We are leaping to become a global leader in power IT solutions.

LSIS has provided a variety of power IT solutions for customers in the entire power system, from power generation, transmission, transformation, distribution and consumer applications.

GridSol is an integrated brand of LSIS’ Energy Grid Solution. This is a robust customer-oriented solution aimed at digital transformation by applying the latest ICT technology to the conservative industry electric power field.

GridSol is an architecture that enables efficient construction and operation of infrastructure facilities in various environments. It can save customers time and money from design to installation and commissioning. LSIS can quickly respond to the diverse needs of customers anywhere, anytime because we have a systematic service organization.
MicroGrid

A micro grid is a system that supplies power independently from an existing major power grid in a specific region. It has all of the components of the grid including distributed energy resources, energy storage systems, and consumer loads.

EMS

Utility EMS is the main system of the power supply system that performs functions such as monitoring and control of the power system, automatic power generation control, automated topology (power system analysis), information storage, and emergency power simulation training.

SCADA

SCADA is a system that monitors and controls the power facilities installed in the power system. It is a system that displays and highly reliable information through real-time acquisition of power data analysis, data trend analysis, and operation-oriented control.

DMS

DMS is a distribution automation operating system that remotely monitors and controls the operation status and manages the operation of power distribution facilities. It is a system that optimally manages the power distribution system by automatically classifying and processing faults, minimizing losses, restoring power failure intervals, and balancing loads.

GridSol xEMS

GridSol xEMS provides customized solutions for energy life cycle to customers such as factories, buildings, homes, etc., and through energy management systems offers customers various values such as energy saving, efficient operation, distributed energy storage, and emergency generator replacement.

LSIS

LSIS (LS Industrial Systems Co., Ltd.) is a high-end process product that started supplying boiler main control systems to Honam thermal power plant since 2013. LSIS is the only company in Korea that has R&D, production, commissioning and delivery performances.

LSIS’ advanced technology and solutions ensure stable power supply management throughout the whole power system.
Gridsol is a representative brand of LSIS' Energy Grid Solution.

By providing a systematic data circulation system for high-quality energy services, we provide optimal solutions for energy efficiency management.

It combines the latest ICT technology and domain knowledge in electric power field to provide optimal services such as demand prediction, energy demand management and energy cost analysis.

Renewable energy solutions such as ESS, Distributed Energy Resources and Micro Grid and energy management solutions such as energy demand monitoring, and cost analysis, contribute to customers' total energy saving.

Utility EMS is the core system of the power supply system that performs functions such as monitoring and control of the power system, automatic generation control, economic dispatch, power system analysis, information storage and emergency power simulation training.

The efficient operation/management of large-scale power system and economic dispatch system had been implemented in technology of LSIS.

SCADA: Supervisory Control And Data Acquisition
- Real-time data processing of over 200,000 points in the control area
- Provides commercial FORMAS based on international standard IEC61970
- Provides database and data synchronization function

GC: Generation Control
- Control of generator output to keep the grid frequency within the control area at the target frequency
- Control of generator output to keep connected power flow as target power flow

NA: Network Analysis
- Power system topology analysis and state estimation using real-time SCADA data
- Provides optimal flow calculation, outage study, fault analysis, transmission capacity and service interruption plan
- Provides real-time incident analysis data that can occur in current and future system operation

DTS: Dispatcher Training Simulator
- Provides recovery operation training function in case of system accident of EMS operation dispatcher
- Provides the same operation function and screen as EMS and perform power system simulation
Scada is a system that remotely monitors and controls the power facilities installed in the power system. It is a system for stable and highly reliable operation through real-time acquisition of power data analysis, data trend analysis and operator-oriented control.

Highly reliable monitoring and control system for stable power supply comes with accumulated know-how of LSIS

**User-oriented**
- GUI configuration of familiar Windows technologies and environments
- Support various applications such as power equipment diagnosis, power quality monitoring, facility protection, and substation automation.

**Standardization**
- Data access and presentation through the same interface
- Supports industry standards such as 3rd party ActiveX, Excel, and reports
- Operate a unified interface between operator and system
- Supports system integration engineering tool

**Intuitive analysis and operation**
- On-screen Help menu
- Visual system resource management for network, CPU and disk
- Support for trends by providing a variety of chart styles and grids
- Analysis of various intuitive information with Chart 3D

**Stable power system monitoring**
- Rapid recognition of accidents
- Reduced recovery time with immediate response
- Peak control, planned power use
### SCADA

Supervisory Control And Data Acquisition System

- Remote monitoring and control: Generator control, bus control, transformer control, power line protection, motor protection
- Preventive diagnosis analysis: Precise diagnosis of gas in liquid for specialized DB base

### PQMS

Power Quality Monitoring System

- PQ data acquisition and application: PQ data acquisition, real-time events, PQ event occurring trend analysis
- PQ analysis:
  - Sag / Swell analysis
  - ODEMA and other statistical analysis
  - On / Off Line power quality analysis

### PDPS

Power Equipment Diagnosis & Preventive System

- On-line monitoring diagnosis:
  - Indication of abnormality for each diagnosis category of TR and GIS for each Bay
  - GIS PD measurement and 2D / 3D analysis screen
  - Real time event and information screen indication
  - Real time communication condition
- Convenience of operator:
  - Monitoring screen editing
  - Communication device On-line setting
- Preventive diagnosis analysis:
  - Precise diagnosis of gas in liquid for specialized DB base

### SAS

Substation Automation System

- Automatic control:
  - Automatic interlocking, Synchronous check, balanced voltage regulation (Tap-changer control), transformer load balance control, Automatic power failure / return control, load shedding, automatic re-closing function, power factor control
- Facility protection:
  - Generator protection, bus protection, bay protection, transformer protection, power line protection, motor protection
- Data acquisition and application:
  - Remote data acquisition and decision, event alarm record, accident waveform capture
- Facility status monitoring:
  - GIS gal malfunction condition, circuit breaker condition, transformer condition

### ECMS

Electrical Equipment Control & Monitoring System

- Remote monitoring and control:
  - Operating status of circuit breakers / relays
  - Circuit breaker remote control
  - Multi level fluctuation control of the power generator
- IED analysis / correction:
  - Relay / Logic operational status
  - Relay remote setting
- Protective function (IED):
  - Power generator / bay and line / transformer / breaker / motor protection

### ECMS (Electrical Equipment Control & Monitoring System)

The ECMS (Electrical Equipment Control & Monitoring System) carries out generator operation, management and control by applying multi-functional integrated digital relay to the power-generating facilities and the power equipment within the power plants.

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### PQMS (Power Quality Monitoring System)

PQMS analyzes the primary causes of power quality decline and suggests solutions for this problem by gathering power quality information from the PQ meter installed in major power facilities and analyzing the information in real time. In particular, this is a useful system for production facility systems requiring a high quality of power:

- PQ data acquisition and application: PQ data acquisition, real-time events, PQ event occurring trend analysis
- PQ analysis:
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  - ODEMA and other statistical analysis
  - On / Off Line power quality analysis

### PDPS (Power Equipment Diagnosis and Preventive System)

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The Distribution Management System (DMS) performs prompt recovery of the distribution line automatically 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 DMS controls the Pad-mounted or over head switchgear and monitors its status at distance by communicating with the FRTU installed in the switchgear based on computer and communication technology.

Distribution management system that optimizes the distribution system is provided by LSIS with a leading technology.

**Visualization**
- GridSol Scada platform provides unified user interface
- Provides various operating screens (full disconnection diagram, automatic disconnection diagram, GIS disconnection diagram)
- Apply familiar configurations including toolbar, tree view, and data view

**Connectivity**
- Easy linked with G-Builder, a SCADA drawing tool
- Simple DB access and utilization by constructing distribution system DB
- Easy to connect external system according to international standard

**Application**
- network connectivity processor(NCP)
- distribution fault section(DFS)
- Distribution Service Restoration(DSR)
- Short Circuit Analysis(SCA)
- Distribution Network Re-configuration(DNR)
- real-time power flow(RPF)
- Voltage-Var Optimization(VVO)
- Distribution Load Pattern(DLP)
GridSol xEMS provides customized solutions for energy generation, storage and consumption to customers such as FEMS, BEMS and HEMS, also provide various customer values such as energy saving, efficient operation, demand management, and replacement of emergency generator.

In order to provide customized solutions and various customer values, LSIS will be closer to you

- **Energy monitoring**
  - Visualization of usage by heat source, grid, space, and facility
  - Trend/forecast/cumulative graph
  - Equipment information management
  - Comparison of energy utilization status by time and space

- **Energy management**
  - Ability to set power and energy usage targets by energy source
  - Alarm setting and history searching when energy usage is exceeded
  - Load control heat source control function
  - Peak control
  - Economic operation of ESS
  - Diagnosis and maintenance support function of major facilities for renewable energy sources

- **Energy analysis**
  - Facility operation cycle diagnosis and analysis
  - Ability to predict the generation of renewable energy sources
  - Energy usage prediction
  - Energy-optimized operation based on weather information, previous year usage, and energy use requirement
The Master P-5000 is a DCS system optimized for the most high-level process industries such as power plants, steel, chemicals, and water treatment. LSIS has carried out many projects with its own development, design, production and commissioning know-how.

**Distributed Control System (DCS)**

- **High Performance**
  - Application of product structure for high-speed control, such as turbine control
  - Supports HART communication which is widely-used for plant monitoring and control
- **Convenient Operation**
  - Based on the latest Windows operating system
  - Supports international standard (IEC61131-3) control language: FBD, LD, SFC
- **High Reliability**
  - Fully redundant system
  - Fail-safe function
  - RCS self-diagnosis function
- **Easy Maintenance**
  - Hot swap of system
  - SMS Service
  - Online diagnosis
- **LSIS’ control technology for high difficulty process**
  will be recognized as many delivery results.

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<tr>
<th>Year</th>
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1989 Korea’s first pure domestic DCS launch

**Main control system**

- Main control system for Honam Power Plant Boiler #2 (701)
- Main control system for Honam Power Plant Boiler #1 (702)
- Main control system for Punggyeol Power Plant Boiler #1-4 (704)
- Integrated main control system for Busan Combined Cycle Power Plant’s Boiler and Turbine (712)
- Main control system for Bucheon Combined Cycle Power Plant (712)

**Reference**

- Power plant boiler main control system algorithm
- Power plant integrated (boiler + turbine) main control system algorithm

1989-2008: LSIS’ control technology for high difficulty process will be recognized as many delivery results.
The Micro Grid is a system that supplies power to a specific region independently from an existing grid, and it has all of the components of the grid, including distributed energy resources, energy storage system, consumer loads and Energy Management System.

MicroGrid

LSIS will lead the micro grid, a new paradigm of the power grid.

Multi-MG operating system with single/MG power flexibility and integrated peak management. Single-MG energy management system with including uninterruptible power, generation / load prediction, peak management, distributed power management. It is economical operation and efficient operation control solution of distributed energy resource of single MG.

Economics
Reduce energy costs and reduce transmission and distribution costs by linking distributed and energy storage to high-power locations. In the case of on-grid type Microgrid, you can participate in the DR business at the request of the utility company to earn additional revenue.

Environment
By utilizing renewable and dispersed power sources such as solar power, wind power, and geothermal power, we can reduce greenhouse gas emissions and protect the environment.

Reliability and Power Quality
For the critical load can continue to provide uninterrupted power capability and uniform quality.
LSIS is proving its competitive edge through various products developed and produced based on technology of electric power supply in both domestic market and overseas market. LSIS is a leader of the electric power and automation industry. Through ongoing innovation, LSIS strives for top quality and groundbreaking products, so that it can become the global leader the world of tomorrow requires.

### SCADA Delivery performance

- **2016** LG Chem Poland factory SCADA
- **2016** Kuwait Causeway main link SCADA
- **2016** Samsung Electro-Mechanics integrated power and utility monitoring system
- **2016** Ghana Kumasi 330kV SCADA
- **2016** LG Chemical Nanjing SCADA
- **2015** KARABATAN CPP PJT SCADA
- **2015** Incheon International Airport Terminal 2 Power Control System
- **2015** LGD Guangzhou 120K SCADA
- **2014** Honam High Speed Rail Integrated SCADA Project
- **2013** Jordan EDCO SCADA

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### DCS, EMS, DMS, xEMS, MG Delivery performance

- **2017** Honam thermal power boiler denitrification/desulfurization facility main control system
- **2016** Seogoeocha-do DC-based island micro grid construction
- **2015** Nigeria Gas Turbine Control System
- **2015** Iraq 108NT (Bismillah)-DMS
- **2014** Hoa Khanh Tay Water Supply Project
- **2014** Dangjin Thermal Power Units 1 ~ 4 Desulfurization main control system
- **2013** Ilsan Cogeneration 2 Power generation S / T main control system

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### Outline

**Ilsan Cogeneration 2 Power generation S / T main control system (2013)**

**Features**

- Control of HRSG boiler, control of 300MW steam turbine, auxiliary facility and integrated monitoring system

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**KRX power grid operation system (2011 ~ 2014)**

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**Ilsan Cogeneration 2 Power generation S / T main control system (2013)**

**Outline**

- Power plant monitoring, remote meter reading, preventive diagnosis system, exterior and lighting control system, CCTV system interface, integrated information system, distribution automation system construction
Global Management

LSIS is engaged in business all over the world. LSIS global network includes 7 overseas corporations, 12 overseas branches, and 224 clients in 77 countries.