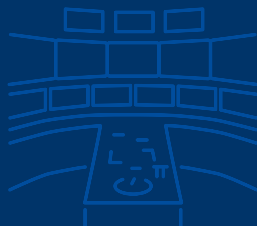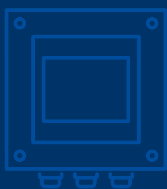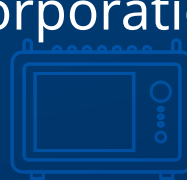# Yokogawa Solutions and Products in North America

Yokogawa Corporation of America

About Yokogawa

Company Overview

Yokogawa provides advanced technologies and services in the areas of measurement, control, and information to customers across a broad range of industries, including energy, chemicals, materials, pharmaceuticals, food, and water. Yokogawa addresses customer issues regarding increasingly complex production, operations management, and the optimization of assets, energy, and the supply chain with digitally enabled smart manufacturing, enabling the transition to autonomous operations.

Founded in Tokyo in 1915, Yokogawa continues to work toward a sustainable society through its 17,000+ employees in a global network of 122 companies spanning 61 countries. Yokogawa Corporation of America is a wholly owned subsidiary of Yokogawa. Established in 1957, the business is headquartered in Houston, Texas and supported by other domestic manufacturing and service locations across the U.S., Canada and Mexico.

Co-innovating tomorrow™

Co-innovating conveys our determination to create value by partnering with our customers to develop value-driven solutions that improve today's business and lays the foundation for continuous improvement. Tomorrow expresses our resolve to evolve our technologies and the digital enablement journey for a sustainable, long-term business while working to reduce industries' impact on our environment.

For more information, visit www.yokogawa.com/us

Our Core Values

Respect
We respect and trust each other and create an environment where individuals can exercise initiative and support each other.

Value Creation
We work together with our colleagues and customers to create value, thereby enhancing efficiency and achieving overall optimization.

Collaboration
We collaborate with and support each other and our customers to achieve mutual objectives and maximize results.

Integrity
We build trust by demonstrating uncompromising honesty and integrity at work.

Gratitude
We show appreciation and thankfulness for the kindness of others and benefits received at work, creating a positive work environment.

▶ Learn More About Our Values

Our Social Mission

Yokogawa is working to achieve "Three Goals" by 2050 in order to become the society we want to be: these are realizing net-zero emissions, ensuring the well-being of all and transitioning to a circular economy. To this end, we are focusing on six areas to accelerate contribution and ensure growth for 2030.

▶ How Are We Achieving a Sustainable Society?

Our Purpose

Utilizing our ability to measure and connect, we fulfill our responsibilities for the future of our planet.

▶ Learn More About Our Purpose

Our Business Units

Energy & Sustainability

Yokogawa supports safe and optimal operations in a diverse range of energy sectors, spanning the entire value chain from exploration, production, manufacturing and recycling.

Main Markets

Oil & Gas   Petrochemical   Refining   Renewable energy

Electricity   Energy management systems (EMS)   Energy storage

Materials

Yokogawa's materials processing focused sensing, controls and information processing capabilities contribute to the improvement of production and reduction of environmental waste.

Main Markets

High performance chemicals   Biomass materials   Pulp & paper

Mining   Steel   Electrical & electronics   Textiles   Mobility

Non-ferrous metals

Life

We contribute key technologies for pharmaceutical manufacturing and water treatment processing that improve outcomes and help protect people's health.

Main Markets

Pharmaceutical   Healthcare   Food   Water

Our Offices

● Yokogawa Offices

San Diego, CA
• PXiSE, A Yokogawa Company

Newnan, GA
• Manufacturing
• Product management
• Customer service & support
• Training

Baton Rouge, LA
• Technology Service Center
• Training

Scarborough, ME
• Yokogawa Fluid Imaging Technologies

Wayne, PA
• Technology Service Center
• Training

Salt Lake City, UT
• Technology Service Center
• Training

Carrollton, TX
• U.S. Technology Center

Coldspring, TX
• Advanced analytical engineering, design & construction

Stafford, TX
• Yokogawa Fluence Analytics

Sugar Land, TX
• Automation engineering services & support
• Control systems design, sales & support
• Training

Calgary, AB Canada
• Sales, Engineering & Service Operations

Mexico City, Mexico
• Sales, Engineering & Service Operations

● Yokogawa Business Reps

USA
• Brea, CA
• Lakeland, FL
• Hebron, KY
• Baton Rouge, LA
• Plymouth, MA
• Frontenac, MO
• Farmington, NY
• Media, PA
• Deer Park, TX
• Kirkland, WA

Canada
• Edmonton, AB
• Brossard, QC

Mexico
Guatemala
Belize
El Salvador
Honduras
Nicaragua
Costa Rica
Panama

Capabilities: Comprehensive and Proven

Autonomous Operations

Yokogawa believes autonomous operations constitute the destination for many end users to achieve their smart manufacturing goals. Yokogawa supports its customers' smart manufacturing goals through co-innovation and OpreX.

IA2IA™
Industrial Automation to Industrial Autonomy

In a highly uncertain and complex business environment, companies in the process industries are embracing emerging digital technologies to transform their operations, hold down costs, reduce downtime, and improve profitability.

An autonomous operation is a state in which plant assets and operations possess learning and adaptive capabilities that enable responses with minimal human interaction, thus empowering operators to perform higher-level optimization tasks.

Yokogawa is setting a course for transformation from industrial automation to industrial autonomy—IA2IA. Yokogawa is driving this transformation to empower customers to achieve breakthrough results and thrive in markets that continually present new challenges.

▶ Watch the IA2IA Explainer Video

	Autonomy Level	Stage	Attribute
Industrial Autonomy	5	Autonomous operations	The facility is completely autonomous including process operations, supply chain, etc.
	4	Autonomous orchestration	The facility operates autonomously, synchronized to optimize manufacturing and safety under most circumstances.
	3	Semi-autonomous	A mixture of autonomous and automated assets with human orchestration.
Industrial Automation	2	Automated	Humans are responsible for safe operations, assisted by traditional automation systems.
	1	Semi-automated	Humans and automation systems share the workload, with humans responsible for safe operations.
	0	Manual	Humans control the facility at all times.

Yokogawa has developed a maturity model to establish where companies are today and where they need to be in the future.

Digital Transformation

Digital transformation (DX) is the novel use of digital technology to accelerate business strategies. DX empowers people, optimizes processes, and automates systems within an organization to radically reorient its business performance.

By combining an understanding of our customers' businesses, automation, and operational technologies, cultivated over decades, with the latest digital technologies, Yokogawa drives their digital transformation journeys toward sustainable, smart, and autonomous operations.

People   **Process**   **Technology**
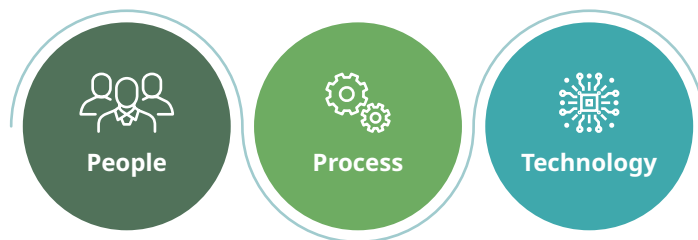
Smart Manufacturing

Smart Manufacturing employs digital transformation and IA2IA to achieve autonomy in manufacturing plants, enterprises, and supply chains to dramatically improve productivity and safety.

Innovative from the start, responsive to the end, Yokogawa collaborates efforts with process industry manufacturers to navigate, reorient, and remap their Smart Manufacturing journeys for optimal results.

OpreX™

OpreX is the comprehensive brand for Yokogawa's industrial automation and control business. The OpreX brand stands for excellence in the technology and solutions that Yokogawa cultivates through the co-creation of value with its customers. OpreX includes all Yokogawa's control products, services, and other solutions that customers are using to digitalize and transform their businesses and drive growth in this time of unprecedented change.

Under the OpreX brand name and based on the Co-innovating tomorrow corporate brand slogan, Yokogawa will continue to co-create value with its customers and thereby help to create a brighter future for all.
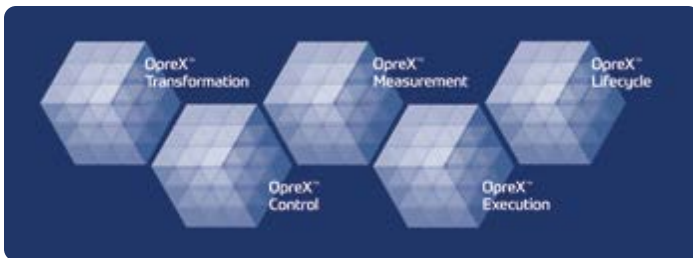
OpreX comprises five categories of transformation, control, measurement, execution, and lifecycle, based on which Yokogawa provides products, services, and solutions covering everything from business management to operations.

Smart Industry Readiness Index

The Smart Industry Readiness Index (S.I.R.I.) is a suite of frameworks and tools to help manufacturers plan and benchmark their transformation journeys. The S.I.R.I. assessment program sets Smart Manufacturing projects on course and minimizes investment risks with quantifiable metrics. Yokogawa's staff of S.I.R.I. assessors enables manufacturers to start, scale, and sustain their manufacturing transformation journeys, regardless of size and industry.

Contracting and Integration

Yokogawa's comprehensive services include system design, integration, installation, and commissioning for instrumentation & control systems, telecommunications systems, IT systems, enterprise resource planning (ERP), and security.

Our capabilities extend well beyond traditional main automation contracting (MAC) to include quality assurance across the complete project scope, logistics, and warehousing management. Yokogawa has further taken complete responsibility for management of global automation and measurement suppliers on large-scale projects such as offshore oil production platforms.

As a main automation and information contractor (MAIC), we provide services that optimize plant operations by integrating both the management system and manufacturing system domains. MAIC encompasses every aspect of project execution including budgeting, scheduling, resource allocation, and risk management. These services improve supply chain management and provide the agility necessary for the end-user to thrive in rapidly changing markets.

Agile Program Execution

Yokogawa's innovative, flexible project delivery methodology utilizes the latest technologies and work processes to achieve maximum benefits to the project while keeping it off the critical path. The legacy waterfall methodology has been replaced by a modular, parallel execution strategy that uses decoupled pathways to minimize costs and delivery risks.

Capabilities: Emerging Technology

Yokogawa Industrial AI

Yokogawa's global AI center-of-excellence is leveraging extensive domain knowledge and expertise to provide optimal AI technology for process operations. Through an advanced understanding of industrial processes, customer operations, and AI, Yokogawa bridges the gap between data and practical insights.

Yokogawa Cloud

Yokogawa Cloud is a digital transformation and IoT platform to accelerate the development and deployment of industrial cloud applications. It provides industry-specific algorithms and models and integrates them across applications to empower insightful decision-making and higher levels of automation.

Digital Twin Technology

By simulating devices, systems, processes, or people to predict future performance, digital twins drive agility and the convergence of understanding to enable effective decision-making. Based on first-principles models, Yokogawa's and KBC's digital twins maximize safety, reliability, and profitability.


Yokogawa Robotics Solution

The Yokogawa Robotics Initiative is an integrated software platform that unifies the operating environments across drones and mobile robots from different manufacturers. Working with a broad variety of such devices significantly expands the robotics scope and value for plant operations and maintenance. Yokogawa's robotic solutions are currently optimizing operations in plants throughout the world.

Open Process Automation

Open Process Automation (OPA) is an initiative to create a new generation of automation systems with a distinctly different architecture from the Distributed Control Systems (DCS) and Programmable Logic Controllers (PLCs) used in today's process and factory automation strategies.

OPA's goal is to bring together OT and IT technologies, utilizing standards, to reduce the CapEx and OpEx costs of automation. The OPA system uses components, technology, and standards to achieve the same level of high availability and performance of the existing automation strategies. These standards allow for selecting, adding, and upgrading critical components based on "best of breed" criteria and not a single supplier. Standard communication interfaces allow the addition of new applications such as machine learning and advanced process control without the high cost of today's systems integration. The use of smaller, interchangeable I/O devices and local compute capabilities (Distributed Control Nodes (DCN's)) opens up new ways of looking at and implementing complex control strategies.

As the leading System Integrator in OPA development, Yokogawa has spent years working with other technology suppliers to bring together world-class automation solutions. Our clients are looking for best-of-breed components, the process knowledge, and skills to blend these technologies together to achieve their desired outcomes.
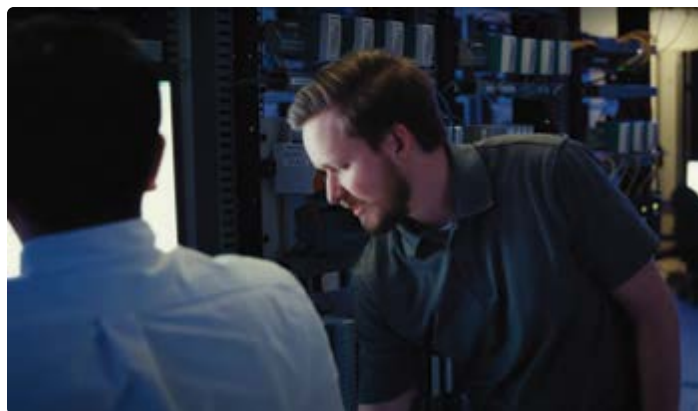
▶ See Inside the OPA Test Bed in Houston

PXiSE Energy Solutions

PXiSE is a Vision for How to Make the Electrical Grid Work

PXiSE (pronounced 'pice'), develops next-generation grid control software that unlocks the potential of distributed generation to improve grid reliability and increase renewable energy output, while helping ensure system balance and power quality.

Today's dynamic grid requires a faster, more precise solution than SCADA can provide. That's why PXiSE's software uses real-time data provided by phasor measurement units (PMUs), combined with artificial intelligence to manage the increasing number of distributed energy resources, such as wind, solar, electric vehicles, and batteries on the grid.

Through its patented technology, PXiSE enables utilities, campuses, and communities to hit their clean energy goals by giving grid operators the control they need to manage unlimited renewables and distributed energy resources while still providing safe and reliable power.

PXiSE's products include:

- Microgrid Controller
- Distributed Energy Resource Management System (DERMS)
- Renewable Power Plant Controller

For more information, please visit www.PXiSE.com

Yokogawa Fluence Analytics

Yokogawa Fluence Analytics, which was named as a Top 50 global advanced manufacturing startup by CB Insights, provides patented process analytics and control solutions to polymer and biopharmaceutical customers worldwide. Yokogawa Fluence Analytics is a global leader in real-time polymer reaction monitoring and control, and its industry-leading ACOMP product is the only commercially available smart manufacturing system that continuously monitors and measures polymerization reactions.

The company's biopharmaceutical product line includes a high-throughput static light scattering instrument that can independently measure the stability of biopolymers under thermal, chemical and/or mechanical stress, while also performing shelf-life stability studies at low temperatures.

For more information, please visit www.fluenceanalytics.com

Fluid Imaging Technologies

Flow Imaging Microscopy from Yokogawa Fluid Imaging Technologies

FlowCam is a flow imaging microscope that combines the benefits of digital imaging, flow cytometry, and microscopy into a single solution for life science, materials research, and industrial applications. Beyond traditional particle sizing and counting, image-based analysis allows for the comprehensive characterization of subvisible API aggregates and contaminants in biopharmaceuticals, mammalian cells, microplankton, emulsions, and advanced materials. FlowCam products include:

- FlowCam 8000 Series, our most versatile instrument and enumeration
- FlowCam LO, flow imaging microscopy and light obscuration in a single instrument
- FlowCam Nano, submicron imaging for particles 300 nm to 2 µm
- FlowCam 5000, an affordable instrument optimized for your application
- FlowCam Macro, analysis of visible particles from 300 µm to 5 mm
- ALH for FlowCam, automated liquid handling for unsupervised analysis
- VisualSpreadsheet, powerful analytical software with an optional AI module

Yokogawa Fluid Imaging Technologies' mission is to bring clarity and focus to the study of subvisible particles in the life sciences, including monitoring Earth's water bodies and drinking water supply for hazardous algae, helping to make vaccines and injectable medicines safer, and improving product quality in a variety of applications.

For more information, visit www.FlowCam.com

Featured Services and Solutions

KBC, A Yokogawa Company

Bringing Decarbonization to Life

KBC is all about excellence in the energy and chemical industries.

We are passionate about driving sustainable change for our planet. We have been building to this for over 40 years, deploying world class technology & expertise in energy & process management.

Our world-renowned experts rose from within the industry. We understand what it takes to succeed and maintain resilience and will work with you to support you through your projects and after their completion.

As a leader in digital energy management & carbon emissions management, we innovate with novel, award-winning technologies for low and no carbon processes, and deliver robust and proven automated surveillance to meet your sustainability goals.

Our integrated capabilities of consulting and technology make us a trusted partner by the industry and can help you in the following areas:

- Energy transition
- Process optimization
- Value chain optimization
- Asset management
- Operational performance
- Digital transformation

Although an independent company, our synergy with Yokogawa allows us to offer solutions that cover the whole lifecycle of an asset, from the field to plant, combining technologies to bring more value and success to our customers.

We know how to roadmap to net zero and beyond and how to deliver it.

For more information, please visit www.kbc.global

Process Analyzer Integration

anyProcess   anyAnalyzer   anyWhere

Yokogawa Analytical System Integration provides turnkey analytical solutions for gas and liquid measurements to support product refinement, process efficiency, and safety. A full scope of services includes the following:

- Front end engineering design (FEED) and detailed engineering
- In-house fabrication of process analyzer systems, including sample systems, racks, panels, and air-conditioned analyzer houses
- Project management
- In-house testing and factory acceptance testing (FAT), including Yokogawa or third-party analyzers, analyzer house/shelter/HVAC, fire and gas, network, and more
- Site installation supervision services
- Commissioning and start-up
- Training, repair, and annual maintenance support

We possess expertise in liquid and gas analyzers with extensive application experience in all process industries and in-depth knowledge and experience with third-party analyzers for cost-effective solutions.

We also specialize in continuous emission monitoring systems (CEMS) that ensure compliance with state and federal emissions regulations for monitoring, measuring, and recording of sulfur and other gasses.

Recognized globally for turnkey execution excellence in process analytics and CEMS, Yokogawa has successfully delivered thousands of systems since 1967.

System integration solutions are available for large or small-scale projects, including single sample systems for existing analyzers, free-standing enclosures, and three-sided shelters.

▶ Learn More About Our Analyzer Integration and Sample Systems

Advanced Solutions

Yokogawa's extensive advanced solutions portfolio enables users to optimize their operations and profitability in a sustainable manner.

Featured Solution: Advanced Process Control (APC) – The Platform for Advanced Control and Estimation (PACE) brings multivariable control, quality estimation, complex custom calculations, and operator user interface design all into a single application. PACE dramatically reduces deployment time while simplifying maintenance for robust performance.

Industry-Specific Solutions

Yokogawa offers a broad array of solutions that allow industries such as chemicals, energy, pharmaceuticals, and water/wastewater to thrive in emerging business ecosystems.

Featured Solution: CombustionONE is a holistic approach to fired asset management excellence. It has been proven to improve safety, increase fuel efficiency, increase productivity, minimize downtime, reduce NOx and CO_2 emissions, and increase asset and catalyst life spans.

System Deployment Solutions

A complete portfolio of solutions optimizes project planning and design and maximizes operations and maintenance performance over the complete lifecycle.

Featured Solution: Plant Resource Manager (PRM) is an asset performance management solution that automates the field device commissioning process and provides real-time asset monitoring with condition-based and predictive maintenance.

Operations Management Solutions

A broad portfolio ensures compliance and safety while optimizing operations.

Featured Solution: RAP4 for Digital Control of Work is a system of clear, intuitive software modules for workforce safety. RAP4 is an intelligent alternative to simply digitizing paper-based systems. Layers of safety for all industries, all scales, and all risks assure complete control of work audit compliance and drive continuous safety improvement.

For more information, visit www.yokogawa-rap.com

Solutions for Enterprise Performance Enhancement

Complementing our control and safety instrumented systems is a comprehensive solutions suite that extends from the sensor level to the boardroom to meet virtually all requirements.

- **Scalable:** Add to the system at any time and scale-up as it grows.
- **Agnostic:** Most solutions can be used not only with Yokogawa's but with any control system or safety instrumented system on the market.

KBC Operational Excellence

- Cloud services
- Consulting services
- Energy management
- Digital twins
- Simulation and optimization
- Production planning
- Supply chain management
- Production and yield accounting
- Process unit data reconciliation
- Operational readiness consulting

Operations Management

- Profit driven operation
- Permit to work
- Incident/near miss management
- Plant information management
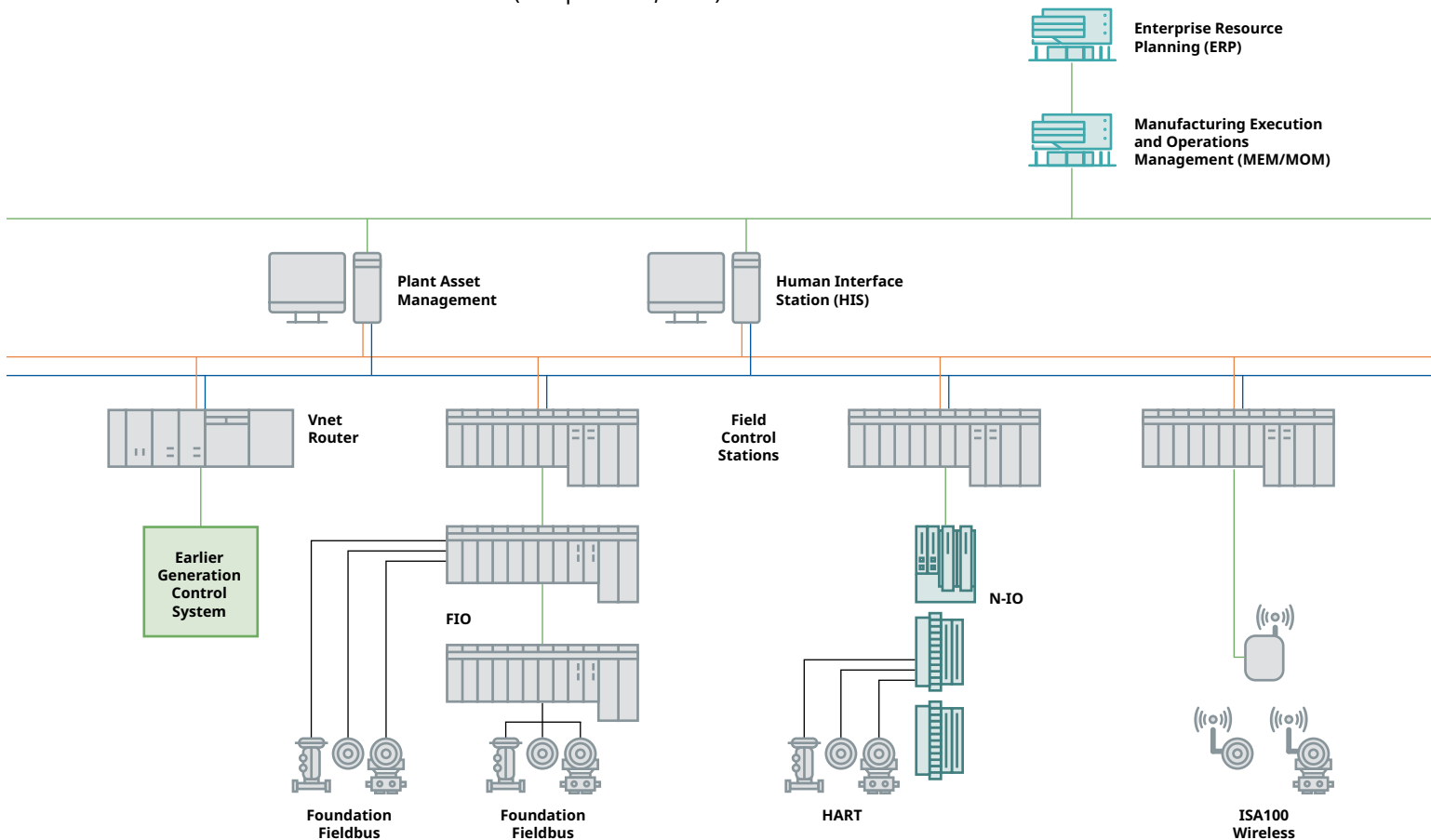- Field assistant mobile

Advanced Solutions

- Alarm rationalization
- Control room design
- Operator training simulation
- Modular procedural automation
- Advanced process control
- PID loop auto tuning
- Advanced analytical instrument management system (AMADAS)

Alarm Management and Analysis

- Sequence of events recorder (Exaquantum/SER)
- Alarm reporting and analysis (Exaquantum/ARA)
- Alarm master database (Exaquantum/AMD)

Industry Specific Solutions

- Distributed energy resource management (renewable power)
- Laboratory information management (LIMS) (pharmaceutical/life)
- CombustionONE (holistic fired asset solution)
- Terminal logistics suite (terminal automation)
- Turbomachinery controls and optimization
- Rotating machinery controls

Enterprise Resource Planning (ERP)

Manufacturing Execution and Operations Management (MEM/MOM)

Plant Asset Management

Human Interface Station (HIS)

Vnet Router

Field Control Stations

Earlier Generation Control System

FIO

N-IO

Foundation Fieldbus

Foundation Fieldbus

HART

ISA100 Wireless

Process Data Historian

- Historian (Exaquantum)
- Batch historian (Exaquantum/Batch)

Human Operator Effectiveness

- Report manager (Exaquantum/RM)
- Graphical framework (Exaquantum/GF)
- Operator trending module (Exaquantum/OYM)
- AutoTrend (Exaquantum/AutoTrend)
- Electronic log book (eLogBook)

Production Management

- Down time analysis (Exaquantum/DTA)
- Movements monitoring (Visa-OM)
- Production accounting (Exaquantum/mPower)
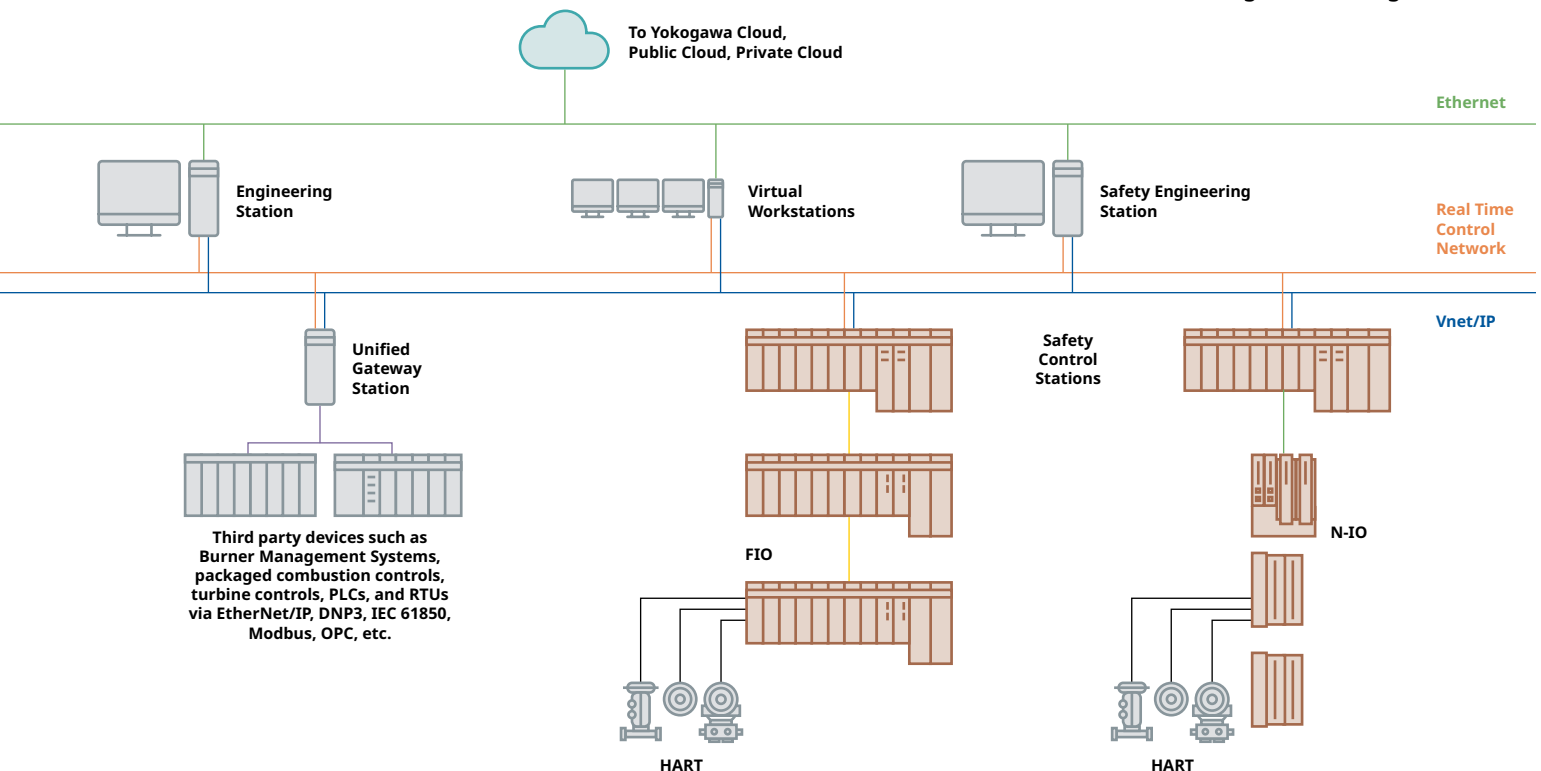
Functional Safety Management

- Subsea historian (Exaquantum/SSH)
- Safety function monitoring (Exaquantum/SFM)
- Override safety advisor (Exaquantum/OSA)
- Interlock status monitoring

Energy Management

- Power performance calculations (Exaquantum/PPC)
- Production accounting (Exaquantum/mPower)

System Deployment Solutions

- Agile project execution
- Automation design suite
- Secure remote solutions
- Asset management (plant resource manager)
- Cybersecurity solutions
- Main automation contractor (MAC)
- Main automation and information contractor (MAIC)
- Main instrumentation vendor (MIV)
- Systems integration
- Lifecycle services
- Maintenance services
- Consulting and training

To Yokogawa Cloud, Public Cloud, Private Cloud

Ethernet

Engineering Station

Virtual Workstations

Safety Engineering Station

Real Time Control Network

Vnet/IP

Unified Gateway Station

Safety Control Stations

Third party devices such as Burner Management Systems, packaged combustion controls, turbine controls, PLCs, and RTUs via EtherNet/IP, DNP3, IEC 61850, Modbus, OPC, etc.

FIO

N-IO

HART

HART

Industrial Automation Products & Solutions

Control Systems and Safety Instrumented Systems

CENTUM VP Distributed Control System

Yokogawa's robust production control system is designed for mission-critical applications that demand performance, reliability, and scalability. New releases maintain compatibility with all prior versions—by design.

Key Capabilities

- Highest Proven System Availability – "Seven nines" (99.99999%) meet requirements when availability is critical.
- "On-the-fly" updates – Version updates and application modifications can be made with no shutdown required.
- Automation Design Suite – Global collaboration-enabled application engineering environment. Auto-documenting, bulk engineering, change management, and flexible binding eliminate errors and considerably reduce engineering hours.
- Automated Commissioning – Automate verification, binding, configuration, testing, and documentation for multiple field devices. Reduce wiring design by 90% and commissioning time by 95+%.
- Network I/O (N-IO) – Redundancy throughout provides high availability. Software-configurable I/O at the edge eliminates marshalling and reduces wiring up to 80%. Project de-coupling minimizes design change schedule impacts.
- Smart Junction Box – Pre-engineered N-IO cabinet eliminates custom design work, document creation, and testing.
- Virtualization – Provides major reductions in cost, footprint, and hardware/software maintenance with enhanced system availability and simplified updates.
- Sustainable Cybersecurity – Third-party certified: Achilles, ISASecure EDSA (IEC 62443-4), and WIB (IEC 62443-2-4).

 The Top 10 Features of CENTUM VP

ProSafe Safety Instrumented System

- ProSafe-RS Lite – up to SIL2; entry-level design
- ProSafe-RS – up to SIL 3; dual architecture in every module
- ProSafe-SLS – SIL 4; inherently failsafe design.

Key Capabilities

- Maximum Fault Tolerance – Exclusive Versatile Modular Redundancy in ProSafe-RS maintains unlimited SIL 3 operation even under multiple failure scenarios.
- "On-the-fly" updates - Version updates and application modifications can be made without pausing the safety function.
- Integrated Control and Safety System (ProSafe-RS) – Maintains control/safety segregation while providing a common operator environment, common system maintenance, precise time synchronization and sequence of events to minimize CapEx and OpEx.
- Scalable – From small process units to large petrochemical facilities—all with IEC 61508 type approval.
- First Globally Certified Functional Safety Management Solution - TÜV certified according to IEC 61508 and IEC 61511 Edition2 2016.
- Network I/O (N-IO) – High availability, software-configurable I/O reduces wiring up to 80% and supports project de-coupling.
- Smart Junction Box – Pre-engineered N-IO cabinet expedites projects and reduces engineering hours.
- Sustainable Cybersecurity - Third-party certified security protects process safety functionality.

 The Top 10 Features of ProSafe-RS

SCADA Systems, Controllers, and Edge Devices

Digital Transformation-Enabling SCADA Platform

Collaborative Information (CI) Server enables digital transformation across multiple facilities by unifying data with disparate formats and protocols into valuable, actionable information. CI Server features:

- High performance, high capacity, and broad scalability
- Open architecture and platform independence – on-premise or in the Cloud
- Simplified deployment and version management minimize TCO
- Advanced HMI and mobile device support
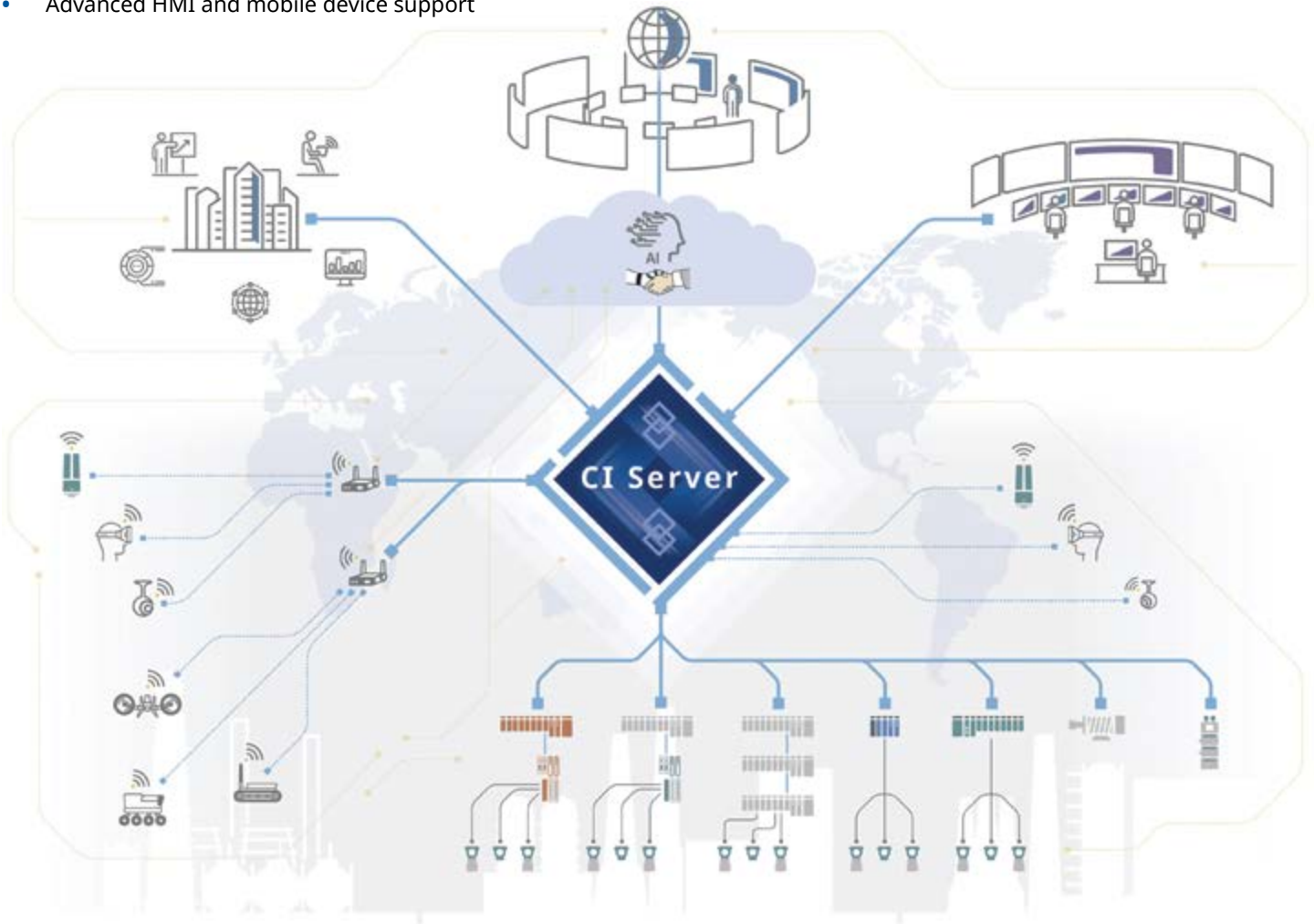
▶ Digital Transformation Through CI Server

Autonomous Controller/Remote Terminal Unit (RTU)

STARDOM is a high-performance, autonomous controller that is compatible with a wide range of SCADA systems. For applications that demand high availability, redundant CPUs and networks are options. IEC 61131-3 programmable, STARDOM provides integral alarm management, thin-client HMI, historian, and special applications such as gas flow computing.

Programmable Logic Controller (PLC)

Yokogawa's FA/M3 next-generation PLC products feature ultra-high speed, stable control and high-performance networking for real time, deterministic automation and monitoring. FA/M3 is scalable up to 8192 I/O points.

Industrial AI Edge Platform

The e-RT3 Plus industrial AI Edge platform is ideal for IoT and AI adoption in manufacturing. With Cloud Service accreditation from Microsoft and Amazon Web Services, the E-RT3 Plus is leading the future of manufacturing from automation to autonomous operations.

Field Instruments

EJA & EJX Pressure Transmitters

- DPharp sensor technology provides simultaneous measurement of DP and static pressure
- Class leading total accuracy and long-term stability up to 15 years
- Fast response time of 90ms
- Built-in compliance to IEC61508 as standard
- Multi-variable transmitter available with compensated mass flow output

RotaMASS Total Insight Coriolis Flowmeters

- Unique "box-in-box" design decouples the measuring tubes from pipeline stresses and vibration guaranteeing reliability
- Easy installation design
- Uninterrupted and reliable measurement under extreme aeration conditions by utilizing Smart Power Management
- Tube Health Check function for in-line meter verification without disturbing process measurement
- Net Oil and advanced concentration measurements
- NTEP and 3A Approvals

▶ Superior Design with Total Insight

VY Series Vortex Flowmeters

- Up to 16 inch models with Reduces Bore types up to 2 sizes down
- Supports flexible piping design and installations
- Unique noise reduction and Spectral Signal Processing (SSP) to provide an accurate and stable measurement
- Robust Shedder bar construction makes measurement at high temperatures (max. 450°C) and high pressure possible
- Vortex Waveform Monitoring without an Oscilloscope

Field Wireless

- ISA100.11a (IEC62734) open standard supported by many vendors
- Object oriented, IPv6 communications supports IIoT, and future applications
- Stable, deterministic networks with TDMA, duocast, and up to 0.5 sec update
- Multiple levels of industry leading wireless security
- Flexible, highly scalable, fully redundant network designs from Sky Mesh to star
- Up to 10 year battery life with easy, low cost replacement
- ISA100 infrastructure plus pressure, temperature, protocol, and I/O transmitters
- Modbus/TCP connectivity to DCS, SCADA, or DAQ including extensive diagnostics

MLX Field Mount Loop Indicator

- 4-20 mA DC input
- Explosion-proof housing
- 6 digit numerical or alphanumerical display
- 20 segment bar graph indicating 0 to 100% of full scale
- Square root extraction from a pressure transmitter signal for flow measurement

AXG/AXW Magnetic Flowmeters

- Exclusive dual frequency excitation method ensures quicker response, reduced noise, and greater stability in high concentration slurries
- Advanced diagnostics with built-in health check verification, detection of flow noise, electrode coating, and conductivity changes
- Micro SD for easy duplication, data logging, or offline maintenance
- Flat spec accuracy up to 0.15% and measurement of fluids with conductivity as low as 1uS/cm
- Ethernet/IP ready and 3A approved

▶ Advantages of Dual Frequency Excitation Magmeters

Field Instruments

AXR 2-wire Magnetic Flowmeters

- Premium performance from field proven dual frequency excitation comparable to 4-wire meters
- Reduced installation costs by avoiding the extra AC power supply and wiring. Lifetime power savings due to 1-4% of power usage compared to typical 4-wire magnetic meters

YTA Temperature Transmitters

- Single or dual input temperature transmitter
- Dual compartment, ultra-low copper housing
- Display with local parameter setting
- Global approvals, including SIL2
- High accuracy with advanced diagnostics (NE107)
- User selectable inputs: T/C, RTD, ohm, or DC mV

Rotameters

- Direct measurement and indication
- Easy installation with low maintenance
- Various process connection and wetted materials
- Available in either glass or metal
- Countless options such as 4-20 mA output, adjustable limit switches, pulse output, etc.

DTSX3000\DTSX200 Distributed Fiber Optic Temperature Sensor

- Senses temperature and distance with fiber optic cable over a wide area
- Can be installed on pipe, vessels and equipment while remaining non-intrusive to the process
- Easy integration with Modbus/TCP
- Up to 50km measuring distance on select models
- Ideal for leak detection and preventative maintenance applications

DTSX1 Fiber Optics Heat Detector

- Senses temperature and distance with fiber optic cable and detects elevated heat over a wide area
- Self-contained solution with integrated IO and visual alarm panel
- Use as stand-alone system or easily integrate with Modbus/TCP
- Up to 16km measuring distance
- Ideal for heat detection and preventative maintenance applications

Networked Solutions

Sushi Sensors

- Automated plant equipment health monitoring to replace manual operator rounds and digitize data
- Industrial IoT sensor with long-range capability via LoRaWAN
- Easy plug and play installation with intuitive set-up from Smart phone application
- Artificial Intelligence and data monitoring on-premise and/or in the cloud
- FM approval for hazardous locations

SMARTDAC+ GX/GP Paperless Recorders

- Modular construction, scalable from 30 to 100 input channels on the main unit, and expandable to 450 input channels
- Built-in Artificial Intelligence with "Future Pen" predictive waveforms and "Future Alarm" to predict trouble events
- Ultimate data integrity complying to FDA 21 CFR Part 11
- Easy integration to PLCs and DCS via EtherNet/IP
- Intuitive touch screen to visualize and search for data, write freehand messages, and more
- Modules that can support measuring TC, DCV, RTD. DI, and DO
- Fast selectable scan intervals from 1 ms to 5sec
- Secure and reliable data storage to both internal (500MB standard and 1.2GB Large) and external (up to 32GB) storage media

> ▶ SMARTDAC+ GX/GP Data Recorders Features & Benefits

SMARTDAC+ GM10 Modular Data Acquisition System

- Scalability: Up to 420 channels per system / plug and lock modules
- Ease of Use: Web-based configuration / Live Web-based data viewing
- Mobile Connectivity: Bluetooth / Mobile Application
- Open Network: Modbus, EtherNet/IP, SLMP, and OPC-UA server
- Reliability: High accuracy measurement, Ultimate data security complying to FDA 21 CFR Part 11
- Noise Torrance: Electromagnetic relay module
- PID, Program control, and high speed (1ms) measurement options

GA10 Data Logging Software

- PC based, monitors and records data from a variety of instruments networks
- AI anomaly detection and notification
- Cost-savings through demand monitoring

Artificial Intelligence Solutions

Yokogawa's AI solutions are focused on producing concrete results in abnormal signal detection, root cause analysis, and quality estimation. AI options are available on SMARTDAC+ GX/GP Recorders, GA10 Software + Sushi Sensors, and e-RT3 controllers.

UTAdvanced, TC10, and YS1000 Series Industrial Controllers

- Advanced PID control, ladder sequence control and fuzzy logic
- Function block programming
- Bright and easy to read color LCD displays with scrolling text
- Multiple communications protocols, Ethernet, Modbus, PROFIBUS, CC-Link, DeviceNet
- Three-year warranty and NEMA 4 face

µR10000 & µR20000 Chart Recorders

- Industrial 100 and 180mm intelligent strip chart recorders
- Ethernet and serial communications interface options
- Large, bright, multi-function data display and user interface

DD Direct Handheld HART® Communicator

- Reads manufacturers' DDs in their native format without the need for translations
- HART®-compliant modem communicates with any registered or unregistered HART® device
- Features an ergonomic, handheld design
- Enhanced 4.3" diagonal anti-glare touchscreen with color graphic display (no stylus required)
- Full QWERTY keyboard for commissioning new transmitters

FieldMate

- Field Device Configuration and Management Tool
- HART, ProfiBus, ISA100, Modbus RTU, Foundation Fieldbus, BRAIN
- Enhanced operations of product verification, calibration support, and primary element configuration
- Also Available in Class I Div 2 Tablet

Analytical

Liquid Analyzers & Sensors

- Single point or multi-channel options for analog or digital sensors
- pH and ORP, conductivity, inductive conductivity and dissolved oxygen measurements
- HART®, Modus, Ethernet, Foundation Fieldbus™, PROFIBUS™
- On-line sensor diagnostics
- Predictive maintenance and sensor replacement

TDLS8000 Tunable Diode Laser Spectrometer

- Measure O_2, CO, NH_3, CO_2, CH_4, H_2O, HCl, and H_2S
- Faster response time vs. traditional analyzers
- No calibration, no consumables
- Non-contacting: Nothing to corrode or degrade from aggressive process conditions
- No background Interferences
- Fully field serviceable
- SIL2 Certified

TDLS8100/8200 Single Flange Probe Type

- Measure O_2, CO/CH_4, $O_2 + CO/CH_4$, NH_3, and HCl up to 850°C
- Single flange design allows for installation flexibility
- In-situ installation removes the need for sample extraction and provides fast response time (<5 seconds)
- Solid state technology means virtually no drift or routine calibration
- On-board diagnostics with 50 days of spectral and historical data
- SIL2 certified, SIL3 capable

TB820D Turbidity Detector

- High reliable measurement with excellent linearity and repeatability
- Measure wide turbidity range (0-0.2 to 0-700 FNU (Light source 860 nm), 0-0.2 to 0-500 NTU (Light source 660 nm))
- Longer lifetime light source by LED, front panel access to maintenance parts
- Flat window cell structure is designed for small dead volume to prevent dirty retention
- Automatic 2 or 3 range switching is available
- Max 20 m cable length is available between TB820D and FLXA402T thanks to digital technology

GD402 Gas Density Analyzer and Detector

- Highly responsive
- Outstanding, stability and resistance to vibration
- Simple, user-friendly interface
- General purpose and explosion-proof

Zirconia Oxygen Analyzers and Detectors

- Single point and multi-point analyzers
- HART, Modbus RTU, and Modbus TCP
- Long-life, highly reliable Zirconia sensor
- Field replaceable probe heater assembly
- Remote and integral converters

GC8000 Process Gas Chromatograph

- TCD, FID and/or FPD detectors
- Custom column design to fit a wide variety of applications with intuitive 12" touch screen interface
- High-sensitivity Thermal Conductivity detector (HTCD) measuring range into the low parts-per-million often replacing Flame Ionization Detectors (FID) and/or Flame Photometric Detectors (FPD)
- High speed Ethernet based analyzer communications and PC interface
- Single or multiple ovens available with multiple system clocks; isothermal and programmable temperature designs available
- GC module (GCM) concept for intuitive, modular parallel chromatography and user defined functions using Y-Basic

FC800D Digital Chlorine Analyzer

- Amperometric measurement of free chlorine (polarographic method)
- Measure Free chlorine continuously without reagent
- Unique rotation electrode method keeps the sensor clean and reduces the maintenance cycle
- Easy maintenance structure, modularized motor unit, and diagnostics functions support simplified maintenance
- Equipped with manual and auto calibration, 2 points correction, basic (reference) sensitivity calibration, and circuit open zero calibration

Test and Measurement Products

DL350 Portable ScopeCorder

- A4-sized compact chassis
- Touchscreen operation
- 2 slots for 20 types of input modules
- Up to 32 Ch with 2 16-channel scanning inputs installed
- Oscilloscope mode and Memory Recorder mode for ease of use
- Up to 50 days recording onto SD card
- Up to 100 MS/s input cards available

CA500 Multi-Function Process Calibrator

- Accuracy of 0.015% (DC current), 0.020% (resistance), and 0.3˚C (RTD)
- Sources and measures DC voltage, DC current, RTD, TC, resistance, frequency and pulse signals
- Corresponds to 17 types of TC standard (JIS/IEC/DIN/ASTM/GOST R)
- Corresponds to 14 types of RTD standard (JIS/IEC/GOST R)
- Multiple source patterns: linear sweep, step sweep, and program sweep functions

MT300 Digital Manometer

- High measurement accuracy of 0.01% as relative accuracy
- Gauge, absolute, and differential models: 10kPa to 70MPa
- Long-term stability performance guaranteed with a measurement accuracy of 12 months
- Various functions for field device calibration, including 24 VDC transmitter output, built-in communication resistance, and Li-ion battery operation

DL950 ScopeCorder

- 200 MS/s high-speed sample rate
- 8G points large memory plus real-time streaming to computer, internal, or external hard drive
- Long recording to internal flash memory at 20 MS/s
- Up to 160 synchronized channels
- Sensor connectivity, high accuracy, and low noise through 22 plug-in modules
- Simultaneous high and low speed recording
- Extensive math and waveform analysis functions
- USB, GPIB, Ethernet, IRIC, and GPS interface options
- Web server, FTP, and email functions via Ethernet

Learn More About the DL950

CA700 Pressure Calibrator

- Achieves the highest accuracy in the portable class
- Achieves the highest resolution and widest range in the portable class
- Strong support for field calibration and maintenance work
- IP54 robust case enables use in harsh environments
- Three high-performance hand pump models for different pressure ranges are available

CW500 Power Quality Analyzer

- Simultaneously measures 3 CH Voltage input, 4 CH current clamp probe input, 2 CH DCV input
- Log anything from single-phase two-wire to three-phase four-wire systems, and everything in between
- Capture irregularities in your power system such as voltage sags, dips, swells and log them conveniently to RAM or an SD card
- Log up to 50th orders of harmonics
- Vector display for convenient tracking of voltage/current phase relationships
- Measurement method conforms to IEC standard 61000- 4-30 Class S

High Content Analysis Platforms for Drug Discovery

Yokogawa's life science business started in 1996 with the development of innovative instruments based on proprietary confocal microscopy technologies, and is dedicated to providing novel products employing microscopy and/or image analysis technology for the advancement of cell biology research and drug discovery. The company's portfolio includes the Confocal Spinning Disk Unit (CSU), CellVoyager™ High Content Analysis Systems and Software, and the new Single Cellome™ portfolio for nano-point delivery and subcellular sampling.

## CellVoyager™ High Content Analysis Systems and Software

Yokogawa's CellVoyager High Content Analysis platforms acquire large numbers of high-resolution cellular images with the fast scanning speed that is critical to phenotypic screening in the drug discovery and development process. The core technology, the microlens-enhanced dual Nipkow disk in the Yokogawa Confocal Scanner, makes it possible to capture high quality images with a remarkably short acquisition time.

Benefits

- High-speed imaging enables researchers to monitor the behavior of live cells.
- Minimal phototoxicity and greatly reduced photobleaching allow imaging over extended timeframes.
- 3D imaging allows analysis of complex cellular behavior.

Contribution to COVID-19 Therapeutic Drugs Development

Yokogawa contributes to the research and development of COVID-19 vaccines and therapeutic drugs at universities and research facilities in the US through its CellVoyager series of high-content screening systems.
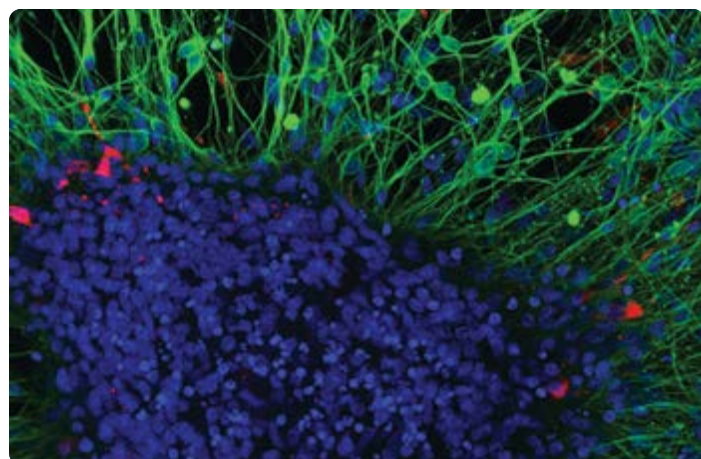

CV8000 High-Content Screening System

- Yokogawa's most advanced, high content platform
- Expandable to four cameras and five lasers
- Standard, stage incubator enables non-stop, long-duration (over three days) live cell imaging via control of humidity, temperature and CO_2.

CQ1 High-Content Analysis System

- Space-saving, compact tabletop design
- Provides multiple, fully integrated functions.
- Open platform supports integration and laboratory automation.
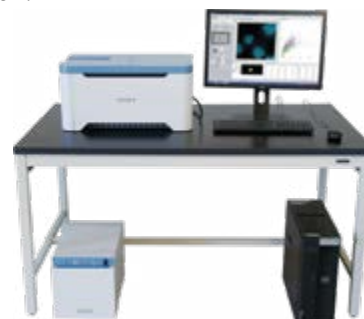
CellPathfinder Analysis Software

- Advanced insights include 3D image analysis and texture analysis.
- Intuitive interface guides users through processes.
- Machine learning continually improves success.
- Provides abundant analysis functions to individualize research.
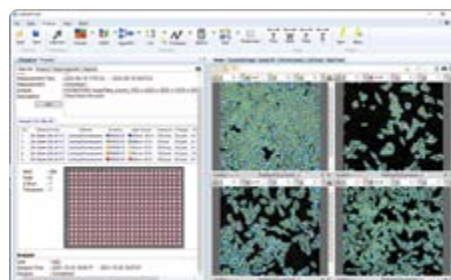
Single-Cell Analysis Solutions

Mass spectrometry and genomic sequencing applied to isolated single-cell components are powerful analytical techniques providing new insights into cell biology and disease research. Yokogawa has recently introduced two new single-cell solutions to enable these applications with unprecedented engineering precision and automation. The SS2000 and SU10 instruments leverage microscopic imaging and live cell manipulation to perform automated sub-cellular sampling and nano-point delivery into cells.

Single Cellome™ Unit SU10

- Nano-point delivery of substances directly to the cytoplasm or nucleus of targeted single cells using disposable nano-pipettes
- For use with inverted optical microscope and optional confocal scanner unit for high resolution live cell imaging
- Automated cell detection and delivery
- High cell viability

Single Cellome™ System SS2000

- Automated single-cell or intracellular sampling with high resolution confocal microscopy imaging
- Sampling with retention of morphological and spatial information of sampled cell and intracellular component
- Incubator function for live cell sampling
- Image recognition software enables automatic target cell selection by cell morphology and fluorescence
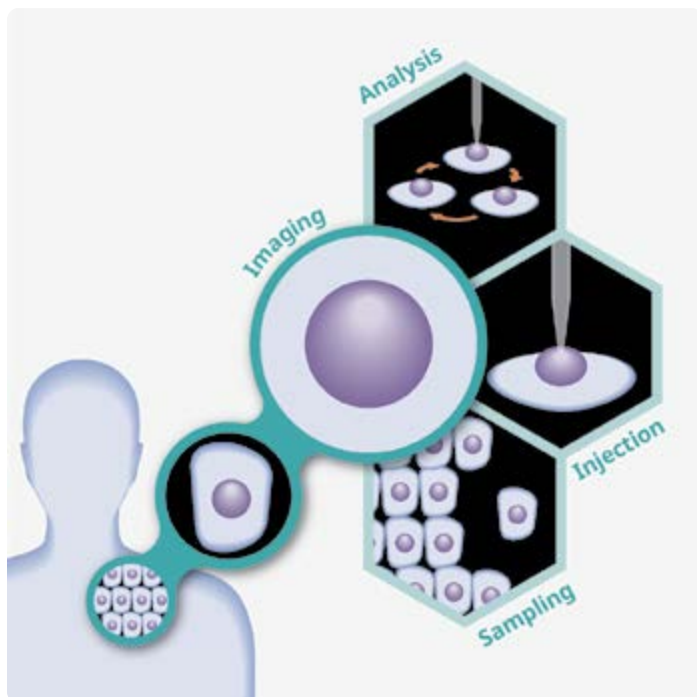

Yokogawa Insilico Biotechnology

The Insilico Digital Twin Platform is an enterprise software that produces a virtual representation of a cell culture bioreactor. The modules within the platform provide an experimental simulation to determine the optimal bioprocess conditions. The ability to carry out virtual experimentation substantially reduces experimental effort, costs of goods and time to market.

The innovative approach of combining the platform's mechanistic models, advanced machine learning and minimal bioprocess data, makes it possible to predict the concentration profile of biomass, titer, lactate, amino acids, and ammonia at the investigated bioreactor scale, as well as other unknown scales.

The Insilico Digital Twin Platform can be applied from the cell line development stage to manufacturing. Yokogawa Insilico Biotechnology provides services using the platform to optimize the customer's bioprocess. In addition, the Insilico Digital Twin Platform can be transferred to the customer, which allows the customer to conduct virtual optimizations independently.

For more information, visit www.insilico-biotechnology.com
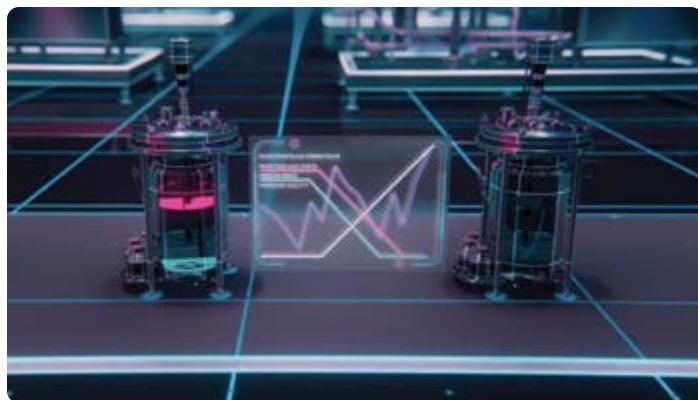
OEM Partner Program

Yokogawa's partner program for Original Equipment Manufacturers (OEMs) helps companies improve their business bottom line. Using a structured, long-term engagement model to deliver unique cost and sustainability benefits, the OEM program ensures that partners always have access to Yokogawa's end-to-end technology portfolio and a broad range of industry applications.

For more information on our OEM Partner Program, please email yca-oem@yokogawa.com.

Lifecycle Services

Yokogawa's Life Cycle Services portfolio optimizes performance, total-cost-of-ownership, and system maintenance over an extended process life cycle. We focus on designing long-term preventive maintenance, cybersecurity updates, and technology refreshes with no process downtime. System maintenance and upgrades are timed to provide the highest productivity and profitability.

For more information, please visit Lifecycle Services
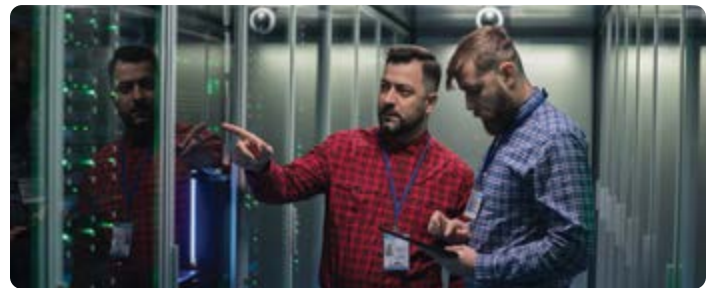
Training Solutions

We provide options for personnel to review fundamental principles, sharpen existing skills, and learn how to integrate new advanced strategies.

Classes are available at our training centers for a hands-on experience and in-depth instruction. Classes also offered online, on-demand, and on-site.

In addition, Virtual Field Training represents the next-generation 3D solution enabling training by simulating the customer's plant in a virtual space. An immersive training experience is interlinked with virtual reality (VR) to solve on-site training challenges.

For more information, visit Training or Lifecycle Services Training.

Contact

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Mon-Fri, 8AM-5PM ET | 24/7 for emergencies

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Local Delivery. Global Experience

Business Sites

60 countries

Subsidiaries and Affiliates

129 companies

Manufacturing Sites

13 countries

Service Network

200+ countries & sites served
180+ service sites
2,500+ service engineers

Local Manufacturing in North America

Yokogawa's 125,000 sq. ft manufacturing facility in Newnan, Georgia includes production lines for analytical instrumentation, flowmeters, and pressure transmitters. The facility supports a North American "Quick Ship" program and provides calibration and repair services. In addition, this location has a flow testing facility to test any flowmeter to NIST standards.

The Newnan factory is ISO9001 and ISO14000 certified and offers contract manufacturing services.

Capabilities include assembly, engineering, injection molding, laser engraving, machining, pad printing, and surface mount manufacturing.

Yokogawa Europe (Netherlands)
Analytical Instruments

Yokogawa Russia (Moscow)
Field Instruments

Yokogawa Canada (Calgary)

Yokogawa Corporation of America Headquarters (Sugar Land, TX USA)

GERMANY
Field Instruments

Yokogawa Corporation of America (Newnan, GA USA)
Field Instruments
Test & Measurement
Analytical Instruments
Control & Data Acquisition Instruments

Yokogawa de Mexico (Mexico City)

Yokogawa Colombia (Bogota)

Yokogawa Nigeria (Lagos)

Yokogawa Chile (Santiago)

Yokogawa Argentina (Buenos Aires)

Yokogawa Angola (Luanda)

Yokogawa America do Sul (Brazil)
Measuring Instruments

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Yokogawa Middle East and Africa (Bahrain)

Field Instruments

Yokogawa Engineering Asia (Singapore/Indonesia)

Control Systems
Analytical Instruments
Measuring Instruments
Field Instruments
Aviation Instruments

Yokogawa China (China)

Yokogawa Electric Korea (Seoul)

Controllers
Measuring Instruments

Yokogawa World Headquarters (Tokyo, Japan)

Main Factories in Japan

Komagane Silicon sensors

Komine Analytical Instruments

Kofu
Field Instruments
Measuring Instruments
Analytical Instruments

SAUDI ARABIA
Field Instruments

Yokogawa India (Bangalore)

Field Instruments

Yokogawa South Africa (Johannesburg)

Yokogawa African Anglophone Region (Johannesburg)

Yokogawa China (Shanghai)

CHINA (Sichuan)
Field Instruments

CHINA (Suzhou)
Field Instruments
Recorders

CHINA (Shanghai)
Field Instruments

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YOKOGAWA ◆

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