

Smart Manufacturing

Measure and Connect Together
for a Green Battery Future



Create a Sustainable Future for **Batteries** Together
Through the Realization of Smart Manufacturing

Production
Efficiency
Improvement

- Factory Profitability Improvement
- Effective Use of Limited Resources

Environmental
Responsibility

- Carbon Dioxide Emissions Reduction
- Effective Utilization of Resources

Digital
Transformation
Initiatives

- Efficient Use of the Scattered Data Within the Factory
- Data Integration Across Supply Chains

Demand for batteries has surged rapidly in recent years, with the popularity of EVs and the increasing renewable energy needs.

In addition, there are also constant requests for improved performance, such as higher capacity, smaller size, and lighter weight.

Due to these changes in the environment surrounding batteries, factory production capacity and product quality have become major challenges. Furthermore, we have to deal with new challenges such as carbon-neutral management and security.

Yokogawa proposes optimal solutions to these issues utilizing measurement and control technologies. We contribute to realizing a prosperous future society together with our customers.

Realize the Future of Green Battery Together With Yokogawa

High-Quality × Mass-Production

- Still room for improvement in production efficiency and quality

Decarbonization of Factories

- Manufacturing processes emits a large amount of CO₂

Security Measures

- Hidden security risks
- Long-standing security

Customer's Challenges

AsIs / ToBe

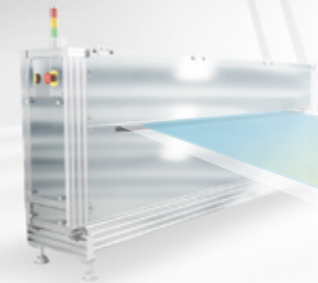
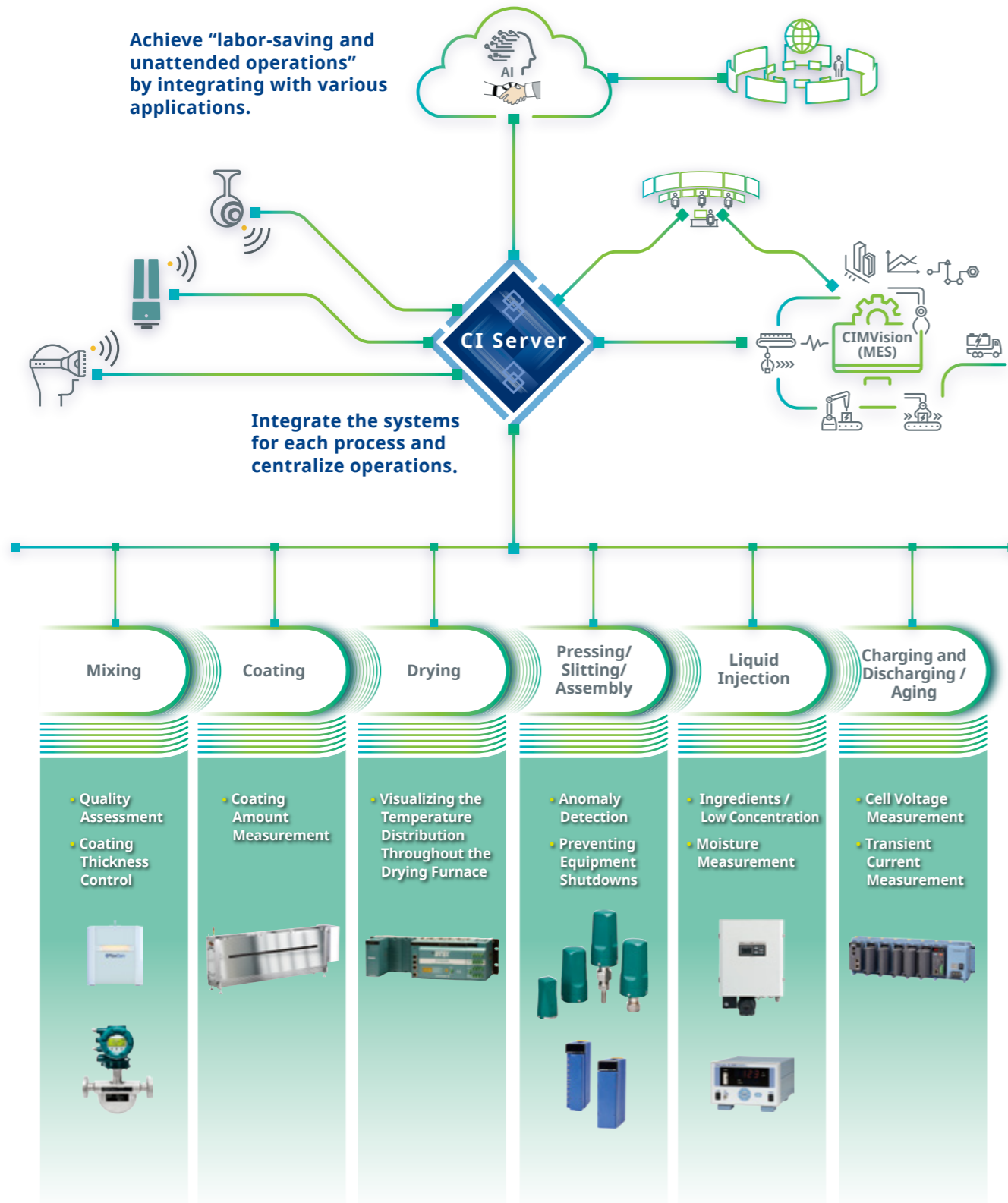
- High production efficiency to meet the surging demand
- Low-cost and high-quality battery manufacturing

- Achieving carbon neutrality in the factory
- Environmentally friendly products both in production and use

- Identifying security risks associated with factory development
- Security design and implementation based on risk assessment

Battery Manufacturing

Yokogawa contributes to solving challenges at each process of battery manufacturing.
We also achieve overall optimization of battery manufacturing by integrating the systems and data from each process.



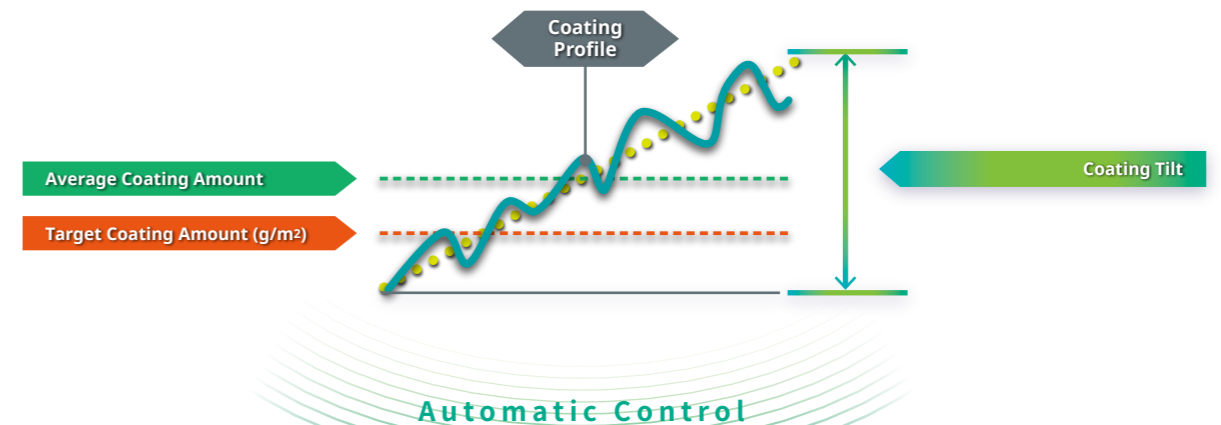
Coating Control

Maintaining and improving product quality is a particularly crucial challenge in the battery industry.
Among these, slurry coating is an important process directly affects product quality.

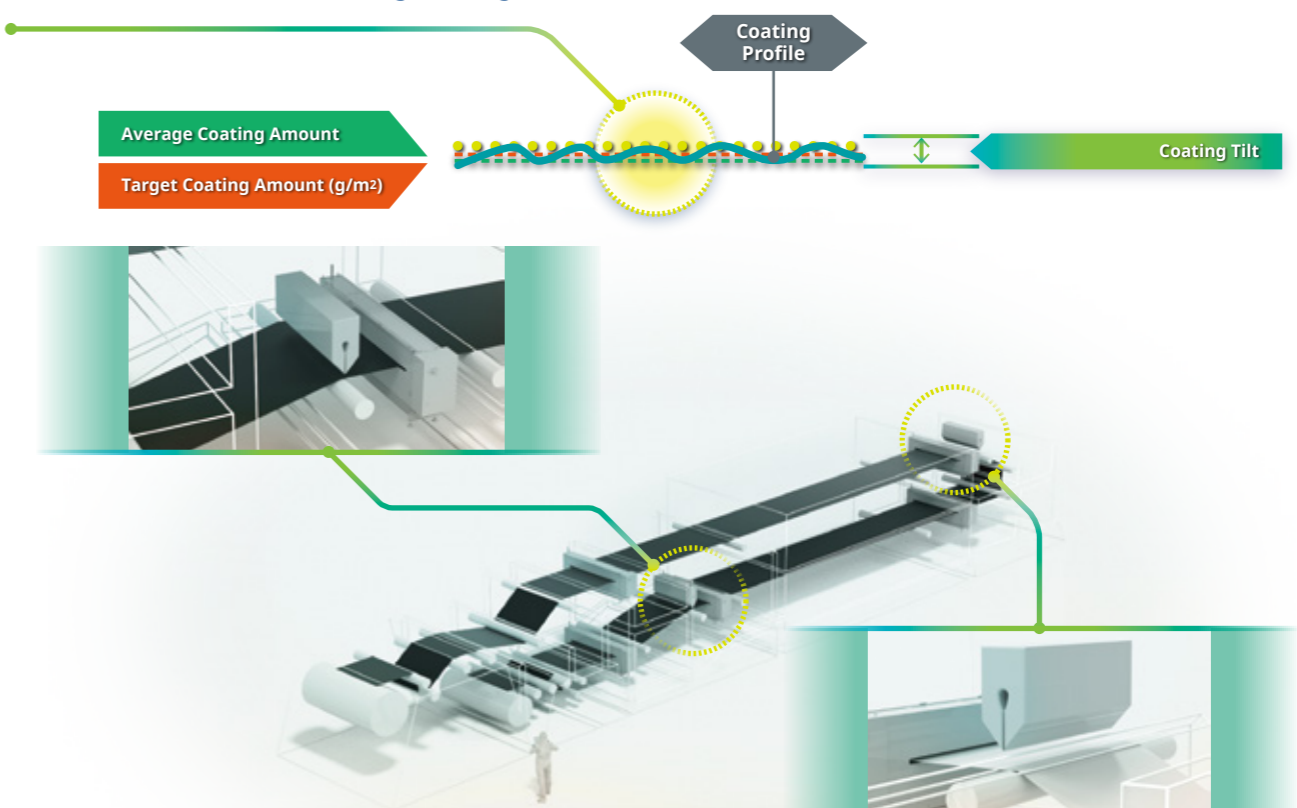
Optimal control of the coating amount reduces energy consumption and materials, improves yield, and minimizes losses through stable quality.

Yokogawa's online thickness gauges were developed based on over 50 years of experience in "thickness measurement and control technology development" and a track record of delivering more than 2,000 systems.

We contribute to solving challenges that cannot be addressed by measurement alone through our technology that combines measurement and control.

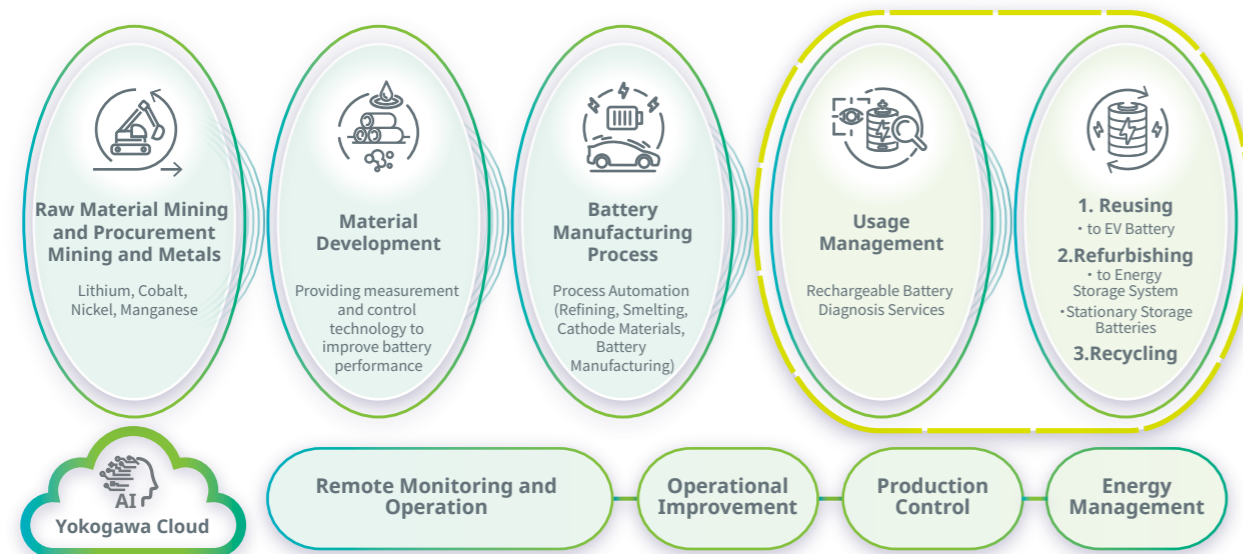


Achieve the Target Thickness by Minimizing Tilt and Minor Fluctuations During Coating.



Battery Supply Chain

Providing customer value and solutions to challenges throughout the supply chain



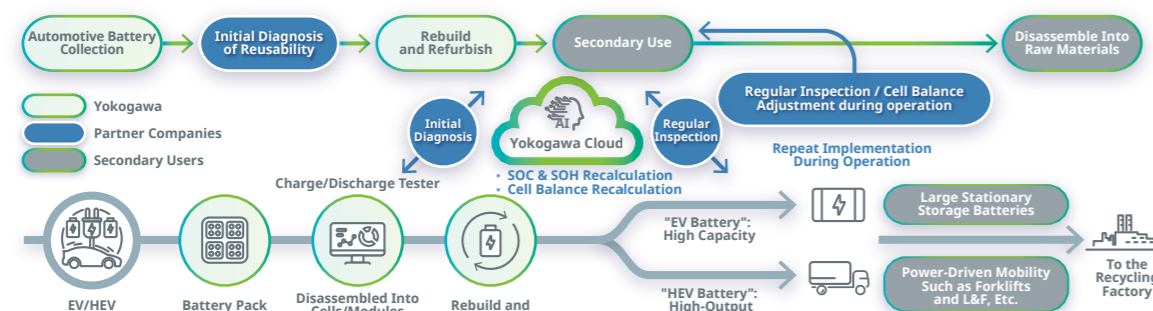
Yokogawa contributes to achieving carbon neutrality with battery reuse solutions that are essential for environmental protection and efficient resource utilization.

Reusing Batteries

Yokogawa's diagnostic technology enables the safe reuse of used storage batteries



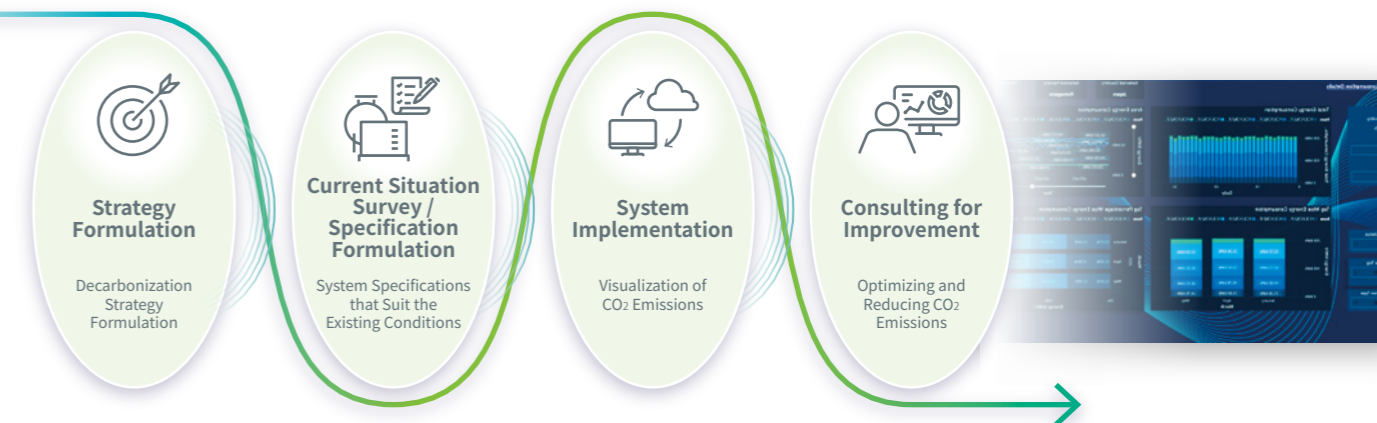
Flowchart for the Reuse of Automotive Lithium-Ion Batteries



•Diagnosis and sorting batteries after use in EVs •Provide online diagnosis and efficient operation after implementation

Carbon Neutral

Efficient Carbon-Neutral Measures Based on CO₂ Emissions Visualization



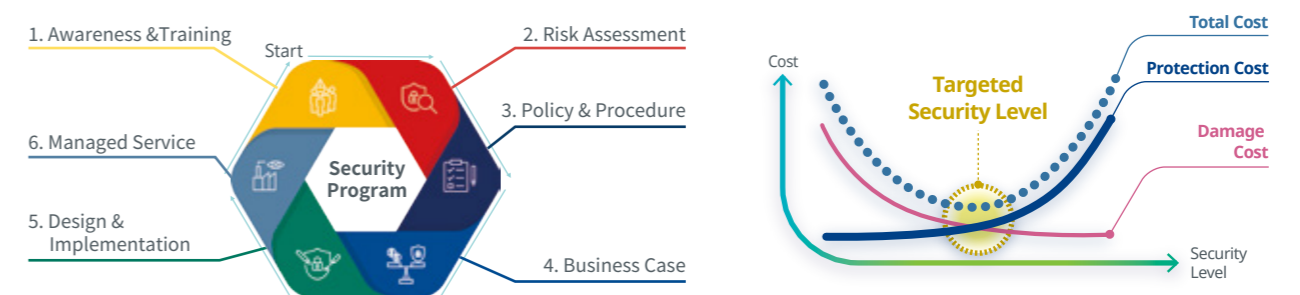
Among the various carbon neutral measures, optimizing the manufacturing process has many benefits, including not only reducing CO₂ emissions but also reducing production costs and improving production efficiency.

Yokogawa provides comprehensive support, from the formulation of decarbonization strategies to consulting on energy reduction after system introduction.

Utilizing measurement and control technologies, we visualize factory CO₂ emissions based on actual measured values rather than theoretical values. We identify energy losses in the manufacturing process, and develop and implement optimal reduction plans.

Cyber Security

Appropriate Security Measures Based on Risk Assessment

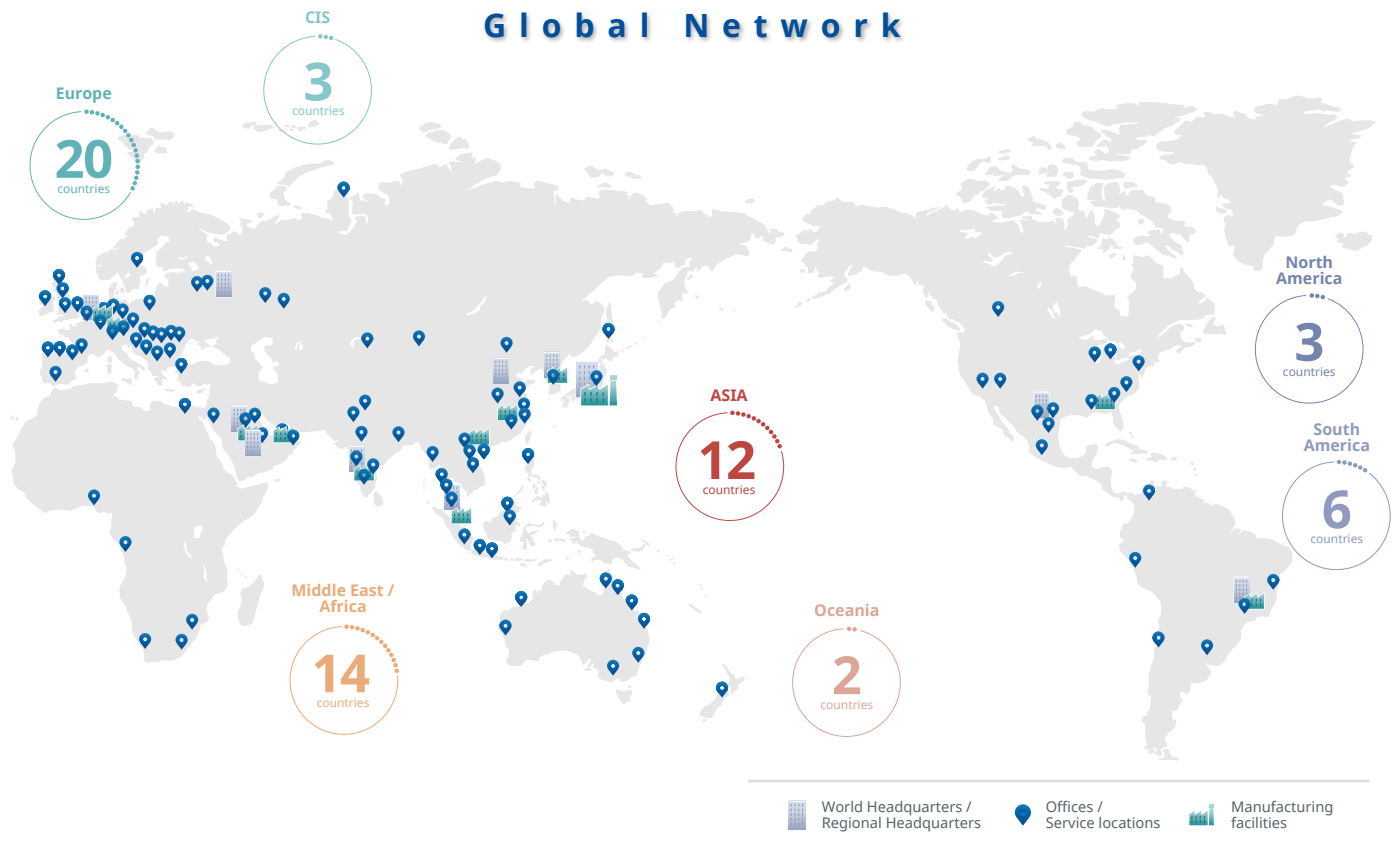


Digital transformation improves factory productivity, but it also increases cybersecurity risks. Yokogawa reveals potential security risks in factories through risk assessment. We design and implement security measures based on IEC62443*.

We also propose the optimal security measures by considering the balance between security level and cost.

*IEC62443: International industrial security standards
Jointly developed by the International Electrotechnical Commission (IEC) and the International Society of Automation (ISA)

Global Network



Subsidiaries and affiliates

13 in Japan | **113** outside Japan

*Includes branches and representative offices

Business sites

60 countries

Manufacturing sites

12 countries

Service network

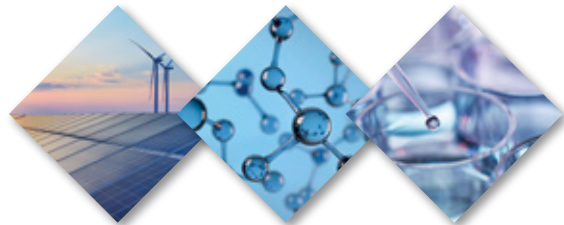
Service sites

180+

Service engineers

2,500+

Since our inception in 1915, Yokogawa has been achieving a sustainable society through our business activities leveraging our expertise in measurement, control, and information technologies. Building on trust-based relationships with our worldwide customers, Yokogawa is creating new value across entire supply chains and shaping the future together.



Yokogawa Battery Manufacturing

<https://www.yokogawa.com/industries/bt/>



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