
LS ELECTRIC

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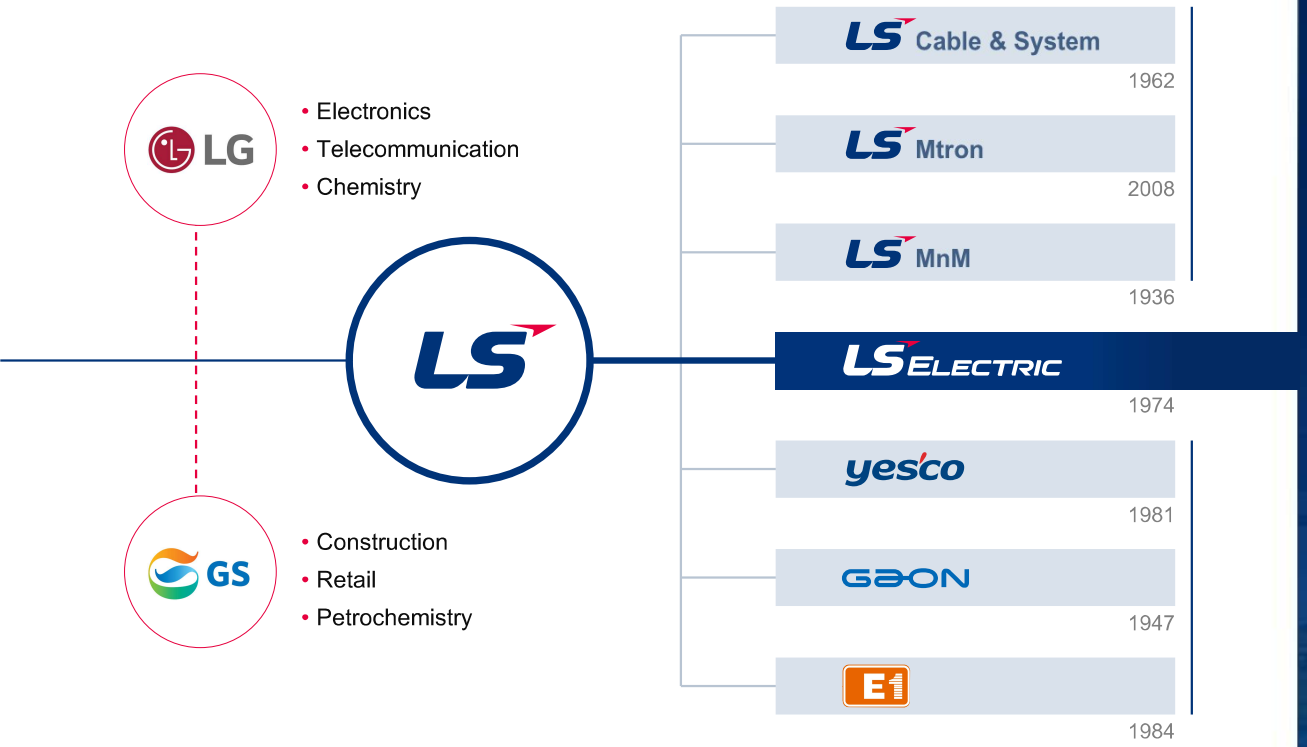
LS Group

LS Group, a South Korean conglomerate, emerged as a spin-off from LG Group in 2003.
LS is renowned for its expertise in electric power, automation, machinery and energy.



LS

EMPLOYEES	25,000
AFFILIATES	132
REVENUE	20.1B USD
OPERATION INCOME	788M USD

* Financial figures in 2024

LS ELECTRIC

EMPLOYEES	4,378
AFFILIATES	9
REVENUE	3.3B USD
OPERATION INCOME	286M USD

* Financial figures in 2024

LS ELECTRIC

LS ELECTRIC is the pioneer of electric power system, automation, and green energy industry in South Korea

* Financial figures in 2024

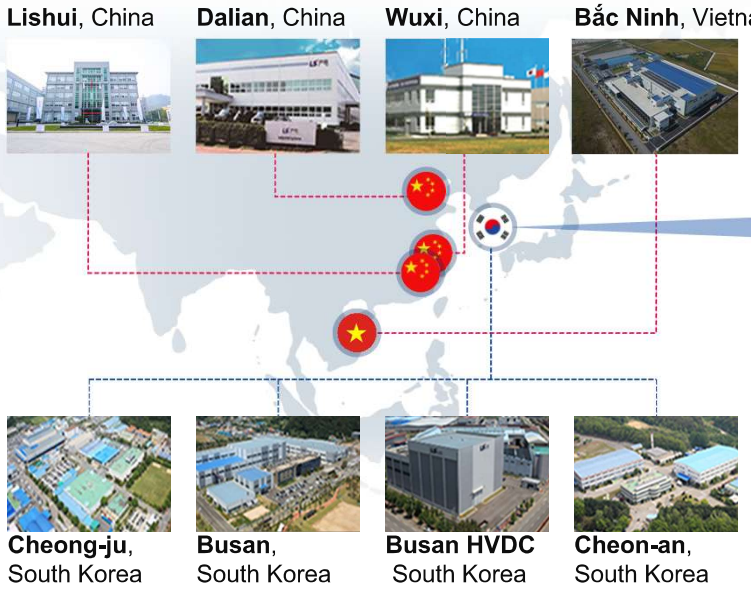
Company Name	LS ELECTRIC	**HQ**	LS Tower, Anyang-si, Korea
Founded	1974	**Seoul Office**	LS Yongsan Tower, Yongsan-gu, Seoul, Korea
Employees	4,378	**Plants**	4 in Korea, 3 in China, 1 in Vietnam, 1 in Indonesia, 1 in Turkey and 1 in U.S.
Revenue	3.3B USD		

LS Yongsan Tower

Head Office R&D Campus

Global Manufacturing Footprint

Global manufacturing footprints and top-notch R&D centers allows LS ELECTRIC to produce global top level products with unparalleled cost competitiveness



R&D centers

- Convergence Tech. R&D Center
- Power Tech. R&D Center
- Automation R&D Center
- Power Testing & Technology Institute

History

Era of Beginning
We Pioneer the Power and Automation Industries

Era of Challenge
We Become the Leader in Power and Automation Sectors

Era of Growth and Innovation
We Takeoff as a Global Leader

Era of Value Management
We Open Up the Future of Smart Energy

1974.06 Established Goldstar Instrument & Electric Co., Ltd.

1987.03 Renamed to Goldstar Industrial Systems Co., Ltd.

1995.02 Renamed to LG Industrial Systems Co., Ltd.

1997.06 Established an Overseas Subsidiary in Hanoi, Vietnam

2000.08 Completed construction of Power Testing & Technology Institute (PT&T)

2003.11 Separated to become LS Group

2007.11 Awarded the Korean Quality Grand Award

2009.10 Established an Overseas Subsidiary in Amsterdam, Netherlands

2011.10 Completed construction of Busan factory for HVDC

2013.11 Awarded the Grand Prize at the 39th National Quality Management convention

2016.04 Completed construction of a R&D Campus in Anyang

2020.03. Renamed to LS ELECTRIC Co., Ltd.

2023.03 Established LS ELECTRIC Indonesia

2023.03 Completed the 2nd 2000 MVA class short-circuit generator

2024.12 Won the '$900 million Export' Award

Mission

FUTURING SMART ENERGY

LS ELECTRIC, which has been pioneering the power and automation industries for the past 40 years, now offers smart convergence solutions by combining ICT and DC technologies.

Futuring
We are leading the way towards a New future through innovations that Exceed our customers' expectations

Smart
We are creating an efficient & convenient future through ICT convergence and technologies.

Energy
We are creating an abundant future by delivering safe clean energy

Vision

DRIVE CHANGE FOR 2030

Fundamental transformation for the growth era

Core Value

LS ELECTRIC's core values are Agile Execution, Bold Challenges, and Excellence, and they guide everything we do

- AGILITY
- CHALLENGE
- EXCELLENCE

Integrated Control of ESG Management

For advancement as a global leader that achieves sustainable growth and creates the future of smart energy, LS ELECTRIC internally and externally declared ESG management on October 4, 2022 under the ESG management vision of “Sustainable Future with Green Energy Solution.”

LS ELECTRIC’s ESG Strategy System

Mission

FUTURING SMART ENERGY

We open up a brighter future through efficient and convenient energy solutions

Vision

DRIVE CHANGE FOR 2030

ESG Management Vision

SUSTAINABLE FUTURE WITH GREEN ENERGY SOLUTION

ESG Directivity

REDUCE Carbon Emission	RESPECT Society	RESPONSIBLE Business
Eco-friendly management to Contribute to carbon neutrality	Safe and happy working environment	Ethical, transparent, and Responsible management

Sustainability Journey

2014 ~ 2017

2014

- First Sustainable Management Report Publication
- Selection as a Family-Friendly Company

2015

- LACP* Sustainable Management Report Category Gold Award
- Joining the UN Global Compact

2016

- Presidential Commendation for Special Contributions to Inclusive Growth and FTA

* League of American Communications Professionals

2018 ~ 2021

2019

- Rating A in ESG assessment
- from KCGS (2019-Present)

2020

- Attained ISO 45001 Certification

2021

- Establishment of an ESG Committee
- Outstanding Anti-corruption Company Award at the UNGC Korea Association Awards

2022 ~ 2023

2022

- Appointment of ESG Chief Executive Officer/Representative Director
- Establishment of ESG Management Team
- Holding of ESG Management Declaration Ceremony (2040 Carbon Neutrality Declaration)
- Prize from Minister of Environment
- Award for Green Company (Cheong-ju Worksite)
- Implementation of Integrated ESH Management System
- Establishment of ESG Volunteer Group 'HighLights'
- Attained ISO 27001 Certification

2023

- Joining ‘RE100’
- Top Prize from Minister of Environment Award for Green Company (Busan Worksite)
- Nominated as Excellent Company in the Industrial and Capital Goods category at the '2023 JoongAng ESG Awards'

Key ESG Evaluation Results for 2023

한국ESG기준원 (Korea Institute of Corporate Governance and Sustainability)
Rating **A** for 4 years in a row

SUSTINVEST
Overall rating **AA**
Raing **A** by scale

Who's Good
A

SUSTAINALYTICS
Low Risk

CDP
Climate Change **B-**

MSCI ESG RATINGS
BBB

LS ELECTRIC responding to climate change

2040 Carbon Neutrality

To take part actively in the climate change response, LS ELECTRIC aims to achieve carbon neutrality in relation to Scope 1 and Scope 2 emissions by 2040. Recognizing that risks arising from climate change extend beyond the environmental realm to encompass social and economic dimensions, we plan to strengthen our renewable energy sourcing capacity and continuously monitor the promotion status of carbon neutrality, particularly given our business's characteristic of having a higher rate of Scope 2 emissions.

RE 100

In December 2023, LS ELECTRIC completed its membership in the Global renewable energy campaign, 'RE100.' RE100 stands for Renewable Electricity 100%, which is a voluntary global campaign where companies commit to using 100% renewable electricity for their operations. As part of our participation in RE100, we plan to transition our renewable energy usage to 60% by 2030 and 100% by 2040. To achieve this, we will actively utilize measures such as enhancing energy efficiency at domestic and overseas facilities, expanding solar power generation facilities, purchasing Renewable Energy Certificates (REC), and engaging in Power Purchase Agreements (PPA).

R&D Innovation

LS ELECTRIC, a smart power and automation total solution provider, is revitalizing its existing core businesses and securing early access to next-generation growth engines.

Lighthouse Factory

A lighthouse factory is a factory that creates a new performance model for manufacturing by utilizing core technologies that will drive the Fourth Industrial Revolution, such as the IoT, AI, and cloud, just as a 'lighthouse' shines a light in a dark sea to guide ships.LS ELECTRIC was selected as the second Lighthouse Factory in South Korea after POSCO was selected in 2019.

WORLD ECONOMIC FORUM

R&D Campus_Anyang

R&D Campus is consistently developing differentiated technologies and software in new business sectors as a future growth engine.

Electronic Power R&D Center_Cheongju

R&D Center is the main laboratory for electrical power solution business of LS ELECTRIC.
Our focus is to lead smart energy & smart factory industry from transformation to distribution.

Power Testing & Technology Institute

World 6th largest testing capacity lab

Short circuit test capacity
4,000MVA

6

Resolute investment for competitiveness

Completed the 2nd 2000 MVA class short-circuit generator In 2023

Global standard activities with IEC

IEC TC
:Technical Committee activities

Performance test for credibility of products

- **MV/LV (~36kV)**
  MV test & Direct test
- **Ultra high voltage (~170kV)**
  Synthetic test
- **Testable equipment**
  41

Global reputation with international certificate associations

ILAC-MRA	KOLAS KORAS Testing	KOLAS KORAS Calibration
UL	ASTA Intertek (ASTA)	DEKRA DEKRA(KEMA)
CESI	ANCE	KERI

* KOLAS : Korea Laboratory Accreditation Scheme

* ILAC-MRA : International Laboratory Accreditation Cooperation - Mutual Recognition Arrangement

Global Operations

LS ELECTRIC is the pioneer of electric power system, automation, and green energy industry in South Korea.

Domestic Subsidiaries

LS Metal	**Core Biz** Copper tubes and STS steel pipes Korea
LS Mecapion	**Core Biz** Industrial electronic equipment Korea
LS - Sauter	**Core Biz** BAS / IBS / GBS systems Korea
LS e-Mobility Solutions	**Core Biz** EV Relay / BDU Korea

Overseas Subsidiaries (Sales)

Hoofddorp (Netherlands),
Madrid (Spain), Istanbul (Türkiye),
Dubai (U.A.E), Bac Ninh (Vietnam),
Jakarta (Indonesia), Tokyo (Japan),
Dalian / Wuxi / Lishui (China),
Charlotte / Chicago / Enoch (U.S.)

Overseas Branches

Brescia (Italy), Moscow (Russia),
Karnataka (India), Singapore,
Bangkok (Thailand), Tokyo (Japan),
Shanghai / Beijing / Guangzhou /
Qingdao / Chengdu / Nanjing (China),
Santa Fe Springs / Bastrop (U.S.)

Overseas Factories (Production)

Dalian / Wuxi / Lishui (China),
Jakarta (SYMPHOS / Indonesia),
Bac Ninh (Vietnam),
Istanbul (Türkiye),
Enoch (MCM / U.S.)

Presence Internationally

107 countries

Global Exhibitions

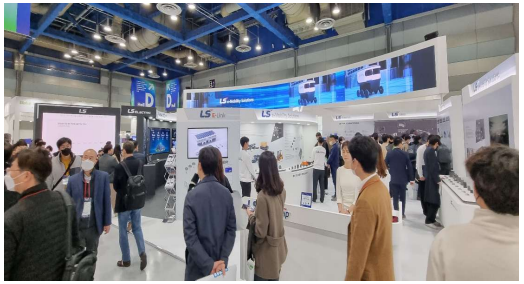
LS ELECTRIC strives to create communication channels with current and potential customers by regularly participating in domestic and international exhibitions and seminars.

Munich EES & InterBattery Germany 2023

KSGE & SIEF South Korea 2023

Hanoi ELECS 2023

Hannover Messe Germany 2023



InterBattery South Korea 2023

KOMARINE South Korea 2023

Global Leader in Infrastructure Business

Power Solution

- Power Transmission
- Power Distribution

Smart Energy Solution

- Photovoltaic (PV)
- Energy Storage System (ESS)
- Microgrid

Railway Solution

- Railway Signaling
- Railway Power Supply

Automation Solution

- PLC
- Drive
- Servo
- HMI

Power / Automation Sector
Total Solution Provider

Smart Grid, Smart Factory, Smart Building
Solution Leading Company

Smart Energy Global Leader
including ESS, EMS, HVDC, PV

Key Achievement Projects

Solar Plant Projects for Carbon Neutrality and RE100

- Bigeumdo Solar Plant(200MW)
- Yeongam Solar Plant(94MW)
- Saemangeum Solar Plant (99MW)
- Iwon Lake Solar Power Plant (30MW)
- Japan Renewable Energy Mito Solar Plant (40MW)
- Chitose Hokkaido Solar Plant(39MW)
- Morioka Solar Plant(50MW)

BESS (Battery Energy Storage System)

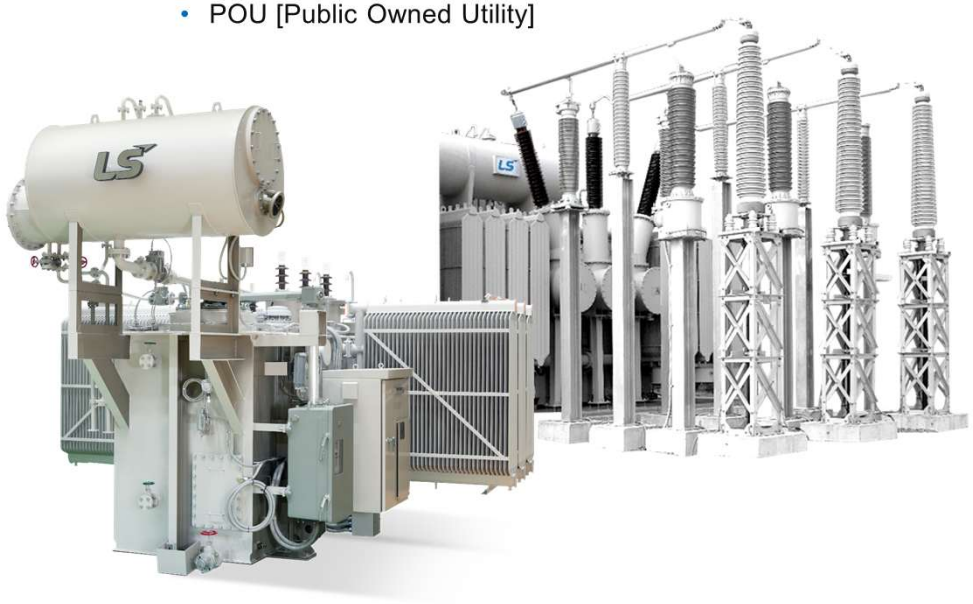
- UK Botley Widow Hill ESS (120MW/280MWh)
- KEPCO Generation Constraint ESS (56MW/63MWh)
- Yeongam Solar Power ESS(78MW/250MWh)
- Peak Cut ESS for Steel Manufacturer (20MW/100MWh)
- Pacifico Japan ESS in Hokkaido/Kyushu (4MW/16MWh)

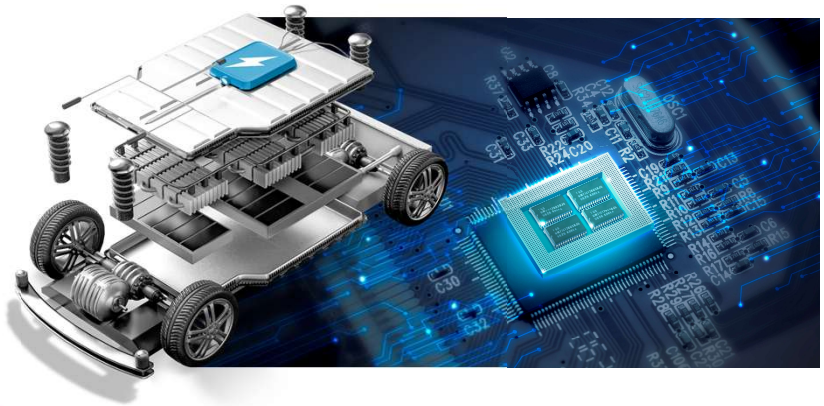
Key Achievement Projects

Highest performance in the North American Ultra-HV transformer market in 2023

References

- Renewable Energy Developer
- IOU [Invest Owned Utility]
- POU [Public Owned Utility]





Growth in North America, led by batteries, electric vehicles and semiconductors

Batteries	• BlueOval SK Battery Park (TN/KY) • Ultium Cells Project (OH/TN/MI) • LGES Michigan Phase 2
Electric Vehicles	• HMGMA Project (GA)
Semiconductors	• Taylor Project (TX) • SVM Absolics (GA)

Key Achievement Projects

Semiconductor Infrastructure Systems

Our HMI and AC Drive are applied to semiconductor factory infrastructures such as Samsung and SK Hynix, the world's top semiconductor manufacturers.

Gas Supply Equipment

- **Samsung Electronics**
  - Godeok Pyeongtaek P2 Project VMB Production
  - Godeok Pyeongtaek P3 Project GC , BUNDLE , VMB
  - Hwaseong16-2L VMB

Chiller, Scrubber, and HVAC Equipment

- **Magnachip**, Cheongju - Chiller
- **SDC**, Tangjeong - Chiller, Scrubber
- **Samsung Electronics**, Godeok - Fan Pump, Chiller, Scrubber
- **SK Hynix** - Vacuum Pump

Energy-saving systems for carbon neutrality, HVAC

High-efficiency drives are the solution for saving energy, often referred to as the 'fifth fuel'. They optimally control motors, which account for the largest share of a building's electricity consumption, to prevent unnecessary energy usage.

LS ELECTRIC's high-efficiency drives ensure continuous and reliable system control while offering a high level of user-friendliness tailored to the specific needs of the industry.

- **Incheon Airport**
- **63 Building**
- **Jamsil Lotte World**
- **Yeouido IFC Mall**
- **Naver Green Factory** (Naver HQ)
- **Yeouido Social Pension Complex**
- **Yonsei Severance Hospital**
- **Lotte Department Store & Mart**
- **Homeplus** (Korean Mart)

Key Achievement Projects

Production Systems for EV Manufacturing Plants

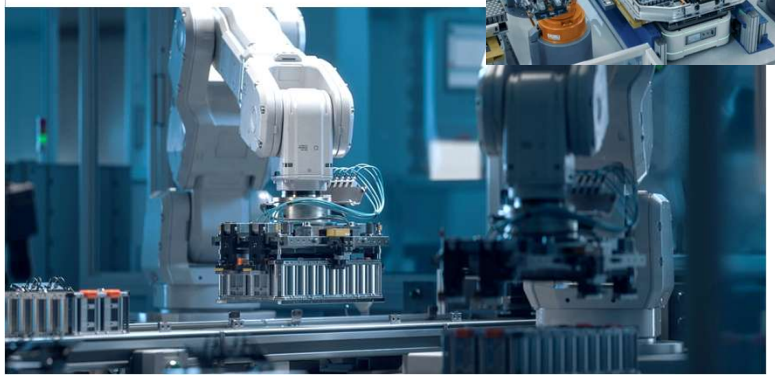
LS ELECTRIC establishes automated production systems for top global automotive factories, operating each process based on digital twins. From internal combustion engine to electric vehicle production, we're demonstrating the competitiveness of our products.

- **Hyundai Motor Indonesia Plant**
- **Gwangju Global Motors**
- **Kia Motors India / Mexico Plant**
- **Hyundai Ulsan EV Plant**
- **New Kia Hwaseong EV Plant**

Rechargeable Battery Production Process

LS ELECTRIC is localizing control systems by applying our products to manufacturing processes of various domestic rechargeable battery companies, aiming to increase our market share in the high-end market.

- **Hyundai Ulsan Electric Vehicle Battery Pack Assembly Line**
- **LG Energy Solutions**
- **SK ON**



Key Achievement Projects

Leader in railroad signal and power systems

- **Technology for large-scale high-speed rail projects**
- **Developed the first domestic unmanned driving signal system in Korea**

- Gyeongbuk & Honam Line, and Seoul High Speed Rail ATC Signali System
- Gimhae, Yongin, Uijeongbu light rail power system
- Seoul Line 7 subway signaling and integrated control system
- Turnkey APM system for Incheon Airport Phase 2
- Implemented unmanned train control for Sillim Line light rail (CBTC GOA4)



Experience with large-scale rail system projects

- **Large-scale projects**
- **Expanding global market share**

- The world's longest monorail in Cairo, Egypt
  35 stations
- Kaohsiung Subway Feeder System, Taiwan
  3 lines, 36 stations
- Taiwan General Railway Signaling System
  6 stations
- Signaling and control system in Bangladesh
  100 stations
- Thailand General Railway Signaling System
  70 stations
- Canada Edmonton Light Rail
  E house feed system
- Manila Metro Line 7
  Feed system




Smart Energy Solution | Digital & Smart Energy

LS ELECTRIC is developing efficient and convenient smart energy solutions for a safe and prosperous future,
and is leading the development of future energy technologies to become a leading company not only in Korea but also in the global market.

Smart Energy

LS ELECTRIC provides smart switchboards and higher-level S/W through smart power facility integrated management services such as the GridSol CARE® system, providing solutions to efficiently manage power operations from energy management to facilities and maintenance.

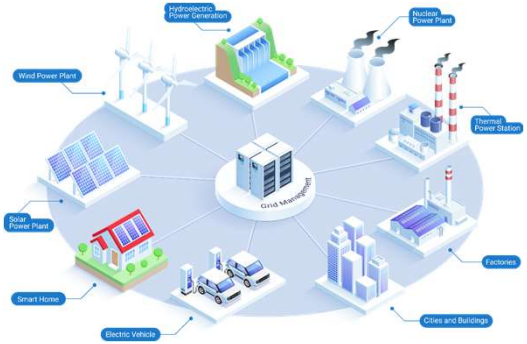
Renewable Energy

LS ELECTRIC leads the global energy transition trend by providing products and solutions for the utilization of various renewable energy sources, including solar energy.

Smart Energy Solution | Digital & Smart Energy

Smart Energy

LS ELECTRIC is leading the smart energy industry with products/solutions such as BESS (Battery Energy Storage System) and GridSol CARE*.
In addition, we realize efficient energy utilization by introducing power solutions such as Smart Grid / Micro Grid to reduce energy costs, protect the environment by reducing greenhouse gas emissions through the utilization of renewable energy, and provide uniform power quality.



BESS

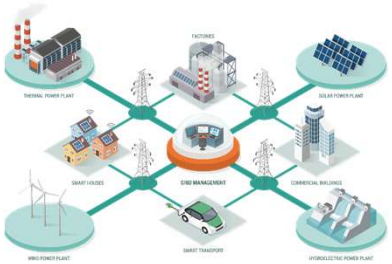
Battery Energy Storage System

BESS is a next-generation power solution that can be used in conjunction with a variety of renewable energy sources, including solar and wind, as a storage device that can store energy generated by power plants and deliver and utilize it where it is needed.

Smart Energy Solution | Digital & Smart Energy

Smart / Micro Grid

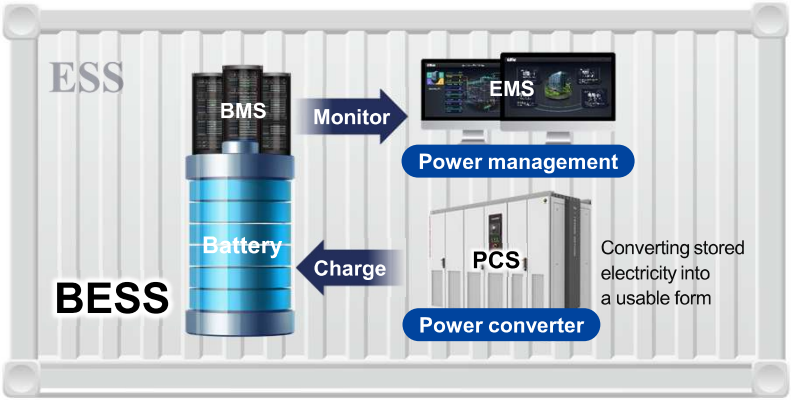
Smart grid is a next-generation power grid that utilizes ICT technology to optimize electricity supply and demand, an IT-electricity interconnection system that enables consumers and utilities to share information in real time, breaking away from a centralized structure.



A microgrid is a local, independent electricity supply system, rather than a centralized grid, that provides power to a small group of people, usually in a specific neighborhood or building, and also provides power to other areas as needed.

BESS

A battery energy storage system (BESS) is a system that increases the utilization of renewable energy by storing power during times of low demand and using the stored power during times of high consumption.



Smart Energy Solution | Digital & Smart Energy

LS ELECTRIC delivers reliable and most efficient power supply solutions across the entire spectrum from power plant to receptor.

DCS
Distributed Control System
System optimized for the most high-level process industries

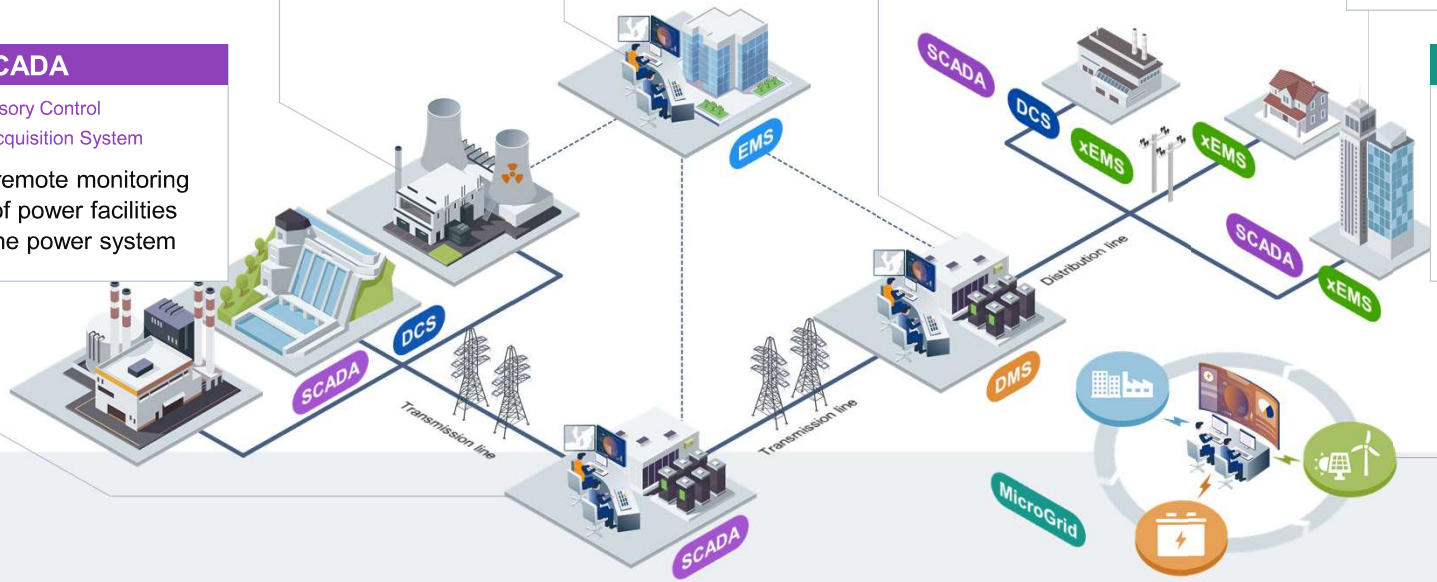
EMS
Energy Management System
Core system of the power supply system

DMS
Distribution Management System
Distribution automation operating system

GridSol CARE
SCADA, PDPS, Smart LV/MV, xEMS
Digital power utility management platform for factories, buildings, homes, etc.

SCADA
Supervisory Control And Data Acquisition System
A system for remote monitoring and control of power facilities installed in the power system

MicroGrid
Supervisory Control And Data Acquisition System
Powering a specific area independently of the existing grid



Power supply process | Power generation | Transmission | Distribution | Consumer

Power Solution System | Gas Insulated Switchgear

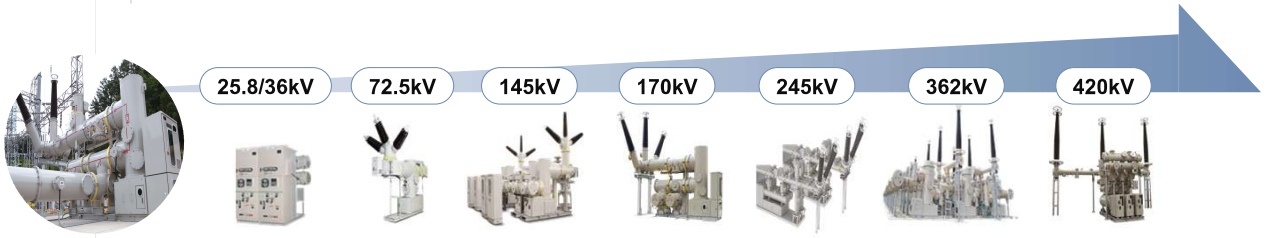
LS ELECTRIC's Gas Insulated Switchgear (GIS) is a switchgear for indoor and outdoor power plants and substations that protects the power system by safely opening and closing the line under normal operating conditions, as well as under abnormal conditions such as accidents and short-circuit currents. It meets all the latest specifications and requirements for rated voltages from 25.8kV to 420kV in terms of performance and reliability, utilizing a space-saving design to provide the most effective solution for customers.

Ease of installation and maintenance

Not only is it easy to transport to the site due to its compact size, but it is also very simple to install, which greatly reduces installation time.
In addition, maintenance checks are performed at ground level, and the main parts are sealed in SF6 gas, so they are not affected by the external environment, so maintenance can be performed even during operation.

Cost and space efficiency

Requiring a minimal footprint, it provides the easiest and most economical solution for your system needs.



Up to 420kV / 63kA / 6300A
IEC 62271-200

Power Solution System | Power Transmission

LS ELECTRIC provides FACTS (Flexible AC Transmission System), which applies control technology using semiconductor switching devices for electric power to AC transmission lines, HVDC (High Voltage Direct Current transmission system), which converts AC power generated from power plants into DC power and transmits it, and Power Transformer, which converts AC power back into DC power at the receiving area to supply power.

Transmission Line Construction

- Underground Cable Construction (200SQ~2000SQ)
- Overhead Line Construction

Substation Construction

- 22.9/154kV and 345kW Substation Construction
- On-site Line Construction

Construction Design

- Layout Design
- Basic Design
- Grounding Grid Calculation and Design
- Other Detailed Design

Power System Analysis

- Short Circuit Current Calculation
- Relay Setting (Relay Coordination Calculation)
- Harmonic Analysis
- System Stability Analysis

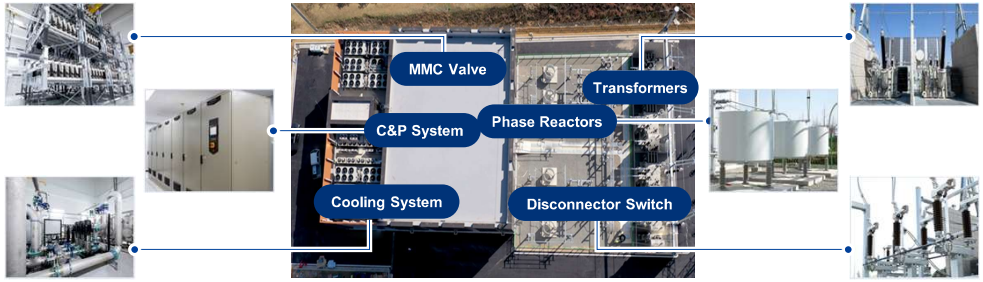
Power Solution System | Power Transmission

LS ELECTRIC offers a wide range of services, from substation design and construction to the application of control technology with power semiconductor switching devices for Flexible AC Transmission Systems (FACTS) on AC transmission lines. We also provide High Voltage Direct Current (HVDC) transmission systems, which convert AC power generated at power plants into DC power for transmission, and Power Transformers, which convert the DC power back into AC power at the receiving area for power supply.

FACTS

Flexible AC Transmission System

The Flexible AC Transmission System (FACTS) is a power system technology that improves the flexibility and efficiency of AC transmission systems by connecting power electronic devices in series or parallel with the power grid.



HVDC

High Voltage Direct Current System

High Voltage Direct Current System (HVDC) is a technology for transmitting power over long distances using power electronic devices and DC transmission lines. It also offers several advantages over traditional AC transmission systems.

Power Solution System | Power Distribution

LS ELECTRIC is leading the way in efficient power supply through various products such as low and high voltage switchboards, power wiring systems, and transformers that are utilized in the power distribution process from substations to receptors.
In addition, we provide power solutions that realize optimal grid protection and various functions by applying high-performance smart power devices.

LV (Low Voltage) SWGR

LS ELECTRIC's LV switchboards are available with a wide range of breakers, protectors, and relays, and can be used in a wide range of everyday applications where power is needed, such as in the power company's power generation and transformation facilities, industrial plants, buildings, and water and wastewater treatment plants.

MV (Medium Voltage) SWGR

LS ELECTRIC's HV switchboards are designed and manufactured according to standards such as KS, IEC, ANSI, etc. to provide monitoring and control equipment with high reliability and compact size for optimal grid protection.

Power Solution System | Power Distribution

LS ELECTRIC is leading the way in efficient power supply through various products such as low and high voltage switchboards, power wiring systems, and transformers that are utilized in the power distribution process from substations to receptors.
In addition, we provide power solutions that realize optimal grid protection and various functions by applying high-performance smart power devices.

LV (Low Voltage) SWGR

LS ELECTRIC low-voltage switchboard is a switchboard designed and manufactured with a focus on safety for the purpose of monitoring, control ling, and protecting the water distribution system from 1kV to 25.8kV, and is a facility that houses various monitoring and control devices such as ACBs and MCCBs to monitor and protect the system.

Devices

Metasol Contactor	Metasol MCCB/ELCB	Metasol ACB	Metasol MCCB	Metasol ACB	Metasol Contactor ACB

DIN Type	Box Type	MCB	CP	Soft Starter	RCB	DC Devices

MV (Medium Voltage) SWGR

LS ELECTRIC's high-voltage switchgear is designed and manufactured according to various standards from 600V or lower to 25.8kV and is widely applied from power generation and substation facilities to apartments based on its high reliability.

In particular, it provides optimal grid protection and various functional solutions by applying high-performance power devices such as VCBs.

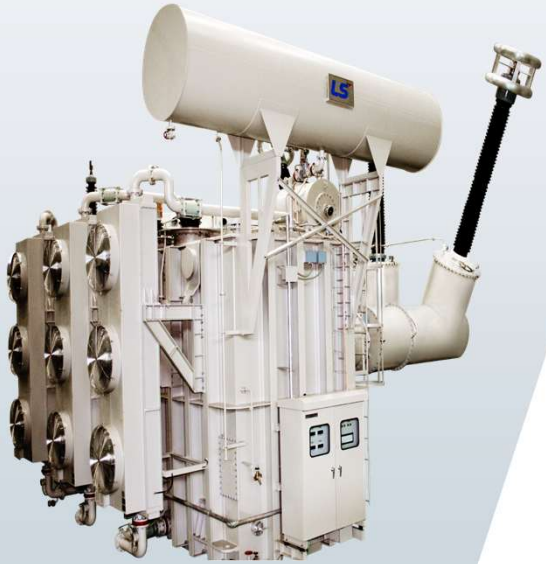
Devices

Metasol VCB	Metasol VCS

LBS / ASS	Power Fuse	GLBS / SLBS	ALTS

Power Solution System | Power Transformer

LS ELECTRIC's Power Transformer ensures high efficiency by selecting winding types and methods to minimize losses. Additionally, it guarantees electrical stability by selecting optimal insulation structures. LS ELECTRIC's high-voltage transformer factory is equipped with cutting-edge facilities for each process and world-class equipment in its Test Room.



Magnetic Field Analysis

The 3D magnetic field analysis program calculates magnetic flux and performs stray losses calculations for structures like tanks and frames within the magnetic field. It also calculates the hot spot temperature.

Insulation Analysis

Voltage oscillations for various impulse voltages are analyzed using a voltage oscillation program. Additionally, insulation strength analysis for the Main gap at the center of the winding and for the insulation strength at the ends is conducted using an electric field analysis program.

33kV 69kV 132kV 220kV 400kV 550kV

Up to 550kV 800MVA
IEC 60076, ANSI/IEEE C57

Power Solution System | Special Purpose Power Transformer

LS ELECTRIC offers not only medium voltage transformers for general power, but also a wide range of specialty transformers to suit your needs.

Converter Transformer

The special purpose transformers used in HVDC systems, converting the existing high-voltage alternating current (HVAC) transmission method to high-voltage direct current (HVDC) transmission.

Static Var Compensator TR

The core equipment of Static Var Compensator (SVC), which supplies or absorbs the reactive power inevitably present in the AC transmission system to improve electrical quality and stability.

Scott Connection TR

A special transformer capable of obtaining a 2-phase (2 Phase, 90° phase difference) output from a 3-phase (3 Phase, 120° phase difference) power source.

Used for special purposes such as supplying large single-phase loads from a 3-phase power source (typically used in railway supply lines).

Automation Solution | Devices

LS ELECTRIC offers various automation solutions from unit devices to process control. Its major products include, among others, PLC that effectively controls devices, AC Drive that converts motor speed, Servo that meticulously controls devices, and HMI that provides real-time monitoring of devices.

PLC

Provides Optimized Network Solutions
with Market-proven XGT PLC

HMI

High-performance HMI
with Improved User Convenience

AC DRIVE

Provides Customized Functions
for Each Application
[Up to 500kW]

Automation Solution | Devices

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SERVO	EtherCAT-based Servo Drives with High Resolution Encoders	
MOTION	EtherCAT-based Efficient Motion Controllers	
GEARBOX	Helical Gearboxes for Motion Control	

Automation Solution | Software

LS ELECTRIC provides customers with optimal total solutions from unit devices to process control to factory automation.
Main products include PLCs, AC Drives, HMIs, servo systems, industrial communication equipment and systems.

Backup Solution

DEXA

Engineering backup programs
for reliable asset management

DEXA
DATA EXPERT AGENT

Edge Computing Solution

Edge Hub

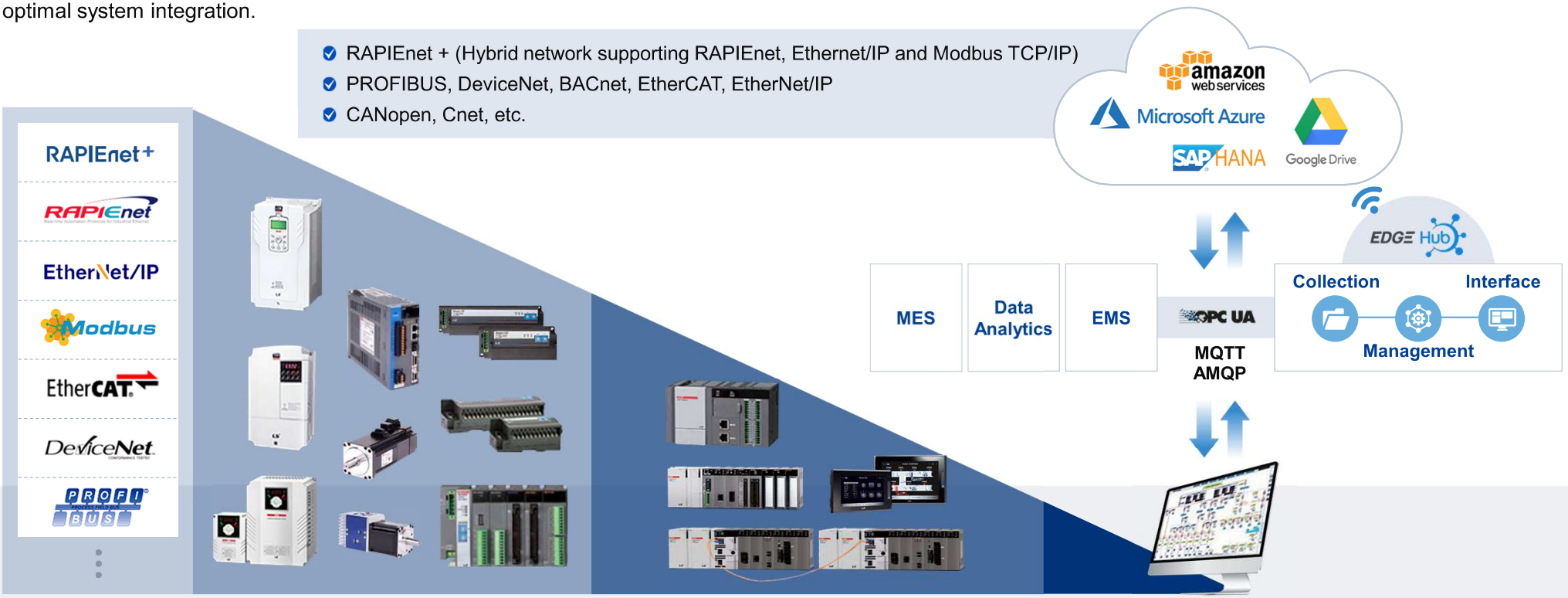
Edge computing solutions that connect
various assets in the OT/IT area
and process and analyze
the collected data.

EDGE Hub

Automation Solution | Network

From production facility to information system, LS ELECTRIC is creating on core automation solution.
We are not only providing integrated solutions for factory and process automation, but also support various communication protocols to create optimal system integration.

- RAPIEnet + (Hybrid network supporting RAPIEnet, Ethernet/IP and Modbus TCP/IP)
- PROFIBUS, DeviceNet, BACnet, EtherCAT, EtherNet/IP
- CANopen, Cnet, etc.



Automation Solution | Applications

LS ELECTRIC provides optimized solutions for the automation industry, enabling a more efficient and safe smart manufacturing environment.

Automation Solution | Automotive

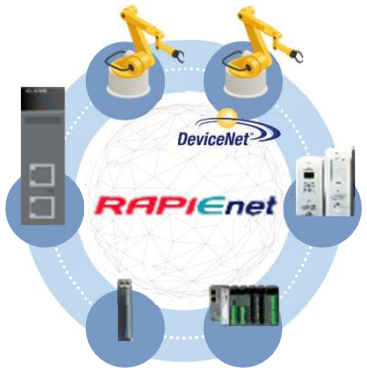
Stable Network

Redundancy

Fast and stable ring network through RAPIEnet

Quick Response

Response to faults through network diagnostic features (HMI, XG5000)



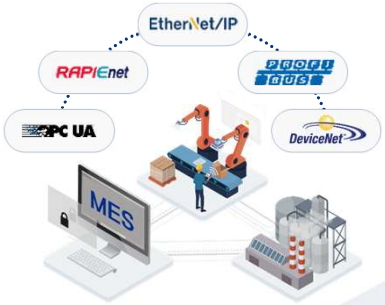
Enhanced Scalability

One-Stop Network Setup

Establishing a one-stop network setup via OPC UA
From field-level networks to control-level networks up to the upper MES

Various Networks

Various and validated Fieldbus networks such as Profibus-DP / DeviceNet / Rnet, etc.



Convenient Maintenance

Backup System(DEXA)

Stable operation through automatic backup of engineering data and generation of history reports on schedule

Preventive Maintenance

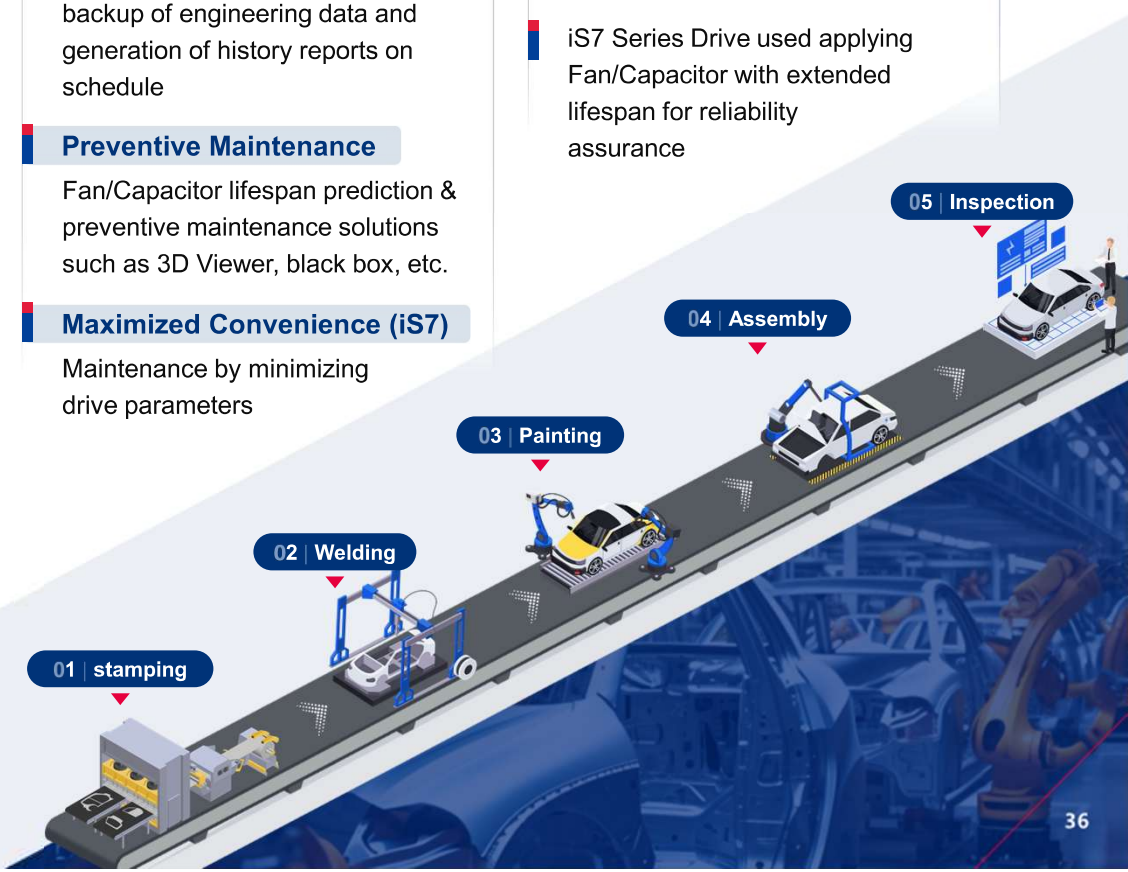
Fan/Capacitor lifespan prediction & preventive maintenance solutions such as 3D Viewer, black box, etc.

Maximized Convenience (iS7)

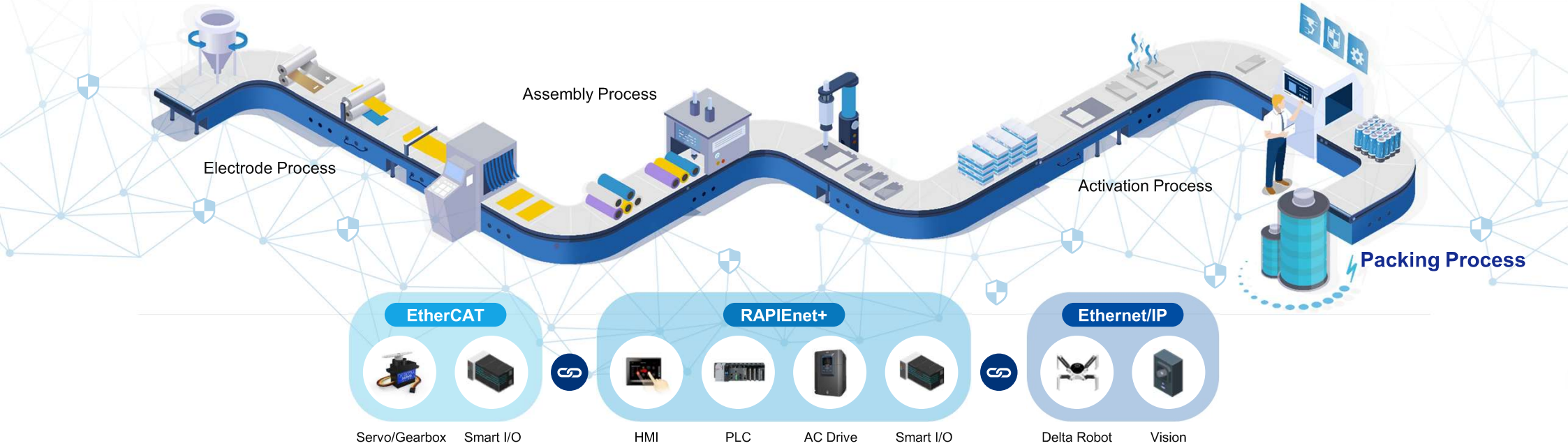
Maintenance by minimizing drive parameters

Durability and Convenience

- iXP2 Series HMI used featuring aluminum body and tempered glass
- iS7 Series Drive used applying Fan/Capacitor with extended lifespan for reliability assurance



Automation Solution | Rechargeable Battery



FA Control System

- PLC, Smart IO, HMI, Software based motion control
- AC Drive, Servo, Linear Motor, Moving magnet, Gearbox
- Delta Robot, Vision

Connectivity

- Industrial Ethernet Network RAPIEnet+ (RAPIEnet + ModbusT CP + Ethernet/IP)
- EtherCAT Motion Control

IoT & Digital Twin

- Edge Computing (Edge Hub)
- Back-up Solution (DEXA), Blackbox
- 3D Viewer

Safety & Security

- Developing Hybrid Safety PLC
- IEC 62443 4-1 ML 2
- NOZOMI NETWORKS, NNSP (OT security company) Partnership

Automation Solution | Vessel

Stable System Operation

- Data logging and trend management via HMI
- Control various operations and PID function control through a high-performance PLC
- Control with RTD temperature module
- Redundancy for CPU, power supply, communication, and expansion drives

Data Management Solution

- Provide data reports via HMI
  (PDF generation, Viewer provided)
- Prevent data tampering
  (PLC project Binary file provided)

Communications for Ship Networks

- GPS Communication
  (NMEA-0183 Protocol)
- Communication with AMS and other measuring equipment
  (Modbus RTU/TCP communication module)

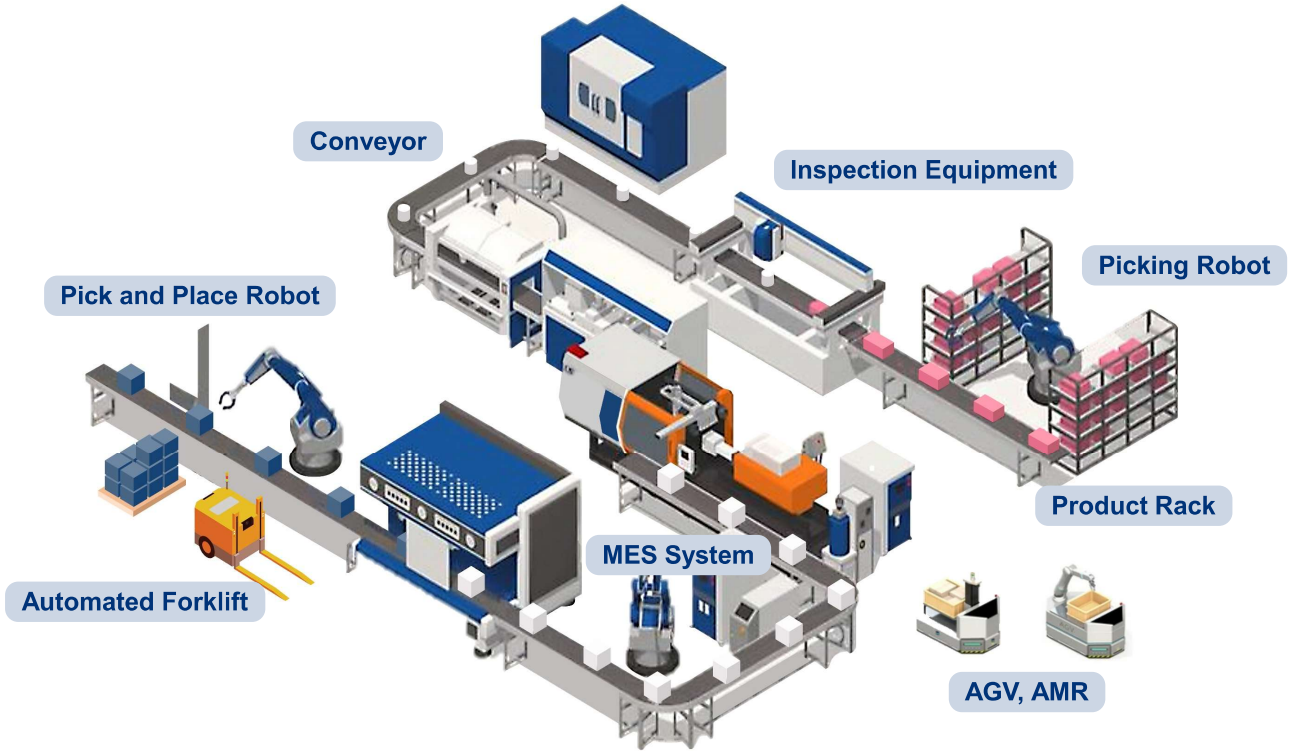
Customized Drive Solutions

- Top 9 Global Classification Certifications

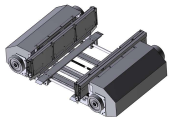
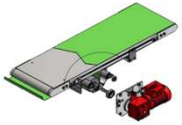
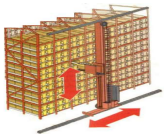
- Mid- to high-capacity product lineup tailored to equipment features.
- Optimized features for fans and pumps
- Noise optimization (C3 EMC filter and DC reactor included)

Automation Solution | Logistics

Supply System for Production Automation



Core Solutions

Shuttle	
Conveyor	
AGV/AMR	
Robot SI	
Crane	

Automation Solution | Solution Square

Solution Square (SSQ) is a cloud-based engineering platform that provides deep insights into a wide range of industries and enables users to quickly implement technologies.

Information Portal

Find the information you need quickly and easily.

- Product Documents
- Engineering Documents
- Online Trainings
- Application Notes

Engineering Portal

Make product engineering easy.

- Community
- Product Selector
- Remote Control
- S/W auto Update

Maintenance Portal

Make product operations easy.

- Monitoring
- Remote Control
- Trouble Shooting
- System Alarm

LS ELECTRIC Main Solutions

Railway Solution

LS ELECTRIC is specialized in rail signaling, communications, and power T&D solutions to deliver world-class projects in the rail systems industry
We have been executing world-class projects in the railroad system industry.

Communication

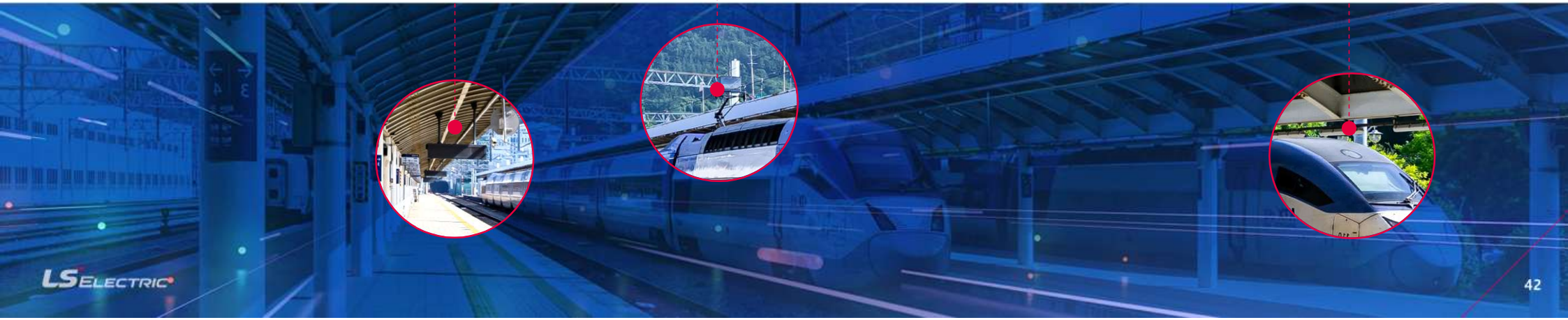
- Communication Management System
- Passenger Information System (PIS)
- Automatic Fare Collection (AFC)

Power Supply System

- AC High-Voltage System
- AC Medium & Low Voltage System
- DC System
- Super Capacitor Energy Storage System
- SCADA System

Signaling & Control

- Centralized Traffic Control (CTC)
- Automatic Train Control (ATC) / Integrated Onboard Train Control
- Communication Based Train Control (CBTC)
- Electronic Interlocking System (EIS)
- AF Track Circuit
- Platform Screen Door (PSD)



Railway Solution | Signaling & Control

From High Speed Rail to automatically operated LRT, LS ELECTRIC provides the most appropriate signaling solutions for each site environment.

CTC
Centralized Traffic Control

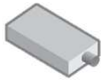
A system monitors and controls overall train and passenger operations.

- Train Operation Management
- Operation / Route / Delayed Train Control
- Management of Public Announcement System and Recording System, and etc.

EIS
Electronic Interlocking System

A system that interlocks and controls trackside equipment for railway operator to determine train operation route.


Railway Signals


Point Machine


Track Circuit


SIL4 Certificate

ATC
Automatic Train Control

On-board System

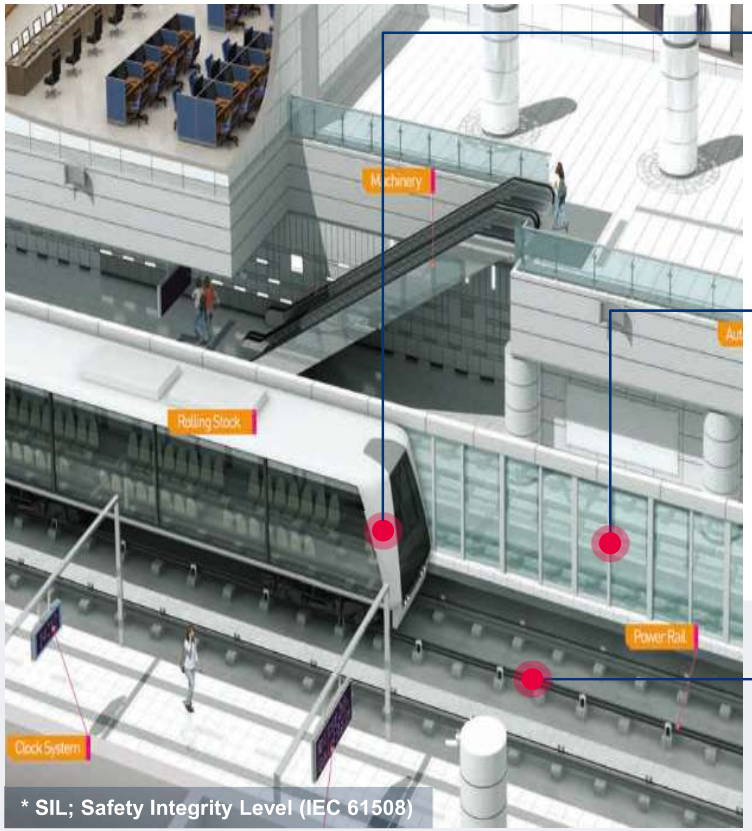
- Automatic Train Speed Control
- Optimal Speed Display
- Train Condition Monitoring
- Self-diagnosis Function

Wayside Equipment

- Obtaining Speed Information on a Real-time
- Delivering Speed Information to Train Device
- Controlling Train Operation
- Monitoring Field System Status

Railway Solution | Signaling & Control

From High Speed Rail to automatically operated LRT, LS ELECTRIC provides the most appropriate signaling solutions for each site environment.



* SIL; Safety Integrity Level (IEC 61508)

CBTC

Communication Based Train Control

A train control system using a wireless communication between onboard system and wayside equipment.

- ATP (Automatic Train Protection)
- ATO (Automatic Train Operation)

→ Enable automatic or driverless train

SIL4 Certificate

PSD

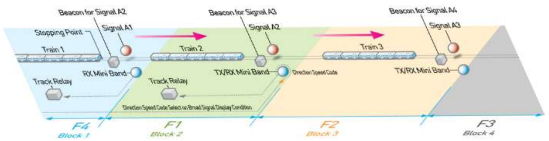
Platform Screen Door

Installed at the platforms of MRT / LRT stations, platform screen door is automatically opened and closed by train position information.

AF

Audio Frequency Track Circuit

A Track circuit that check locations of trains and transmits information from wayside to on-board devices for speed control of trains



SIL4 Certificate

Railway Solution | Communication

LS ELECTRIC implements wired and wireless network environments for train operation and therefore facilitates information exchange between the complicated systems. LS ELECTRIC implements stable and convenient communication environment in train, station, tunnel and bridge.

PIS

Passenger Information System

- **Provide train information to passengers such as train departure, arrival and destination**
- **Provide transfer information between connected routes for train transfer passengers**

AFC

Automatic Fare Collection

Communication Management System

- **Digital Fiber Optic Transmission**
- **Wireless communication between train crews and operating staffs**
- **Telephone hot-line communication**
- **Video surveillance and recording**

50TH ANNIVERSARY ENABLE THE CHANGE

LS ELECTRIC

LEADING SOLUTION

THANK YOU