



SANION

POWER AUTOMATION SOLUTION



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sanion



Power System IT Solutions

SANION is a premier "Protection and Automation Power System Supplier" specializing in IEDs and digital power systems. We offer specialized solutions for a wide range of voltage grids, fully integrated with IEC 61850 Substation Automation standards.

With our status as a KEPCO Trusted Partner and NEP certification, our technology ensures the highest reliability and safety for global energy infrastructure. SANION is dedicated to driving the evolution of Smart Grids through continuous R&D and innovative power IT solutions.



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About Company

Since its establishment in August 1997, SANION has evolved into a leading specialist in the field of digital power equipment and automation. We focus on delivering comprehensive power automation solutions by integrating IEDs with advanced HMI systems and specialized software. Our technical expertise ensures high-performance protection, control, and monitoring for critical power infrastructure of a wide range of voltage levels. As a "Protection and Automation System Supplier," we prioritize creative engineering and digital innovation to optimize energy reliability and system efficiency.

Our portfolio includes sophisticated protection panels for transmission lines, transformers, and busbars, supported by a proven track record of long-term supply to South Korea's national utility, KEPCO, and major private industrial sectors such as POSCO. With NEP (New Excellent Product) and INNO-BIZ certifications, and recognized as a KEPCO Trusted Partner, SANION has established unmatched credibility through years of stable operation in both public and private industrial plants. We remain a steadfast partner, providing top-quality digital solutions that enhance the safety and reliability of global power grids.



CEO Message

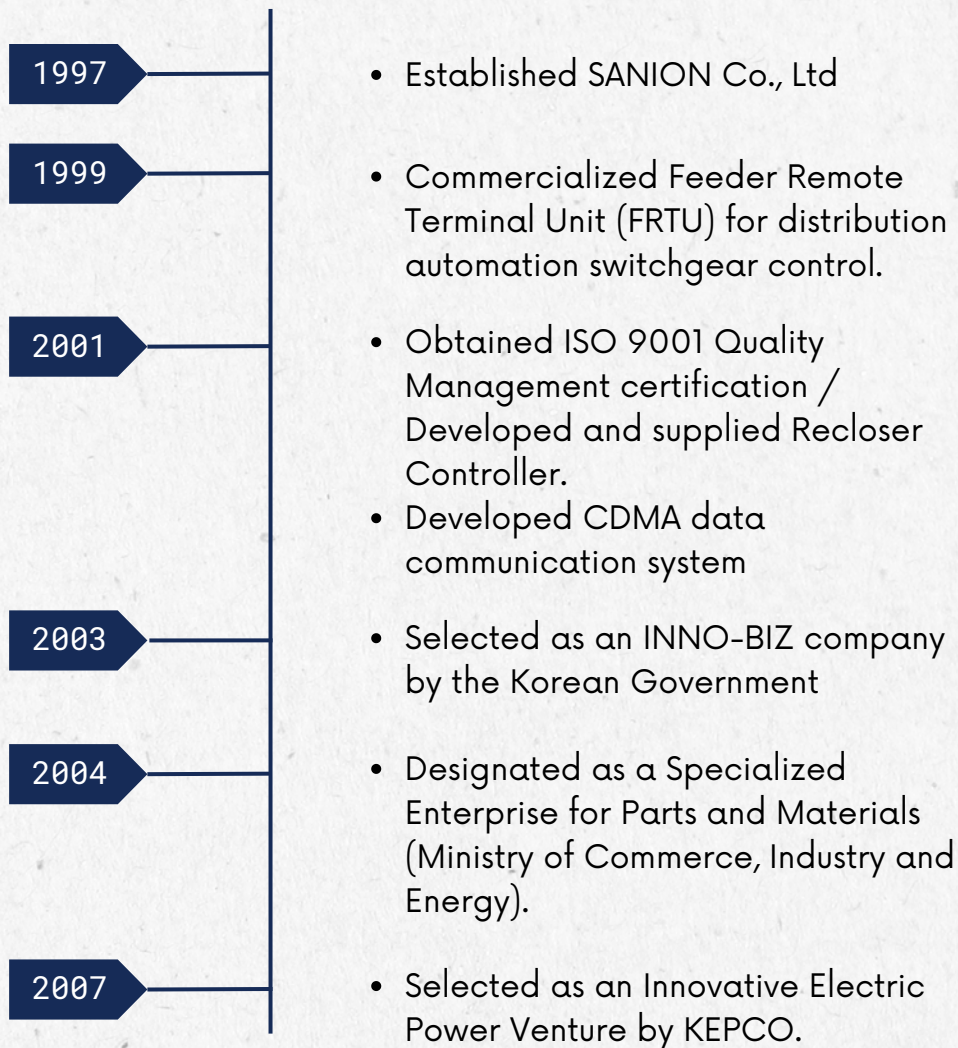
Electrical energy is the fundamental foundation of our future, and its reliability remains our most critical mission. SANION is moving beyond traditional boundaries to become a leading provider of intelligent energy systems and advanced services. By concentrating our investments on the intelligence of power grids, we provide next-generation power automation solutions driven by high-performance IEDs, HMI systems, and integrated software.



Dong Ryul Lee

Our future vision is to establish SANION as a premier global brand that redefines flexibility and efficiency of power systems. We are committed to continuous technological innovation to ensure that our digital solutions offer unmatched precision and convenience for the evolving energy landscape. Through a relentless pursuit of technical excellence, we will lead the way in creating a more connected and intelligent power infrastructure for the world.

Company History



2012

- Registered as a qualified supplier for 154kV transmission line protection/IED panels and completed the initial delivery.

2013

- Obtained NEP certification for 154kV transmission line protection switchgear and IED panels.
- Registered as a qualified supplier to KEPCO for 3 types of 154kV transformer IEDs and 2 types of 170kV GIS IEDs.
- Registered as a qualified supplier to KEPCO for 154kV transformer protection switchgear.

2016

- Registered as a qualified supplier to KEPCO for 345kV transmission line protection switchgear.
- Registered as a qualified supplier to KEPCO for 345kV breaker failure protection panels.

2017

- Registered as a qualified supplier to KEPCO for 154kV busbar protection panels.
- Registered as a qualified supplier to KEPCO for four types of 23kV BCUs (Bay Control Units).

2018

- Registered as a qualified supplier to KEPCO for two types of Digital Fault Recorders (DFR).
- Supplied 154/22/6.6 kV IEDs and BCUs for the POSCO Gwangyang Steelworks Substation Automation project.
- Registered as a qualified supplier to KEPCO for 345kV busbar protection panels.

2019

- Conducted a pilot project for the EVN-SPC 110kV Lai Hung Substation, Vietnam.
- Registered as a qualified supplier to KEPCO for 154kV SA (Substation Automation) operating systems.

2020

- Obtained New Excellent Product (NEP) certification for 154kV busbar protection panel.

2021

- Supplied 22.9kV protective relays for the Angang Auxiliary Feed Sectioning Post Korea National Railway (Donghae Line, Ulsan-Pohang section).
- Supplied protective relays for the new railway power facilities of the Seohae Line double-track railway to Korea National Railway.
- Registered as a qualified supplier to KEPCO for 154kV SA (Substation Automation) hybrid operating systems.

2022

- Supplied 154/22/6.6 kV protection and control systems for the POSCO Gwangyang Steelworks Hae-an Substation Automation project.

2023

- Successfully completed the R&D project: "Development of a Universal-type IED for 765kV Transmission Line Protection."

2024

- Developed and supplied 154kV multi-functional protection panels.

2025

- Supplied IEDs for the 170kV GIS Improvement Project at Substations A and B to Incheon International Airport.



Our Products

Digital Substation Operating System

Transmission Line Protection IED

Busbar Protection IED

Transformer Protection IED

Fault Recorder

Bay Controller

Multifunction Relay

Smart IED



Digital Substation Operating System

Our Digital Substation Operating System is a high-performance HMI (Human Machine Interface) designed for IEC 61850-based Substation Automation (SA). It provides operators with a comprehensive view of real-time operational data, equipment status, and diagnostic insights to ensure seamless power system management.

- **Integrated Control:** Utilizes IEC 61850 to communicate with IEDs, collecting critical equipment data and executing precise control commands.
- **Seamless Connectivity:** Bridges the gap between IEDs, RTUs, and SCADA systems using both IEC 61850 and DNP protocols for superior interoperability.
- **Advanced Diagnostics:** Offers real-time data logging and analysis, providing essential communication history for rapid troubleshooting and failure analysis.

System Operation & Communication

- HMI Main: Provides real-time monitoring of device status and system events.
- IEC 61850 Client:
 - Manages connections to Intelligent Electronic Devices (IEDs).
 - Handles data collection and management for IEDs based on the IEC 61850 standard.
- DNP Master:
 - Manages connections to Remote Terminal Units (RTUs).
 - Collects data and provides control capabilities for RTUs using the DNP protocol.

Configuration & Engineering Tools

- Engineering Tool:
 - Used to configure the properties and attributes of symbols displayed on the HMI.
 - Saves all configuration history and settings into a database.
- Single Line Diagram Editor:
 - Allows users to add or delete symbols within the HMI single-line diagrams.
 - Provides functionality to edit symbol properties and save updated layout files.

Data Monitoring & Analysis

- Real-time Monitoring & Measurement: Enables real-time tracking of data coming directly from IEDs and RTUs.
- Analog Trend:
 - Displays analog data measured from field devices (IED/RTU) in a real-time graph format.
 - Includes a history search function to review past data trends.
- Event Search:
 - Displays a log of events that have occurred within the IEDs or RTUs.
 - Includes a history search function to track and analyze past system events.



Transmission Line Protection IED

Transmission lines are one of the power system facilities used to transport electricity generated by power plants to consumers. They primarily serve to connect substations to one another. Due to their nature, these lines often span tens of kilometers and are mostly exposed to the natural environment. Consequently, they are highly susceptible to failures caused by natural factors such as wind, rain, and lightning, leading to a much higher fault frequency compared to other power equipment.

Due to their critical impact on grid stability, these lines require reliable protection systems that provide primary protection for designated sections and backup protection for subsequent segments.

SLP Series

The SLP series is designed to protect and control transmission lines by integrating advanced differential and distance protection algorithms. While all models share a common 7-inch color graphic LCD and high-speed communication capabilities, they are optimized for different line configurations and signal requirements.

All models in the SLP series utilize a standardized hardware platform to ensure consistency in maintenance and operation:

- Human-Machine Interface (HMI): 7-inch TFT color graphic LCD (800 X480 resolution) with a touchscreen and 32 customizable LED indicators.
- Power Supply: Supports a wide DC range (90V ~ 140V).
- Time Synchronization: Supports IRIG-B and SNTP for precise event tagging across the grid.
- Communication: Dual-redundant Ethernet ports supporting IEC 61850 and TCP/IP for modern digital substation integration.

Features

Description	SLP-K140	SLP-K310	SLP-K310-P01
Primary Application	Standard 2-terminal T/L Protection	1.5CB 2-terminal T/L Protection	2-terminal & 3-terminal T/L Protection
Protection	87+21	87 or 21	87+67
CT / PT Inputs	4 CT / 5 PT	8 CT / 5 PT	8 CT / 3 PT
Digital I/O (DI/DO)	36 Inputs / 32 Outputs	24 Inputs / 48 Outputs	36 Inputs / 32 Outputs
Communication	IEC 61850, TCP/IP	IEC 61850, TCP/IP	IEC 61850, TCP/IP
Special Features			8-ch 4~20mA Inputs

SLP-K140: The Standard Protection Solution

The SLP-K140 is the baseline model for 154kV and other standard transmission line panels.

- **Dual Protection:** Integrates both Current Differential (87 & 87G) and Phase/Ground Distance (21S & 21G) elements.
- **Comprehensive Monitoring:** Measures V, A, Hz, Power (W, var, VA), and sequence components.
- **Event Logging:** Stores up to 10,000 events and 40 fault waveforms in COMTRADE format.

SLP-K310: 1.5CB T/L Protection Solution

The SLP-K310 is designed to provide current differential protection or distance protection for T/L with 1.5CB configuration.

- **Expanded Current Inputs:** SLP-K310 provides 8 CT channels, allowing for more flexible current measurement and differential protection configurations.
- **Enhanced Control:** Offers the highest density of digital outputs (48 points), making it ideal for substations with numerous switching devices.

SLP-K310-P01: High-Density and Multi-Terminal Protection

This model is designed for complex substation environments requiring more analog inputs or specialized monitoring.

- **Dual Protection:** Integrates both Current Differential (87 & 87G) and Phase/Ground Direction Overcurrent (67 & 67G) elements.
- **Expanded Current Inputs:** SLP-K310-P01 feature 8 CT channels, allowing for more flexible current measurement and differential protection configurations.
- **Multi-Terminal Support (K310-P01):** Specifically supports 3-terminal Tie Line protection and includes 8 channels of 4~20mA analog inputs for integrating external sensors (e.g., temperature or pressure).



Busbar Protection IED

Busbars are critical substation components that centralize and redistribute power from multiple transmission lines and transformer banks. Due to the risk of high fault currents causing cascading failures across an entire substation, reliable configurations like the Double Bus or the 1.5 Circuit Breaker (1.5CB) scheme are preferred for their superior reliability and maintainability.

Low-impedance busbar protection system utilize high-speed current differential protection to accurately isolate faults within double bus structures. This protection logic is divided into "Individual Zone Protection (Zone 1 or Zone 2)" and a system-wide "Check Zone Protection" where a final trip is only initiated when both protections simultaneously detect a fault to ensure maximum stability.

SBP Series

The SBP series provides a distributed architecture for busbar protection, consisting of a Central Unit (CU) that performs main protection functions and multiple Bay Units (BU) that interface with individual circuits. This system is specifically optimized for high-speed, reliable protection in double-busbar configurations.

In a typical 154kV substation, these units work together to ensure maximum stability. The BUs provide the raw data and physical trip execution, while the CU accurately determines the faulted busbar. A final trip is only initiated when both the Individual Zone Protection and the overall Check Zone Protection coincide, preventing unnecessary power outages.

Features

Description	SBP-K110-CU (Central Unit)	SBP-K110-BU (Bay Unit)
Primary Application	Main Decision Maker / Hub	Data Acquisition / Tripping
Protection Functions	87B, 50BF, UV/UVS/UVD	BFI Monitoring, Local Measurement
CT / PT Inputs	6 PT	8 CT (for 2 circuits)
Digital I/O (DI/DO)	24 Inputs / 24 Outputs	24 Inputs / 14 Outputs
Communication	IEC 61850, TCP/IP, 1Gbps Fiber (16-ch)	1Gbps Fiber-Optic (1-ch)
User Interface	7" Color Graphic LCD with Touch Screen and customizable LED indicators	3 LED Indicators

SBP-K110-CU: Central Management Unit

The CU serves as the processing hub that monitors the entire busbar system and makes the final tripping decisions.

- **Large-Scale Management:** Manages complex bus structures by integrating data from up to 32 circuits, including Bus Ties and Feeders.
- **Advanced Protection Elements:** Performs Phase Differential (87B), Breaker Failure (50BF), and Under-voltage (UV/UVS/UVD) detection.
- **Logic Reliability:** Implements "Check Zone" logic, which cross-verifies fault detection across the entire bus to prevent accidental trips.
- **Self-Compensation:** Features automatic CT ratio compensation and continuous self-monitoring of internal system health.

SBP-K110-BU: Distributed Bay Unit

The BU is the interface unit installed at each circuit bay, acting as the primary point for data acquisition and trip execution.

- **Two Feeders Monitoring:** A single BU can measure currents and monitor the status of Circuit Breakers (CB) and Disconnectors (DS) for up to 2 feeders.
- **High-Precision Measurement:** Ensures current measurement accuracy of $\pm 0.5\%$ within a range of 10% to 200% of the rated current.
- **Rapid Execution:** Receives high-speed trip commands from the CU via fiber-optics and executes immediate breaker opening to isolate faults.
- **Status Monitoring:** Constantly monitors Breaker Failure Initiation (BFI) information and reports circuit status back to the CU.



Transformer Protection IED

Power transformers are critical assets that determine the efficiency and stability of power transmission by stepping voltage up for long-distance transport and stepping it down for consumer delivery. Due to their high cost and the significant time and expense required for repairs, they require high-speed, reliable protection systems to prevent catastrophic failures.

Primary protection for transformers utilizes current ratio differential protection, which operates on the principle that the power capacity remains balanced between the primary and secondary windings under normal conditions. For backup protection, overcurrent functions are applied to both sides of the transformer, while specialized ground overvoltage protection is used to safeguard the Neutral Grounding Reactor (NGR) applied to the secondary side of transformer.

STP Series

The STP series is a high-performance protection solution specifically engineered for 2-winding transformers. These IEDs ensure grid stability by integrating high-speed phase current differential (87HOC) and phase current ratio differential (87R) protection. To maximize reliability, this series features advanced magnetizing inrush current detection, which utilizes 2nd harmonic restraint logic to accurately distinguish between internal faults and normal transformer energization, thereby preventing nuisance trips.

All models in the STP series utilize a standardized hardware platform to ensure consistency in maintenance and operation:

- Human-Machine Interface (HMI): Features a 7-inch color graphic touch LCD (800 X 480 resolution) for intuitive real-time monitoring.
- Power Supply: Supports a wide DC range (90V ~ 140V).
- Time Synchronization: Supports IRIG-B and SNTP for precise event tagging across the grid.
- Communication: Fully supports the IEC 61850 communication standard.

Features

Description	STP-K110	STP-K120	STP-K130
Primary Application	2-Winding Transformer Protection (Current Focused)	2-Winding Transformer Protection with Voltage Monitoring	2-Winding Transformer Protection with Voltage and ZCT Monitoring
Protection Functions	87R, 87HOC, 50/51, 50/51G	Same as STP-K110 + 59 (Overvoltage), 59G (Ground Overvoltage)	Same as STP-K120 + 59G Trip Permission
CT / PT Inputs	10 CT (5-ch Pri / 5-ch Sec)	8 CT (4-ch Pri / 4-ch Sec) & 4 PT	8 CT (4-ch Pri / 4-ch Sec) & 4 PT & 1 ZCT
Digital I/O (DI/DO)	36 Inputs / 20 Outputs	24 Inputs / 28 Outputs	24 Inputs / 28 Outputs
Communication	IEC 61850, TCP/IP, USB, RS-232, Fiber	IEC 61850, TCP/IP, RS-232, Fiber	IEC 61850, TCP/IP, RS-232, Fiber

STP-K110: Focused Current Protection

The STP-K110 is optimized for environments where extensive current-based protection is the priority.

- **Enhanced Current Monitoring:** With 10 CT channels, it provides comprehensive current sets for both primary and secondary windings (5 channels each).
- **Stability Features:** Uses magnetizing inrush current detection (based on 2nd harmonic components) to prevent accidental trips during transformer energization.
- **High-Density Inputs:** Features 36 digital inputs, making it ideal for monitoring a high number of auxiliary contacts and statuses.

STP-K120: Integrated Voltage & Current Protection

The STP-K120 adds voltage-based protection elements, making it a more versatile unit for complete transformer protection.

- **Voltage Protection:** Unlike STP-K110, this model includes 4 PT channels to support Overvoltage (59) and Ground Overvoltage (59G) protection.
- **Flexible Control:** With 28 digital outputs, it offers more control points for switching devices compared to STP-K110.
- **Measurement Accuracy:** Provides high-precision measurement for both current and voltage elements required for detailed fault analysis.

STP-K130: Enhanced Voltage Protection

The STP-K130 offers enhanced voltage protection features compared to the STP-K120.

- **59G Trip Permission :** the device features built-in logic that permits 59G trip only when the ZCT input current is either above the ground fault detection level or below the NGR disconnection detection level.



Fault Recorder

Power plants and substations experience a vast number of events, ranging from routine equipment operations to high-speed circuit breaker actions triggered by protection devices during electrical faults. Accurate analysis of these diverse events is essential for ensuring the stable and reliable operation of the power system, as it provides the critical data needed for post-event investigation and the implementation of effective measures to prevent future accidents.

Fault recording systems monitor power system oscillations and acquire comprehensive fault information by recording wide-ranging data such as voltage, current, frequency, and power, as well as the operational status of key equipment like circuit breakers. By providing integrated functions to record, store, and analyze grid data from both before and after an event occurs, these systems empower operators to maintain grid integrity and achieve highly reliable system management.

SPR Series

The SPR series is a dedicated fault recording solution designed to provide a high-resolution window into power system behavior during critical events. Unlike standard protection IEDs, the SPR series is optimized for extensive data capture, allowing it to monitor complex power system oscillations and acquire comprehensive grid data from both before and after a fault occurs. This high-fidelity recording capability is essential for post-event investigation, enabling operators to verify the correct sequencing of protection devices and implement measures to prevent future system failures.

- **High-Resolution Monitoring:** Utilizes a high sampling frequency of 7680Hz to deliver high-precision measurement data necessary for detailed fault analysis.
- **Advanced Trigger Logic:** Features versatile trigger modes, including level and rate-of-change triggers for voltage, current, frequency, and power, as well as digital input and manual/automatic initiation.
- **Synchro-phasor Integration:** Supports the IEEE C37.118 standard for synchro-phasor transmission, allowing it to function as a vital component in Wide Area Monitoring Systems (WAMS).
- **Massive Signal Capacity:** Simultaneously monitors 48 analog channels (12 Voltage, 36 Current) and 96 digital channels to provide a complete overview of substation facility status.
- **Standardized Data Storage:** Automatically stores recorded events and waveforms in the industry-standard IEEE C37.111 COMTRADE format for seamless integration with analysis software.

SPR-K010: High-Performance Fault Recorder

The SPR-K010 is the flagship model designed for comprehensive substation and power plant monitoring.

- **Visualization Hub:** Equipped with a large 10.4-inch color TFT-LCD (1024 X 768 resolution) that provides clear, real-time visualization of measured data and captured waveforms.
- **Continuous Supervision:** Features an automatic self-monitoring function to ensure the device is always ready to capture unpredictable grid events.
- **Precision Timing:** Uses PTP or IRIG-B time synchronization to ensure that every recorded event is accurately timestamped across the entire power grid.
- **Synchro-phasor Integration:** Supports the IEEE C37.118 standard for synchro-phasor transmission up to 120 times/sec.

Description	SPR-K010
Ratings	115V/ $\sqrt{3}$, 5A
CT / PT Inputs	36 CT / 12 PT
Digital I/O (DI/DO)	96 Inputs / 8 Outputs
Sampling Frequency	7680Hz
Communication	IEC 61850, IEEE C37.118, TCP/IP
Display	10.4-inch Color TFT-LCD (1024 X 768)
Time Sync	IRIG-B, PTP



Bay Controller

The Bay Controller is a fundamental automation and monitoring unit designed to manage the switching devices within an individual substation bay. It acts as a primary control interface for operators, ensuring that critical commands for opening or closing circuit breakers and disconnectors are executed reliably according to pre-defined scheme.

This system is essential for maintaining substation safety because it integrates advanced control logic with real-time interlocking functions to prevent dangerous human errors or incorrect operational sequences. It further enhances the reliability of the power network by supporting modern digital communication standards like IEC 61850 and providing precise time-stamping for all events across the grid.

SOC Series

The SOC series is a high-performance Intelligent Electronic Device (IED) designed for the control of Gas Insulated Switchgear (GIS) in Transmission Line, Transformer, Bus Tie, and Bus Section bays. It further ensures the safety and reliability of power infrastructure through integrated over-current protection, which precisely detects and isolates faults.

- **Protection Functions:** This device performs both instantaneous and time-delay over-current protection for phase and ground faults while supporting various standard and user-defined inverse time curves. It also performs load unbalance detection through zero-sequence current monitoring and includes supervision for Current Transformer and Potential Transformer failures.
- **Hardware Interface:** The unit is equipped with 5 Potential Transformer inputs, 4 Current Transformer inputs, 64 digital inputs and 28 digital outputs.
- **Core System Features:** It supports single-line diagram editing through PC S/W and provides control and interlock functions for switching devices. The system allows for flexible configuration of trip and control logic and stores fault, monitoring, and alarm events with a high resolution of 1ms.
- **Monitoring and Precision:** It saves fault waveforms in the IEEE C37.111 COMTRADE format and provides periodic automatic self-monitoring functions. Additionally, it offers high-precision measurement capabilities at a level of class 1.0 or better.

SUF Series

The SUF series is an Intelligent Electronic Device that performs under-frequency and under-voltage protection to maintain electrical grid stability. It is specifically designed for Gas Insulated Switchgear Potential Transformer and Earthing Switch bays to monitor frequency and voltage.

- **Protection Functions:** This device performs eight-stage under-frequency protection as well as over-voltage and ground over-voltage functions. It achieves high-precision frequency measurement with an accuracy of 5mHz and a rapid response time of one-half cycle.
- **Hardware Interface:** The hardware is equipped with 6 Potential Transformer inputs, 64 digital inputs, and 28 digital outputs.
- **Core System Features:** Like other models in the series, it supports single-line diagram editing via PC S/W and provides advanced control and interlock functions for switching devices. Users can configure complex trip and control logic tailored to grid stability requirements.
- **Monitoring and Precision:** The device records events with 1ms resolution and exports fault waveforms in IEEE C37.111 COMTRADE format. It performs continuous automatic self-diagnosis and provides high-precision measurements of class 1.0 or better.

SUR Series

The SUR Series is an Intelligent Electronic Device that performs over current, directional overcurrent, overvoltage and undervoltage protection and auto-reclosing for Distribution Line bays within Gas Insulated Switchgear systems. These devices are designed to provide integrated protection, measurement, control, and monitoring for the power infrastructure.

- **Protection Functions:** This device performs overcurrent, directional overcurrent, overvoltage, or undervoltage protection for phase and ground faults while supporting various standard and user-defined inverse time curves. It also performs 4-shot auto-reclosing function for instantaneous line faults.
- **Hardware Interface:** The unit is equipped with 6 Potential Transformer inputs, 2 GPT inputs, 4 Current Transformer inputs, 24 digital inputs and 16 digital outputs.
- **Core System Features:** It supports single-line diagram editing through PC S/W and provides control and interlock functions for switching devices. The system allows for flexible configuration of trip and control logic and stores fault, monitoring, and alarm events with a high resolution of 1ms.
- **Monitoring and Precision:** It saves fault waveforms in the IEEE C37.111 COMTRADE format and provides periodic automatic self-monitoring functions. Additionally, it offers high-precision measurement capabilities at a level of class 1.0 or better.

STC Series

The STC series is an Intelligent Electronic Device that performs transformer control and monitoring functions to manage the health and operation of power transformers. It integrates voltage regulation and cooling management into a single platform.

- **Primary Function:** This device performs comprehensive control, monitoring, and interlocking specifically for power transformers.
- **Control Features:** It performs automatic and manual On-Load Tap Changer regulation using sliding block logic for stable voltage control. The system performs automated cooling control for fans and pumps to optimize the operating temperature of the transformer. It performs mechanical relay monitoring and provides lockout outputs for physical protection.
- **Hardware Interface:** The device utilizes 10 analog input channels and 12 dedicated Resistance Temperature Detector channels for temperature sensing. It performs data exchange via IEC 61850 and TCP/IP protocols through fiber optic and serial interfaces.
- **Advanced System Capabilities:** The unit performs single-line diagram editing through PC S/W and performs control and interlock functions for switching devices. It performs trip and control logic configuration for complex transformer schemes. It performs event storage with one millisecond resolution and performs fault waveform recording in the COMTRADE format. The IED performs periodic automatic self-monitoring and performs measurements with high precision at class 1.0 or better.

Features

Description	SOC-K110	SUF-K110	SUR-K220	STC-K120
Primary Application	Control of GIS for Transmission Line, Transformer, Bus Tie and Bus Section bay	Underfrequency protection to maintain grid stability	Protection and Control of Distribution Feeder	Power transformer control
Protection Functions	50/51, 50N/51N	81U/O	50/51, 50N/51N, 51G, 67, 67N, 79, 25, 59, 64, 27, 46	86T lockout logic
CT / PT Inputs	4 CT / 5 PT	6 PT	4 CT / 6 PT / 2 GPT	4 CT / 5 PT
Digital I/O (DI/DO)	64 Inputs / 28 Outputs	64 Inputs / 28 Outputs	24 Inputs / 16 Outputs	48 Inputs / 28 Outputs
Communi-cation	IEC 61850, TCP/IP, USB, RS-232, Fiber	IEC 61850, TCP/IP, RS-232, Fiber	IEC 61850, TCP/IP, RS-232, Fiber	IEC 61850, TCP/IP, RS-232, Fiber

SOC-K110: Bay Control IED with Overcurrent Protection

The SOC-K110 is optimized for Gas Insulated Switchgear (GIS) control, featuring integrated overcurrent protection to detect and isolate faults within critical high-voltage bays.

- It is primarily applied to Transmission Line (T/L), Transformer (T/R), Bus Tie (B/T), and Bus Section (B/S) bays within GIS systems.
- This device performs over-current (50/51) and ground over-current (50N/51N) protection for both phase and ground fault detection.
- The hardware utilizes ten Current Transformer (CT) inputs, consisting of five primary channels and five secondary channels.
- It performs load unbalance (46) detection through zero-sequence current monitoring.
- The unit performs continuous supervision for Current Transformer (CT) and Potential Transformer (PT) failures to ensure measurement reliability.

SUF-K110: Frequency & Undervoltage Protection IED

The SUF-K110 is designed for high-precision grid stability management through frequency protection.

- This device performs 8-stage frequency protection, which includes four dedicated stages for over-frequency and four stages for under-frequency.
- It provides high-precision frequency measurement with a specialized accuracy of plus or minus 5mHz.
- The device performs frequency measurement with a rapid response time of one-half cycle.
- It performs individual phase or bus under-voltage (27) protection with both instantaneous and definite time characteristics.
- The hardware features 6 Potential Transformer (PT) inputs covering voltages from double busbar.
- It supports a specialized automatic bus selection function for accurate frequency detection.

SUR-K220: Bay Control IED with Multifunction Protection

The SUR-K220 is an expanded, high-capacity IED designed for systems that require extensive I/O points for complex interlocking and control.

- **Protection Functions:** Provides overcurrent, directional overcurrent, overvoltage, undervoltage protection and auto-reclosing functions.
- **Expanded I/O:** Features high-density connectivity with 24 Digital Inputs (DI) and 16 Digital Outputs (DO).
- **Enhanced Visibility:** Includes 16 customizable LEDs to provide more detailed status reporting for multiple switching devices.
- **High-Capacity Storage:** Capable of storing an expanded log of up to 20,000 events with 1ms resolution.
- **Measurement Accuracy:** Ensures grid stability with precision measurement of voltage and current at 0.5%.
- **System Integrity:** Offers periodic automatic self-monitoring and simulation functions for DO output and fault testing.

STC-K120: Control IED for Transformer

The STC-K120 integrates automated control logic and environmental monitoring specifically for power transformer management.

- This device performs intelligent On-Load Tap Changer (OLTC) regulation using automatic Raise/Lower commands and sliding block logic.
- The hardware features the highest density of sensor inputs in the series, with 12 Resistance Temperature Detector (RTD) channels supporting sensors such as PT100 and Ni120.
- The system performs a lockout trip (86T) logic for transformer mechanical protection (96P/D/B/T).
- It manages transformer cooling systems by performing automated fan and pump control based on thermal data.



Multifunction Relay

Modern multifunction relays, or IEDs, consolidate diverse protection, control, and monitoring functions into a single hardware platform to manage power facilities such as feeders and motors. Unlike traditional relays limited to one task like overcurrent or undervoltage protection, these units simultaneously handle multiple protection elements to provide comprehensive system coverage.

These systems enhance grid reliability by integrating real-time interlocking logic with precise measurement and IEC 61850 communication standards. Our devices provide essential diagnostic data through 1ms resolution event logging and COMTRADE fault waveform storage, ensuring efficient operation of power facilities and rapid fault analysis.

SUR Series

The SUR Series represents a next-generation lineup of Universal Protective IEDs and Bay Controllers. These devices are designed to provide integrated protection, measurement, control, and monitoring for power distribution systems and facilities.

Key highlights of the series include:

- **Intuitive Interface:** Equipped with a 7-inch high-resolution color touch LCD for easy on-site operation.
- **Advanced Communication:** With full support for IEC 61850 (excluding certain models), Modbus RTU/TCP, and RS-232C, our solutions are ideal for Smart Grid power facilities.
- **Precision & Reliability:** Offers high-accuracy measurement (0.5%) and a 1ms resolution for event logging (up to 20,000 events).
- **Flexibility:** Features programmable Trip and Control Logic, allowing users to customize the device for various engineering environments.

SAFARI Series

The SAFARI Series is a multi-function protective relay lineup designed for reliable power system management and monitoring. It provides a wide range of protection elements and high-precision measurement in a robust, traditional hardware format.

Key highlights of the series include:

- **Text-Based Interface:** Features a 20 x 4 character text LCD for displaying operating status and relay information.
- **Draw-out Construction:** Utilizes a Draw-out type design, allowing for easy maintenance and replacement without disturbing external wiring.
- **Versatile Protection:** Provides a diverse set of protection elements, including overcurrent, voltage, frequency, and specialized motor protection functions.
- **Robust Build:** Constructed with an iron (Fe) material for enhanced durability in industrial environments.

Features

Description	SUR-K110-FI	SUR-K110-MI	SAFARI-S2
Primary Application	Feeder Protection (Digital Protective IED)	Motor Protection (Digital Protective IED)	Multi-function Protection Relay
Protection Functions	50/51, 50N/51N, 67, 67N, 59, 64, 27, 32RP, 79, 67G, 25, 46, 47N	50/51, 50N/51N, 67, 67N, 59, 64, 27, 32RP, 79, 67G, 25, 46, 47N, 47, 37, 49, 48/51LR, 66	50/51, 50N/51N, 37, 67, 67N, 67G, 59, 64, 27, 47P, 47N, 46, 81U, 81O, 49, 48/51LR, 66
CT / PT Inputs	PT: 110V (6ch), GPT (2ch) CT: 5A (4ch), Iz 1.5mA	PT: 110V (6ch), GPT (2ch) CT: 5A (4ch), Iz 1.5mA	PT: 110V (3ch), GPT (1ch) CT: 5A (4ch), Iz 1.5mA
Digital I/O (DI/DO)	12 Inputs / 6 Outputs	12 Inputs / 6 Outputs	8 Inputs / 14 Outputs
Communication	IEC 61850, Modbus RTU/TCP, RS-232C, RS-485/422	IEC 61850, Modbus RTU/TCP, RS-232C, RS-485/422	Modbus RTU/TCP, RS- 232C

SUR-K110-FI: Digital Protective IED - Feeder

The SUR-K110-FI is designed as a universal protective IED specifically optimized for the protection, control, and monitoring of general distribution feeder lines.

- **Interface:** Equipped with a 7-inch TFT-color graphic touch LCD (800x480) and supports multi-language selection.
- **Communication:** Fully supports IEC 61850 and Modbus RTU/TCP protocols for seamless smart grid integration.
- **Engineering Tool:** Allows for Single Line Diagram (SLD) editing and configuration through dedicated PC software.
- **Logging:** Provides high-resolution event recording (1ms) with a capacity for up to 16,000 events.
- **Protection Elements:** Features a wide range of protection including directional/non-directional overcurrent (50/51, 67) and automatic reclosing (79).
- **Measurement:** Offers high-precision measurement (Class 1.0 or better) for voltage, current, power, and frequency.

SUR-K110-MI: Digital Protective IED - Motor

The SUR-K110-MI is a specialized IED tailored for the safety management of high-voltage industrial motors, featuring specific algorithms to prevent mechanical and thermal damage.

- **Motor Specialization:** Includes specific protection elements such as Thermal Overload (49), Locked Rotor (48/51LR), and Start-up protection (66).
- **Advanced Monitoring:** Provides additional protections for phase loss (47), undercurrent (37), and negative sequence overcurrent (46).
- **Self-Diagnosis:** Features an automatic self-diagnosis function specifically for the circuit breaker (CB) trip coil.
- **Operation Feedback:** Equipped with 8 user-defined LEDs and 15 operation buttons for intuitive field control.
- **Fault Analysis:** Saves fault waveforms in standard IEEE C37.111 COMTRADE format for detailed post-event analysis.

SAFARI-S2: Multi-function Protection Relay

The SAFARI-S2 is a versatile and robust protective relay featuring a modular "Draw-out" design, prioritizing ease of maintenance and reliable operation in industrial environments.

- **Hardware Design:** Utilizes a Draw-out type construction, allowing the internal unit to be removed without disturbing external wiring.
- **Display & Indicators:** Features a 20 x 4 Text LCD and 25 status LEDs (3 for relay status, 22 for operation status).
- **Broad Protection:** Offers a comprehensive suite of elements including selective ground overcurrent (67G) and frequency protection (81U/O).
- **Rugged Construction:** Built with an iron (Fe) housing for maximum durability in harsh environments.
- **Power Flexibility:** Supports a wide-range auxiliary power input (AC 80~264V / DC 90~320V).
- **Control Capability:** Provides both local control via front buttons and remote control via MODBUS and PC S/W.



Smart IED

The Smart IED integrates the functions of a Merging Unit (MU) and a traditional protection IED, serving as a high-speed hub for publishing and subscribing (Pub/Sub) Sampled Values (SV). By utilizing a Process Bus architecture, it enables seamless digital data exchange across the network in full compliance with IEC 61850 standards.

This integration is essential for executing advanced protection and control logic based purely on digital values. By processing real-time data streams, the Smart IED ensures superior fault detection accuracy and rapid response times, providing a scalable and future-proof foundation for modern energy infrastructure.

SIM Series

The SIM Series was developed as a strategic response to the rapid Digital Transformation of modern power grids. As substations transition from legacy analog systems to intelligent and interconnected systems, there is a critical need for devices that can handle massive data streams with absolute precision. Designed in full compliance with the IEC 61850 standard, the SIM Series bridges the gap between primary field equipment and high-level control systems, replacing labor-intensive copper wiring with a streamlined, fiber-optic-based digital architecture.

The Vision for Digital Transformation

The SIM Series accelerates the shift to digital grids by replacing legacy copper wiring with a streamlined, IEC 61850-compliant fiber-optic architecture. It redefines the IEDs as a high-performance Smart IED platform, bridging the gap between field assets and centralized control with absolute precision.

- **MU-IED Convergence:** Combines Merging Unit and IED functions to support seamless SV Pub/Sub, drastically reducing hardware complexity.
- **Process Bus Excellence:** Leverages high-speed digital streams for ultra-accurate, low-latency protection and control logic.
- **Intelligent HMI:** Features a high-resolution wide-screen interface and intuitive controls for enhanced situational awareness.
- **Dynamic Customization:** Supports multi-language packs and on-the-fly logic reconfiguration, allowing rapid adaptation to evolving grid requirements without hardware changes.

Comparison

Description	Legacy IED	SIM73
Functional Design	Discrete/Distributed Functions	Condensed All-in-One Platform
Integration Level	Multi-device dependency	Integrated MU + IED functionality
Protection Scope	Specific to purpose	Multi-Protection Supported
Wiring & Architecture	Complex Copper Hard-wiring	Copper Hard-wiring + Streamlined Digital Process Bus (SV Pub/Sub)
Logic & UI	Fixed Logic / Standard HMI	Flexible Logic Reconfiguration / Wide-screen HMI
Communication	Trimod Ethernet	Trimod Ethernet + HSR/PRP Supported
Time Synchronization	SNTP	SNTP + PTP
Language	Korean + English	Multi Language, depending on requests
Process Bus	None	Supports SV Subscription & Publication (IEC 61850-9-2 LE, 61869-9)

SIM73: Advanced All-in-One Smart IED

The SIM73 is a flagship platform designed to consolidate comprehensive protection and control into a single digital architecture.

- **Digital Convergence:** Unifies Merging Unit and IED functions, supporting seamless SV Pub/Sub over a standardized Process Bus architecture.
- **Integrated Protection:** Provides a full-spectrum solution for various protection.
- **Maximum Adaptability:** Enables on-the-fly logic reconfiguration and multi-language support, allowing rapid adaptation to evolving grid demands without hardware changes.

Feature	SIM73
Power Voltage Range	DC 90V ~ 140V AC 100V ~ 250V
Power Consumption	less than 45W
Digital I/O (DI/DO)	DI: 34 Points (Wet Contacts over 70V) DO: 52 Points (Dry contacts)
Analog Inputs	Supports 2 Slots Each slot support: 12CT/4PT OR 8CT/8PT
User Interface	LCD: 7" TFT Color Graphic LCD (Touch Input, 800 X 480) LED: 41 Units (includes 32 User-Configurable LEDs)
Front IP Grade	IP 55
Supported Protocol	IEC 61850 Ed 1.0, 2.0, 2.1, DNP3, Modbus, IEEE 37.94
SV Pub/Sub	Maximum 8 SVCB Pub/Sub

The Company Values



At Sanion, our philosophy is rooted in building enduring partnerships through absolute trust and a deep sense of responsibility toward the communities we serve. We recognize that every energy landscape is unique, which is why we are dedicated to providing fully customized Power System Automation solutions that align perfectly with our clients' specific operational needs. To us, automation is more than just a technical service; it is a sincere commitment to ensuring the continuous stability and safety of the infrastructure that powers our world.

We understand that in critical industries, time is of the essence, which is why we have made rapid response and agile support the hallmarks of our service. We approach every challenge with a client-first mindset, prioritizing flexibility and open communication to deliver the most effective outcomes for your system management. By combining our expertise in monitoring and control with a genuine focus on customer satisfaction, we strive to be a partner you can truly rely on for a more secure and efficient tomorrow.



Let's Work Together

At Sanion, we are more than just a solutions provider; we are your strategic partner for operational success. We are dedicated to understanding your unique environment and engineering Power System Automation solutions tailored specifically to your needs. Backed by unwavering reliability and rapid support, we are ready to revolutionize your infrastructure. Let's discuss how Sanion can provide the answers to your operational challenges today.



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Power Automation Solution

