Leading the Future World Class Product

LS Industrial Systems

CONTENTS

LS Industrial Systems is an industrial solution specialist, from electric power control to the most advanced ubiquitous solutions, playing an important role in creating a more convenient and productive society.

ELECTRIC POWER SOLUTIONS

Electric Equipment
Power Transmission & Distribution
Power IT Solutions
Power Photovoltaic Systems

Electric Power Solutions

LS Industrial Systems is taking off as a global leader in the field of electric power solutions, producing a comprehensive range of products with its own technology know-how and meeting the need for environmentally compatible solutions.

Using technology that it has accumulated over more than 30 years in the electric power industry, LS Industrial Systems develops, produces, and supplies a whole range of products related to power plants, power transmission and distribution, equipment for electricity users, and electric power IT to overseas markets as well as within Korea.

LS Industrial Systems' electric equipment products are developed under the quality-first principle. Year on year, its sales in the global market have increased by 30 to 40 percent. LS Industrial Systems develops and produces various products in the field of power solutions. Most notable among these is its Susol series, a premium brand that was developed through the company's "World's No. 1 Product Project," which only further increased the company's reputation internationally. The company's basic technology in fields like arc discharge protection, application of environmentally-friendly materials, and technology for multifunctional digital watt-hour meters and relays are already at the highest international standards. The company's leading technology was further recognized when it released circuit breakers with the world's highest levels of breaking performance. The first company in the world to develop hybrid superconducting fault current limiters, LS Industrial Systems has expanded to develop high voltage business and sold the 25.8kV gas insulated switchgear all over the world. With the world's highest levels of technology and product quality in electric power solutions, LS Industrial Systems is always actively exploring the global market in the field of ultra-high voltage products as well.

MAJOR SALES REFERENCE

2008

- Pelabuhan Tanjung Pelepas Sdn Bhd: 145kV 1,250A 31.5kA GIS (Malaysia)
- Doosan Heavy Industries & Construction: SWGR, LV switchgear, electric equipment (Pakistan)
- LENENERGO/ADD: 126kV 2,000A 40kA GIS (Russia)
- Hochiminh City Power Company (HCMC PC): 123kV 2,000/1,250A 40kA GIS (Vietnam)
- Shingori Nuclear Power Plant: MV switchgear (Korea)
- Busan New Port: MV switchgear, electric equipment (Korea)
- GS E&C: MV switchgear, transformer (Korea)
- LG Display: MV switchgear, transformer (Korea)
- Korea Railroad Corporation, Janghang line & Jungang line: Protection & measurement (Korea)
- Jeju International Airport: Protection & measurement (Korea)
- POSCO E&C, Songdo: Automatic meter reading system (Korea)
- GS E&C's Xi Apartment in Banpo: Automatic meter reading system (Korea)
- LS Mtron: 154kV SCADA/PQMS (Korea)

2006 ~ 2007

- Samsung Electronics/Suzhou, Tangjeong plant: Electric equipment (China)
- National Petrochemical Company (NPC): 145kV 1,250A 31.5kA (Iran)
- South Oil Refinery MCC SCADA (Iraq)
- Global Bio Disel Sdn, Bhd.: Switchgear, electric equipment (Malaysia)
- AFAM VI Power Station: Electric equipment (Nigeria)
- AFAM VI Power Station: Switchgear, electric equipment (Nigeria)
- Barka Power IWPP: Busduct, switchgear, electric equipment (Oman)
- Thanh Hung 110kV Substation: Switchgear, electric equipment (Pakistan)
- LG. Philips LCD Module Plant: 123kV 1,250A 40kA GIS (Poland)
- Shuaibah Power & Water: Switchgear, electric equipment (Saudi Arabia)
- Shuaibah Power & Water: MV switchgear, electric equipment (Saudi Arabia)
- Barka Power IWPP: Switchgear, electric equipment (Saudi Arabia)
- Kirikkale DHP-CCR: Busduct, switchgear, electric equipment (Turkey)
- Amman East Power IWPP: LV & MV switchgear, electric equipment (UAE)
- POSCO FINEX: Electric equipment (Korea)
- KEPCO, Shinnamwon Substation: 362kV 50kA GIS (Korea)
- SK Group: Switchgear, electric equipment (Korea)
- Incheon International Airport, IAT: Switchgear, electric equipment (Korea)
- KEPCO, Seosan Substation: SCADA system (Korea)
- GS Caltex: MV Switchgear, electric equipment (Korea)
- Incheon International Airport: Switchgear, electric equipment (Korea)

2004 ~ 2005

- Cheong do Lidong: Busduct, switchgear, electric equipment (China)
- LG. Philips LCD Nanjing plant: Switchgear, electric equipment (China)
- Taegwang, Sangsuk Plant: 145kV GIS, swithgear, electric equipment (China)
- HUVIS SICHUAN, HN HEG Project: HV switchgear, electric equipment (China)
- Power Distribution Company: Gas insulated switchgear (Iran)
- Car Manufacturing/KKPTC: Switchgear (Iran)
- Ryudensha Ltd., NPC MOBIN Project: Switchgear, electric equipment (Iran)
- Daewoo E&C, B.N. CCPP Project: LV switchgear, electric equipment (Libya)
- Sohar Power & Water: MV Switchgear, electric equipment (Oman)
- Toyo Engineering, YRM Project: MV switchgear, electric equipment (Russia)
- Phu Quoc Power: MV switchgear (Vietnam)
- LG VINA, VINA PC2 Project: 24kV Switchgear (Vietnam)
- POSCO: Switchgear, electric equipment (Korea)
- Samsung SDI: Transformer (Korea)
- KEPCO, Sindeokeun Substation: 362kV 50kVA GIS (Korea)
- Daejeon, Daegu, Busan Subways: Relay, switchgear, electric equipment (Korea)
- Samcheonpo Power Plant: 100kW photovoltaic system (Korea)
- Jeonnam Provincial Office: 100kW Photovoltaic system (Korea)

2002 ~ 2003

- Al Mabani Contracting Co./Ahli United Bank New Headquarter: Switchgear (Bahrain)
- Panasonic Corp.: Inner High Fin copper tube (China)
- Samsung Electronics, Suzhou plant: Digital protective relay (China)
- LG DAGU Chemical: Mold transformer, electric equipment (China)
- KUBOTA, Incinerator Factory: MV switchgear (Japan)
- Hyundai Engineering, Electric Power Network Expansion Project: Relay, electric equipment (Nicaragua)
- Yaroslavl Refinery Modernization: Electric equipment (Russia)
- Mistubushi Kakoki Kaisha, AIT-2 Project: Switchgear (Thailand)
- HCMC PC, Thu Duc Substation: Switchgear (Vietnam)
- KTX (Korea Train eXpress): GIS, switchgear, transformer, electric equipment (Korea)
- POSCO, Gwangyang Power Plant: Electric equipment (Korea)
- Chosun University: 53kW photovoltaic system (Korea)

2000 ~ 2001

- Porto Velho 380MW CCPP: Relay, switchgear, electric equipment (Brazil)
- Jiujiang Power Plant: Electric equipment (China)
- BD, AD, NH Substation: 24kV switchgear, electric equipment (Vietnam)
- KEPRI: 50kW photovoltaic system (Korea)

Electric Equipment

Low Voltage

Susol Air Circuit Breakers

Susol ACB provides you with total solutions — an advanced trip relay for measurement, diagnosis, and communication, as well as protective functions for complete protective coordination and electric power monitoring systems.
- Rated current (In): 630 ~ 6,300AF, 2/3poles, fixed type/draw-out type
- Rated breaking capacity (Icu=Ics): 80/100/150kA (at 500VAC)
- Varies accessories, connecting method and customized digital trip relay
- Certificate & approval: IEC 60947-1, 2/KS, KEMA, CE, JIS, JEC, GOST

Metasol Air Circuit Breakers

Metasol ACB provides you with the industry's leading breaking capacity and a wide range of other functions.
- Rated current (In): 630 ~ 6300AF, 2/3poles fixed type/draw-out type
- Rated breaking capacity (Icu=Ics): 75 (65)/85 (70)/100/120kA (at 500VAC)
- Max breaking capacity: 120kA (6300AF at 500VAC)
- Various large capacity: 4,000AF (E/F/G, 85/100/120kA)
- Various accessories, connecting method and customized digital trip relay
- Certificate & approval: IEC60947-1, 2/KS, KEMA, CE, JIS, JEC, GOST

Metasol Molded Case Circuit Breakers

Rating: 30 ~ 250AF with 3 frame size
- Compatible size, upgraded design from Meta-MEC
- Same external dimensions with MCCB and ELCB
- Upgraded breaking capacity
- E type 100AF: 10 → 18kA
- S type 125AF: 25 → 37kA
- S type 250AF: 25 → 37kA
- H 250AF: 35 → 50kA
- Uimp=8kV, Ui=750V, Ics=100% Icu
- Certificate: KEMA, CE

Molded Case Circuit Breakers (AB-Type) Earth Leakage Circuit Breakers

Rating: 30 ~ 225AF
- Easy panel manufacture by unification of main values
- Handle cutting value: 24×52mm
- Height: unified as 60mm
- High breaking capacity: 35kA at 460V (high breaking type)
- Identical size of MCCB/ELCB
- New and old products are replaceable
- Easy attachment of accessories
- 4poles type ELB
- Certificate : KEMA, CE, KR, LR

Molded Case Circuit Breakers (AB-Type) Earth Leakage Circuit Breakers

Rating: 400 ~ 1,200AF

MCCB
- Rated current changeable
- Identical size of MCCB/ELCB
- Accessory attachments extended
- New and old products are replaceable
- Certificate: CE, KEMA CB

ELCB
- Identical size of MCCB/ELCB
- Accessories added: UVT, Push to Trip button, SHT, leakage indicator button
- Extension of types: Economical type, standard type, current limiting type

Susol Molded Case Circuit Breakers (up to 800A)

- Susol stands for super solution • Simplified 4 frame size (160, 250, 630, 800AF)
- Improved quality: Uimp 8kV, Ui 750V, Ue 690V
- High breaking capacity (50/60/85/100/150kA at 415VAC, Ics=100% Icu)
- Optimized protection and accurate measurement
- Communication capable circuit breakers via Modbus, RS485
- Interchangeable trip units & add-on module system
- Ensuring discrimination and cascading
- Plug-in versions for fast removal or insertion of the circuit breaker without exposure to live parts
- Easy installation and various connection, mounting
- Compliance with international standard IEC60947-2 and RoHS directive
- Approved by shipping registries • CE marked, CB approved by KEMA
- Protection of the environment by avoiding use of hazardous substance

Susol UL 489 Certified Molded Case Circuit Breakers

Rating: 125 ~ 820AF 2/3poles (TD & TS Series)
- Simplified product range
- 4 ampere frame: 125/250/400/800AF
- Applied current range: 15 ~ 800A
- High breaking capacity: N type 35kA, H type 65kA at 480 VAC
- Standard: UL 489
- Various trip unit: FTU, ATU, FMU, MCS
- Various auxiliaries
- Inner attachment: AL, AX, SHT, UVT (general use)
- Outer attachment: outer controlling handle, locking device, interlock

Molded Case Circuit Breakers Earth Leakage Circuit Breakers

Rating: 1,000 ~ 1,200AF (AB & EB series)

MCCB
- Standard/limiting (1,000 ~ 1,200AF) same size
- Standard type is compatible with the current products
- Standard 65kA at 460V, current limiting type 85kA at 460V
- Electronic type 1,200AF 3poles
- controlling long-time/short time trip, pre-alarm function

ELCB
- Minimizing the size & same size on 1,000 ~ 1,200AF
- Raising the breaking capacity: standard type 85kA at 460V
- Instantaneous operating current 3 ~ 6 in adjustable type

Plug-In Molded Case Circuit Breakers

- Easy replacement and maintenance
- Meta-MEC MCCB 30 ~ 800AF applied to all series
- Connection type: general, panel 1row, 2rows, exclusive to source side
- Terminals for accessories such as AL, AX, SHT, UVT, etc.
- High reliability of tulip connection
- Certificate acquired
- Extension of types
- Economical type, standard type, current limiting type

Earth Leakage Circuit Breakers Fb Series

Rating: 30 ~ 100AF
- High breaking capacity (5kA at AC 220V)
- Leakage indicator button
- Various and shared accessories
- AX, AL, insulation barrier, terminal cover

Electric Equipment

Low Voltage

Miniature Circuit Breakers & Isolators

- Suitable for protection against overload & short circuit (BKN, BKN-b, BKN-c, BKH, BKP, BFN type)
- 1, 1+N, 2, 3, 3+N, 4poles & isolator
- 35mm DIN-rail mounting & plug-in types
- Rated voltage: 120-400VAC
- Characteristic curve: B, C, D
- Accessories: AX, AL, SHT, UVT
- Standard: IEC 60898, 60947-2
- Approval: CE, KEMA, UL1077, SEMKO, CCC, SABS

Residual Current Devices

RCCB (RKN)
- Protection: ground fault
- Rated current In: 25, 32, 40, 63A
- Poles: 1P+N, 3P+N
- Standard: IEC61008
- Approval: CCC, SEMCO CB, SABS

RCBO (RKS, RKP, 32KGRa, 32KGRb)
- Protection: ground fault and overcurrent
- Rated current In: 3, 6, 10, 16, 20, 25, 32A
- Breaking capacity: 4.5/10kA
- Poles: 1P+N
- Standard: IEC61009
- Approval: CCC, CQC CB, SEMCO, CB

Surge Protective Devices (BKS Series)

- Rating: maximum charge current_ 20/40/60kA
- application to 220/380V power system protection on surge over voltage
- BKS-B/C/D three kinds 1 ~ 4poles
- Distinguishable for the accident through the operating state display
- After abnormality or accident only MOV element interchangable
- DIN- rail attached micro minimal product

Magnetic Contactors/Thermal Overload Relays (From 100A to 800A)

- Wide coil operating range: AC/DC 100 ~ 240V in one coil
- Easy to replace coil with another voltage or new one (draw out cassette type coil construction)
- Accessories
- Auxiliary contact block
- Mechanical interlock
- Mechanical latch
- Superior surge suppress or built in
- Certificate: CE, UL, TÜV, KR, LR

Mini Contactor & Thermal Overload Relays

- Rating: 6 ~ 16AF
- Direct connection with MMS
- Ultra-miniature size (1 frame size)
- Variation of terminal structure
- Screw clamps, fast-on, cage clamps, solder pins
- Accessories
- Surge unit, sub contact, surge-up server, electronic timer
- Certificate: CE, UL, KEMA, CCC, GOST, Safety

Manual Motor Starters (MMS)

- Rating: 32, 63,100AF
- Direct connection with Susol MC 9 ~ 95A and mini MC 6 ~ 16A
- Breaking current: max 100kA 415Vac, Icu=100% Ics
- Rated current adjustable
- Motor protection overload, short circuit, phase fault protection
- Accessories: AX, AL, SHT, UVT, PB, MMS+MT
- Certificate: CE, UL, KEMA, CCC, GOST, Safety

Susol Contactors & Overload Relays (up to 95A)

- Compact & cutting-edge design
- 3 frames (32/63/95AF)
- Superior quality and long lifespan
- Ideal solution where space is limited through perfect combination with Manual Motor Staters
- Eco-friendly products (eliminate hazardous substances : lead, cadmium, and hexavalent chromium)
- CE marked, KEMA CB approval, UL listed
- Compliance with international standard IEC60947-4 and RoHS directive

Metasol Contactors & Overload Relays

- Ampere range 6 ~ 800A
- Improved Arc Protection from sealed structure
- Combination with overload relays
- Setting range: 0.1 ~ 95A
- Upgrade low current reliability at low voltage
- DC24V 10mA -> DC 17V 5mA
- Upgrade rated insulation voltage
- 6kV -> 8kV over 40AF
- Upgrade impulse withstand voltage
- 690V -> 1,000V over 40AF
- Direct MMS mounting under 40AF

Magnetic Contactors Thermal Overload Relays (From 9A to 85A)

- Compact size (3 frame size)
- Offering complete ranges (3poles & 4poles contactors)
- Easy to mount & separate on DIN-rail
- Common use auxiliary contact unit
- Various kinds of accessories are available
- Auxiliary contact block (front, side)
- Mechanical interlock, mechanical latch unit
- Direct mounting structure without additional brackets
- Delay opening device lug terminals
- Certificate: CE, UL, KEMA, KR, LR

Digital Motor Protection Relays (Digital EMPR)

- Overall digital motor protection relay using microprocessor control
- Diversified protections overcurrent, phase fault, inverse phase, unbalance, undercurrent, arresting, ground fault, instantaneous short circuit
- 3 phase digital ammeter: detachable display section
- Fault cause and value indication/overall operation time
- Inverse/definite time delay characteristic
- Terminal connection type and penetration type
- Certificate: CE, UL, TÜV, Safety

Electronic Motor Protection Relays for Ground Fault (GMP60-3TN, TZ)

- Final fault cause recording function
- Overcurrent, phase fault, inverse phase, arresting, ground fault protection
- Rated current: adjustable current range due to DIP S/W setting
- 1 model applies to 0.5 ~ 60A
- Ground fault detection
- Zero phase current detection type (0.1 ~ 2.5A),
- Residual current detection type (0.5 ~ 6A)
- Penetration type, screw type
- Operation power: 110 ~ 220V free voltage

Electronic Motor Protection Relays (EMPR)

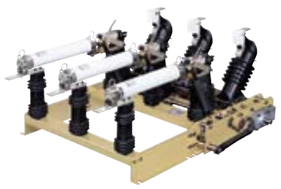
- Electric current display type EMPR
- Monitoring the causes of the fault and the values
- Setting by the key button
- Various protecting function
- Over & under current, phase failure
- Saving the memory of operating time and failure cause

Electric Equipment

Medium Voltage

Auto Section Switches

- Rating: 25.8kV 200A
- Air arc extinguishing type
- Rated short time current (asym/sym):15/10kA/1s
- Minimum distance between phases (215mm, metal to metal)
- Overcurrent and ground fault protection, and short circuit current lock • Bending knife structure
- Accessories: switching counter, sub switch (2A2B)
- Applied standard: KEMC1126 (Korea Electrical Manufacturers Cooperative)



Load Break Switches

- Rating: 24kV 630A
- Rated short time current: 20kA/1s (52kA peak)
- Performance up-grade by new standard
- Metal screen test
- Miniature type design
- 3 phase package operation and combination type fuse
- Bending knife structure
- Accessories: switching counter, sub switch (2A2B)
- Applied standard: IEC62271-105, IEC60265-1

Power Fuses

- Rating: 3.6/7.2/24kV
- Unification of connection size by DIN43625 for easy replacement and maintenance
- Viewing verification due to the improvement of operation distance and weight of striker
- Electrical signal and mechanical interlock by striker
- Applied standard: KSC4612, DIN43625, IEC60282-1

Susol Vacuum Circuit Breakers

- Rating: 7.2/17.5/24/36/40.5kV
- LS New Generation MV Vacuum Circuit Breaker
- Rated breaking capacity: up to 50kA
- CB compartment available (box type credle)
- Full range of safety accessories
- Standard: IEC62271-100
- Certificate: KEMA, KERI

Vacuum Circuit Breakers

- Rating: 7.2/12/17.5/25kV
- Rated breaking time: 3 cycles
- Rated short-time withstand current: kA/3s
- Dual connection of main body and cradle (clip, tulip)
- Diversification of accessories
- Switching durability mechanical: 20,000 times, electrical: 20,000 times
- Passed development tests of KERI, KEMA
- Applied standard: new standard IEC62271-100 [M2, E2 (List1), Class C2]

Automatic Load Transfer Switches

- Rating: 25.8kV 630A
- Air insulation method
- Rated short time current: 16kA/1s
- High speed transfer time: 10 cycles, 167ms or less
- Monitoring of the phase fault of main power
- Saving events (20EA max.)
- Various output contacts • Small, light-weighted
- Motor spring charge method
- Applied standard: IEC60265-1, PS151-05

Vacuum Contactors

- Rating :3.6/7.2kV 200/400A
- Rated short time current: 6.3kA/1s (16.4kA peak)
- Perfect compatibility with the existing products
- Diversified customer-oriented safety equipments
- Detachable type, metal shutter installed
- Applied standard: IEC60470, IEC60282-1

Ring Main Units

- Rating: 15/24kV 630/200A
- Function: (2LBS+1PF, 1LBS, 1PF)
- Operating power: DC 24V
- 3 positions (on, off, earth)
- For sectionalizing and branch
- Protection of customer load and transformer
- Applied standard: IEC60265-1, 60129, 60298, 60694, 60056

Epoxy Insulated Load Break Switchers

- Rating: 25.8kV 600A 12.5kA
- Circuits and switches: 3W3S, 4W4S
- 3 positions (on, off, earth)
- For line sectionalizing and branch
- Applied standard: RS5929-001

Vacuum Interrupters

- Rating: 400 ~ 3, 150A 4 ~ 40kA, 3.6/7.2/12/15/17.5/24/25.8kV
- High safety and reliability
- High vacuum
- Excellent mechanical solidity and degassing
- High speed breaking and short arcing time

Metering

Electronic Electricity Meters (Single, three phase)

- Pulse, exclusive line, communication (option)
- Large LCD
- Remote reading
- Small size and easy wiring
- Penetration structure wiring
- RoHS-applied eco-friendly product
- Wiring regardless of source or load

Electronic Electricity Meters (Single phase) (LGRW)

- 1P2W 220V 40 (10)/80 (20)/120 (30)A
- Accuracy: class 1.0
- Remote reading system (exclusive line)
- Detachable communication model
- Conforming to KS, IEC standard
- RoHS-applied eco-friendly product

Electronic Polyphase Electricity Meters (LGRW)

- 3 phase 3 wires, class 0.5, 110V, 5 (2.5)A
- 3 phase 4 wires, class 0.5/1.0, 110/190V, 5 (2.5)A
- 4 channels, maximum demand power, power factor, reactive power, apparent power
- Saving load profile data of 90 days
- Saving 6 months data
- Compatible with AMR (Automatic Meter Reading)
- Adopted by KERI
- RoHS-applied eco-friendly product

Electronic Electricity Meters (LD Series)

- Reading reliability secured by authentic CPU
- Non-volatile memory for protecting data in power failure
- Improved accuracy against the existing induction model (class 2.0, 1.0)
- Easy reading due to large LCD
- Diversified models general type, pulse type, remote reading type
- RoHS-applied eco-friendly product
- Safety cover to prevent accident on the connection part

Electronic Electricity Meters (LK Series)

- 1P2W 220V 40A/120A/5 (2.5)A
- 3P4W 220V 40A/120A/5 (2.5)A
- 3P4W 110/190V 5 (2.5)A class 0.5/1.0
- 3P3W 110V 5 (2.5)A class 0.5
- Active/reactive/maximum demand power/power factor
- Measure by time • Saving data of 90 days
- IEC62056 DLMS authorization certificate
- New IEC standard
- Satisfies RoHS

Automatic Meter Reading Systems (AMRS) Exclusive Line Method

- Economical installation, high communication reliability
- Wide application fields (Home network, home automation, multi air conditioner)
- Regular reading and reading on demand
- Failure compensation
- Overall reading information
- Diversified reports

Inductive Watt Hour Meters

- Single and three-phase digital and transformer electricity meters
- Aluminum die casting frame
- Phenol resin, polycarbonate case
- 200 ~ 400%
- IEC and KS mark standard

Demand Controllers (WDC-3000)

- High efficiency energy device certificate
- Electricity fare reduction by maximum demand control
- Load management by time
- Synchronous to KEPCO watt hour meter
- Diversified measurements
- Automated calculation of electricity fare
- Various value settings due to large LCD
- Diversified communication method

Electronic Time Switches

- 1P2W 220V 30 (10)A
- Automated transfer for late night equipments
- Load switching 2 times/day
- Present time, switch-on time, breaking time
- Automatic load breaking in overload
- Built-in battery for failure compensation

Electric Equipment

Protection & Measurement

Digital Integrated Protection & Monitoring Devices (GIPAM-2000)

- Protection: 27, 27R, 46, 47N, 47P, 48/51LR, 49, 50/51, 50/51N 59, 64G, 67N, 68, 79, 86, 87T
- Metering & monitoring: V, Vo, V2, I, Io, I2, Ø, W, Wh, Var, Varh, VA, F, PF, DPF, demand (W, Var, I), THD (V, I)
- Event & fault recording
- event recording: Max. 800 events
- Fault recording: max. 200 faults
- Fault wave recording: 512 cycles/phases
- SOE & SBO functions
- MIMIC diagram & 320x240 Graphic LCD
- Harmonic distortion spectrum • Vector diagram
- Programmable I/O (with PLC program): DI 20, DO 19 point

Digital Integrated Protection & Monitoring Equipment (GIPAM-2200)

- Protection: 27, 27R, 37, 46, 47N, 47P, 48/51LR, 49, 50/51, 50/51N, 59, 64G, 66, 67N, 79, 87T-P, 87T-G
- Metering & monitoring: V, Vo, V2, I, Io, I2, Ø, W, Wh, Var, Varh, VA, F, PF
- Event & fault recording
- Event recording: max. 800 events
- Fault recording: max. 200 faults
- Fault wave recording: 512 cycles/phases
- SOE & SBO functions • PT failure
- Programmable I/O: DI 6, DO 10, AI 4 points
- TCS/TRS functions • Circuit breaker failure
- Communication: RS485/optic, DNP 3.0/Modbus/I-Net

Digital Protective Relays (DPR-1000)

- High voltage protection (MPR)
- Event & Fault recording
- Fault waveform recording
- SOE (sequence of event) function
- SBO (select before operate) function
- Programmable I/O
- Analog Input (4 ~ 20mA): TPR
- DNP 3.0/Modbus/RS485

Digital Integrated Protection & Monitoring Devices (GIPAM-115)

- Diversified measurement/indication (GIPAM) V, A, W, Wh, Var, Varh, PF, F, Vo
- Diversified protections OCR, OCGR, SGR, OVR, UVR, OVGR, POR
- Breaker on/off control, local/remote selection
- Slim distribution panel • Operation state input/output
- Data communication (Modbus, I-Net)

Digital Protective Relays (DPR)

- Various functions of protection
- Independently programmable settings for each measuring element and timer
- Fault recording, sequence of event
- Back-lit LCD display • Self-diagnostic
- User friendly interface • Data communication
- KEMC1120, IEC225, IEC1000-4

Power Quality Meters (GIMAC-PQ)

- Diversified measuring factors and class 0.2% high accuracy measurement
- Sag, swell, interruption, undervoltage, overvoltage
- Measuring voltage/current harmonics, THD, TDD and k-Factor
- Saving PQ event/fault recording and fault waveform

Digital Integrated Metering & Control Devices (GIMAC-IV)

- Automatic power factor controller/demand controller
- Diversified measuring factors • Harmonic analysis and indication • 0.3% high accuracy measurement by 128 samplings per cycle • Maximum 8 capacitor/load control
- Event recording (Max. 300EA)
- Communication: Modbus/ RS-485, I-Net
- Optimal power factor control by automatic/manual control, circulation control, combination control (GIMAC-415AP)

Digital Integrated Metering & Control Devices (GIMAC-i)

- High accuracy measurement
- Voltage, current 0.3%
- Power, electric energy 0.5 class (IEC 1036)
- Voltage/current 15th harmonic, THD, current/ power demand
- Wrong wiring check
- AC/DC 88 ~ 264V free voltage control power

Digital Integrated Metering & Control Devices (GIMAC-II Plus)

- Various metering factors and precise measurement
- Event recording function of 256
- Self monitoring of miswiring and disconnection
- Controlling breakers' on/off
- Data communication (Modbus, I-Net)

Intelligent Motor Controllers (IMC-III)

- Overcurrent, phase failure, inverse phase, unbalance, undercurrent, stall, locked rotor, ground fault protection
- Direct on-line, Y-D, reversing, reactor, inverter with 1 model
- Motor control at LOP, MCC, auto, water level, remote 0.125 ~ 60A with 1 model
- Temporary power failure compensation and automatic restart
- Interlocked operation between motors and built-in timer
- Applicable to complex water processing facility or chemical plant
- Data communication (Modbus/RS485)

Protocol Converters (GMPC-V)

- Communication relay to link the company exclusive terminals using I-Net communication and the superior computer system
- Communication method RS232, RS485, RS422, Ethernet
- Supporting protocols: Modbus, DNP3.0, Glofa PLC
- Dual communication lines (option)
- 20 terminal devices linked to 1 protocol converter (max. 80EA connected in case of module addition)

Protocol Converters (GMPC-III)

- Communication relay to link the company exclusive terminals using I-Net communication and the superior computer system
- I-Net frame
- I-Net protocol
- RS232, RS485 frame
- Modbus protocol
- Offering RS232, RS485, RS422 port
- SOE function and viewing synchronization
- 20 terminal devices linked to 1 protocol converter

Micro Remote Terminal Units (Micro RTU-II)

- Features local control on circuit breakers
- Status monitoring on contact points
- Electricity meters analog value
- I-Net communication method

Transformers

Transformers convert primary voltage to secondary voltage.
We produce and sell mold transformers, low-noise, high-efficiency transformers, and oil transformers.

Cast Resin Transformers

- Compact size, high efficiency, easy maintenance
- Excellent shortage mechanical strength, water proof characteristic, and non flammability, appropriate for severe load change such as subway power supply
- Rating: 3P 3.3-22.9kV/HV-LV 50 ~ 15,000kVA

Cast Resin Transformers

- Laser core is applied as core material and wire winding process is improved to optimize the overall loss.
- Rating: 3P 3.3-22.9kV/HV-LV 50 ~ 15,000kVA
- Noise reduced 7 ~ 11dB or more against KS standard

Oil Immersed Transformers

- Volume is reduced by 30% by corrugate radiation pin instead of panel radiation plate for lowering temperature.
- Rating: 3P 3.3-22.9kV/HV-LV 50 ~ 20,000kVA

Power Transmission & Distribution

Gas Insulated Switchgears

In order to guarantee the most reliable and most stable operation of electric equipment for indoor and outdoor substations, GIS acts as an integrated switchgear that monitors, controls, protects, and measures power systems with protection & control relay panels by safely opening and closing power lines in both normal and extraordinary operational situations.

25.8kV GIS (Gas Insulated Switchgears)

- Rating: 25.8kV 25kA 600 ~ 2,000A
- Compact size: 2,500 (H)×600 (W)×2,620 (D) for 2DS + 1CB
- Motor spring charged operating mechanism
- Vacuum interrupting and gas insulation
- Highly reliable and safe operations
- Lightweight aluminum casing

36 ~ 72.5kV GIS (Gas Insulated Switchgears)

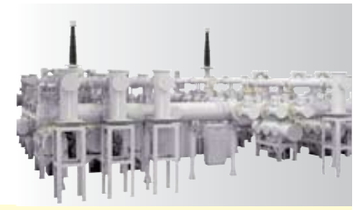
- Rating: 72.5kV 20kA 600 ~ 2,000A
- Competitive price and compact size by applying three-phase encapsulated GIS enclosure
- Hydraulic (CB), Motor (DS) operating mechanism
- Improved reliability by removing exposed connection rods

Up to 145kV GIS (Gas Insulated Switchgears)

- Rating: 145kV 40kA 3,150A
- Combined arc extinguishing method allows low power mechanism to safely switch the abnormal condition.
- 3 phase package operation method

170kV A-GIS (Gas Insulated Switchgears)

- Rating: up to 170kV 50kA 1,200 ~ 4,000A
- Excellent performance & highly reliability
- Hydraulic operating mechanism
- Easy Installation & maintenance
- 3 phase encapsulated enclosure
- Minimum space requirement



245 ~ 362kV GIS (Gas Insulated Switchgears)

- Rating: 245kV 50kA 3,150A
  362kV 40kA 4,000A
  362kV 50kA 4,000A
  362kV 63kA 4,000 ~ 8,000A
- Easy installation and extension through compact size

Low & Medium Voltage Switchgears

From 600V to 24kV rated voltage, LS LV & MV switchgears (LS LV & MV SWGR) meet all the requirements of the IEC, JEM, and ANSI standards.
LS's LV & MV SWGRs are generally utilized in the field of power facilities, industrial plants, and buildings.

25.8kV Soild Insulated Switchgears

- Rating: 24kV 25kA/600 ~ 2,000A
- SF_6 Free (compliance with Kyoto protocol)
- Application 22.9kV to receiving end
- Compact and light
- Flexible system structure (modular design)

7.2kV/12kV/17.5kV MCSG (Metal Clad Switchgears) SOLUTION Power V

Separation of CB room, bus room, cable room, LV room to prevent accident spread
- Internal arc test performed
- Incoming panel and main circuit PT panel are integrated in 1 cubicle
- Certified by KEMA, CESI, KOLAS laboratory

LV MDB TM-Solutions

- Rating: 690V
- Rated current: 2,500/1,600/800/400A
- Rated short time withstand current: up to 50kA/3s
- Degree of protection: IP 42, Form 4b • IEC60439-1
- Full type-tested by ASTA
- Design for coordinated protection
- Panel design software available
- Modular panel & easy assembling system

Standard Distribution Panel Boards

- Minimizing panel size through phase insulation
- Easy maintenance and extension
- Applied to areas which requires the highest reliability of products (such as Incheon International Airport and ASEM Conference Hall, Korea)

7.2kV MCSG (Metal Clad Switchgears) THRUTEC V7

- Rating: 7.2kV 40kA 3,150A
- Exterior body reduced by 18%
- Safety structure strengthened by door lock and earthing s/w

Intelligent LV Panels THRUTEK 600

- Rating: 24kV, 25kA/3s, 630 ~ 2,000A
- Internal arc proof construction
- CESI certificate
- Withdrawable circuit breaker with interlocks
- Pressure relief device is available

25.8kV C-GIS SOLUTION Power G

- Rating: 25.8kV 25kA/3s 1,250A, 630A
- Safety first considered
- Compact structure
- Excellent economical efficiency
- Stainless pressurized instrument
- Mechanical interlock between breaker and disconnecting switch

DC Switchgears

- Rating: DC1,500V, 750V 50kA 4,000/3,000/2,000A
- Metal-clad panel with built-in detachable HSCB for DC distribution panel
- Easy operation and analysis of control an protection section at the front
- DC protection relay of integrated protection and control system installed for control and monitoring of the remote control system

Compact Type Switchgears MASCON S

- Install space 80% reduce because compact size
- Combination structure 1 set 6 panels necessary
- Build up earthing function and situation checking strength
- Easy operation, installation and transportation

Motor Control Centers SOLUTION 2000

- Rating: 600V 100kA 5,000A
- Passed ASTA authorization as the first in the country
- 1, 2, 3, 4th withdrawable structure (line, load, control circuit, aux. circuit)
- Arc shielding plate is installed at the vertical bus to prevent accident spread
- Basic unit 13 layers, 100A MCCB unit 26 layers by flat type basis

Subway Substations (Silicon Rectifiers)

- This silicon rectifier with automatic air-cooling system converts the alternating current into a direct current for subway trains
- Features natural cooling system
- Compact size
- Large-capacity rectifier (DC 1,500 V, 4,000kW)

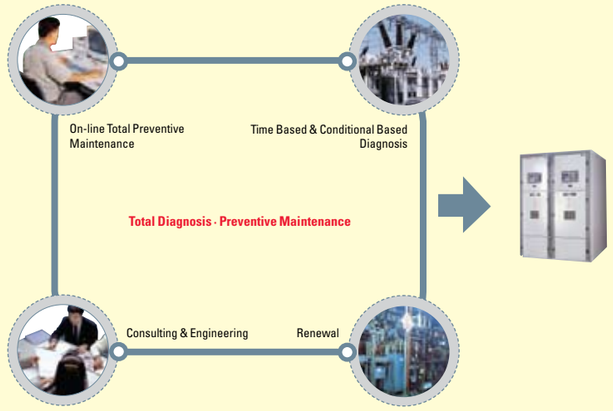
Power Transmission & Distribution

Power Equipment Diagnosis · Preventive Maintenance

We provide comprehensive one-stop total solutions, from consulting engineering to power equipment preventive maintenance and power systems.

PQ Equipment

PQ equipment prevents any harmful elements from altering the electricity quality in electric systems. The DVR compensates for temporary voltage sags and swells, the SVC compensates for reactive power while stabilizing voltage, and the APF compensates current harmonics.



Dynamic Voltage Restorers (DVRs)

DVRs are inserted in series in distribution systems to compensate for low quality power such as voltage sags and swells and to supply high quality power.
- Rating: capacity-100/200/300/500kVA 1,000/2,000kVA voltage - 200/380/440V/6.6/22.9kV

Static Var Compensators (SVCs)

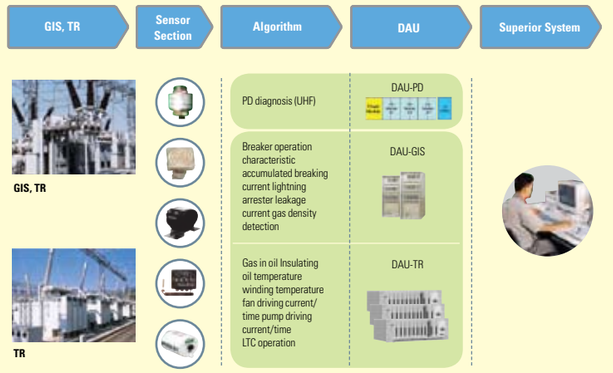
SVCs compensate for voltage fluctuation as well as reactive power online using power semiconductor elements to improve the quality of power supply.
- Rating: 3P3W 380V, 440V, 6.6kV, 22.9kV, 500kVA-100MVA
- Compensates for lagging and leading reactive power and voltage
- Improves power factor, saves energy
- Compensates for flickers

Active Power Filters (APFs)

APFs eliminate the harmonics of source current by inputting an electric current (which has the same value as but contrary polarity to the harmonic current generated by nonlinear load) into the line.
- Rating: 3P3W, 3P4W 100-400kVA
- Removes harmonics from non-linear loads such as rectifiers by using power transfer equipment

Substation Monitoring and Diagnosis Systems

The substation monitoring and diagnosis system is a web-based online diagnosis system which examines/forecasts the cause of failure by monitoring and diagnosing the operation of substation power facilities to improve the reliability of power supply.
- Improves the stability and reliability of power supply. Efficient and reliable equipment operation. Accident prevention and minimization of regular maintenance. Mid-and long-term data trend management of equipment.



GIS Maintenance Solutions

- Insulation diagnosis using UHF PD technology
- Forecasting life expectancy of facilities by checking GCB contact wearing
- Maintenance upkeep using GCB operation characteristics

Power Tr Diagnosis Solutions

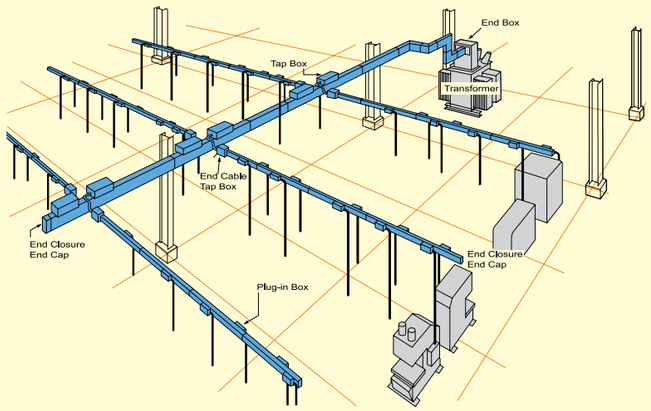
- Deterioration diagnosis using DGA technology
- Maintenance strategy support

LA Diagnosis Solutions

- Deterioration diagnosis using harmonic analysis

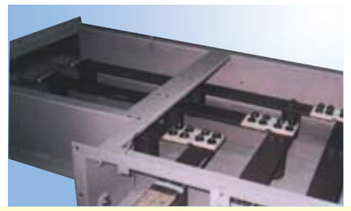
Bus Duct Systems

Bus duct systems are fully suited for factories, research labs, hotels, apartments, and department stores which have highly automated equipment, a high electricity demand, and large-scale equipment.



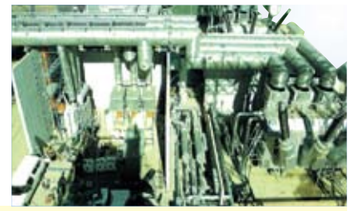
Plug-in Bus Ducts

- Adaptable to factories, buildings and automated facilities requiring large-scale facility maintenance
- Downsized and lightweight by utilizing a vacuum duct/ features include reduced facility space and vibration-free transmission
- One-touch-joint method/features easy bolt-less installation and maintenance/possible to conduct inspections on joints even during operation



NSPBs (Non-Segregated Phase Bus Ducts)

- Adaptable to substation power transmission and industrial/construction facilities' mainline systems
- Features high insulation resistance and easy installation, maintenance and extension



IPBs (Isolated Phase Bus Bar, Detachable Bus Ducts)

- Detachable structure prevents short-circuit interface hazards
- Constant supply of dry air preserves exsiccated interior, with interior pressure of bus bar maintained at a desirable level
- Equipped with an efficient heat emission system
- Classified by two phases, with each phase using natural and artificial cooling air

Power IT Solutions/Power Photovoltaic Systems

Power IT Solutions

We provide dynamic, customer-oriented power IT solutions that will transform the conventional electric industry into the most advanced information industry by applying integrated digital networking and trend-setting information technology throughout the entire field, from generation and transmission to power distribution.

Energy Management Systems

The Energy Management System (EMS) ensures optimal control of power plant facility operations with a linkage system through the normal collection of information and load frequency monitoring of the overall power supply system. With the efficient management of the power system, this large-scale power control system facilitates economical energy management.

Power Monitoring Systems

The Power Monitoring System (PMS) has been designed for remote monitoring and control using power equipment with digital relay or RTU for power facilities in factories, plants, buildings, and other facilities. In addition to power equipment, this monitoring and control system is equipped for application and integrated operations in various fields including lighting, remote meter reading, air conditioning and water treatment facilities.

Distribution Automation Systems

The Distribution Automation System (DAS) automatically performs the prompt recovery of the distribution line with a function which separates the shutdown section and recovers the normal distribution line in the event of a breakdown of the distribution line. The DAS controls the pad-mounted or overhead switchgear and monitors its status at a distance by communicating with the FRTU, which is installed in the switchgear, and is based on computer and communication technology.

Power Quality Monitoring Systems

The Power Quality Monitoring System (PQMS) analyzes the primary causes of power quality decline and suggests solutions to the problem by gathering power quality information from the PQ meter installed in major power facilities and analyzing the information in real time. This is a particularly useful system for production facility systems requiring a high quality of power.

Electrical Equipment Control and Monitoring Systems

The Electrical Equipment Control & Monitoring System (ECMS) carries out generator operations, management and control by applying a multi-functional integrated digital relay to the power-generating facilities and the power equipment within power plants. A multi-functional integrated digital relay has been applied to this monitoring and control system to enable the simplification and effective functioning of the system.

Substation Automation Systems

The Substation Automation System provides remote control and monitoring functions in real time, promptly acquiring the information of facilities for all types of unmanned substations ranging from distribution to extra-high voltage substations, and which may be applied to an Intelligent Electronic Device (IED) for protection and control, as well as to facility security devices of unmanned substations.

Supervisory Control and Data Acquisition Systems

The Supervisory Control and Data Acquisition System (SCADA) fulfills the role of monitoring and controlling the power facility. This online system is located off site and takes information concerning circuit breaker status and analog and digital data collected by the Remote Terminal Unit (RTU) and transmits it to a central computer through a line or wireless communication network.

Automatic Meter Reading Systems

The Automatic Meter Reading System (AMR) measures power consumption in remote users through wire or wireless communication and issues power bills automatically. Depending on the site, it also enables various system configurations such as RF, CDMA, PLC, and the Handy Terminal method. In addition, automation of the meter ensures that customers save money and can rely on the transparency and reliability meter under any circumstance.

Power Equipment Diagnosis and Preventive Systems

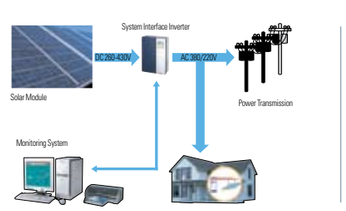
The Power Equipment Diagnosis and Preventive System (PDPS) monitors the functions and capabilities of major power facilities to prevent malfunctions and accidents in advance and supports efficient power facility management through equipment records and DB management. This system consists of a sensor, DAU/CCU, and a PDPS server. The sensor is applied to the power equipment to acquire the data. The DAU/CCU then acquires the data from the field equipment and transmits it to the upper server.

Load Management Systems

In order to secure reserve electric power during the summer, this system disconnects the electric power load (that which can be cut off) to some electricity users for a certain length of time in agreement with electricity users. These same people then benefit from the subsidies they receive for their service and the government secures itself a stable power supply through this management program.

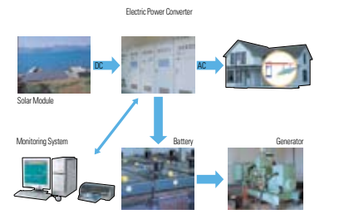
Power Photovoltaic Systems

Sunlight is an infinite energy source. It is a clean form of energy that does not create environmental pollution, noise, or radioactive leakage and one that can substitute for existing energy sources.



On-Gird Photovoltaic Systems

The On-Grid Photovoltaic System transforms DC power generated from solar cell modules into AC power to connect to the network — and all without a battery. The amount of photovoltaic generation can be monitored in real time and at a distance in any monitoring system.



Stand-Alone Photovoltaic Systems

The Stand-Alone Photovoltaic System provides power to areas the power network cannot reach, and consists of a photovoltaic module, a charging regulator, an inverter, a storage battery and a generator.

Photovoltaic Modules

The photovoltaic module is the part of the semiconductor that directly transforms light energy into electrical energy through the photoelectric effect. The photovoltaic module connects them in series or parallel with one another so that they can generate constant output power.

Photovoltaic Inverters

A photovoltaic inverter transforms DC power into AC power.

Batteries

Batteries supply power both at night and when the solar cells generate an insufficient amount of power.

Electric Power Converters

A power transformer supplies the load or storage battery with the power generated from solar cell plates.

DRIVE SOLUTIONS

VFDs (Variable Frequency Drives)
Photovoltaic Inverters
Medium Voltage VFD
PSCs (Power Semiconductor Components)

Drive Solutions

LS Industrial Systems' drive solutions reduce energy consumption in innovative ways. Based on leading solutions in the drive industry, LS Industrial Systems offers environmentally-friendly and highly energy-efficient drive solutions for a wide range of industrial fields.

LS Industrial Systems' drive solutions division consists of businesses for drives, photovoltaic inverters, and power semiconductors. Products in each of these businesses are developed and produced with a focus on saving as much energy as possible and the application of new & renewable energy. As the first company to introduce a general-purpose drive in Korea and the undisputed leader in the field of drives, LS Industrial Systems developed iS7 drives, which provide advanced embedded functions and PLC (K120S), and recently released next generation products such as high voltage drives through continuous technology development. The company has had its products recognized as employing optimum solutions in several industrial fields such as cranes, elevators, steel manufacturing, automobiles, air conditioning, and water treatment plants. Today, the company is expanding its market share both in Korea and overseas. In the field of power semiconductors, LS Industrial Systems is developing a broad range of optimal power semiconductor modules for specific fields within the electric & electronic industries that include automobiles, new & renewable energy sources, and electronics. At present, it is manufacturing general-use IGBT modules (600V to 1,700V) as it further expands its product range. Also, the company produces and supplies photovoltaic inverters which are a type of power transformation equipment that converts solar energy (a clean, unlimited energy source that leads to no environmental pollution, noise damage, and radioactivity leak) into input power.

MAJOR SALES REFERENCE

2008

- Lotte Mart & Lotte Department Store, Air conditioning: iP5A drive (Korea)
- Doosan Heavy Industries & Construction, Marine crane line: iV5 (Korea)
- LS Nikko, Desulfurization system: 500kW high voltage drive (Korea)
- Ssangyong Motor Company, New model production: iS7 (Korea)
- Daejeon Cogeneration Plant, IDF: 1,250kW high voltage drive (Korea)
- Samsung Precision Industry, Mill: 650kW high voltage drive (Korea)
- Jeju Power Plant, IDF/FDF: 400/250kW high voltage drive (Korea)

2006 ~ 2007

- Beijing Hyundai Motor Company: iS5 (China)
- Hyundai Motor's Czech plant: iS5 (Czech Republic)
- GS Caltex, Filling stations: Drive (Korea)
- POSCO, CAL line: Drive (Korea)
- KT, Air conditioning: Drive (Korea)
- KEPCO, Pung-dong Test Center: 2,500kW high voltage drive for tester M/G set (Korea)
- Yeongdong Thermal Plant: High voltage drive (Korea)
- Kia Motors, Hwasung plant: Drive panel (Korea)
- LG Chem: Drive (Korea)
- LG. Philips LCD, Paju, Secondary electric fan line: Drive (Korea)
- LG Electronics, Cheongju, Electric fan line: Drive (Korea)

2004 ~ 2005

- POSCO, CAL Line: Drive system (China)
- KALAYE PETROCHEMICAL: Drive system (Iran)
- RAZI PETROCHEMICAL: Drive system (Iran)
- Hyundai Motor, Alabama plant: Drive (USA)
- KEPCO, Honam thermal plant: FDF, high voltage drive (Korea)
- Kia Motors, Hwaseong plant/ESCO Project: High efficiency drive (Korea)
- Daejeon Subway Line 1: High efficiency drive (Korea)
- LG Micron, Electric fan line: Drive (Korea)
- Samsung Fine Chemicals, Ulsan plant, Chemical blower line: Drive (Korea)

2002 ~ 2003

- Shinsegae Department Store, Gangnam, AHU: Drive (Korea)
- GM Daewoo, Bupyeong plant, Secondary fan line: Drive (Korea)
- LG Nikko, Steel-making pump line: Drive (Korea)
- POSCO, Power generation & steel manufacturing lines: Drives (Korea)
- LG Micron, Electric pan/pump line: Drives (Korea)
- Doosan Power Plant, Icheon FDF: 750kW high voltage drive (Korea)

2000 ~ 2001

- LG Nikko, Ulsan, FDF: 7,500kW high voltage drive (Korea)
- Hankook Security, Gajwa, Cooling Blower: 750kW high voltage drive (Korea)
- Incheon International Airport, Refueling system & passenger building: Drive system (Korea)

VFDs/Photovoltaic Inverters
PSCs

VFDs (Variable Frequency Drives)/Photovoltaic Inverters

Starvert-iE5

User friendly mico size slim VFD
1 phase 0.1 ~ 0.4kW (0.1 ~ 0.5HP), 200 ~ 230V
3 phase 0.1 ~ 0.4kW (0.1 ~ 0.5HP), 200 ~ 230V
- V/F control
- Compact size: 68 X 128 X 85 mm (2.7 X 5 X 3.3 inch)
- 0.1 ~ 200Hz frequency output • 1 ~ 10kHz carrier frequency
- Fault history: last 3 faults • IP20 enclosure
- RS485 (LS Bus/Modbus RTU) communication (built-in option)

Starvert-iC5

Powerful & compact sensorless vector control VFD
1 phase 0.4 ~ 1.5kW (0.5 ~ 2HP), 200 ~ 230V
3 phase 0.4 ~ 22kW (0.5 ~ 30HP), 200 ~ 230V
3 phase 0.4 ~ 22kW (0.5 ~ 30HP), 380 ~ 480V
- Selectable V/F, Sensorless vector control
- Motor parameter auto-tuning
- Powerful torque at overall apeed range
- IP20 enclosure, UL type 1 (option)
- Built-in RS485 (LS Bus/Modbus RTU) Communication

Starvert-iG5A

Powerful & compact sensorless vector control VFD
1 phase 0.4 ~ 1.5kW (0.5 ~ 2HP), 200 ~ 230V
3 phase 0.4 ~ 22kW (0.5 ~ 30HP), 200 ~ 230V
3 phase 0.4 ~ 22kW (0.5 ~ 30HP), 380 ~ 480V
- Selectable V/F, sensorless vector control
- Motor parameter auto-tuning
- Powerful torque at overall apeed range
- IP20 enclosure, UL type 1 (option)
- Built-in RS 485 (LS Bus/Modbus RTU) communication

Starvert-iS5

Precise vector control standard VFD
3 phase 0.75 ~ 55kW (1 ~ 75HP), 200 ~ 230V
3 phase 0.75 ~ 75kW (1 ~ 100HP), 380 ~ 480V
- Selectable V/F, sensorless, sensored vector control (optional)
- Optimum acceleration & deceleration for a maximum torque
- Muilt-function I/O terminal
- input: 27 functions/output: 21 functions
- Communication options: Modbus RTU, Profibus-DP, Devicenet, RS485 (LS Bus), Fnet

Starvert-iS7

High torque perfomance and precise VFD
3 phase 0.75 ~ 22kW (1 ~ 30HP), 200 ~ 230V
3 phase 0.75 ~ 160kW (1 ~ 250HP), 380 ~ 480V
- Constant torque/variable torque dual rating
- Selectable V/F, sensorless, sensored vector control
- Available IP54 enclosure (0.75 ~ 22kW[1 ~ 30HP]) as built-in option
- Built -in RS485 (LS Bus/Modbus RTU) Communication
- Available EMC filter & DC reactor as built-in option EMC filter (0.75 ~ 22kW)/DC reactor (0.75 ~ 160kW)

Starvert-iP5A

Fan & pump specialized VFD
3 phase 5.5 ~ 30kW (7.5 ~ 40HP), 200 ~ 230V
3 phase 5.5 ~ 450kW (7.5 ~ 600HP), 380 ~ 480V
- Specialized functions for fan & pump: Advanced PID control (Pre-PID, Dual PID) Multi motor control funtion (Up to 4 motors: 5.5 ~ 90kW)
- Selectable V/F, sensorless vector control
- Built-in RS485 (LS Bus) communication
- Communication boards (optional): Modbus RTU, Devicenet, Profibus-DP, Lonworks, Bacnet

Starvert-iH

Robust dual fated high power VFD
3 phase 30 ~ 55kW (40 ~ 75HP), 200 ~ 230V
3 phase 30 ~ 220kW (40 ~ 300HP), 380 ~ 480V
- Space vector PWM technology
- Low noise level (high performance DSP & IGBT)
- Precise torque calculation through current control
- 4 ~ 20mA analog output
- 2 line 32 characters LCD display as standard
- Built-in process PI • 150% starting torque
- 2 ~ 10kHz carrier frequency

Starvert-iV5

High duty full flux vector control VFD
3 phase 2.2 ~ 37kW (3 ~ 50HP), 200 ~ 230V
3 phase 2.2 ~ 375kW (3 ~ 500HP), 380 ~ 480V
- Ultimate performance solution for system drive
- Advanced speed & torque control (200% instantaneous torque: max. 250%)
- Precious speed & position synchronization operation
- Static motor parameter auto-tuning
- Synchronous motor sensorless control (SPM & IPM motors)
- Built-in dynamic braking transistor (2.2 ~ 22kW[3 ~ 30HP])

Solarverts

Photovoltaic Inverter
Indoor: 1 phase 1, 3kW (IP20 enclosure)
Outdoor: 1 phase 3kW (IP45 enclosure)
- Max power point tracking (MPPT)
- Low distortion (below 5%)
- High efficiency (more 95%)
- Compact & slim size
- Remote monitoring with RS485 communication
- User frendly HMI

Medium Voltage VFD

High performance, Sensorless vector control, Easy-to-use basic startup menu (same as iP5A series), Designed to save energy, Dependable cascade type design, Built-in RS485 (or Modbus-RTU) communication, Obtained compact size by placing the transformer in rear of the panel, Optimized monitoring system for users, Auto cell bypass method allows an easy maintenance

Perfect Energy Saving Drive

- 3,300V 200 ~ 2,500 kVA
- 4,160V 250 ~ 3,000 kVA
- 6,600V 400 ~ 5,000 k VA

Simple Solution Power Modules (SISPM™)

SISPM™ product lines offer two package types (SISPM0 and SISPM1) and cover the current range from 5A to 30A (@ Tc ≥ 80°C) at 600V and 1,200V. SISPM1 products actually have three different configurations, CIB, CIP and CIPB, depending on the system requirement of the customer.

SISPM0

Features
- The latest IGBT technology
- Low power dissipation
- Optimized anti-parallel diodes
- Various circuit configurations
- Single phase CIB/3 phase CIB/ single phase CIP application

Product range
- 600V 7 ~ 15A
- 1,200V 5 ~ 10A

SISPM1

Features
- The latest IGBT technology
- Low power dissipation
- Optimized anti-parallel diodes
- Various circuit configurations
- Single phase CIB/3 phase CIB/single phase CIP/ single phase CIPB

Product range
- 600V 7 ~ 20A
- 1,200V 5 ~ 20A

Super Solution Power Modules (SUSPM™)

SUSPM™ product lines offer three standards package types (34mm, 48mm and 62mm) with the latest IGBT technology and other outstanding technology in package design. They cover the current range from 50A to 400A (@ Tc ≥80°C) at 600V, 1,200V and 1,700V voltage ratings. To ensure complete customer satisfaction, LSIS also provides some specialty products embedded with ESD protection and shoot-through protection functions.

SUSPM1

Features
- 2 pack half bridge
- The latest IGBT technology
- Low power dissipation
- Embedded ESD protection diode
- Optimized anti-parallel diode
- Operation frequency up to 40KHz

Product range
- 600V 50 ~ 200A
- 1,200V 50 ~ 150A
- 1,700V 50 ~ 75A

SUSPM2

Features
- 2 pack half bridge
- The latest IGBT technology
- Low power dissipation
- Embedded ESD protection diode
- Optimized anti-parallel diode
- Operation frequency up to 40KHz

Product range
- 600V 150 ~ 400A
- 1,200V 150 ~ 200A
- 1,700V 100 ~ 150A

SUSPM3

Features
- 2 pack half bridge
- The latest IGBT technology
- Low power dissipation
- Embedded ESD protection diode
- Optimized anti-parallel diode
- Operation frequency up to 40KHz

Product range
- 600V 400A
- 1,200V 200 ~ 400A
- 1,700V 200 ~ 300A

AUTOMATION SOLUTIONS

PLCs (Programmable Logic Controllers)
HMIs (Human Machine Interfaces)
Automation Systems

Automation Solutions

LS Industrial Systems creates core automation solutions that cover everything from production facilities to information systems.
As a leader in automation solutions that introduced products like PLCs, DCSs, and HMIs for the first time in Korea, LS Industrial Systems is developing and producing top products that meet the most exacting standards in Korea and around the world.



Ever since producing and supplying Korea's first programmable logic controller (PLC), LS Industrial Systems has played a pivotal role in the history of automation equipment in Korea. From the most diverse machines to large-sized process control, the company has created an optimum automation environment based on the country's highest levels of reliability and technology. While leading industrial automation and supplying optimum solutions for automobile companies, international airports, subways, power plants, and LCD production complexes, LS Industrial Systems has had its industry-leading technology recognized by international certification organizations like CE and UL. In fact, LS Industrial Systems' XGT series, developed in 2005, was selected as one of the top 10 new technologies in Korea that same year by Korea's Ministry of Knowledge Economy. With the fastest CPU speed in its class and open network-based system solutions, this only confirmed the company's high competitiveness in the field of automation solutions. As a leader in the field of process control, LS Industrial Systems developed a distributed process control system (DCS), the core of any automation system that controls and monitors all systems in a wide range of industrial workplaces and has supplied cutting-edge process control technology to many different companies internationally.

MAJOR SALES REFERENCE

2008
- LG Display: XGR, XGK, XGT Panel, XGT InfoU (Korea)
- Ssangyong Motor, New model production: XGT PLC (Korea)
- Environmental Management Corporation, Sewage disposal: GLOFA PLC (Korea)
- Korea Water Resources Corporation, Water treatment plants: XGR PLC (Korea)
- LS Tower: Integrated IBS system (Korea)
- Korea District Heating Corporation: Designing service for the integrated center (Korea)
- Korea Water Resources Corporation, Daecheong Dam: Power generation facilities (Korea)
- Dalseong Incinerator: Distributed control system (DCS) (Korea)
- Jecheon Incinerator: DCS (Korea)

2006 ~ 2007
- Beijing Hyundai Motor Company: Smart I/O, XGB PLC (China)
- Tata Daewoo, Overall car production process: XGT PLC (India)
- GM Daewoo, J300 Sub line: XGI PLC (Korea)
- HANGLAS, LCD glass tester (Gunsan plant): GLOFA PLC (Korea)
- GS Power, Anyang Power Plant, Main control facility: DCS (Korea)
- Jeju province: Control system of metropolitan wide area water service (2nd stage) (Korea)
- Seoul, Amsa Water Treatment Plant: DCS (Korea)
- Pohang, Sewage disposal process (2nd stage): DCS (Korea)
- Korea Water Resources Corporation, Industrial water in the downstream of the Hangang river: DCS (Korea)
- Hyundai Motor, Kia motors / Body equipment: XGK PLC (Korea)
- Daejeon sewage processing system: GMR PLC (Korea)
- Jeollanam-do, environmental basic equipment integrated management system: GLOFA PLC (Korea)
- Korea Water Resources Corporation: Integrated management system of metropolitan wide area water resources (Korea)
- Korea East-West Power, Ilsan Combined Cycle Power Plant: DCS (Korea)
- Mungyeong city, Jeomchon sewage treatment facility: DCS (Korea)
- Korea Western Power, Pyeongtaek Thermal Power Plant, DeNOx facility: DCS (Korea)
- POSCO, Hyeongsan #12 power plant facility: DCS (Korea)

2004 ~ 2005
- Kumho Tire, Namgyeong plant: GLOFA PLC (China)
- Hyundai Motor, Namyang-myun plant / body line: XGT PLC system (Korea)
- LG. Philips LCD, Module facility: XGT PLC system (Korea)
- Korea Water Resources Corporation: Integrated management system and DCS of metropolitan wide area water service (6th stage) (Korea)
- Korea Water Resources Corporation, Measurement & control facility: DCS (Korea)
- POSCO, 2nd steel mill, Fluorine treatment facility: Control & monitoring system (Korea)
- POSCO, 2nd steel mill, Shaft furnace & dust-collecting facilities: Control & monitoring system (Korea)
- Changwon Specialty Steel, Gas refining facility: Control & monitoring system (Korea)
- LG Electronics, PDP plant: GLOFA PLC system (Korea)
- Ssangyong Motors, Body assembly line: GLOFA PLC (Korea)
- HANKOOK Tire: GLOFA View (Korea)
- Deoksan Water Treatment Plant: DCS (Korea)
- Ilsan Water Treatment Plant: DCS (Korea)
- Pyeongtaek Thermal Power Plant #1-4, Main control system: DCS (Korea)
- Seoul city, Mapo incinerator unit #1-3: DCS (Korea)
- LG Power Co. Ltd., Boilers: DCS (Korea)

2002 ~ 2003
- Hyundai Motor, Beijing plant: Smart I/O (China)
- Korea East-West Power, Honam thermal plant #1, #2: Main control system (DCS) (Korea)
- POSCO, Lime recarbonization facility: DCS (Korea)
- POSCO, Motor-driven blower: DCS (Korea)
- Korea Hydro & Nuclear Power, Anheung Small Hydro Power Plant: DCS (Korea)
- Ssangyong Motors, Body line: GLOFA PLC (Korea)
- Korea District Heating Corp., Local heating in Dongsuwon area: DCS (Korea)
- Republic of Korea Navy, Electric power control: DCS (Korea)
- Gimhae city, Myeong-dong Water Treatment Plant: DCS (Korea)
- POSCO, 1st steel mill: DCS (Korea)
- POSCO, Rotary kiln facility: DCS (Korea)
- POSCO, Blower facility for power plant: DCS (Korea)

2000 ~ 2001
- Daewoo Motors, Gunsan plant/Nubira assembly process: GLOFA PLC system (Korea)
- Mail Center, Mail classification process: GLOFA PLC system (Korea)
- POSCO's Gwangyang Steel Works, Energy center: Main control system (DCS) (Korea)
- Korea East-West Power, Honam thermal plant #2: DCS (Korea)
- Korea Water Resources Corporation, Industrial water of Asan Bay (2nd phase): DCS (Korea)
- Anyang city, 5th phase water supply facility: DCS (Korea)
- LG. Philips LCD, Line P4: GLOFA PLC system (Korea)
- Milyang Dam wide area water treatment system (DCS) (Korea)
- Jeju wide area water treatment system (DCS) (Korea)
- Osan city, Osan Sewage Disposal Plant: DCS (Korea)
- Korea Water Resources Corporation, Unmanned Booster Pump Stations in Yongin & Migeum: DCS (Korea)
- Gimhae city, Gimhae Water Treatment Plant (3rd phase): DCS (Korea)

PLCs

XGT Series

- One of Korea's 10 new technologies
- The fastest CPU processing speed in its class: 28ns/Step (XGK-CPUH)
- System solutions based on an open network
- Built-in USB port for program uploads and downloads
- Expanded device capacity: index (Z), file register (R), analog register (U)
- Integrated software package: XG5000, XG-PD, APM software package

XGR

- Base, power, CPU, network redundancy
- Processing speed: 42ns/step • I/O points: max. 131,072
- Total memory: 32MB (program 7MB, data 2MB, reserved 7MB, flash 16MB)
- Max. 31 expansion base
- Switching over time: 4.3 ~ 22ms
- IEC 61131-3 standard language
- Enhanced maintenance via system history and network ring configuration

XGI

- Processing speed: 28ns/step
- I/O device point: 131,072 (remote I/O)
- Program capacity: 128k ~ 1Mbyte
- IEC61131-3 standard programming
- LD (ladder), SFC (sequential function chart) ST (structured text) User defined FB (function block)
- Powerful built-in PID and process control
- Max. 256 loops and variety of process functions

XGK

- Processing speed: 28ns/Step
- High speed backplane (base) transfer
- Compact size (Module size 27x98x90)
- The system solution based on open network
- Setup and operation of each special modules without additional complicated user program

XGB (XBM)

- Processing speed: 160ns/Step
- The smallest size among the same class (Basic unit: 30x90x60)
- Extension to as many as 7 layers, controlling as many as 256 points
- Best suited for medium and small system
- Maximum 5 channel communication available using built-in and extension communication modules

XGB (XBC)

- Processing speed: 83ns/Step
- Extension to as many as 10 layers, controlling as many as 384 points
- Supporting floating-point arithmetic
- Built-in Cnet, HSC, PID, Positioning, Pulse Catch, Input Filter, External Interrupt
- Download port: serial, USB

GLOFA-GM Series

- IEC61131-3 standard language support
- High-speed processing through LS Industrial Systems microprocessor
- Total system control, from simple mechanical control modules to complicated redundant systems
- International standard communication protocol suitable for CIM

GLOFA-GMR

- CPU, Network, I/O redundancy
- Processing speed: 0.12us/step
- I/O points: max. 7,680
- Total memory: 512kbyte, 2Mbyte
- Max. 15 expansion base
- Floating-point arithmetic & hot stand-by

GLOFA-GM1

- Processing speed: 0.12μs/step
- I/O points: max. 16,000
- Total memory: 512kbyte, 1Mbyte
- Max. 31 expansion base
- Floating-point arithmetic

GLOFA-GM2

- Processing speed: 0.12μs/step
- I/O points: max. 4,096
- Total memory: 512kbyte, 1Mbyte
- Max. 7 expansion base
- Floating-point arithmetic

GLOFA-GM3

- Processing speed: 0.2μs/step
- I/O points: max. 2,048
- Total memory: 256kbyte
- Max. 3 expansion base

GLOFA-GM4/GM4C

- Processing speed: 0.12 ~ 0.2μs/step
- Max. I/O points: 2,048
- Program capacity: 512kbyte
- Max. numberof extension base: 3
- Real numbercalculation support

GLOFA-GM6

- Processing speed: 0.5μs/step
- Max. I/O points: 384
- Program capacity: 68kbyte

GLOFA-GM7/GM7U

- Processing speed: 0.5μs/step
- Max. I/O points: 80
- Program capacity: 68kbyte
- Built-in function: PID, Cnet, etc.

MARTER-K Series

- Windows-based software support
- Open network support
- Optimized control with a range of MASTER-K series
- Various Network modules & special functions module

MASTER-K1000S

- MASTER-K 1000S
- Processing speed: 0.2μs/step
- I/O points: Max. 1,024
- Total memory: 30k step
- Max. 3 expansion base

MASTER-K300S

- Processing speed: 0.2μs/step
- Max. I/O points: 1,024
- Program capacity: 15k step
- Max. number of extension base: 3

MASTER-K200S

- Processing speed: 0.5μs/step
- Max. I/O points: 384
- Program capacity: 7k step

MASTER-K120S

- Processing speed: 0.1μs/step
- Max. I/O points: 120
- Program capacity: 10k step
- Built-in function: PID, Cnet, Positioning, HSC

MASTER-K80S

- Processing speed: 0.5μs/step
- Max. I/O points: 80
- Program capacity: 7k step
- Built-in function: PID, Cnet, etc.

HMIs

SMART I/O Series

Block Type SMART I/O

- Compatible with Modbus, Profibus DP
- Devicenet, Rnet
- Suited for medium and small scale network system
- Small size

Extension Type SMART I/O

- Open protocol Profibus-DP, Devicenet, Ethernet/IP, Modbus/TCP, Rnet
- Suited for medium and large scale system
- Wide extension of input/output
- Maximum 256 points
- 100% compatible with XGB I/O module

XGT InfoU

XGT InfoU
Powerful & Trendy HMI Software

- Integrated development environment for interactive user interface
- Direct import tag database for LS PLC software
- Open architecture meets industrial standards (OPC, OLE DB, etc.)
- Easy to use
- Program development environment for simple application

XGT Panel Series

XP80-TTA

- Screen size: 31cm (12.1")
- TFT color: SVGA (800x600)
- Display color: 65,536 color
- 8-wire system, analog
- 10/100 BASE-T Ethernet, USB
- RS232C, RS422/485
- CF memory card

XP70-TTA

- Screen size: 26cm (10.4")
- TFT color: VGA (640x480)
- Display color: 65,536 color
- 8-wire system, analog
- 10/100 BASE-T Ethernet, USB
- RS232C, RS422/485
- CF memory card

XP50-TTA

- Screen size: 21cm (8.4")
- TFT color: VGA (640x480)
- Display color: 65,536 color
- 8-wire system, analog
- 10/100 BASE-T Ethernet, USB
- RS232C, RS422/485
- CF memory card

XP30-TTA

- Screen size: 14cm (5.7")
- TFT color: QVGA (320x240)
- Display color: 65,536 color
- 4-wire system, analog
- 10/100 BASE-T Ethernet, USB
- RS232C, RS422/485
- CF memory card

XP30-BTA

- Screen size: 14cm (5.7")
- STN MONO (8-bit gray scale)
- QVGA (320x240)
- 4-wire system, analog
- 10/100 BASE-T Ethernet, USB
- RS232C, RS422/485
- CF memory card

XP30-BTE

- Screen size: 14cm (5.7")
- STN MONO (8-bit gray scale)
- QVGA (320x240)
- 4-wire system, analog
- USB, RS232C, RS422/485

XP10-BKA/BKB

- Screen size: 10cm (4.1")
- MONO (192x64 graphic LCD)
- Text display
- RS232C, RS485
- Built-in RTC

PLC Line-up

Series	Product	IEC Standard / Conventional	Feature	Speed	I/O Point (Max.)
High Performance					
XGT		XGR / -	Redundancy system for high-speed process control based on IEC	42ns/step	131,072
XGT		XGR / XGK	High-speed and large scale application	28ns/step	131,072 / 32,768
GLOFA-GM		GMR / -	Redundancy system for process control based on IEC	0.12㎲/step	7,680
GLOFA-GM		GM1 / -	Multi-CPU system (max 4 CPU module), high-speed application	0.12㎲/step	16,000
GLOFA-GM		GM2 / -	High-speed process control PLC	0.12㎲/step	4,096
GLOFA-GM		GM4C / -	Small and medium-scale, high-speed application	0.12㎲/step	3,584
Premium					
GLOFA-GM / MASTER-K		GM3 / K1000S	Small and medium-scale application	0.2㎲/step	2,048 / 1,024
GLOFA-GM / MASTER-K		GM4 / K300S	Small and medium-scale application	0.2㎲/step	2,048 / 1,024
GLOFA-GM / MASTER-K		GM6 / K200S	Small-scale application, various built-in function	0.5㎲/step	384
Economic					
XGB		- / XBM	Slim type compact PLC, various built-in functions	160ns/step	256
XGB		XEC / XBC	Compact & powerful solutions, various built-in functions	83ns/step	384
GLOFA-GM / MASTER-K		GM7U / K120S	Block type PLC, various built-in functions	0.1㎲/step	120
GLOFA-GM / MASTER-K		GM7 / K80S		0.5㎲/step	80

Automation Systems

Process Solutions

Water Treatment

Water treatment includes the treatment and management of all water resources including water treatment for making clean drinking water, sewage water treatment, and industrial wastewater treatment. In order to automate such water treatment systems, we not only design and install control systems but also provide total solutions encompassing equipment manufacturing and tests as well as application software, testing, education and after-sales services.

Steel & Iron

The steel & iron production process is basically the work of batch or repetitious processing. LS Industrial Systems provides control solutions for all steel and iron making processes based on extensive experience in the business that we have applied to Korean steel industry sites on an international scale.

Power Plant & Incineration

Power plant control systems are said to be the core of operating power facilities since they shorten daily and weekly boiler start-up times while also ensuring reliability, safety, and efficient operations by improving load follow-ups and operation utilities maintenance. LS Industrial Systems provides solutions for establishing the main control systems and power plant integration control systems required for efficient management and accident analysis.

Chemical

In the field of petrochemicals, LS Industrial Systems has experience in supplying and installing process control systems such as ABS, PS, PVC/MASS and PMMA, and provides optimal chemical process control solutions in accordance with customer demands.

Industrial Integration Solutions

Water Treatment Production Planning Solutions

Water treatment production planning solutions consist of a water demand forecasting system, a water pumping and supplying system, a facility information management system, a pipe-line network analysis system, a status monitoring system, and web monitoring so as to forecast local water demand, establish a supply plan, and monitor the plant's operating status.

Water Resources Integrated Management Solutions

The Water Resources Integrated Management Center performs remote control and monitoring of every local station to support the creation of synergy in operating each local station.

Sewage Integrated Management Solutions

This consists of a sewage pipe-line maintenance and management monitoring system, a sewage treatment process diagnosis system, a facility information management system, a sewage operation information system, and a sewage pipe-line network monitoring system to monitor and control, from sewage treatment to sewage pipe-line management.

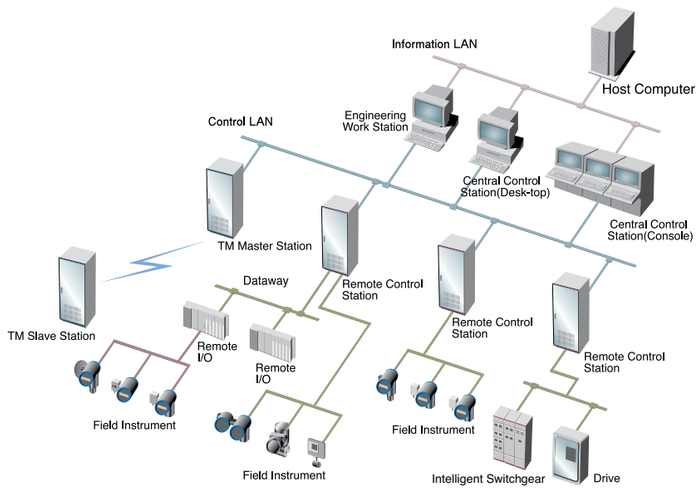
Energy Integrated Management Solutions

By consistently meeting customers' energy demands and saving energy at iron & still mills, this solution maximizes the recovery rate of exhaust energy (gas, vapor, etc.) from the manufacturing process, providing energy to each part of the mill where it is needed.

Integrated Intelligent Building System Solutions

This is an intelligent building management solution that is designed for organic connection between systems and one-stop administration by integrating a building controlling system, a facility management system, an integrated security system and a fire prevention system.

Distributed Control Systems



MASTER P-5000

The core facility used in monitoring and controlling various industrial processes including power plant, boilers, steel and petrochemicals.

Features:

The main center conducts monitoring and controlling, while minimizing risks by distributing other control computers with built-in automatic control programs according to their functions.

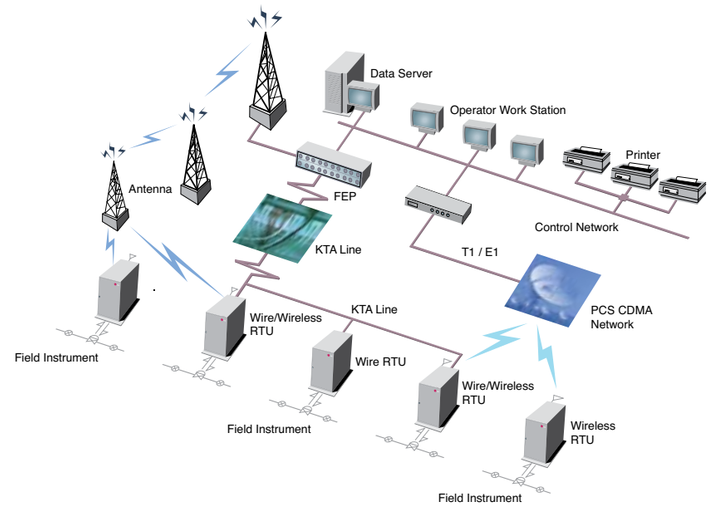
Specification:

- Enhanced functions for power plant & critical process
- System structure for high-speed processing such as turbine control
- Optimized MPU H/W and S/W (Min. 5ms) for high-speed processing
- Full redundancy (including I/O redundancy) for turbine control
- Fail safe function
- Editing control logic during operating
- RCS self diagnosis (MPU, I/O board)
- Web monitoring and seamless interfacing with other systems
- Hot swapping (RCS board)
- Short message service
- Online system diagnosis

MASTER P-3000AT

Process Automation System for water treatment and incineration. It uses hardware that has met the highest international standards, as well as a system bus and communication network. The system is a future-oriented distributed control system that embodies a completely open system.

Supervisory Control and Data Systems



MASTER RTU

The Remote Terminal Unit (RTU) collects data from field instruments & sensors and transmits the information to the Supervisory Control and Data Acquisition System (SCADA) installed in a central control room through wire/wireless communication systems and lines, and receives control commands from the telemeter telecontrol system to conduct online controls in real time.

MASTER RTU MICRO

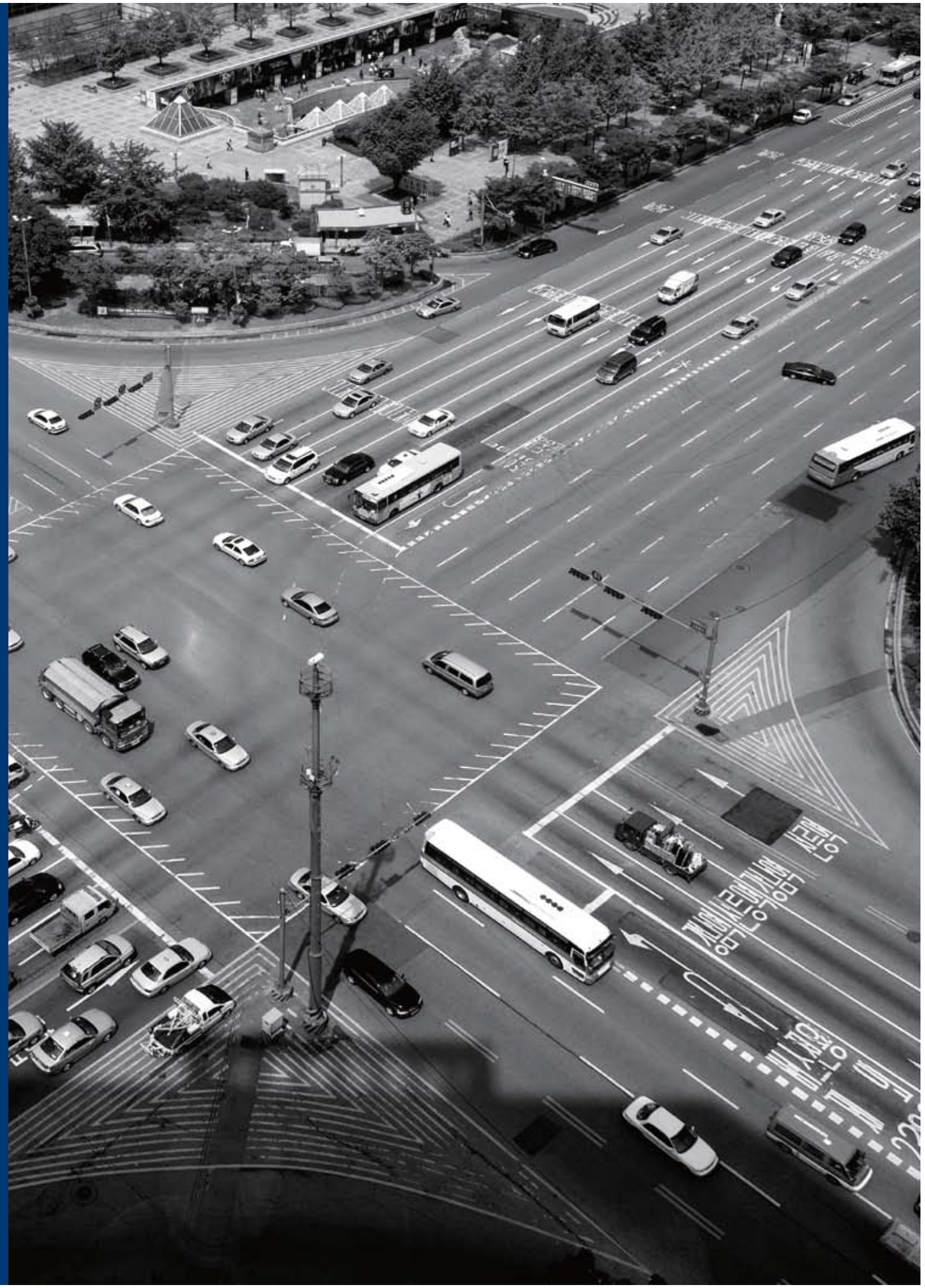
MASTER RTU PCS

MASTER RTU RF

MASTER RTU FIU

TRANSPORTATION SYSTEM SOC

Railway Signaling & Telecommunication Systems
ITS (Intelligent Transport Systems)



As a leader in the field of Railway and Traffic Management, LS Industrial Systems has been dedicated in providing high-tech system solution for Railway and Traffic Management such as Train Management, Road Traffic Information, Toll Collection, Passenger Information system and so on.

As a leading company which develops and produces various high technology systems in Railway and Traffic Controlling fields, LS Industrial Systems has the most experiences in the domestic market and is expanding rapidly into new markets overseas. Traffic Management System (TMS) supplied by LS Industrial Systems is the Railway Signalling System which is operated in main line, metro and light rail transit as Total Solution for the train management and the automatic train control and monitoring by computerized automatic systems. Also LS Industrial Systems supplies AF Track Circuit controlling train space and speed automatically without driver's handling for the safe railway operation. In the traffic industry, our Intelligent Transportation System (ITS) technology has achieved to improve the performance of the road network by improving mobility, safety, traffic control operations and traveler information in urban traffic and highway. And LS Industrial Systems develops and produces overall systems related with the highway and traffic, such as Urban Traffic Management System, Automatic Traffic Enforcement System, and Mechanical and Electronic Toll Collection System.

Through these works and efforts, LS Industrial Systems contributes to make the safe and convenient traffic environment.

MAJOR SALES REFERENCE

2008

- Thailand ST-4 Railway Signalling & Telecommunication - Ongoing (Thailand)
- Korea Expressway Corporation TCS - Ongoing (Korea)
- Suwon-Osan-Pyoungtaek Expressway TCS/ETCS (Korea)
- Incheon International airport Light Rail Transit System (Korea)
- Gwangju Subway Line No.1 Railway Telecommunication System (Korea)
- Busan Metro Line No.2 phase 3 Signalling System (Korea)
- Uijongbu Light Rail Transit Railway Telecommunication system - Ongoing (Korea)
- KTX phase 2 High Speed Rail Control System - Ongoing (Korea)
- Seoul Metro Line No.6 Platform Screen Door - Ongoing (Korea)

2006 ~ 2007

- Railway Akhaura jn. Station Signalling System (Bangladesh)
- KTMB Passenger Information System (Malaysia)
- Thailand ST-2 & 3 Centralized Traffic Control System (Thailand)
- Korea Expressway Corporation TSC (Korea)
- Korea Expressway Corporation Electronic TCS (Korea)
- Busan High-level road Electronic TCS (Korea)
- Ilsan Bridge Electronic TCS (Korea)
- Seoul Outer Belt highway FTMS & TCS (Korea)
- Busan Metro Line No.2 Extension Line Signalling System (Korea)
- KORAIL ATC/ATS Onboard Unit (Korea)

2004 ~ 2005

- Bangladesh Station 10Stations Signalling System (Bangladesh)
- Thailand ST-1 Railway Signalling & Telecommunication (Thailand)
- Daegu-Busan Expressway TCS (Korea)
- Korea Expressway Corporation TCS (Korea)
- KORAIL Automatic Train Protection System (Korea)
- KORAIL ATC/ATS Onboard Unit (Korea)

2002 ~ 2003

- Malaysia Klang Valley Passenger Information System (Malaysia)
- Korea Expressway Corporation TCS (Korea)
- Cheonan-Nonsan Expressway FTMS & TCS (Korea)
- Gwangju Metro Line No.1 Railway Telecommunication System (Korea)
- Korail High Speed Railway(KTX) Honam Line CTC (Korea)
- Korail High Speed Railway(KTX) Existing Line CTC (Korea)
- Korail KTX Kyeongbu Line ATC/CTC System (Korea)
- Korail Busan CTC (Korea)
- Busan Metro Line No.2 Signalling System (Korea)

2000 ~ 2001

- Korea Expressway Corporation Image Vehicle Detector (Korea)
- Seoul Metro Line No. 6 Signalling System/TTC (Korea)
- Seoul Metro Line No. 7 Signalling System (Korea)
- Honam Line CTC (Korea)
- Siheong Station Computerized Based Interlocking (Korea)
- Chochajang Station Computerized Based Interlocking (Korea)

Railway Signaling & Telecommunication Systems
ITS

Railway Signalling & Telecommunication Systems

Traffic Management Systems

With its advanced railway signaling system which can be used for railways, subways, and LRTs, LS Industrial Systems' Traffic Management System (TMS) provides total solutions that realize automatic train control & monitoring and train operation management with automated and computerized systems.

Audio Frequency Track Circuits

- Determines optimized train speed that ensures safety by automatically calculating the preceding train's location without the driver's input.
- Adjusts train intervals and transmits emergency brake data to trains through rails.
- Receives and interprets driving orders and automatically regulates train speed without the driver's input.

Electronic Interlocking Systems (LS-EIS 620)

The LS-EIS 620 controls signals, rail switches, and railway crossings, etc. without relays by selecting the entire electronic module to control the system safely and smoothly.

Electronic Interlocking Systems (LS-EIS 520)

The LS-EIS520 enables safe train operations by establishing software with a database of interlocking conditions such as track circuits, point machines, signals and block systems, and then analyzing, controlling and displaying the information on a microcomputer.

Automatic Train Controls

The ATC satisfies requirements of various customer needs for railways, subways, and LRTs with its enhanced safety and reliability based on safe train control and advanced electric/electronic & information processing technology.

Communication Management Systems

- Digital Transmission System: Transmission of various equipment's information (communications, signaling, AFC, electric-power and administration)
- Train Radio Telephone System: Wireless communication system among train drivers and dispatchers
- Dispatch Telephone System: Providing dispatch telephone lines between each control room (operations, electric power, signaling, communications, accident prevention) and the railways or relevant departments

Passenger Information Systems

The PIS receives and processes train operation information, transmits it to the host equipment of each control room, and then accordingly informs passengers who are waiting on platforms.

Automatic Fare Collections

Through computerization, AFC enables efficient management of train station entrances, data processing, equipment monitoring, and collecting of financial and statistical data regarding ticketing, issuing of tickets, and supplemental fare adjustments.

ITS (Intelligent Transport Systems)

Freeway Traffic Management Systems

This system monitors traffic and collects information using car detectors and computers to improve freeway efficiency and capacity for freeway users.

Wide Area Traffic Control Systems

This system collects and manages various traffic data around the downtown area to improve the efficiency of road traffic and to ensure drivers have the best driving environment around them.

Automatic Traffic Enforcement Systems

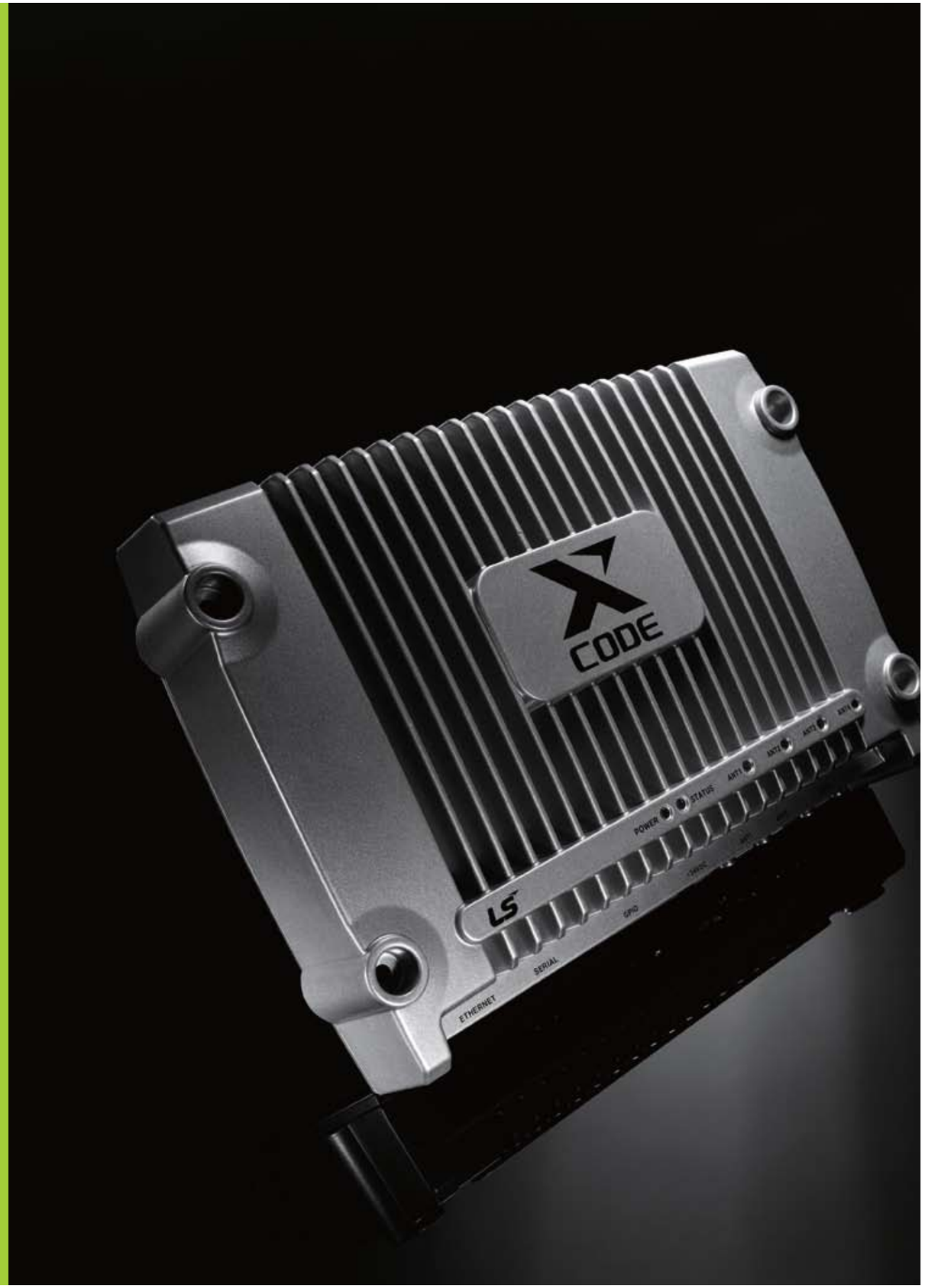
This system monitors traffic violations such as speeding, signal violations, and bus lane infringements in real time, as it automatically carries out all of its administrative processes.

Toll Collection Systems/ Electronic Toll Collection Systems (ETCS)

The ETCS consists of a vehicle identifier, a wireless communication system and an OBU, automatically collecting tollgate fees and enabling drivers to pay a toll fee without stopping their vehicle. LS Industrial Systems provides not only a mechanical toll system using a magnetic ticket but also an up-to-date electronic toll system.

NEW GROWTH ENGINES

Smart Building by SCP Energy Solution
EV Relays & PDUs
PCUs (Power Control Units)
RFID/USN
Fuel Cells

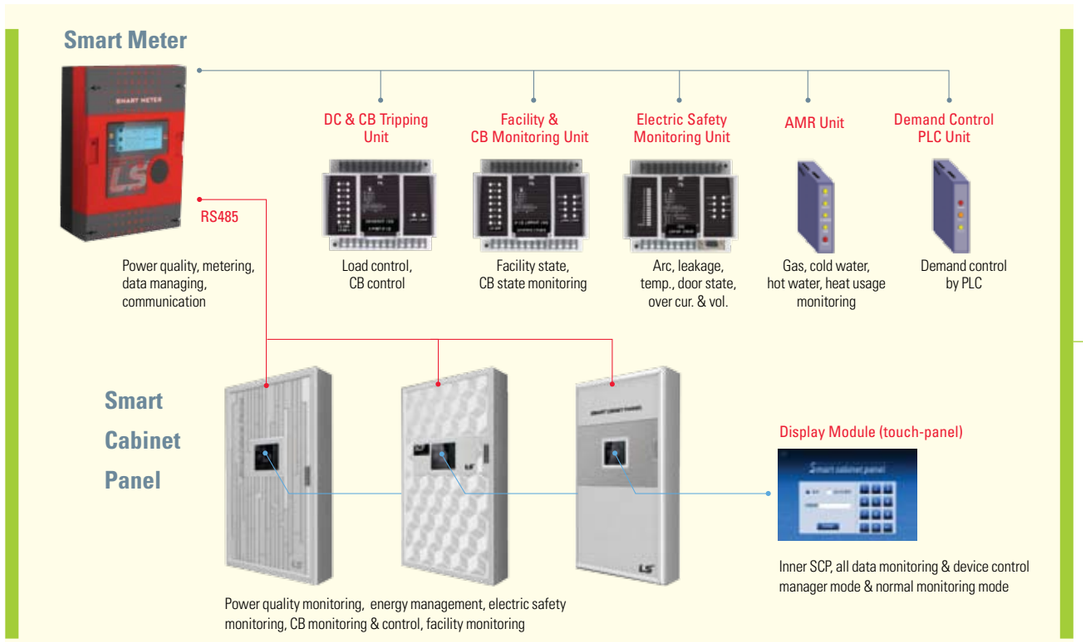


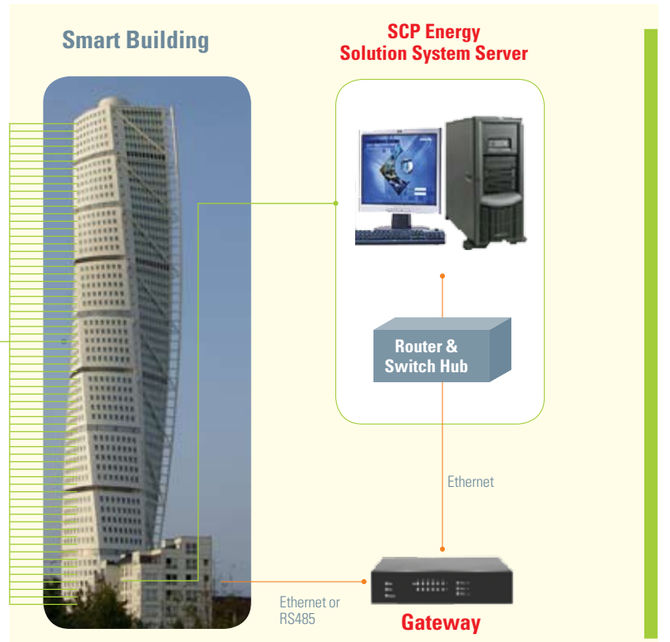
New Growth Engines

Based on electric & electronic technology and automation technology, LS Industrial Systems is protecting the environment with cutting-edge technologies, ranging from the core technology of electric vehicles to Smart Grid, which helps prevent global warming.
The company is also leading Korea's RFID/USN market based on world-class high technology and infrastructure.

In the past, LS Industrial Systems led Korea's electric & automation industries by developing cutting-edge technology. Now, it is actively fostering its green business as its main future growth engine, while offering highly-advanced technology in the field of RFID/USN as well. LS Industrial Systems is opening the age of hybrid cars by developing car inverters, the core of hybrid cars, and EV-relays, which are extremely difficult to develop without special know-how about power control technology. In the field of smart grids—the core element in establishing eco-friendly energy environment—the company provides innovative technology which maximizes electricity consumption by optimizing the operation of an electric network, reducing energy loss and controlling electricity demand & supply. Additionally, in the field of power plant, it is taking the lead in the age of low carbon, green growth by developing hydrogen fuel cells, a pollution-free and unlimited energy source. Furthermore, LS Industrial Systems' RFID/USN business established not only the first RFID reader mass production line, but also the largest RFID tag mass production line in Korea, ensuring innovative efficiency and precision and offering the most advanced technology in related fields such as logistics, publications, medical care, aviation, and leisure-related businesses.

(Smart Building by SCP Energy Solution)





1. Smart Cabinet Panel ?
These panels enable efficient energy management, power quality monitoring, electrical safety monitoring and facility monitoring for building and other large-size structures.

2. Major Functions
Power quality monitoring, demand control (PLC type & relay type) & CB tripping, AMR, metering, electric safety monitoring (arc, leakage current, overcurrent, overvoltage, temperature), CB & facility monitoring

3. Features
- Real-time monitoring and control for all targeted cabinet panels
- Accurate and detailed energy management for all floors or assigned zones in a building
- Flexible options with various functions depending on the customer's application
- Total energy management solution: Offers functions such as gathering information on electric power demand, demand control, power quality monitoring, and building facility monitoring
- Control solutions: Offers functions that include individual control for each office and group control for the whole building, as well as linking every floor with the lighting system and the central air conditioner
- Safety solutions: Fire prevention with real-time monitoring against arcs, leakage currents, bus-bar temperature, overvoltage and overcurrent

EV Relays & PDUs, PCUs RFID/USN, Fuel Cells

EV Relays & PDUs

- Compact design with hydrogen gas and permanent magnets
- Reduced audible noise & anti-shock design
- High reliability in the automotive environment

GER-010

- GER10 Precharge Relay
- DC450V, 10A
- Dimensions (WDH) 25x 25x 39.5mm
- Weight 0.06kg

GER-040

- PTC Heater Air-con Relay
- DC450V, 40A
- Dimensions (WDH) 67x35x47.2mm
- Weight 0.14kg

GER-100

- HEV Main Relay
- DC450V, 100A
- Dimensions (WDH) 78.8x38x69mm
- Weight 0.35kg

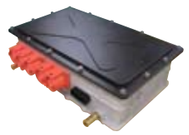
GER-400

- Diesel HEV/FCEV Main Relay
- DC450V, 400A
- Dimensions (WDH) 60x 67x96.5mm
- Weight 0.65kg

PCUs (EV Inverters)

Flexible inverter designs for advanced EVs satisfy every need for customers

- High power density design with optimal thermal analysis
- Guarantee of product reliability for automotive environment



GEI-100

- High power and reliability
- Max/rate output: 100/50kW
- Weight/size: 20kg/15liter
- Water cooling
- Operation temp.: -40°C ~ +85°C
- Vector control: 12,000RPM
- Protection class: IP65

GEI-030

- Efficient and diversifiable
- Max/rate output: 30/15kW
- Weight/size: 9.2kg/8.7liter
- Water cooling
- Operation temp.: -40°C ~ +70°C
- Vector control: 9,000RPM
- Protection class: IP65

GEI-015

- Compact and lightweight
- Max/rate output: 15/6kW
- Weight/size: 4.6kg/5.1liter
- Air cooling
- Operation temp.: -30°C ~ +65°C
- Vector control: 6,000RPM
- Protection class: IP55

RFID/USN

LS Industrial Systems provides important RFID solutions for libraries as well as for the logistics, pharmaceutical, air transportation and leisure industries. In addition to those solutions, LS industrial Systems invests a great deal in state-of-the-art technology such as RTLS (Real Time Locating Systems), and sensor network technology to provide the top solutions that customers expect from us.

900MHz Handheld Readers

Neo Handheld RFID Readers

- Certified by Korea's Ministry of Information and Communication
- User friendly ergonomic design
- Communication options (WLAN, CDMA)

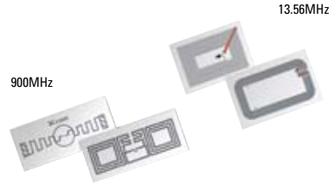
900MHz Stationary Readers & Antennas

Neo UHF Band RFID Stationary Readers & Antennas

- Certified by Korea's Ministry of Information and Communication
- Supports superior DRM (Dense Reader Mode) capability
- Easy to set up and support (remote support available)

13.56MHz Mid-Range Readers & Antennas

- Certified by Korea's Ministry of Information and Communication
- Supports multiple protocols
- Designed to fit in logistics industry working condition



Label Tag 13.56MHz

- Meets ISO15693 standard
- Competitive price and high quality

900MHz

- Meets EPC C1 Gen2 and ISO18000-6C standards
- Widely applicable inlay designs

Fuel Cells

Fuel cells are an eco-friendly product that companies are now embracing in response to global warming.
Fuel cells have a higher electrical efficiency than conventional power plants and lower than average harmful emissions, including carbon dioxide (CO_2). Fuel cells represent the best choice for the coming "hydrogen economic generation."

Combined Heats and Power Generations

- Office buildings and commercial buildings
- This system, which is applied to apartments, commercial buildings and industrial buildings to supply both electricity and heat energy simultaneously, is a high efficiency generation system.
- Capacity: 1 ~ 100KW

Back-up Power Systems

- Back-up Power System that supports facilities for telecommunications and broadcasting
- This is an optimum system for supplying back-up power to communication facilities on islands and mountains.
- Capacity: 10 ~ 200KW

Distribution Power Plants

- Large-size buildings and power plants
- This system produces high-quality electric power and heat energy.
- Capacity: 350kW ~ 10MW

Global Network

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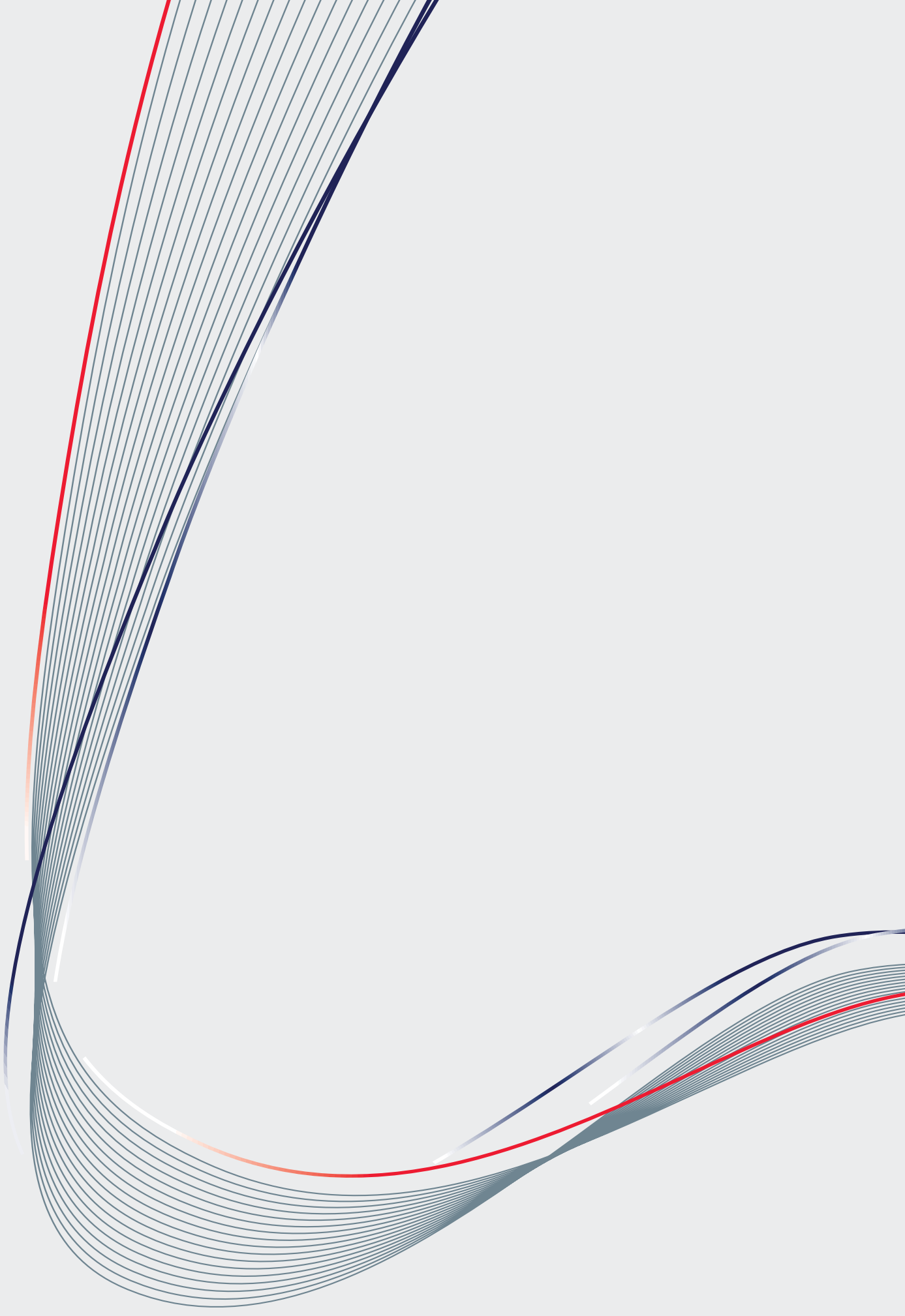
Innovators of Innovation

As innovators of innovation, LS Industrial Systems is profoundly
changing the world through constant innovation.



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