

Yokogawa Middle East & Africa 2023 Corporate Profile

Moving Forward with Customers

Since its inception in 1915, Yokogawa has been acquiring expertise in measurement, control, and information technologies for the offering of cutting-edge industrial products and solutions that contribute to the advancement of society. Upholding the belief that growth comes from our own transformation, Yokogawa is tirelessly creating new value for its customers.

Founded

1915

The company traces its history back to the establishment of an electric meter research institute on September 1, 1915.

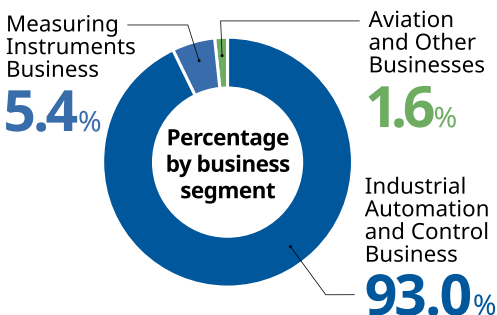
Paid-in capital

4.34 billion yen

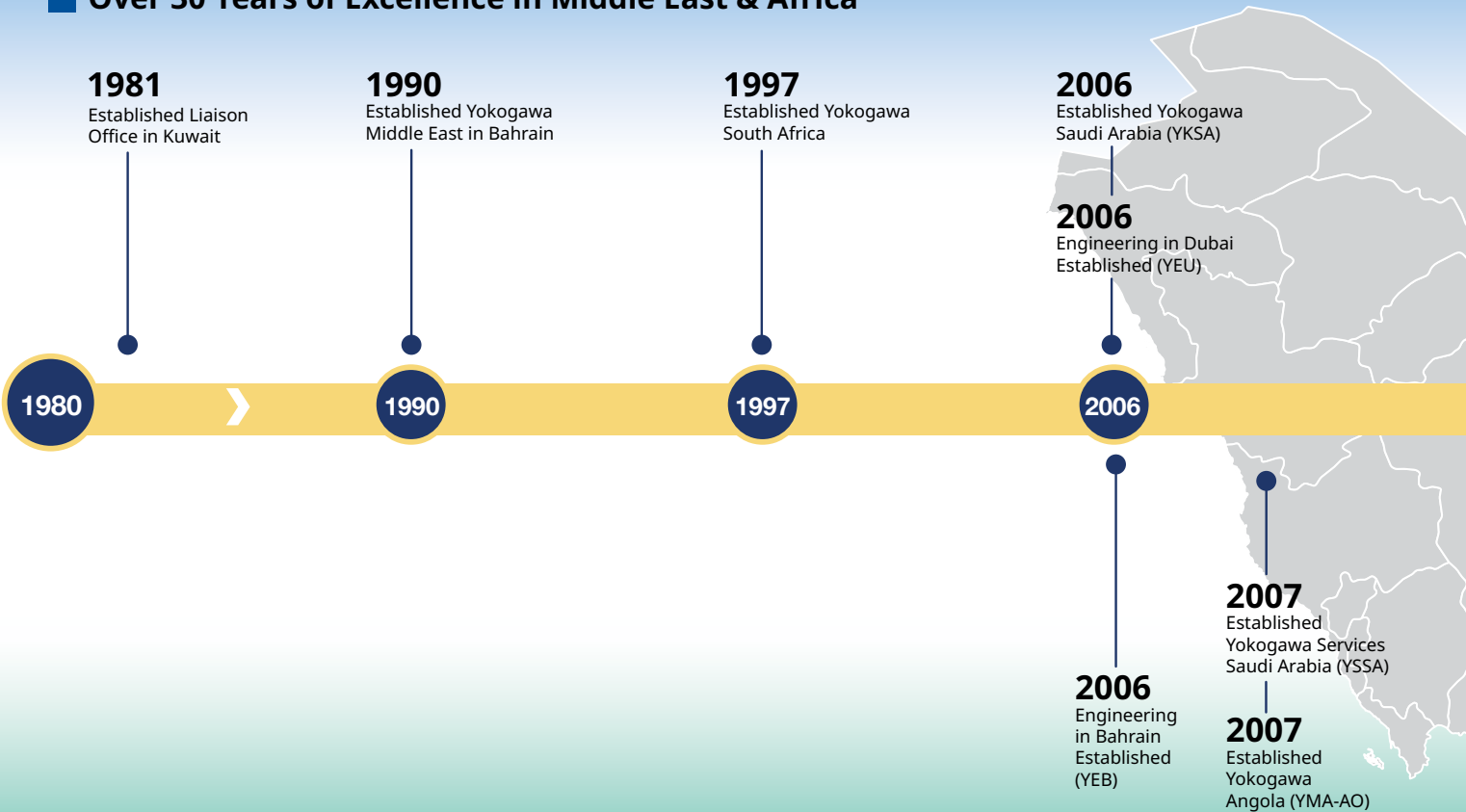
Consolidated net sales

389.9 billion yen

Breakdown of sales

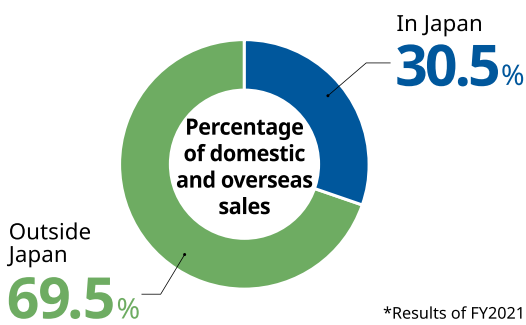


Over 30 Years of Excellence in Middle East & Africa

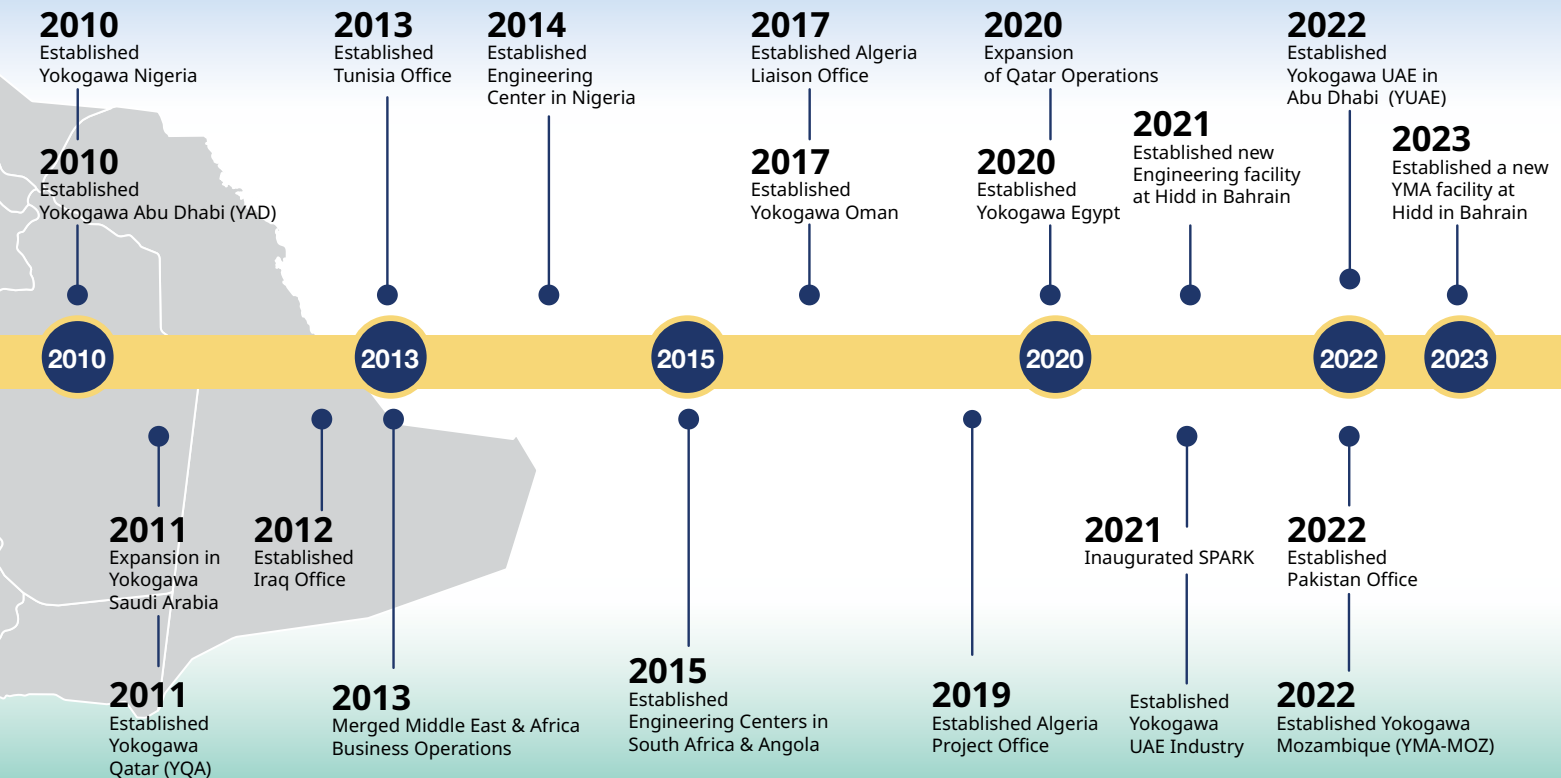
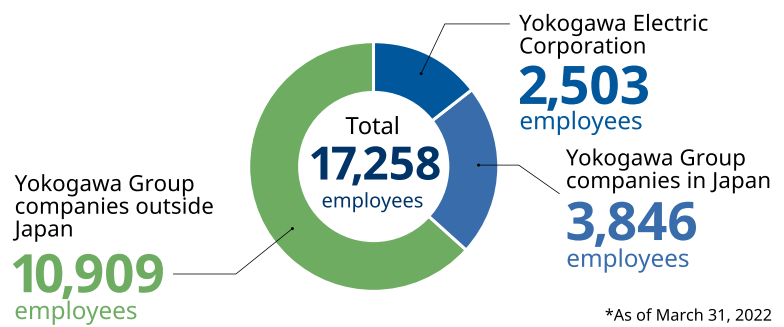


The Yokogawa Group is constantly creating new value for its customers.

Company name : Yokogawa Electric Corporation
 President : Hitoshi Nara
 Headquarters : 2-9-32 Nakacho, Musashino-shi, Tokyo 180-8750, Japan



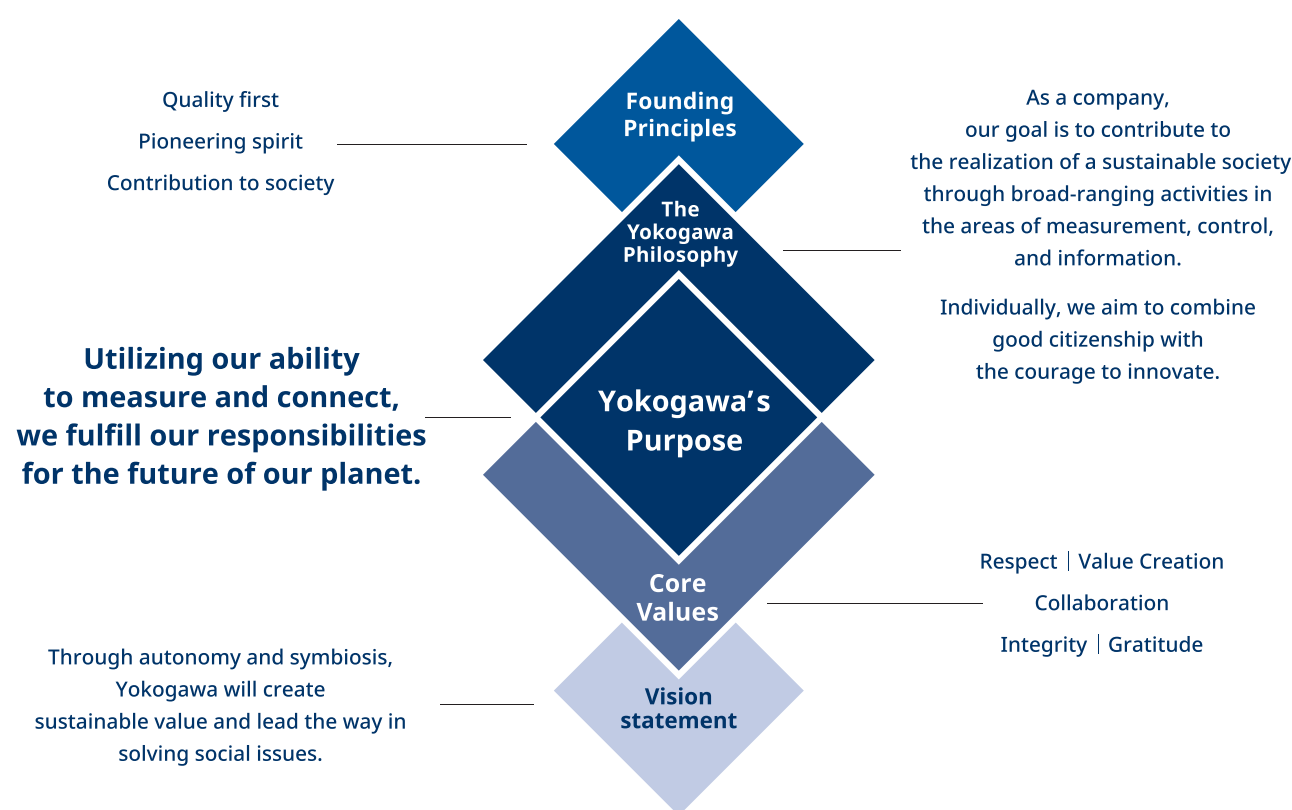
Composition of Yokogawa Group workforce



For Our Planet's Future

All business activities at Yokogawa Electric Corporation are focused on achieving a future in which people and our planet thrive and live in harmony. In a statement entitled Yokogawa's Purpose, the company declares: "Utilizing our ability to measure and connect, we fulfill our responsibilities for the future of our planet." To live up to these words, we have created a roadmap for the future and are carrying out our roles to the best of our abilities.

Yokogawa Group Identity

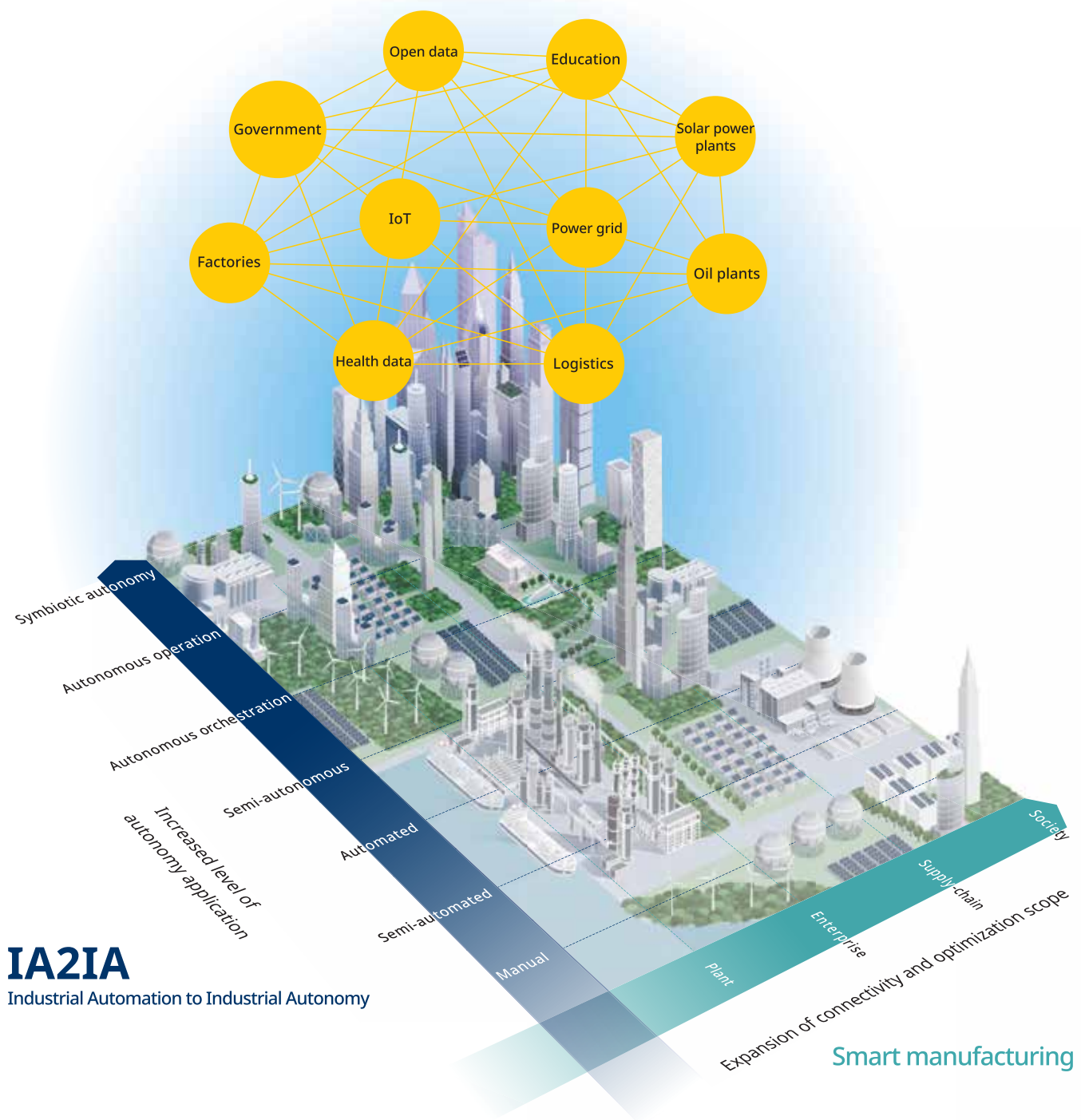


Addressing Global Issues

Our world today is undergoing changes that are global in scale. As a result, the achievement of sustainability is a critically important environmental, societal, and economic issue. Based on a set of precepts known as the Yokogawa Group Identity, the company vows to treat the world's problems as its own and to find solutions using its core competences. Yokogawa's expertise in measurement equips it with the unique ability to assess a situation and extract valuable information. The other expertise of the company—making

connections—enables it to integrate useful information and bring companies and industries together to create greater value. Yokogawa is determined to leverage these abilities to present solutions to global issues, thereby "fulfilling our responsibilities for the future of our planet." To sustain the creation of value in a rapidly changing environment, Yokogawa has designated net-zero emissions, well-being, and a circular economy as its "Three goals" for sustainability.

**Yokogawa delivers sustainable value
by applying its ability to measure and connect.**



The System of Systems (SoS) Approach

Yokogawa's approach to addressing social problems on a global scale is crystal clear. It is based on the system of systems (SoS) concept, in which multiple independent systems are aligned into a holistic system capable of performing tasks that no single system can accomplish. An increasing number of businesses are adopting the SoS approach.

Yokogawa plots its SoS roadmap for value creation on two

axes: industrial automation to industrial autonomy (IA2IA) and smart manufacturing. IA2IA serves to increase the level of autonomy application, whereas smart manufacturing expands the scope of overall optimization. Together, they facilitate integration, autonomy, and the digitization of systems, leading to the creation of even greater value.

Addressing Social Issues

Drawing on its ability to measure and connect, Yokogawa collaborates with its customers. Making full use of the expertise in measurement, control, and information technologies that it has acquired over the years, Yokogawa addresses social issues through its business activities. To attain these goals, the company's core business of industrial automation and control business has been divided into three segments: energy and sustainability, materials, and life. Yokogawa's measuring instruments business and new businesses also significantly contribute to the advancement of industry and technology.

Energy and Sustainability Business

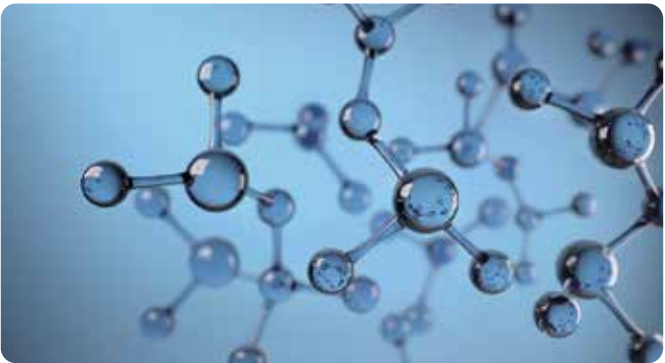


Given the expected surge in global energy demand, the renewable energy market is primed for growth. Yokogawa's energy and sustainability business promotes safe and efficient energy use by interacting with the entire value chain—from the production, supply, and use of energy to disposal and recycling. The business segment aims to protect the environment by achieving a sustainable, carbon-neutral society.

Main Markets

- Oil and gas
- Petrochemical
- Renewable energy
- Electricity
- Energy management systems (EMS)
- Energy storage

Materials Business



Among the requirements in this segment are efficient energy use, recycling, and the use of raw materials that have a low environmental impact. Drawing on its expertise in ecological solutions and digital technologies, Yokogawa is striving for a world that maintains a balance between comfort and sustainability. Our materials business is critical to achieving a circular economy that can exist in harmony with the environment.

Main Markets

- High performance chemicals
- Biomass materials
- Paper and pulp
- Textiles
- Steel
- Non-ferrous metals
- Mining
- Mobility
- Electrical and electronics

Through these businesses, Yokogawa seeks to attain its "Three goals" for sustainability, which call for the achievement of net-zero emissions (stopping climate change), well-being for all (ensuring a high quality of life), and a circular economy (improving circulation of resources and efficiency) by the year 2050.

Yokogawa proposes solutions to global challenges.

Life Business



The growing global population is putting a strain on the production and supply of food and water. Demand for pharmaceuticals is also rising steeply. Yokogawa's life business supports the supply of medicines and food and water so that people everywhere can live safely and enjoy good health.

Main Markets*

Pharmaceuticals

Healthcare

Food

Water

*Includes markets to be targeted in the mid- to long-term



Measuring Instruments Business



Often considered to be the mother tools of modern industry, measuring instruments have been an integral part of Yokogawa's business since the company's inception. Taking advantage of our expertise in the precision measurement of power, voltage, light, pressure, and other physical quantities, we are pursuing decarbonization by helping our customers in such areas as vehicle digitization and electrification, renewable energy, environmental measurement, next-generation communications technology, and plant maintenance.

New Businesses, etc.



Setting its sights on easing the use of the industrial internet of things (IIoT), Yokogawa provides the necessary hardware, software, and cloud solutions. In the materials market, the company has launched a biomass materials business to provide environmentally friendly bio-based materials.

Transforming Businesses

Many customers are transforming their businesses so that they can help to make the world a better place. Yokogawa has a proven record in optimizing value chains and helping customers get the most out of their facilities over the entire plant lifecycle.

That is why Yokogawa's products and other solutions continue to be preferred.

Energy and Sustainability Business

Materials Business

Products and Other Solutions

OpreX is an all-encompassing brand for Yokogawa's industrial automation and control business. The OpreX brand represents Yokogawa's commitment to excellence in technology and solutions through the co-creation of value with its customers. This comprehensive brand comprises the five categories of transformation, control, measurement, execution, and lifecycle, based on which Yokogawa provides products, services, and other solutions covering everything from operations to business management. With these solutions, customers can optimize operations management, production, facility operations, supply chains, and energy use, all of which can help to transform their businesses and maximize the creation of value.

■ Operations management

- Integrated performance management
- Automation of standard operating procedures (SOPs)

■ Production optimization

- Advanced process control solutions, operational optimization solutions

■ Plant asset management

- Facility failure prediction, facility maintenance and management

■ Supply chain management

- Supply chain optimization, inventory and logistics management

■ Attaining the Sustainable Development Goals (SDGs) / energy management and optimization

- Energy management, continuous emission monitoring systems



Collaborative information servers



Distributed control systems



Safety instrumented systems



Programmable logic controllers



Process analyzers
Process gas chromatographs



Film/sheet thickness gauges



Data acquisition systems
Paperless recorders, data loggers



Distributed temperature sensors

Yokogawa supports customers who are redefining themselves to take on social issues.

Life Business

OpreX™ Transformation

OpreX™ Control

OpreX™ Measurement

OpreX™ Execution

OpreX™ Lifecycle

OpreX
5 categories

This segment's products aid in the production of biopharmaceuticals and in the conduct of cell analysis for the R&D of foods and pharmaceuticals.



Advanced control bioreactor systems



Nano-point delivery



IIoT wireless sensors



Field instruments
Pressure/temperature transmitters
Wireless transmitters
Coriolis/magnetic/vortex/variable area flowmeters



High-throughput cytological discovery systems

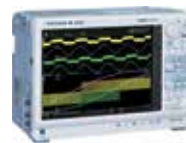
Measuring Instruments Business

This segment offers a broad range of measuring instruments and services that are essential for the benchmarking and optimization of customers' products and technologies.

Products of Yokogawa Test & Measurement Corporation



Precision power analyzers



Scope corders



Optical time-domain reflectometers

New Businesses, etc.

Businesses in this segment include IIoT-based services and the development/ commercialization of biomass materials

Products of amnimo Inc.



Edge gateways
LTE gateways optimized for the operation of security camera networks



IoT routers
LTE routers that enable connections with a wide range of industrial devices

Products of Yokogawa Bio Frontier Inc.

Biomass derived materials

- Sulfate esterified cellulose nanofiber
- Lignin monomer, oligomer and polymer
- Microalgae biostimulants



Sulfate esterified cellulose nanofiber in powder form

Our Project Execution Capabilities

OpreX Agile Project Execution



Realize CAPEX and OPEX Efficiencies with OpreX Agile Project Execution

OpreX Agile Project Execution (APEX) merges innovative project execution processes with enabling hardware and software technologies in order to remove automation from the critical path in a greenfield plant project.

APEX improves time management, minimizes project expenses, reduces risks in project execution and delivery, and ultimately maximizes the value of the automation system throughout the plant lifecycle.

APEX Project Implementation

Predictable, Reliable, High Quality Project Execution

- Deterministic cost and schedule
- Scope clarity in terms of deliverables and services

Change Management

- Minimized impact of late changes
- Standardization instead of customization

Cost and Schedule Reductions

- Improved engineering efficiency
- Automated commissioning
- Optimized lifecycle costs

Flawless Start-up

- Replication - design once, deploy often
- Fit for purpose, high quality products and services

Front End Engineering Design "FEED"

Front End Engineering and Design (FEED) plays a critical part in the pre-project planning process of a new project or plant upgrade. The FEED study serves as a conceptual design phase of a project, aiming to streamline project management by identifying opportunities for maximizing efficiency during project execution.

Yokogawa offers FEED studies in which our analytical engineering experts work directly with the customer to identify opportunities for minimizing costs and enhancing efficiency during project execution. We provide pre-project planning guidance that includes hands-on support and comprehensive expertise to help create for clients a conceptual outline of their project, including a review of the most effective technology available and the expected time and costs associated with project execution.

Yokogawa FEED studies deliver:

- Comprehensive review of client specifications
- Clear definition of project scope
- Evaluation of the most effective current technologies
- Conceptual design sketches and drawings
- Budgetary cost analysis

Greenfield Projects

We take upon ourselves everything a Greenfield Project needs such as basic and detailed engineering, system hardware assembly and wiring, procurement of non-Yokogawa products, system engineering, complete integrated testing at factory, installation, site acceptance testing, commissioning, hand over and maintenance.

Main Automation Contractor "MAC"

The MAC approach involves earlier involvement in the project, which reflects a greater influence over the costs and benefits of a project.

Benefits

- a) Total project management including sub-contractors' management;
- b) Total instrumentation and installation design and engineering;
- c) Total systems integration including communication with subsystems;
- d) Procurement of necessary materials through Yokogawa worldwide network;
- e) Single responsibility/single window; and
- f) Shorter delivery time.

Functional Safety Management System

Yokogawa implements a compliant Functional Safety Management system certified by TÜV Rheinland for the

execution of SIS (Safety Instrumented System) projects in accordance with the IEC 61511:2016 and IEC 615108:2010 safety-related standards. Yokogawa is the first TÜV Rheinland FSM certified organization in the Middle East covering full-phase responsibility for SIS Integrations.

The company currently has three FSM-certified engineering facilities (Saudi Arabia, Bahrain and Abu Dhabi) for delivering SIS Logic Solver Sub-System up to including Systematic Capability 3 (SC3) and Safety Integrity Level 3 (SIL3). The current maturity level classified by TÜV Rheinland for all three locations is at Level 4 Quantitatively Managed.

Brownfield Projects Systems Migration/Replacement Projects (Hot/Cold Cutover)

For "Lifecycle Excellence" initiatives, Yokogawa provides solutions for replacement, revamp and/or migration of legacy systems (DCS/SIS/F&G) without timeframe constraints or interruption of plant operation. Our team approach ensures easy migration or expansion of earlier versions of CENTUM and ProSafe-RS. Other vendor's obsolete system(s) can also be replaced by Yokogawa's latest systems (DCS/SIS/F&G) using tools developed for engineering such replacements.

Our team of experts specialize in site works related to transfer of control loops, safety loops, instruments and systems based on hot or cold cutover methodologies, cutting risk and downtime.

Yokogawa helps customers increase profits via energy savings and operational efficiency improvements.

It aims to realize next-generation productivity improvements in efficiency, thereby adding value and continuing to grow alongside our customers.



Manufacturing, Engineering and Service Facilities

Yokogawa ensures the best-in-class customer support by providing them with manufacturing, engineering and service facilities closer to where the customers operations are. This enables easier access, quicker responses and proactive support.

Yokogawa walks the talk. We invested in state-of-the-art manufacturing facilities in the Kingdom of Saudi Arabia and the United Arab Emirates, the two most important Yokogawa customer hubs in the Middle East. Our additional investment in creating a best-in-class manufacturing unit at the prestigious King Salman Energy Park in the eastern province of the Kingdom of Saudi Arabia is a major part of the Yokogawa commitment to expand local investment and technical infrastructure. The unit not only fulfills our objective of strong customer support on the ground but also provides local talent to build successful careers within their domain. We consider it a privilege to be aligned with the objectives of the Kingdom's Vision 2030 – knowledge-based economy that

supports export-orientated growth of sectors other than oil and gas.

Our facility at King Salman Energy Park will manufacture Analyzer Systems, Transmitters and Control System Panels. Yokogawa's expertise in automation technologies combined with this new manufacturing unit will further facilitate oil, gas and chemical production industries in the region. This will not only serve the domestic market well but also the global one.

In the UAE, Yokogawa has further expanded capabilities with a state-of-the-art center for manufacturing the entire range of Pressure and Temperature Transmitters at Mussafa Industrial Area, Abu Dhabi. The new facility will contribute to local manufacturing and knowledge transfer in line with the vision of the UAE.

Projects within the Middle East and Africa will benefit tremendously from Yokogawa's manufacturing centers in Saudi Arabia and UAE, as they provide faster turnaround in shipment and local support to better control costs.



Analyzer System Integration Manufacturing

The manufacturing center at the King Salman Energy Park (SPARK) in Saudi Arabia provides localized Analyzer System Integration facilities for the Middle East and Africa. The facility can stage more than 20 analyzer shelters simultaneously and will enable customers to conduct Integrated FATs with Process Analyzers running on real process samples. While the DCS system creates a Digital Twin, the SPARK Analyzer Integration Center creates a near plant condition with a Physical Twin. Yokogawa is able to perform the following services at the Analyzer System Integration facilities at SPARK:

- Process Analyzer, CEMS Cabinets, Shelters and Racks
- CEMS Package Integration with EPA / RC Reporting
- Engineered Sample Systems
- Custom HVAC integration for Analyzer Houses and Cabinets
- Custom Electrical items suitable for hazardous areas
- 3rd Party Equipment Integration
- Site Surveys
- Installation and Supervision
- Engineering, Fabrication, Consulting, Training, FAT and SAT
- Startup and Maintenance Services.



Transmitter Manufacturing

A pioneer in Pressure and Temperature Transmitters, Yokogawa can manufacture around 40,000 transmitters each at from the SPARK, KSA and Abu Dhabi facilities. The Yokogawa Transmitter Manufacturing Lines in Saudi and UAE SPARK Manufacturing Center are intended to provide customers with emergency assistance, including a fast turnaround of transmitters. The transmitter line produces the entire range of pressure transmitters, starting from Absolute, Gauge and Differential Pressure to very high pressures and temperature transmitters, with all possible metallurgies, such as direct mount, flange mount or with remote seals.

Key objectives of transmitter manufacturing:

- Offer quick delivery for Pressure, Differential Pressure & Temperature Transmitters

- Handle "specification change order" requests with faster turnaround time
- Handle customer inspections and special requests with help from local experts

The assembly line quality control process is designed as per Yokogawa Manufacturing Group guidelines and each stage of assembly has inward, in-process and outward checking to ensure product quality as per design standards. The "quality" differentiator is maintained with direct control of the quality process held by Yokogawa's headquarters in Japan.

The Quality Management System incorporates all the assembly processes and procedures to ensure a "process-centric" approach. The line is certified by DEKRA (KEMA) to manufacture modify pressure and temperature transmitters complying with ATEX and IECEx standards.



Panel Integration and Assembly

In the Middle East, Yokogawa manufactures the highest quality control panels built to meet all major international manufacturing standards. These facilities are fully ISO45001, ISO14001 and ISO9001 certified. The highest international standards are followed in our panel design that allows the panel layout to be previewed at every stage of the design process whilst minimizing any impact on the schedule. Our highly skilled engineering team delivers best-in-class industry expertise to conceptualize, design, implement, deploy and maintain integrated control panels for projects executed in the Middle East and Africa through the cabinet manufacturing facilities located in King Salman Energy Park (SPARK) in Saudi Arabia, Bahrain and UAE.

Yokogawa manufacturing facilities are equipped with high-precision tools, automated machinery and a full suite of testing equipment which ensures that the highest level of quality.

Within our manufacturing facilities, we provide staging for control system panels, operator consoles and auxiliary consoles. Our primary focus for the manufacturing of cabinets and panels are based on the following types:

- System cabinets
- Marshaling cabinets
- Remote I/O cabinets (Indoor and Outdoor)
- Interposing relay cabinets
- Network cabinets
- Fiber-optic Patch cabinets
- Server cabinets
- Power distribution cabinets
- Well Head cabinets
- RTU Cabinets
- HIPPS Cabinets



Cyber Security Research & Operation Center

Utilizing the latest technologies to cater for new threats and vulnerabilities have become a strong business driver that industries are now implementing. In recent years, OT systems are being targeted more frequently, using methods that keep getting more sophisticated.

Yokogawa has met this challenge head-on by developing a long-term vision for its value customers by securing OT systems with a comprehensive portfolio of cyber security solutions, and establishing a number of Cyber Security Research and Operation Centers at key locations worldwide.



To keep educating and upholding awareness amongst employees about cyber security and knowledge for correct decision making.

To implement enterprise-wide security-managed services for timely monitoring, protection and response at first view

To implement in-depth defense security countermeasures to maintain operation availability at the highest level



To identify existing security risks in prioritized order based on the system vulnerabilities and incident impact levels

To define the most practical policies and procedures for avoiding any gap between the three main pillars – people, processes and applied technology at the site

To create the investment business case and build a security roadmap for mid to long term plans, considering the budget

Our cybersecurity portfolio covers various types of technologies

- Firewalls with IPS, network segregation, data diode
- Secure network design/ zoning, network intrusion detection system & monitoring
- Managed services including Compliance & Vulnerability management
- Customized End Point Security (Antivirus, Application Whitelisting, Windows Domain & Account Management)

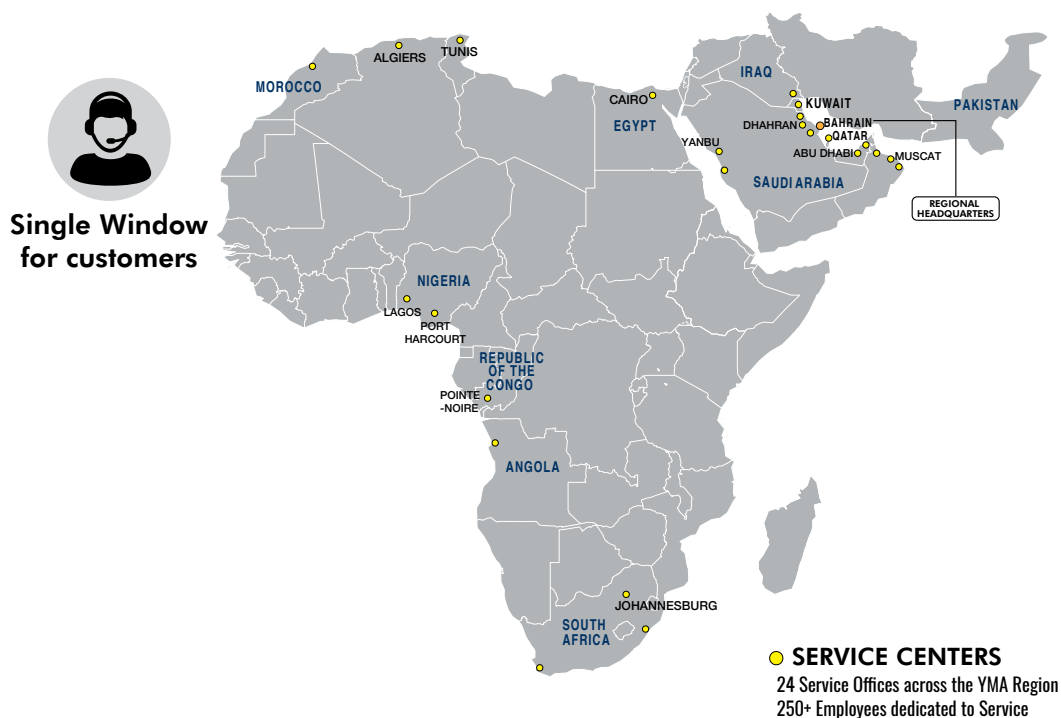
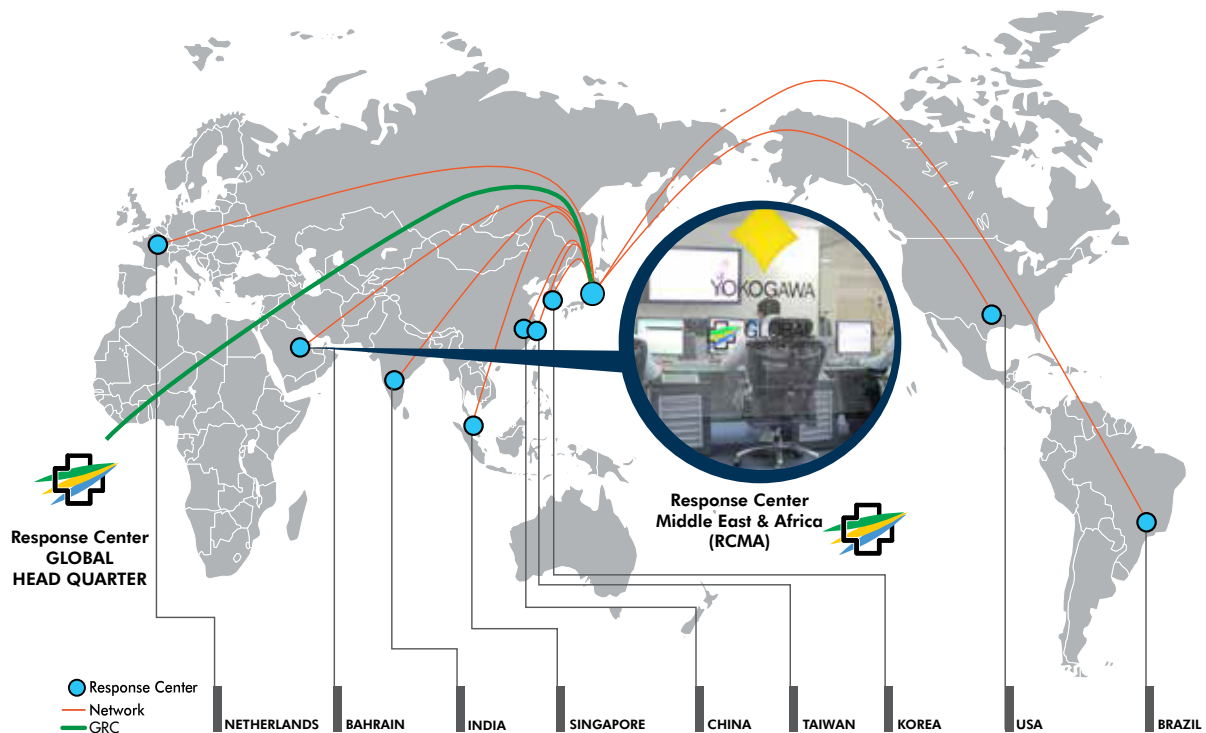
Our Cyber Security Research & Operation Center (CSROC) in KSA provides new opportunities to co-innovate with our customers in the Middle East & Africa. Leveraging on Yokogawa's expertise in the integration of Operational Technology (OT) and Information Technology (IT). The center delivers a wide range of cyber security solutions to make our customers' OT environment safe and sustainable using a lifecycle approach.

CSROC consists of two major functions, laboratory and security operation center (SOC). The lab is designed for the latest cyber security technology research (AI-powered solutions, Anomaly detection, etc.), the verification of the technology, and

providing sustainable cyber security solutions for OT systems across the customers' enterprise. The SOC is established for Cyber Security Managed Services for customers to detect, analyze, and respond to cyber security incidents using a combination of technology solutions and a strong set of processes, it has the infrastructure, access monitoring, patch delivery, and helpdesk capabilities.

The SOC is fully capable of direct or integrated operations with customers in KSA and has full expandable capabilities to integrate with other Middle East customers in line with regional governing laws.

GLOCAL Global Reach, Local Delivery



RCMA Operation Highlights

- System driven support infrastructure
- Single Support window for the entire Yokogawa solution portfolio
- Customer call management
- Quality and timely support/resolutions
- Team of product specialists providing expert consultation
- Remote monitoring and maintenance services
- Customer Data Management and Integrated Customer Portal
- Trouble Simulation
- Advanced Investigation & Analysis
- Warranty management
- Product lifecycle maintenance management
- Customer Support Information Management

Services

Yokogawa Middle East and Africa's service division's focus and goals are centered on our global concept and ideology called the "OpreX Lifecycle". This assures our customers of the highest level of operational excellence while ensuring the best asset cost performance over the entire lifetime.

Our service capabilities and maintenance programs allow us to understand customer priorities, operational KPIs, maintenance goals and challenges. Our ultimate goal is to become the "Most Trusted" partner and service provider to our customers, prioritizing their business needs.

Our services cater to modern IR4 industry needs while imbibing emerging industry trends and applying new technologies, such as Digitalization, AI and Robotics go hand in hand with traditional services.

The OpreX Lifecycle ensures stable and continuous operations. Yokogawa not only designs an optimal Lifecycle Plan for the

customer's control systems but also monitors, implements, and even redesigns it during the lifecycle. Yokogawa's Lifecycle Plan is flexible, taking into consideration system priority, shutdown plans, the installation environment as well as the customer's budget, thereby providing optimal services. Preventive maintenance based on the Lifecycle Plan can reduce potential failures and devastating cyber-attacks by more than half. As a result, stable and long-term operation at optimal cost can be realized.



OpreX™ Lifecycle

Services provided by OpreX Lifecycle includes:

- Sustainable Maintenance
- Safety and Security (including Sustainable SIS, HAZOP studies, Permit management systems) etc.
- Asset Performance Monitoring
- Upgrade and Migration (including MAC Life Cycle Agreement & Planning)
- Operation and Maintenance Improvement
- Telephonic/Response Centre Support, including 24/7 Emergency Services
- Parts Management Program
- Secured Remote Solutions & Consulting Services
- Field Data Digitizer SensPlus Note
- Environment Monitoring services
- Alarm Rationalization / System Health Monitoring Services
- Emission Monitoring Services

● Analyzer and Field Instrument Maintenance

● Training

A MAC Life Cycle Agreement with Yokogawa gives customers a "One-Stop-Shop" maintenance service to ensure stable and continuous operation. Yokogawa not only designs an optimal Lifecycle Plan for the customer's control systems but also monitors, implements, and even redesigns it during the lifecycle. Yokogawa's Lifecycle Plan is flexible taking into consideration system priority, shutdown plans, the installation environment as well as the customer's budget, thereby providing optimal services.

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YOKOGAWA MIDDLE EAST AND AFRICA NETWORK



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For customer feedback and complaints, please contact: qltymgr@yokogawa.com

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