integrates this data directly into Microso Excel, offering engineers, analysts, and managers a familiar pla orm to extract performance trends, monitor KPIs, and make data-driven opera onal adjustments.

In regulated industries, maintaining traceability and auditability is cri cal. The AVEVA PI System provides secure data logs, complete audit trails, and supports compliance with standards such as FDA 21 CFR Part 11, ensuring confidence in every decision made. Its architecture is designed to scale—from single-site deployments to enterprise-wide rollouts—and supports hybrid cloud configura ons, aligning with the digital transforma on goals of forward-looking organizations.

With growing demand for real-me visibility, predic ve maintenance, and energy opmiza on, the AVEVA PI System offers a strategic advantage. It not only streamlines plant opera ons but also provides the founda on for advanced analy cs, sustainability tracking, and future-ready industrial performance.

IT and Data Infrastructure Automation

Kyndryl partners with Dr. Reddy's Laboratries to implement advanced IT solutions

Transforming Pharma IT: Dr. Reddy's & Kyndryl Join Forces

A Strategic Leap Toward Zero Touch Operations

In a bold stride toward enterprise-wide digital transformation, Dr. Reddy's Laboratories has partnered with Kyndryl, a global leader in mission-critical IT services, to modernize and automate its entire IT operations landscape. This strategic initiative spans the pharma giant's global manufacturing sites, offices, data centers, and cloud infrastructure—marking a decisive shitf toward intelligent, autonomous operations. At the heart of this transformation lies Kyndryl Bridge, an AI-powered integration pla orm that will serve as the digital backbone for Dr. Reddy's operations. The plaform is set to deliver predictive insights, enable self-healing and auto-remediation capabilities, and offer unified visibility through a single-pane dashboard. More than a monitoring tool, Kyndryl Bridge aims to evolve the company's IT from reac ve service delivery to a resilient, insight-driven ecosystem.

A key ambition of the partnership is to implement a Zero Touch IT Operations model, dras cally reducing manual interventions by up to 60%. Using Kyndryl's Dual Model IT Ops framework, the focus shi s from fixing incidents to permanently resolving root causes—ensuring not just continuity, but excellence. The transformation will not only enhance service performance and risk management, but also bring new levels of compliance automation, a crucial requirement in pharma's highly regulated environment.

This partnership reflects a broader trend in India's life sciences sector: a move from legacy IT systems toward agile, predictive, and automated digital infrastructure. As Lingraju Sawkar, President of Kyndryl India, aptly states, "By leveraging the expansive predictive capabili es of Kyndryl Bridge, we can identify issues and solve them to support Dr. Reddy's commitment to leverage technology to provide pa ents with access to innovative and affordable medicines." The collaboration marks a new chapter in IT-driven pharma innovation—where technology does not just support operations but defines them.

Dr. Reddy's Laboratories: Pioneering AI-Driven Data Transforma on with Informatica

In the rapidly evolving pharmaceu cal landscape, Dr. Reddy's Laboratories has embarked on a transforma ve journey to harness the power of data and ar ficial intelligence (AI). Recognizing the imperative for agile and trustworthy data management, the company has integrated Informatica's Intelligent Data Management Cloud (IDMC) to revolu onize its data infrastructure.

Facing challenges such as increasing regulatory demands, the rise of digital therapeutics, and the need for personalized medicine, Dr. Reddy's sought a solution to streamline data governance and quality. With IDMC, the company has achieved a 50% reduc on in data pipeline development me, delivering 5,000 records per second for AI applications, and surpassing a 95% benchmark in AI data quality.

A key aspect of this transformation is the empowerment of over 300 data stewards across the organiza on. Through tailored e-learning modules, these stewards have been equipped to manage data quality effec vely, fostering a culture of data accountability.

The integra on of IDMC has also enabled Dr. Reddy's to accelerate its research and development processes. For instance, the company can now process information on over two billion compounds in under five min-utes—a task that previously took months.

Anish Agarwal, Senior Vice President and Global Head of Data and Analy cs at Dr. Reddy's, emphasizes the significance of this shi : "The pharmaceu cal industry is undergoing a massive shift . We needed to reassess our data strategy to ensure that we aggregate and provision the right data to our teams, who in turn can trust and analyze the data to drive the right outcomes." By leveraging Informa ca's IDMC, Dr. Reddy's Laboratories is not only enhancing its opera onal efficiency but also reinforcing its commitment to delivering innova ve and affordable medicines to patients worldwide.

Sterile Manufacturing Automation

Embracing Automation in Steile Manufactuing

Insights from Dr. Reddy's Laboratories

In the evolving landscape of pharmaceutical manufacturing, automation has become a pivotal element, particularly in sterile operations. Krishna Venkatesh, Global Head of Sterile Operations at Dr. Reddy's Laboratories, underscores the industry's shift towards integrating automation, data analytics, and artificial intelligence to enhance efficiency and product quality.

Venkatesh highlights the importance of end-to-end connectivity, enabling seamless information flow from manufacturing to the end custom-er. This integration not only improves timeliness and cost effectiveness but also ensures the delivery of high-quality products. The adop on of track and trace technologies is also emphasized to combat counterfeiting and ensure product authenticity throughout the supply chain.

Krishna Venkatesh

Addressing cost reduction, Venkatesh points out that leveraging data analytics and AI can identify inefficien-cies and areas of waste, allowing for targeted improvements. He notes that organizing data meaningfully enables algorithms to suggest solutions that bring significant value, thus reducing manufacturing time and minimizing waste.

However, challenges persist, particularly in data management. Venkatesh notes that a significant portion of time in data analytics is spent on cleaning data, which is inefficient. He advocates for a concurrent approach to data acquisition and analytics, emphasizing the need for good quality data that requires minimal procesing.

The article also touches upon supply chain disruptions, particularly in obtaining primary packaging materials and sterile filters, which have been exacerbated post-pandemic. Venkatesh stresses the need for predictive maintenance and robust automation systems to mitigate such challenges.

In conclusion, the integration of automation and digital technologies in sterile man-ufacturing is not just a trend but a necessity for achieving operational excellence and ensuring product integrity in the pharmaceutical industry.

Warehouse and Material Handling Automation

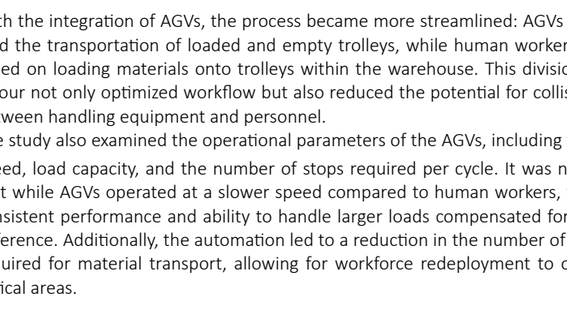
Enhancing Warehouse Efficiency with Automated Guided Vehicles

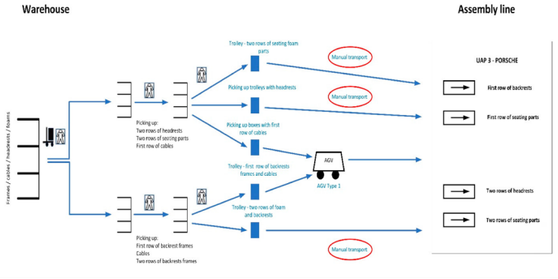
Insights from Recent Research on AGV Implementa on

In the pursuit of operational excellence, warehouses are increasingly turning to automation to streamline processes and enhance safety. A recent study published in Sensors (2024) delves into the practical implementation of Automated Guided Vehicles (AGVs) within a warehouse setting, highlighting their impact on efficiency and human-machine interaction.

The research outlines a scenario where AGVs were introduced to transport materials between a warehouse and an assembly line. Prior to automation, this task required manual labor, in-volving multiple workers and various types of trolleys.

With the integration of AGVs, the process became more streamlined: AGVs han-dled the transportation of loaded and empty trolleys, while human workers fo-cused on loading materials onto trolleys within the warehouse. This division of labour not only optimized workflow but also reduced the potential for collisions between handling equipment and personnel.
The study also examined the operational parameters of the AGVs, including their speed, load capacity, and the number of stops required per cycle. It was noted that while AGVs operated at a slower speed compared to human workers, their consistent performance and ability to handle larger loads compensated for this difference. Additionally, the automation led to a reduction in the number of staff required for material transport, allowing for workforce redeployment to other critical areas.





Overall, the implementation of AGVs demonstrated sig-nificant improvements in warehouse operations, including enhanced efficiency, better utilization of human resources, and increased safety.
This case study serves as a compelling example for organi-zations considering the adoption of automation technolo-gies in their logistics and manufacturing processes.

Download

Acronyms

Following the overwhelming response to our Acronyms Guide in the last issue, Imprint Automation India returns with Part II—an even more comprehensive compilation of essential terms that define the language of automation. From APQP to ZSC, this ready-reference list expands your vocabulary across domains like robotics, control systems, industrial communication, and process safety. Whether you're a seasoned engineer or a new entrant into the automation world, this continued glossary will keep you fluent in the fast-evolving industrial lexicon.

A

APQP – Advanced Product Quality Planning
ASi – Actuator Sensor Interface
AOI – Automated Optical Inspection
AIDC – Automatic Identification and Data Capture
ATP – Acceptance Test Procedure
AIT – Automation Interface Terminal

B

BOP – Balance of Plant
BLE – Bluetooth Low Energy
BPCS – Basic Process Control System
BOM – Bill of Materials

C

CMMS – Computerized Maintenance Management System
CNC – Computer Numerical Control
CRP – Capacity Requirements Planning
CSM – Control System Module

D

DNP3 – Distributed Network Protocol
DLR – Device Level Ring
DTM – Device Type Manager
DAQ – Data Acquisition System
DCM – Digital Control Module

E

ESD – Emergency Shutdown System
EPCM – Engineering, Procurement, Construction Management
EEPROM – Electrically Erasable Programmable ROM
EDA – Electronic Design Automation
EPICS – Experimental Physics and Industrial Control System

F

FAT – Factory Acceptance Test
FDT – Field Device Tool
FPGA – Field-Programmable Gate Array
FCS – Field Control Station
FMEA – Failure Mode and Effects Analysis

G

GSD – General Station Description
GOT – Graphical Operator Terminal
GA – General Arrangement
GAMP – Good Automated Manufacturing Practice
GNSS – Global Navigation Satellite System

H

HART – Highway Addressable Remote Transducer
HILS – Hardware-in-the-Loop Simulation
HTD – High Torque Drive
HPS – High Performance System

Industrial Automation Acronyms Part II

Acronyms

I

ICS – Industrial Control System
ICCP – Inter-Control Center Protocol
IACS – Industrial Automation and Control Systems
IO-Link – Intelligent Sensor/Actuator Communication Protocol

J

JTAG – Joint Test Action Group
JSON – JavaScript Object Notation
JSP – Job Safety Plan

K

KPI – Key Performance Indicator
KUKA – Robotics brand used as programming reference

L

LVDT – Linear Variable Differential Transformer
LOTO – Lockout-Tagout
LCP – Local Control Panel

M

MTBF – Mean Time Between Failures
MTTR – Mean Time to Repair
MCC – Motor Control Center
MODBUS – Modular Bus Protocol

N

NOC – Network Operations Center
NAMUR – Process Automation Standards Group

O

OPC UA – Open Platform Communications Unified Architecture
OEE – Overall Equipment Effectiveness
ORP – Oxidation Reduction Potential Sensor

P

PAC – Programmable Automation Controller
PDM – Plant Data Management
PSSR – Pre-Startup Safety Review
PFD – Process Flow Diagram
PLCopen – PLC Standardization Initiative

Q

QOS – Quality of Service
QRM – Quick Response Manufacturing
QRQC – Quick Response Quality Control

R

RTU – Remote Terminal Unit
RPA – Robotic Process Automation
RFID – Radio Frequency Identification
RTO – Real-Time Optimization
REST – Representational State Transfer

S

SIL – Safety Integrity Level
SOP – Standard Operating Procedure
SCM – Supply Chain Management
SMED – Single-Minute Exchange of Die
SPC – Statistical Process Control

T

TPM – Total Productive Maintenance
TDC – Total Distributed Control
TSN – Time Sensitive Networking
TQM – Total Quality Management
TIA – Totally Integrated Automation

U

UPS – Uninterruptible Power Supply
UART – Universal Asynchronous Receiver-Transmitter
UDT – User Defined Type

Acronyms

V

VSA – Value Stream Analysis

W

WMS – Warehouse Management System

WES – Warehouse Execution System

WCS – Warehouse Control System

X

XIoT – Extended Internet of Things

XSLT – Extensible Stylesheet Language Transformation

Y

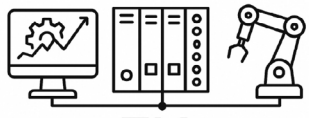
YTD – Year to Date (used in industrial dashboards)

Z

ZTP – Zero Touch Provisioning

ZSC – Zero Speed Control

ZPA – Zone Presence Automation



TIA
TOTALLY INTEGRATED AUTOMATION

Indian Talent in Automation Technology on a Surge

Indian Talent in Automation Technology on a surgeImprint Automation India Magazine tracks the global rise of Indian minds transforming automation. Indian talent is making waves worldwide - Indian Automation Industry Talent Mojo!

*Imprint's robotic reporter **Riya Sewatkar** profiles nine automation domain talent. Contact riya.sewatkar@paratechexpoindia.com (+91 9867670265) to identify decision makers who make a difference.*

Ravindra K. Ahuja (USA)

Role: Founder & CEO of Optym; Professor of Industrial and Systems Engineering at the University of Florida
Expertise: Mathematical modeling, network optimization, and large-scale scheduling problems in logistics and transportation
Notable Achievements: Developed advanced decision support systemsimplemented by major transporttion companies.

Prith Banerjee (USA)

Role: Chief Technology Officer at ANSYS
Previous Roles: CTO at Schneider Electric; Senior Vice President of Research at Hewlett Packard; CTO at ABB Group
Expertise: High-performance computing, AI/machine learning, cloud platforms, and digital engineering.

Shekar Natarajan (USA)

Role: Founder & CEO of Orchestro AI
Background: Held senior supply chain and automation roles at Walmart,Disney, Target, and American Eagle Outfitters
Achievements: Recognized as one of the most impactful business leadersin supply chain innovation.

Galip Ulsoy (USA)

Role: Professor Emeritus of Mechanical Engineering at the University of Michigan
Expertise: Dynamics and control of mechanical systems, manufacturing automation, robotics, and automotive systems
Contributions: Developed reconfigurable manufacturing systems and advanced control methods applied in various industries.

Satyandra K. Gupta (USA)

Role: Professor of Mechanical Engineering at the University of Southern California; Director of the Center for Advanced Manufacturing
Expertise: Manufacturing automation, robotics, and computer-aided design
Achievements: Developed RoboRaven, the first robotic bird capable of flying outdoors using independent wing control

Bashir Al-Hashimi (UK)

Role: Vice President (Research & Innovation) at King's College London; ARM Professor of Computer Engineering
Expertise: Energy-efficient computing, embedded systems, and low-power semiconductor chips
Honors: Knighted in 2025 for services to engineering and education; Fellow of the Royal Society and the Royal Academy of Engineering.

Ashok Jhunjhunwala

Role: Professor at IIT Madras; President of IITM Research Park
Contributions: Pioneered industry-academia collaboration in India; instrumental in establishing the IITM Research Park, fostering innovation and entrepreneurship in technology.

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