



Level



Pressure



Flow



Temperature



Liquid
Analysis



Registration



Systems
Components



Services



Solutions

Tank farm automation

Safety and optimisation solutions for your tank farm

Endress+Hauser – your tank measurement, management and automation partner

Endress+Hauser is a major supplier of measurement instrumentation and inventory control systems for monitoring and controlling liquids during processing, transportation and storage.



Our service includes design, production, installation and servicing of instrumentation, data acquisition, visualisation and control systems for tank farms, terminals and depots.

Our range of level measurement instruments is comprehensive, with a solution to suit every tank environment and required accuracy. However, we also appreciate that in order to reach standard volume or easily compare mass values, it is necessary to consider temperature, expansion functions and other variables. An Endress+Hauser tank monitoring or gauging system includes all the elements to allow you to accurately and safely manage and optimise your inventory.

From simple tank or depot monitoring through to high accuracy tank gauging, SCADA and inventory management, Endress+Hauser is a single source of:

- Project planning and delivery
- Overall project responsibility
- Installation, commissioning, maintenance and calibration
- State-of-the-art technology

We have the people and proven processes to design and deliver the solution you need, ensuring that this is easily scalable to suit your changing needs. We work to ensure the efficiency and safety of your plant and personnel. Our projects are delivered on-time and on-budget, and they meet all appropriate standards and guidelines.



Tank content monitoring

For small tank farms and depots the simplest solutions are often the most effective.

When you need to keep track of how much raw material you have on site and how much storage space you have available, you need reliable data presented in an instantly readable graphic format. By making this information accessible through your web browser, you can actively monitor your reserves to reduce your inventory, lower operating costs and improve your process.

Endress+Hauser will work with you to select the most appropriate measuring instruments from our comprehensive range, taking into account the tank environment and relevant safety considerations.

We'll then add a reliable and robust system to enable remote monitoring, configuration and diagnosis from the installed instruments via Ethernet, TCP/IP, analogue phone lines or mobile communications (GSM/GPRS).

The system will provide reliable monitoring of your tank or silo contents and can be configured to suit your needs, whether you require real-time or interval readings.

The final element is to give you access to your data. Fieldgate Viewer is a web-based remote monitoring solution which gives you a clear and secure view of your tank content status. Access rights can be granted to all necessary personnel and data can be easily filtered, sorted or exported for further analysis and forecasting.

Endress+Hauser's suite of tank monitoring systems delivers accessible inventory data, resulting in improved material availability and significantly increased safety. With extensive network capabilities, data is available from any location, allowing product movement to be monitored and controlled.



Overflow prevention

Ensuring site safety and preventing environmental damage are matters of common sense, as well as legal requirements.

No matter what you're storing, Endress+Hauser has the experience to ensure that your site and personnel stay safe and that you meet all necessary regulatory requirements. We'll consider the properties of the liquid being stored, as well as the tank type, in order to ensure the most suitable measuring devices are installed. We'll also make sure that the instruments can cope with any potential corrosion threat or product build-up while in service.

Incorporating technology that is capable of producing enhanced diagnostic information ensures that reliability and measurement

integrity are maintained. This is the best way to reduce unscheduled maintenance and ensure safety requirements are met in full. Our automatic level switches, electronic gauges and high level alarms are designed to fail to a safe condition, ensuring an immediate alert in the event of a potential problem.

Endress+Hauser goes further than simply supplying the instruments you need to prevent overflow incidents. We can provide the entire safety loop system, including measuring, controlling and correcting elements to ensure you remain protected.

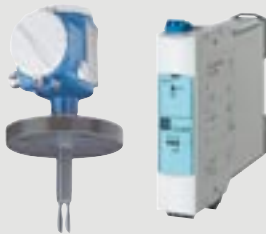
Our systems include bespoke alarm panels, designed and built at our Manchester production facility to meet your exact requirements. If necessary, we can also arrange for SIL safety audits to be carried out that take into account your complete operational processes.

Complete evaluation of a safety function (safety loop)

Sensor / transmitter

Controller

Actuator



Endress+Hauser's Liquiphant M vibrating level switch provides a cost-effective and reliable solution for pollution prevention in oil storage tanks. With both high and low level alarm functions and a unique fork corrosion monitoring system, you'll know immediately if there's a problem. ATEX certified for hazardous area use, Liquiphant M also complies with IEC61508 offering a SIL2/3 rating.

Liquiphant M is a cost-effective solution for overspill protection and was the first point level switch to receive SIL certification, an international standard for operational safety. Liquiphant M includes 'online' diagnostics in its tuning fork working principle. It is the perfect and proven retrofit for float switches. Its installed base of approximately 3,000,000 units emphasises its superiority worldwide.



High accuracy tank gauging

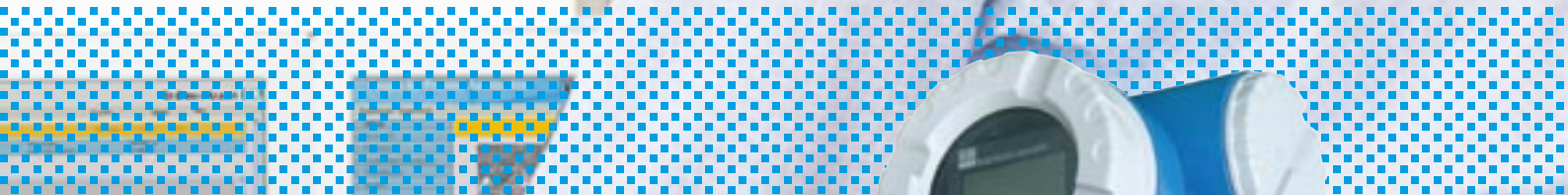
For custody transfer applications, bulk storage of high value payloads or in tank farms where a high level of safety and automation are required, you need highly accurate tank content information and real-time tank monitoring.

Tank gauging solutions from Endress+Hauser provide measurement accuracy alongside intelligent monitoring and visualisation systems, designed to meet your safety and control requirements.

A fully automated tank gauging system from Endress+Hauser will:

- Measure the level, temperature and density in the tanks using the most accurate sensors that are appropriate for the tank environment
- Collect data via the most appropriate fieldbus protocol
- Visually display the information using a Tankvision solution, connected directly to a DCS
- Convert level and temperature readings into a volume measurement to national standards

Having collected the data, the tank gauging system will turn this into meaningful information that improves your material availability and significantly increases site safety. The system displays real-time monitoring information, including level, temperature, pressure, density, volume and mass in a simple visual display that can be accessed on any operator workstation.



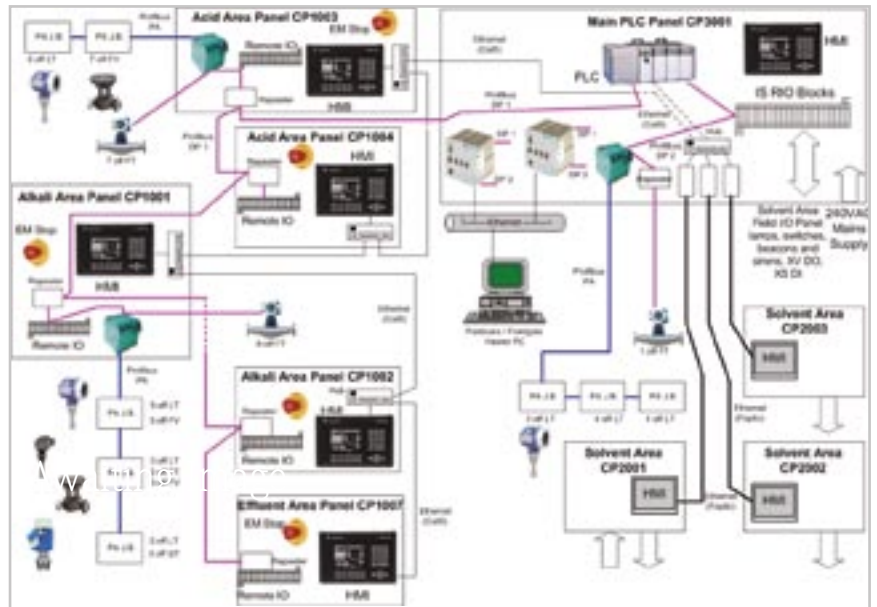
The Tankvision solution is as simple as one, two, three:

1. Transfer the level measurement from the field using HART or Modbus
2. Collect and calculate the data in the Tankvision unit
3. Display real-time, visual data on any PC using Internet Explorer

Tankvision provides consistent, accurate readings in real-time, without the risk of human error from manual daily dip methods.



Safe, secure and efficient product transfer system designed by Endress+Hauser



Individually designed system architecture



Real-time visualisation of tank farm overview and individual tank detail

Tank farm control

The loading, offloading and transfer of liquids at tank farms and terminals require accurate and detailed information to ensure a safe, reliable process.

Successful tank farm control relies on accurate and reliable process measurements such as level and flow. From high accuracy tank gauging to the transfer of highly viscous products, Endress+Hauser is the perfect partner to help you select the most appropriate device. But process measurement is only the start.

Transfer of hazardous or expensive products not only needs reliable measurements but also a correctly designed and implemented control system to ensure safe and timely transfer of liquids. Following detailed discussions with your plant engineers and

operators, a functional design specification is produced that forms the basis of the system. A PLC-based control system is implemented allowing easy integration of pumps, valves and interlocks.

A supervisory control and data acquisition (SCADA) system using bespoke graphical display screens provides the control interface along with alarming, reporting and archiving of data for all aspects of the transfer process. Due to the programmable nature of the system, additions or changes to the control philosophy can be implemented at any time.

Fully supported by Endress+Hauser's highly trained application and project engineers, your tank farm control system will provide safe and efficient product transfer whilst meeting local and international safety, quality and operational standards.

Inventory management

Is your inventory your company's best-kept secret? By sharing inventory data not just internally but also externally, you can unlock the true potential of your supply chain and transform your efficiency, quality and profitability.



How much time does it take for your inventory data to pass from the tank to the office? With an inventory management solution you benefit from improved transparency of information, not only throughout your plant but also from the supplier to the customer. Just imagine how useful this would be for your purchasing, maintenance and logistics functions.

Information that saves you money

With a constant awareness of your current inventory along the supply chain you can actively manage your reserves. You'll always know how much raw material has been added or removed

and if you have enough material for today's orders. By having an immediate indication of demand you'll be able to speed up the replenishment process and use lower reordering limits in order to receive supply at the right time. You'll be able to assess optimum inventory levels, leading to more efficient operations and lower operating costs. With an integrated inventory management system the cost savings potential is considerable.





SupplyCare: simplified logistics

SupplyCare is a server/client-based inventory management software package. Either internet hosted by Endress+Hauser or installed locally on a central server, information can be accessed using an internet browser by numerous clients, each with their own personalised account. It provides a common display platform, historical trending and data export capabilities.

Event-driven reorder email notifications can be configured and directed to specific users, including external suppliers. All acknowledged events and delivery schedules accepted by a user are

electronically signed, providing full logistical process traceability. Better still, the tank overview can be filtered, enabling logistical decisions to be made based on product, physical location or supplier.

Despite its extensive remit, SupplyCare is surprisingly easy to use. It can be administered by your IT department, making the addition of tanks, groups and users a simple operation. Alternatively, why not give the responsibility of gathering and hosting your logistical information to Endress+Hauser?



Our Centres of Competence

Global hubs of industry and application expertise

Endress+Hauser has created a worldwide network of Centres of Competence, each of which acts as the ultimate authority for the Group in their chosen field of expertise. There are 10 Endress+Hauser Centres of Competence worldwide, each specialising in one or two particular industries or applications.

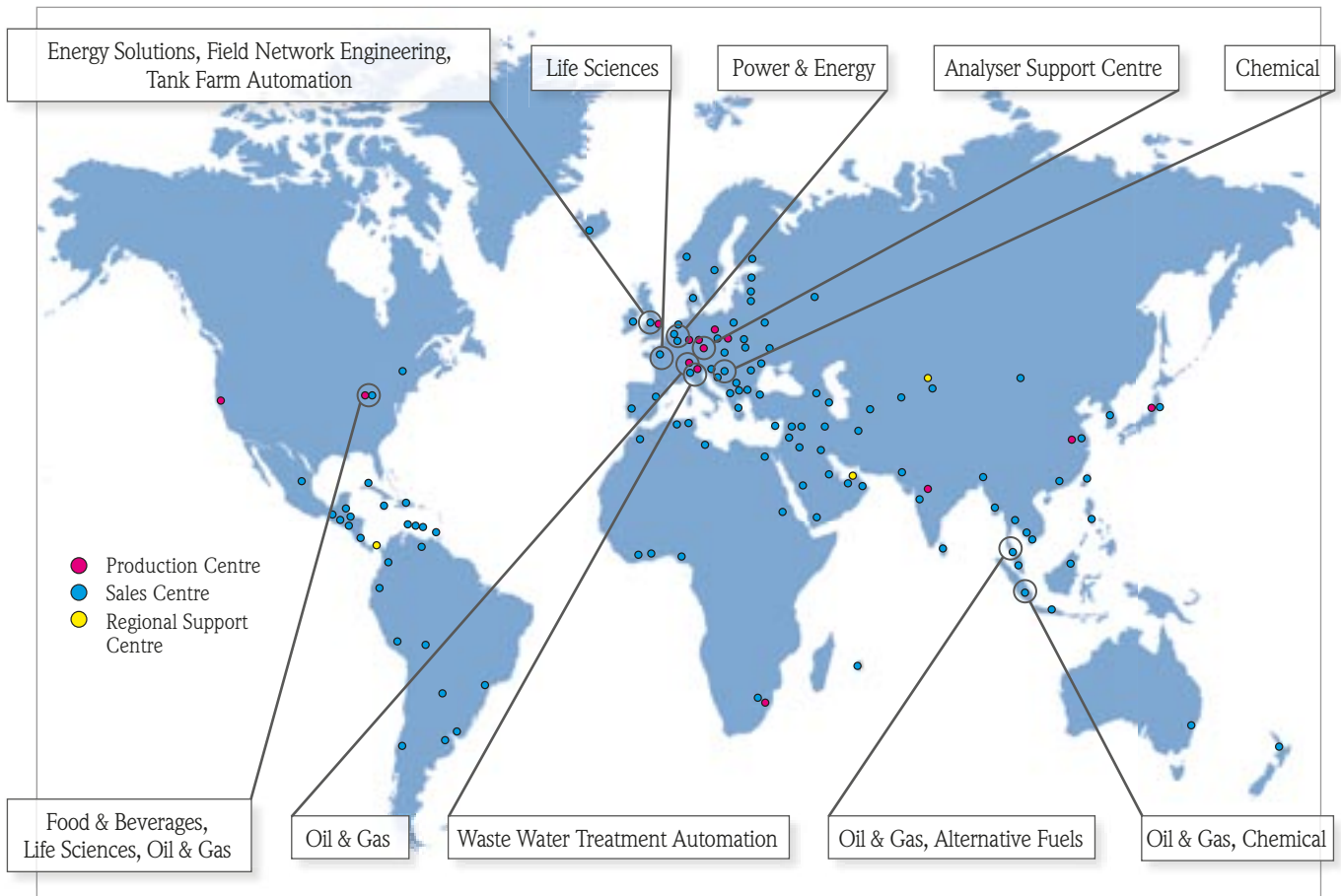
In addition to expertly delivering the field-based, application-based and automation-based solutions detailed on the back of this brochure, Endress+Hauser in the UK is the Group's Centre of Competence for:

- Field network engineering
- Energy management solutions
- Tank farm automation

We therefore have the best resources and specialists on hand at our Manchester headquarters to expertly implement each element of a tank farm automation project. Our services range from consultancy and complementary services through to entire project management.

Our focused nature allows projects to be delivered faster and more efficiently, providing the highest standards at all stages, from project execution to after-sales service and support. Furthermore, Endress+Hauser in the UK is locally audited to ISO 9001 and accredited for the supply of intelligent automation systems.

Centres of Competence: dedicated support



At Endress+Hauser we consider our people to be one of our strongest assets. Based in Manchester, our loyal and committed staff members are highly trained to provide the best level of technical expertise and customer service in the process automation industry. Our team of project eng



Our experts include:



Project managers to execute projects on time, on budget, safely, to your satisfaction, all in accordance with Endress+Hauser procedures and quality standards.



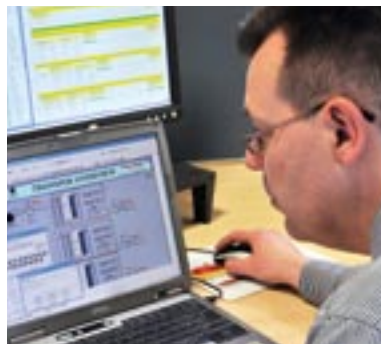
Project engineers who will design, test and commission engineered solutions that are specifically tailored to improve your automation and business processes.



Design engineers and panel builders who work together to design, build and test the panels and enclosures that house our process automation equipment and networking components.



System engineers who fully understand your process automation requirements and can translate these into system designs that completely meet your needs.



Software engineers with vast knowledge and experience of the most popular automation and control platforms used in the process industries.



Commissioning engineers who are fully trained and accredited to commission your projects safely and efficiently on-site, throughout all industries.



Harmonised engineering processes

At Endress+Hauser we appreciate that when you embark on a new project you need assurance that it will progress with minimum risk. That's why we have clear and defined project procedures that are followed by Endress+Hauser teams across the world.

Known as Standard 201, our project process has been designed to improve communication and collaboration, the quality of project results and, most importantly, customer satisfaction. From the very start, project resources are assigned to ensure that the right people are involved at the right time, utilising flexible project teams that have clearly defined responsibilities.

At the outset of a project an experienced project manager is appointed to take ultimate responsibility for decisions, risk and quality management. Then, at critical points in the project, additional risk management resources

are introduced. Following a methodical process and involving the whole project team, the risk management process has four steps:

1. Risk identification
2. Risk analysis
3. Risk response planning (mitigation)
4. Risk monitoring and control

The system also utilises a Quality Gate system, in which a verification checklist is agreed for each stage of the project. Fulfilment of each action on the checklist must be confirmed by the project manager before the project moves to the next phase.

Endress+Hauser reduces your risk:

- Our company is characterised by its highly stable, experienced workforce, who are true experts in their field.
- We follow harmonised standards that are used by Endress+Hauser worldwide.
- We have the flexibility to adapt our services to enhance your business processes.
- We offer a high level of collaboration and communication of information, enabling you to concentrate on your core business.

Our project delivery methodologies are standardised throughout the Endress+Hauser Group, enabling us to deliver guaranteed quality from concept to completion, with reduced risk to you.

In addition to this, our engineers follow audited procedures that allow us to meet ISO 9001 standard project delivery of intelligent automation solutions.

Our accreditations include:

- **ISO 9001:2008** Quality Management System for the design, manufacture, supply, service, maintenance, repair, calibration, supply of spares, associated equipment, accessories, project management of measurement instrumentation, automation instrumentation and intelligent automation systems for the process industries.

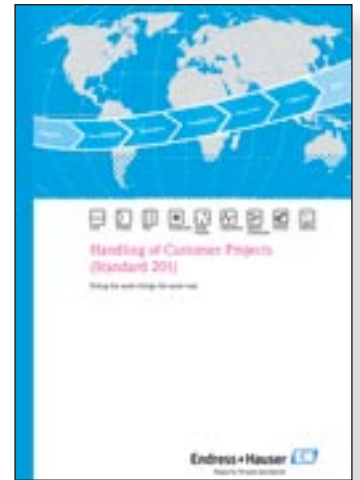
- **OHSAS 18001** international occupational health and safety management system, embracing BS8800, AS/NZ 4801 and NSAI SR 320.

- **ISO 14001:2004** certification in recognition of our Environmental Management System.

- Endress+Hauser Ltd is one of the first engineering companies in the UK to be awarded **EN 16001:2009** certification in recognition of our Energy Management System.

The benefits to you:

- Harmonised processes to deal with Endress+Hauser in project business
- Clear communication and reliability
- We do the same things the same way, every time



A common process results in better quality project delivery.



ISO 9001:2008



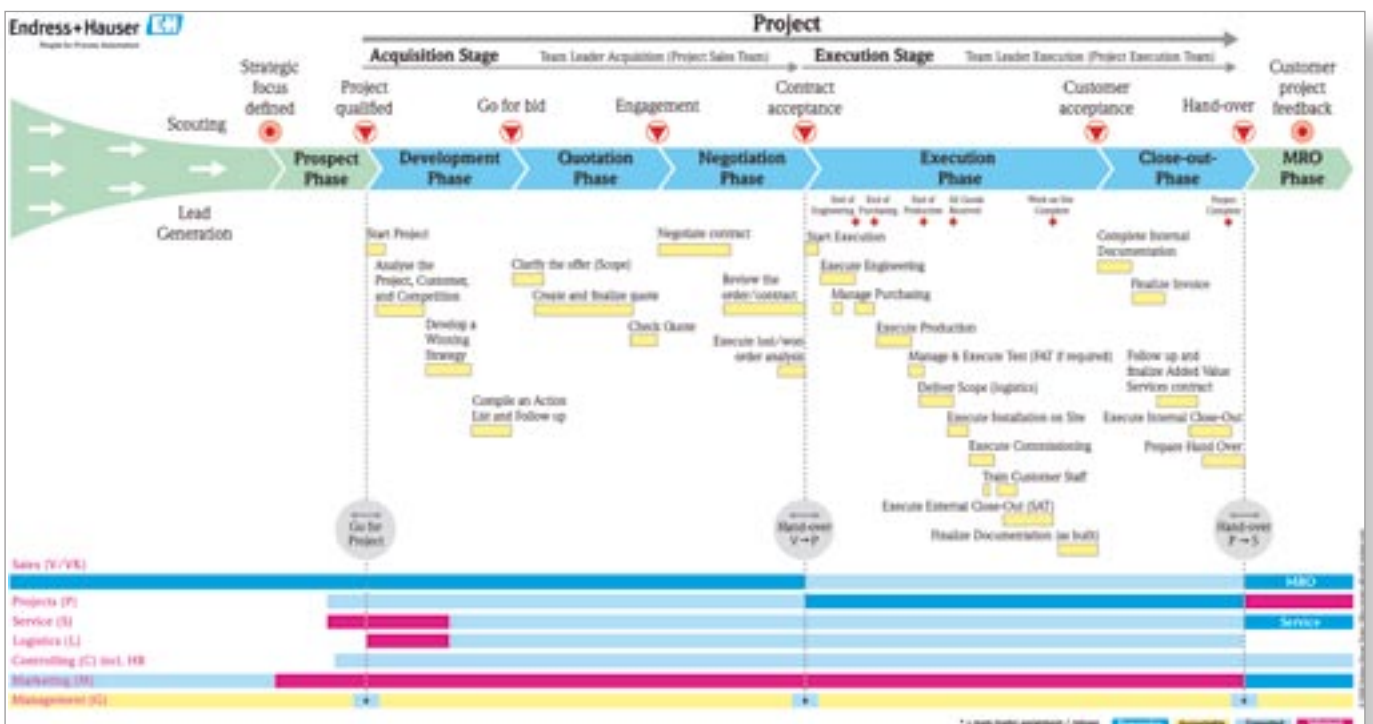
OHSAS 18001



ISO 14001:2004



EN 16001:2009



Our universal project delivery overview clearly assigns responsibility for each stage of the project.

Process solutions from Endress+Hauser



All of the solutions offered by Endress+Hauser have been designed to improve the operational efficiency of your plant, streamline logistical processes and have a proven return on investment.

Our range of field and application-based solutions are repeatable, tested and packaged. They are configured to

meet your needs, the demands of your defined project and the requirements of your industry - and they are immediately deliverable. Where there is no packaged solution, we can design tailor-made engineering systems to provide the ideal process automation for your specific requirements.

Field-based solutions	Application-based solutions	Automation-based solutions
<p>Field devices and network design, installation and commissioning services including multi-vendor device configuration and asset management.</p> <ul style="list-style-type: none"> ■ Plant asset management ■ Field network engineering 	<p>Repeatable, configurable, packaged solutions.</p> <ul style="list-style-type: none"> ■ Tank farm automation <ul style="list-style-type: none"> - Tank contents monitoring - High accuracy tank gauging - Overfill protection - Pump and valve control ■ Energy solutions <ul style="list-style-type: none"> - Automatic monitoring and targeting - Energy management ■ Inventory control ■ Control panel and analyser solutions 	<p>Programmable PLC/SCADA based automation solutions.</p> <ul style="list-style-type: none"> ■ Process automation <ul style="list-style-type: none"> - Intelligent automation solutions specifically designed to solve your process automation requirements

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People for Process Automation