Smart LV Solution upper system

Smart LV Solution upper system provides a variety of solutions for customers to conveniently manage their devices, systems, and energy information anytime, anywhere.
For convenience of on-site management, Panel HMI and Mobile App. are provided, and various S/W for remote monitoring/control is provided.

Smart LV Solution Upper system

GridSol CARE Monitoring S/W (Cloud)

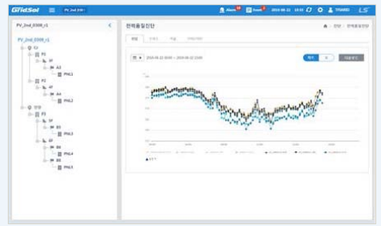
GridSol CARE Monitoring SW provides real-time remote monitoring function to safely manage power facilities anytime, anywhere, and to operate them efficiently. It also provides event notifications and monthly reports through e-mail and SMS services.

Features

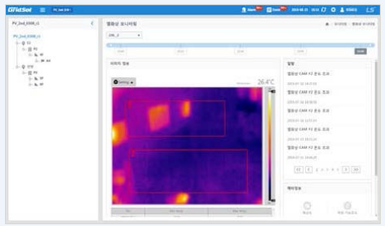
- **Energy consumption monitoring by project and category (place, usage, day, time, etc.)**
  : Voltage, current, power, power demand, etc.
- **Power quality information monitoring by project and category (place, panel, device, etc.)**
  : Voltage, frequency, power factor, harmonics, etc.
- **Device self-diagnosis function**
  : Memory, Setting time, contact life, number of opening/closing, temperature overheating, Wiring status, battery, relay operation, etc.
- **Device lifespan prediction function**
  : Operating time, breaker On time, electrical/mechanical operation number, trip number, etc.
- **Temperature monitoring function**
  : Real-time monitoring of a specific point is possible through TRIO
  : Real-time monitoring of the area of interest is possible through Thermal CAM
- **When an event occurs, event recording and fault waveform data are provide**
  : Point information, phase angle analysis, harmonic analysis, effective value chart, etc.
  : E-mail, SMS transmission function support
- **Provide regular reports**
  : Energy consumption, power demand, power quality, diagnosis, alarm/event, etc..
  : E-mail transmission support for monthly reports

Screen composition

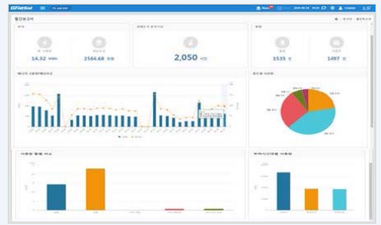
- **Dashboard**
  : Energy consumption, estimated price, power quality, instantaneous power, weather information, project status are analyzed by category (location, use, time, day, week, month)
- **Monitoring & Control**
  : System/device monitoring, Hierarchy data
- **Diagnostics**
  : Energy diagnosis (total usage trend/comparison, usage/hourly usage)
  : Power quality diagnosis (voltage, frequency, power factor, THD/TDD)
- **Event**
  : Alarm, Event, Trip Wave
- **Customer support**
  : Customer center, Download center
- **Report**
  : Location, usage, usage by period, event, etc.
- **Common setting**
  : Theme setting (White, Dark), Language setting (Korean, English, Chinese), Personal information (Personal information, Electric charges)



Power quality diagnosis



Thermal cam - track monitoring



Monthly report

Send event alarm

Target device

Communication device	Data Logger, Gateway, Ethernet Converter, E COLLECTOR
Accessory device	M LINK, TRIO, Thermal CAM
Circuit breaker	Susol ACB STU, Metasol ACB STU, Susol Smart MCCB
Measurement device	GIMAC1000, GIMAC-B, E TAG, MMP, DMPi, Energy Meter

GridSol CARE Operation S/W

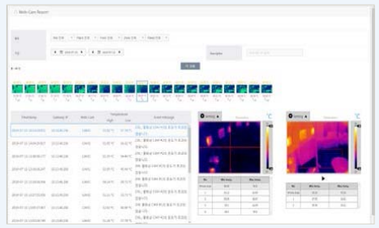
GridSol CARE Operation SW provides real-time remote monitoring and control functions to safely manage and efficiently operate power facilities connected to the same network

Features

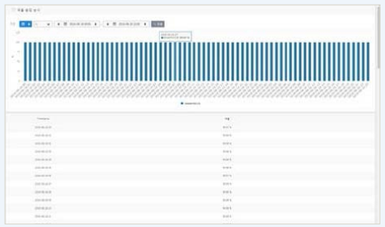
- **Monitoring energy usage by category (place, use, day of the week, time, etc.)**
  : Voltage, current, power quantity, power demand, etc.
- **Monitoring power quality information by category (place, panel, device, etc.)**
  : Voltage, frequency, power factor, harmonics, etc.
- **Device self-diagnosis function**
  : Memory, Setting time, contact life, number of opening/closing, temperature overheating, Wiring status, battery, relay operation, etc.
- **Device lifespan prediction function**
  : Operating time, breaker On time, electrical/mechanical operation number, trip number, etc.
- **Temperature monitoring function**
  : Real-time monitoring of a specific point is possible through TRIO
  : Real-time monitoring of the area of interest is possible through Thermal CAM
- **When an event occurs, event recording and fault waveform data are provided**
  : Event occurrence point information, phase angle analysis, harmonic analysis, effective value chart, etc.
- **Provides regular reports**
  : Energy consumption, power demand, power quality, diagnosis, alarm/event, etc.

Screen composition

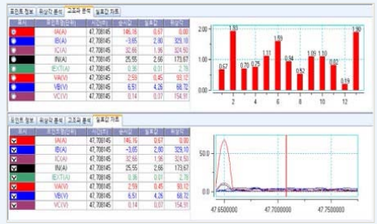
- **Dashboard**
  : Power consumption, power demand information, power device information, energy diagnosis information, energy prediction information, alarm/event, etc.
- **Monitoring & Control**
  : System and device monitoring and control, Hierarchy data
- **Diagnostic management**
  : Voltage PQ analysis, frequency PQ analysis, power factor PQ analysis, THD/TDD PQ analysis, total usage trend/comparison, demand diagnosis, etc.
- **History Management**
  : Alarm, Event, Trip Wave
- **Report**
  : Project, communication status, alarm/event, thermal image monitoring, statistics, diagnosis, system/device information, etc.
- **Common setting**
  : Theme setting (White, Dark), Language setting (Korean, English, Chinese)



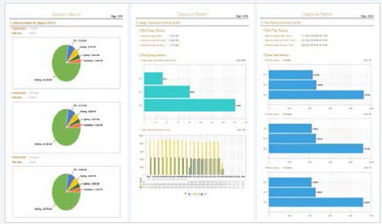
Real-time thermal imaging monitoring



Power factor trend information



Failure waveform analysis information



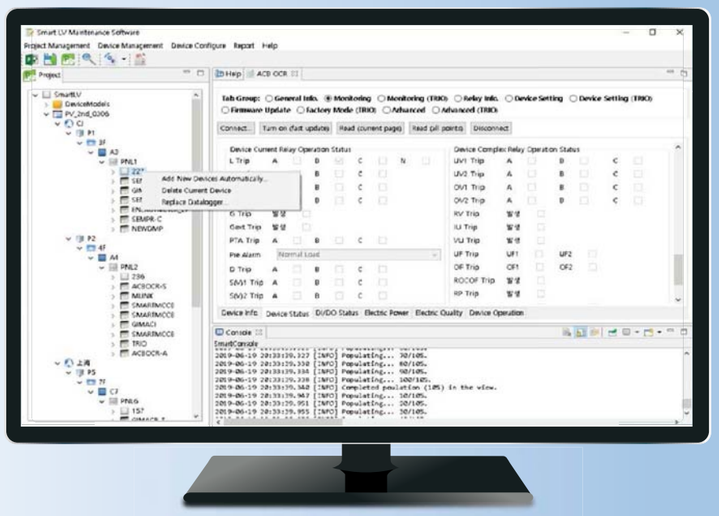
Regular report

Target device

Communication device	Data Logger, Gateway, Ethernet Converter, E COLLECTOR
Accessory device	M LINK, TRIO, Thermal CAM
Circuit breaker	Susol ACB STU, Metasol ACB STU, Susol Smart MCCB
Measurement device	GIMAC1000, GIMAC-B, E TAG, MMP, DMPi, Energy Meter

GridSol CARE Maintenance S/W

GridSol CARE Maintenance SW provides project and device management, remote monitoring and control functions, and testing functions for relay elements for each device.



Features

- **Project engineering function**
  : Project creation, open, close, save, modify, remove, duplicate, user management, etc.
  : Device information modeling and device data processing, replication, standard management by project
- **Device management, monitoring and control functions**
  : Device search, device addition/deletion, representative device setting, purpose setting, etc.
  : Data acquisition, firmware update, device setting, relay setting, control, etc.
- **Testing function for relay elements for each device**
  : Available when using i-Tester
  : Calibration, default test, manual test, scenario test
- **Report provided**
  : Test result, project, communication status, data acquisition status, etc.

Target device

Communication device	Data Logger, Gateway, Ethernet Converter, E COLLECTOR
Accessory device	M LINK, TRIO, Thermal CAM
Circuit breaker	Susol ACB STU, Metasol ACB STU, Susol Smart MCCB
Measurement device	GIMAC1000, GIMAC-B, E TAG, MMP, DMPi, Energy Meter

Smart Viewer (Mobile App.)

Smart Viewer (Mobile App.) provides monitoring function of devices installed on the panel through short-range wireless communication function.

Smart Viewer　Smart MCCB　Smart ACB

Features

- **Device and energy monitoring, failure analysis service**
  · Communication method : BLE (Bluetooth Low Energy)
  · Communication distance : Up to 4m
- **Event information of the device can be checked in the non-powered state.**
  · Communication method : NFC (Near Field Communication)
  · Communication distance : Up to 20mm
- **Provides Push Alarm function through GCM (Google Cloud Message) service**
  : Push Alarm message transmission when an accident occurs
  : Send accident information and location information
- **You can check the trip wave waveform stored in the device where the trip occurred.**
- **You can check the current and voltage waveforms of ACB.**
  : STU S-type only.

Target device

BLE	Susol ACB STU (S-type), Metasol ACB STU (S-type), Susol Smart MCCB ETU (ETLi)
NFC	Susol ACB STU (S-type), Metasol ACB STU (S-type)

Panel HMI (7.0 inch)

Specification

Model name	Rated voltage	Power consumption	Temperature range	
IHM32	DC24V (±20%)	23.0W or less	Operation	0 ~ +50 °C
			Storage	-20 ~ +60 °C

- **Color TFT LCD (7.0” or more) + LED Backlight**
- **User operation** : Touch pad
- **Indication of device communication status**
- **Supports two languages (English and Chinese)**
- **Support upgrade function through USB port**
- **Sub-device connection through Ethernet communication**
  : Up to 32 sub-devices (up to 40 devices can be connected for E TAG)
  : Up to 16 sub-devices can be selected and displayed (screen output)

Display screen

- **Dashboard**
  - Full information display : Displays communication status with Gateway, Panel name, and system date/time
  - Quick View : Displays representative information of the device selected for monitoring in the form of icons
  - Alarm : Displays the alarm information of the device selected for monitoring in the form of a list
  - Event : Displays the event information of the device selected for monitoring in the form of a list
  - Setting : Gateway IP for communication linkage, device selection for monitoring, user password, etc.

- **Device Details**
  - Monitoring : Displays device status, communication status, measurement data, operation time, DI/DO status
  - Control : Performs device On/Off control
  - Management : Display and reset history and count data information
  - Event : Displays incident event, device operation and abnormal event
  - View setting : Displays device setting value and relay element setting value
  - Device information display : Displays device-specific information such as device ID and device name

Target device

Communication device	Data Logger, Gateway, Ethernet Converter, E COLLECTOR
Accessory device	M LINK, TRIO, Thermal CAM
Circuit breaker	Susol ACB STU, Metasol ACB STU, Susol Smart MCCB
Measurement device	GIMAC1000, GIMAC-B, E TAG, MMP, DMPi, Energy Meter

Screen description

Quick View, View All

Display form	Description
ACB STU	Displays device communication status, device name, and device status
TRIO	Displays device communication status, device name, and analog input point (AI #1) value
MCCB	Displays device communication status, device name, and device status
M LINK	Displays device communication status, device name, DI/DO status
MMP	Displays device communication status, device name, and device status
DMPi	Displays device communication status, device name, and measurement value

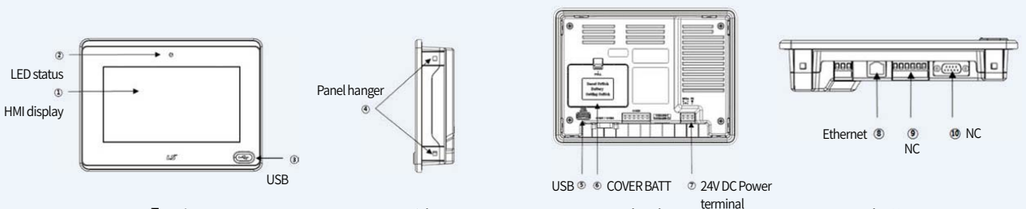
Quick View, View divided

Display form	Description
ACB STU	Displays device communication status, device name, device status, value of Vab, Tot P
TRIO	Displays device communication status, device name, and analog input point (AI # 1) value
MCCB	Displays device communication status, device name, device status, and values of Ia, Ib, and Ic
M LINK	Displays device communication status, device name, DI, DO, Mode status, control mode value
MMP	Displays device communication status, device name, device status, and values of Ia, Ib, and Ic
DMPi	Displays device communication status, device name, and values of Ia, Ib, and Ic

Detailed screen of device

Display form	Description
Monitoring	Displays selected device monitoring data(Device status, communication status, measurement data, operation time, DI/DO status)
Control	Control command (device On/Off)
Management	Display and reset history and count data
Event	Event and alarm list display
Settings	Displays set value information, relay element set value
Device information	Displays device-specific information such as device ID and device name
Group	The category name of the individual information item
Label	Name of individual information item

Exterior description



Upper system

Panel HMI (3.5 inch)

Specification

Model name	Rated voltage	Power consumption	Temperature range	
IHM8	DC24V (±20%)	3.0W or less	Operate	-20 ~ +60 °C
			Store	-30 ~ +80 °C

- **Color TFT LCD (3.5” or more) + LED Backlight**
- **User operation** : cancel, move (up), move (down), confirm, set
- **Displays communication status LED**
- **Supports two languages (English and Chinese)**
- **Supports upgrade function through USB port (PC Manager connection)**
- **Sub-device connection through RS-485 communication**
  : Connects up to 8 sub-devices
  : 9,600, 19,200, 38,400, 57,600bps support
- **Fail safe and termination selection switch applied**

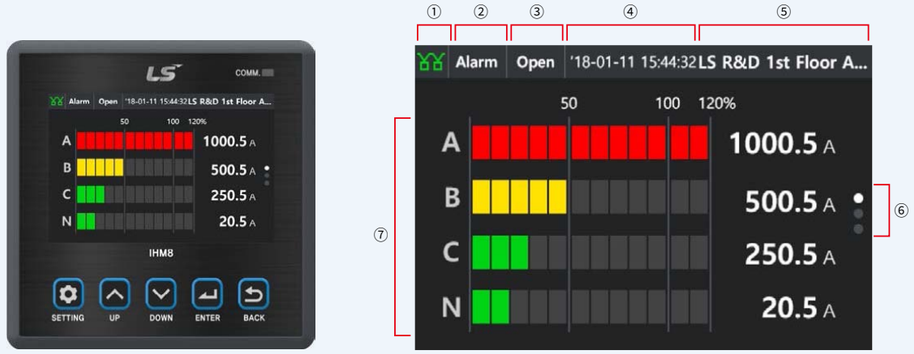
Display screen

- **Basic information of circuit breaker**
  - Number of poles, rated voltage, rated current, communication address, communication speed, control method
  - Manufacturer, model name, H/W version, S/W version, communication version, serial number
- **Current/Time of circuit breaker relay**
  - Long time delay, short time delay, instantaneous, ground fault
- **Measurement data of circuit breaker**
  - Voltage, current, active/reactive/apparent power for each phase
  - Energy : EP, EQ, rEP, rEQ, ES display
  - PQ (Power Quality) : Freq, PF, THD, TDD
  - Max Demand : Current value for each phase, active/reactive/apparent power
- **Breaker operation history**
  - Operating time, circuit breaker close time
  - Number of electrical operations, number of mechanical+electrical operations, number of trip operations
  - Contact consumption rate (0~100%)
- **Circuit breaker DI/DO status information and control**
- **History of events that occurred in the circuit breaker (save 20)**
- **Fault history of circuit breaker (save 20)**

Target device

Type	Model name
Smart MCCB	Susol Smart MCCB
Smart ACB	Susol ACB STU, Metasol ACB STU
MCB	MCB Connected with M LINK

Screen description



1) **Communication connection status display** - 'Communication connected' or 'Communication not connected' is indicated by the RS485 communication icon.
2) **Alarm display** - If there is no alarm, it is shaded. When a new alarm is generated, 'Alarm' is displayed.
3) **Contact status display** - Displays the breaker's contact status ('Close', 'Open', 'Trip').
4) **Time display** - Displays the time (year-month-day hour : minute : second) of the connected device.
5) **Name display** - Displays the name of the connected device.
6) **Page display** - Displays the number of connected devices and brightly displays the order of the currently displayed screen.
7) **Load current display**
   - It is displayed as ‘A/B/C’ or ‘A/B/C/N’ depending on the load connection.
   - The size and color of the graph change depending on the load factor.
   - Displays the load current value.

*The screen configuration of ACB and M LINK is different from that of MCCB, so please refer to the user manual.

Exterior description