

Smart LV Solution accessory device

The accessories of Smart LV Solution consist of devices with the latest IoT technology.

Each device performs functions of measurement, diagnosis, communication, control, monitoring and test to change the distribution panel and switchboard smartly.



Smart LV Solution Accessory device

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Gateway / Data Logger



Gateway and Data Logger are communication devices of Smart LV Solution. Gateway plays the role of transmitting data of serially connected RS485 communication devices to a local area network (LAN) communication using TCP/IP. The Data Logger includes all of the roles of the gateway and transmits data to the cloud connected by a wide area network (WAN). Gateway and Data Logger provide their own web pages. Through this, the setting and status monitoring service of the connected device can be used.

Features

Type	Data Logger web page	Gateway web page
Settings screen	Device information can be checked and name and location information can be changed. Provides web page links for connected Data Logger and Gateway.	Device information can be checked and name and location information can be changed.
Thermal imaging monitoring	-	Provides thermal image monitoring device status, event, and trend information
RS485 (Channel1 & 2)	Displays the name and status of the device connected to the RS458 channel (provides detailed information when the device name is clicked)	
Auto search	Provides ping function to check cloud connection Provides RSTP LAN connection device search and status information Provides RS485 automatic search function HMI connection function	Provides RS485 automatic search function HMI connection function
General settings	Provides network, system and status information	
Monitoring dashboard	Provides main status information of the connected devices (provides detailed information when the device name is clicked)	

Specification

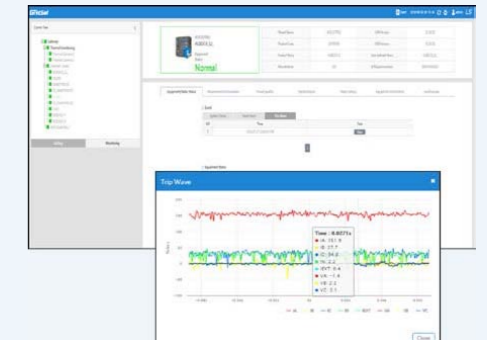
Type	Details	Remark
Rated voltage	DC24V (±15%) For IPM6P - AC240V/DC24V60W only	IEC60038 standard
Power consumption	11W or less	
Communication network type	1 × RJ12 : RS485, Modbus RTU (16 ea) 1 × Terminal : RS485, Modbus RTU (16 ea) 2 × RJ45 : Ethernet Modbus TCP RSTP (100 ea → 100 Client) 1 × RJ45 : Ethernet TCP/IP 1 × WiFi (Data Logger option, AP function)	Ethernet port includes router function. In case of E TAG, 20 per channel through E COLLECTOR
External interface	1 × Digital input(DI) 1 × Digital output(DO) 2 × USB Type A port(Host) 1 × USB Mini B port(Device)	
Memory	RAM : 256MB / Flash : 8GBit	15-minute unit/7 days' worth of storage
Size	90 (W) × 81 (H) × 65 (D), unit : mm	
Weight	500g or less	
Web service	Device setting web page and basic monitoring web page	
Button	1 × Push Button Factory reset : Button input 5 seconds or more Soft Reset : Within 5 seconds of button input	
Switch	2 × Dip Switch/RS-485 communication termination setting	
Battery	0.1F Supper CAP applied (72 hours backup possible)	
Use temperature	-25 ~ +70 ° C/WiFi communication option (0 ~ +50 ° C)	
Storage temperature	-40 ~ +85 ° C/WiFi communication option (-20 ~ +80 ° C)	
Ambient humidity	Within 95% RH, no condensation	

Web service

- Provides device registration and monitoring functions
- Provides remote firmware upgrade function
- Provides wave viewer function



ACB voltage, current waveform



Trip wave

Exterior description



Target device

Circuit breaker	Susol ACB STU, Metasol ACB STU, Susol Smart MCCB
Measurement device	GIMAC1000, GIMAC-B, E TAG, MMP, DMPi, Energy Meter
Accessory device	M LINK, TRIO, Thermal CAM



Ethernet Converter

This device is installed on a low-voltage panel or distribution panel to collect data from serially connected RS485 communication devices and transmit it to a local area network (LAN) communication using TCP/IP. Control/status data and measurement values can be acquired by connecting to smart devices.

Features

This module converts RS485 communication to Ethernet. By supporting a Ring network, it improves the reliability of communication. In case of an accident, it has functions of event push alarm (Mobile App.) and e-mail transmission to 5 registered users.

Specification

Type	Details
Model name	Ethernet Converter
Rated voltage	DC24V (±10%)
Power consumption	1W or less
Function	<ul style="list-style-type: none"> • 1 PORT RS-485 (Modbus/RTU) communication support • 2 PORT Ethernet (Modbus/TCP) communication support • RSTP support • Up to 8 Modbus Masters can be connected simultaneously • Push alarm and E-mail transmission when an event occurs
LED	Power LED Comm. LED
Protocol	Modbus RTU, Modbus TCP
Communication method	RS485 to Ethernet
Port specification	RJ45, 2Port
Ethernet communication speed	10/100Mbps
Ethernet communication distance	Ethernet: up to 100m (single line), up to 50m (stranded line)
Type of dualization	RSTP (Rapid Spanning Tree Protocol)
Size	36 (W) × 81 (H) × 65 (D), unit : mm
Use temperature	-25 °C ~ +60 °C
Storage temperature	-30 °C ~ +70 °C
Ambient humidity	Within 85% RH, no condensation

Exterior description



Device usage example



Target device

Circuit breaker	Susol ACB STU, Metasol ACB STU, Susol Smart MCCB
Accessory device	M LINK, TRIO



TRIO

This device is installed on a low-pressure panel or distribution panel to monitor ACB status, remotely open and close operation control, and measure temperature. DI/DO expansion is possible by linking with communication with STU.

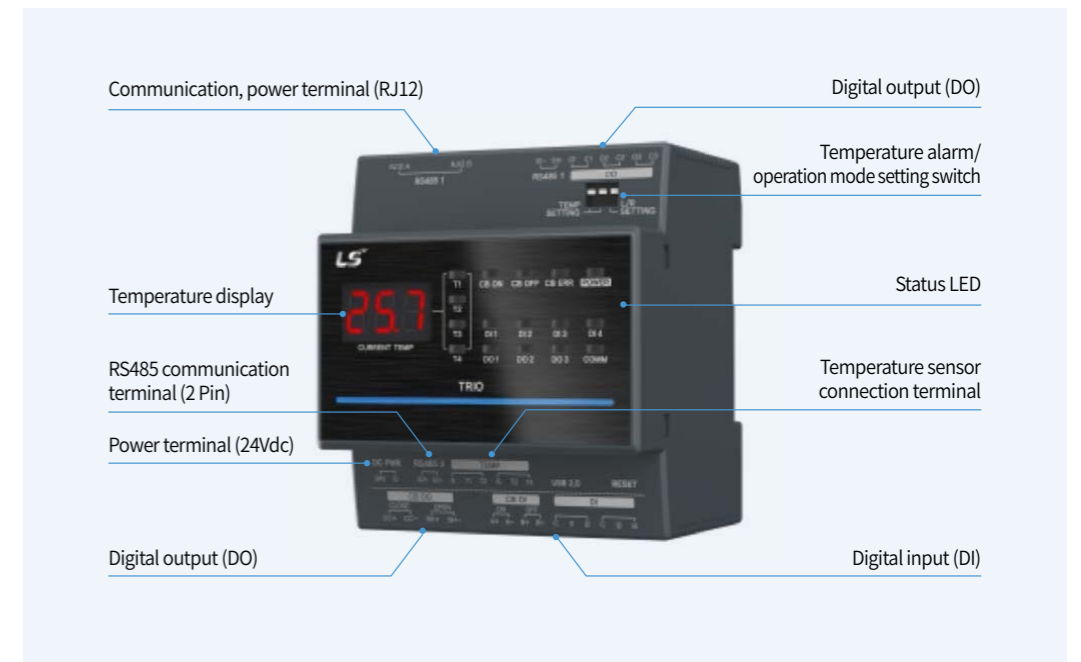
Features

TRIO module can monitor temperature by attaching a separate temperature sensor, and it has built-in DI/DO expansion function, so it can monitor and control the circuit breaker. Compared to the existing TRIO, the number of DI/DO contacts has increased, and the temperature display has been improved to 7-Segment level.

Specifications

Type	Details	Remark
Model name	TRIO	
Rated voltage	DC24V (±10%)	21.6~26.4Vdc
Power consumption	6W or less	
Temperature sensor	4EA	Measurement range : 0~150 °C Error range : ± 3 °C for contact, 5 °C for non-contact Alarm temperature : 55 °C, 65 °C, 70 °C, 80 °C Digital output connection possible Temperature sensor sold separately
DI	General : 4EA CB : 2EA	Cradle status contact monitoring and spring charge status monitoring are possible
DO	General : 3EA CB : 2EA	LATCH, 500ms can be set (CB control possible)
LED	Power LED Comm. LED 3 CB LEDs 4 DI LEDs 3 DO LEDs 4 temperature sensor LEDs	Temperature display 7-Segment 99 °C or less : Display to 1 decimal place 100 °C or more : 1-digit display
Protocol	Modbus RTU	
Communication method	RS485	STU connection possible
Installation type	DIN-Rail, Screw	
Size	72 (W) × 81 (H) × 65 (D), unit : mm	
Use temperature	-25 °C ~ +60 °C	
Storage temperature	-30 °C ~ +70 °C	
Ambient humidity	Within 85% RH, no condensation	

Exterior description



Device usage example



Target device

Circuit breaker Susol ACB STU, Metasol ACB STU

※Can be used alone



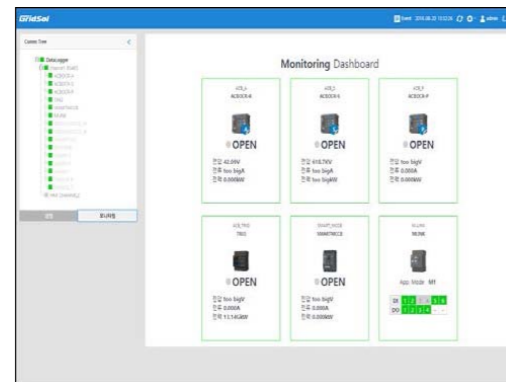
Thermal CAM

This device is a device that performs the function of monitoring the temperature inside/outside the smart switchboard. It is connected to the gateway through a USB cable, and can be installed and used at a user's desired location.

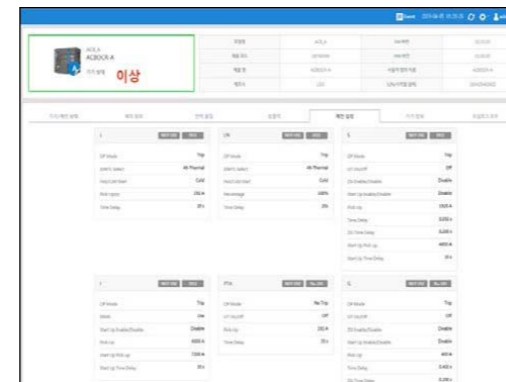
Features

It is connected to the gateway to monitor communication device information on the Web, and it is a solution to check the thermal image information.

- Provides convenient web service to monitor the status of various device



Dashboard screen



Check the setting status of device

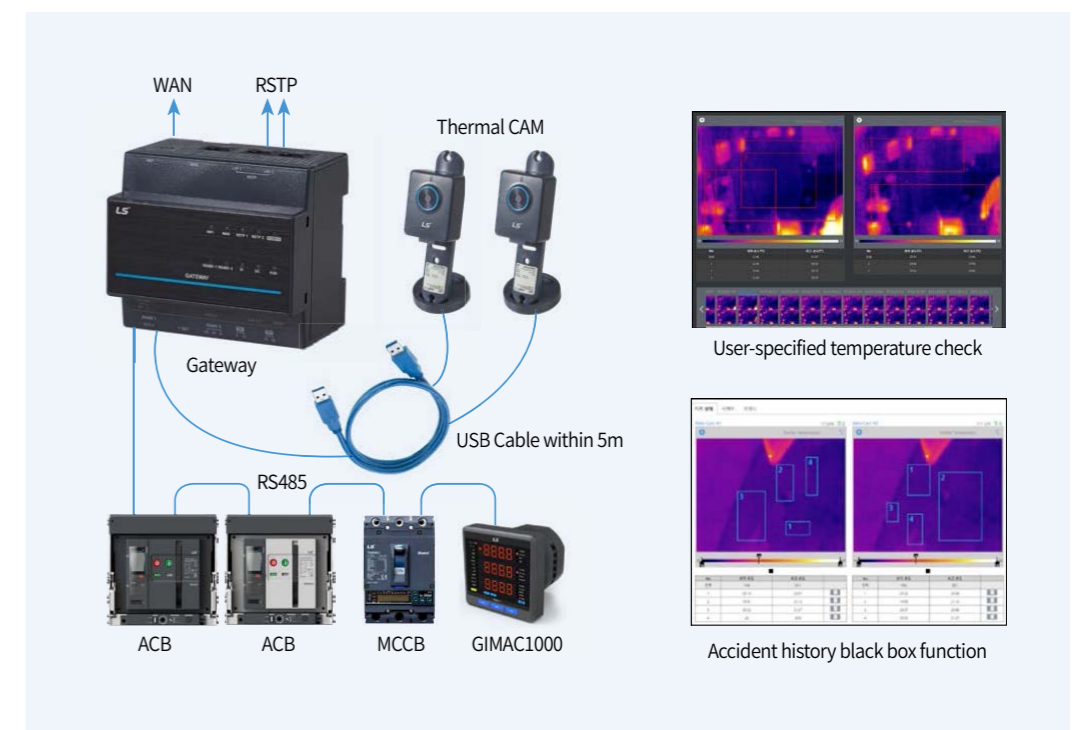
Specification

Type	Details
Model name	THCAM - 5Vdc - USB - P0080
Rated voltage	5V (USB Cable)
Power consumption	2W or less
Resolution	80 × 60 pixels, 51° (horizontal angle) × 66° (diagonal)
Temperature	Operation : 0 °C ~ +70 °C Target : 0 °C ~ +150 °C
Accuracy	0 ~ +100 °C : ±2 °C +100 ~ +150 °C : ±2 %
Operating S/W	Internet Explorer/Chrome
Temperature monitoring	4 ranges and alarm temperature settings
Size	29 (W) × 73(H) × 53 (D), unit : mm
Use temperature	0 °C ~ +70 °C
Storage temperature	-40 °C ~ +70 °C
Ambient humidity	Within 85% RH, no condensation

Exterior description



Device usage example



Target device

Common device



M LINK

It is a digital input/output and communication module for monitoring the status of on-site contacts, remote control of on-site contacts, and measuring on-site analog values on the low-voltage panel monitoring and control system.

Features

Type		Details	
Model name		ILM - DC24V - DI6/DO4	
Rated voltage		DC24V (±10%)	
Power consumption		1.3W or less	
Function		Monitoring function : DI contact monitoring	
		Control function : DO contact control	
		Analog input value measurement : AI contact input value measurement	
		Communication function : RS485 (Modbus)	
Input/output contacts	DI	Number of contacts	6 (6 DI, COM.4) Note] COM contacts are the same in electrical circuit
		Connection method	Hardwired, pluggable
		Contact method	Dry contact
	DO	Number of contacts	4 (4 DO, 2 Com.)
		Connection method	Hardwired, pluggable
		Rated voltage/current	250Vac/3A, 30Vdc/3A
	AI	Contact method	Non-Latch, A contact (Normal Open)
		Number of contacts	1 (AI +, AI -)
		Connection method	Hardwired, pluggable
	Input range	DC 4-20mA	
Protocol		Modbus RTU	
Communication method		RS485	
Size		54 (W) × 81 (H) × 65 (D), uni t: mm	
Use temperature		-25 ~ +60 °C	
Storage temperature		-40 ~ +80 °C	
Ambient humidity		Within 85% RH, no condensation	

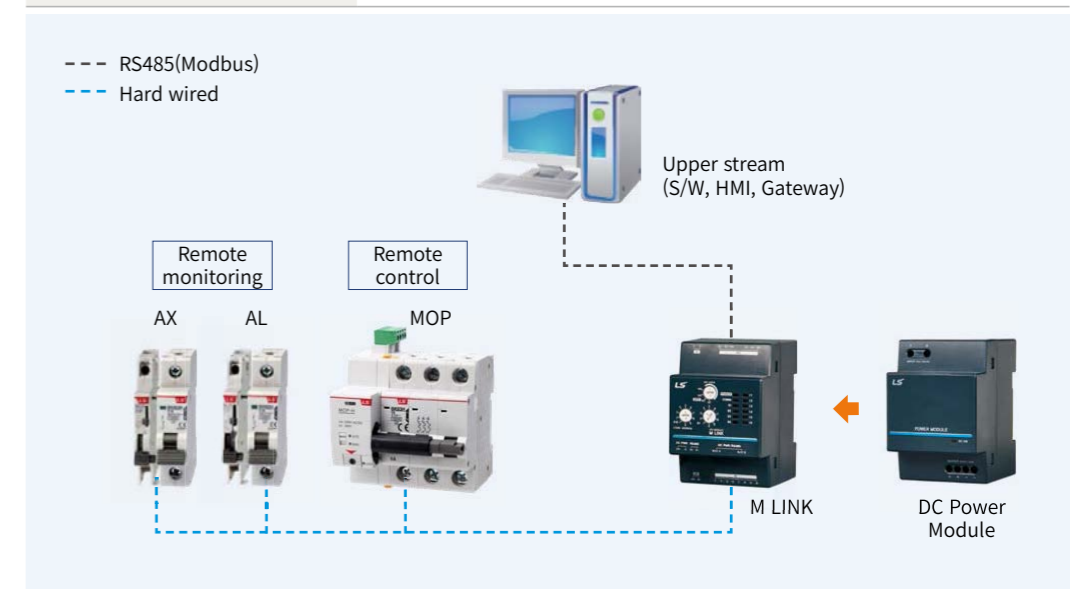
Exterior description



Device usage example

It can be used a digital input/output (DI/DO) communication module for on/off/trip status monitoring and on/off control of the Circuit breaker (MCB/MCCB). It also provides DI/DO operation function according to the operation mode (M1~M4, DO LOCK) for user convenience.

Operation mode	Function and usage
M1	General DI/DO operation
M2	Remote circuit breaker control
M3	Remote/on-site circuit breaker control
M4	On-site load control (DI/DO linkage control)
DO Lock	General DI operation (DO cannot be controlled)



Target device

Common device



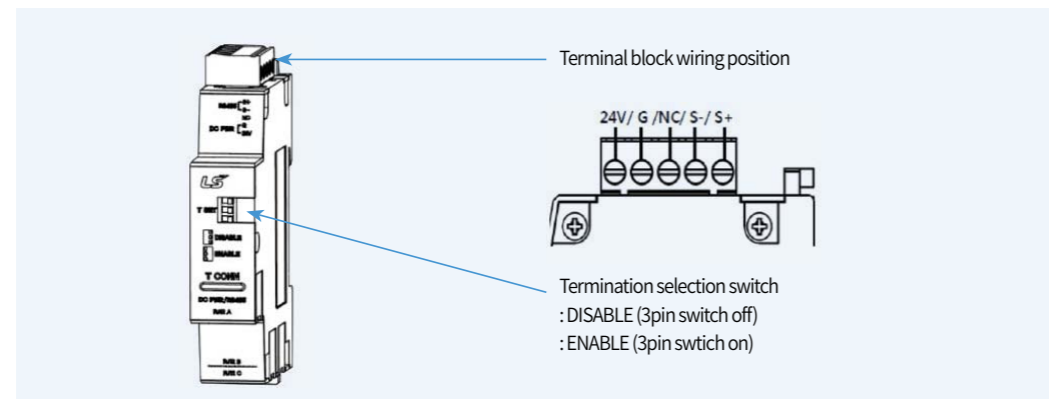
T Connection Module

T Connection Module is a branch module that can provide convenience when connecting multiple RS485 communication devices through multi-drop communication. It also provides termination processing when the device is located at the end.

Specification

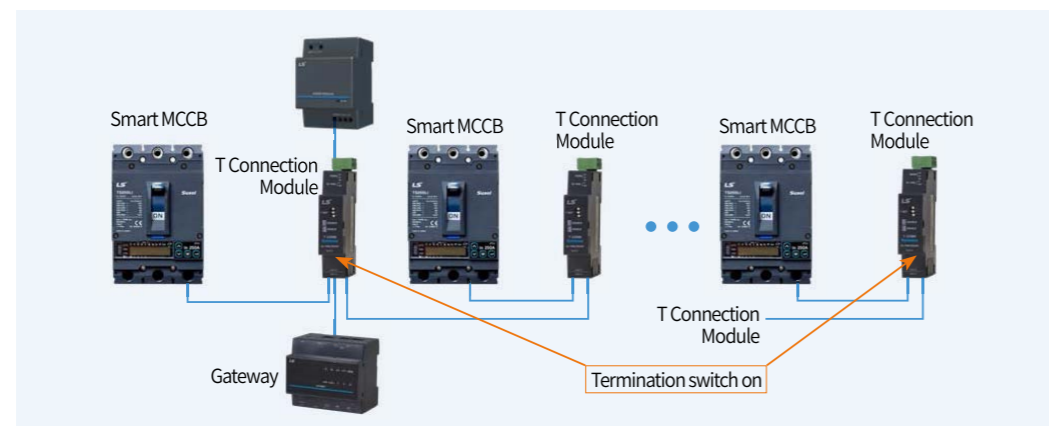
Type	Details
Model name	ITCM
Rated voltage	DC24V (±10%)
Basic function	Multi-drop connection
	Termination Selection
Mounting method	DIN-Rail, Screw (Screw not supplied)
Size	17.8 (W) × 81 (H) × 65.6 (D), unit : mm

Exterior description



Device usage example

When you wish to connect n number of devices excluding the upper system, you can conveniently configure them using n number of ITCM. Stable RS485 multi-drop is possible by deadening.



Target device

Common device

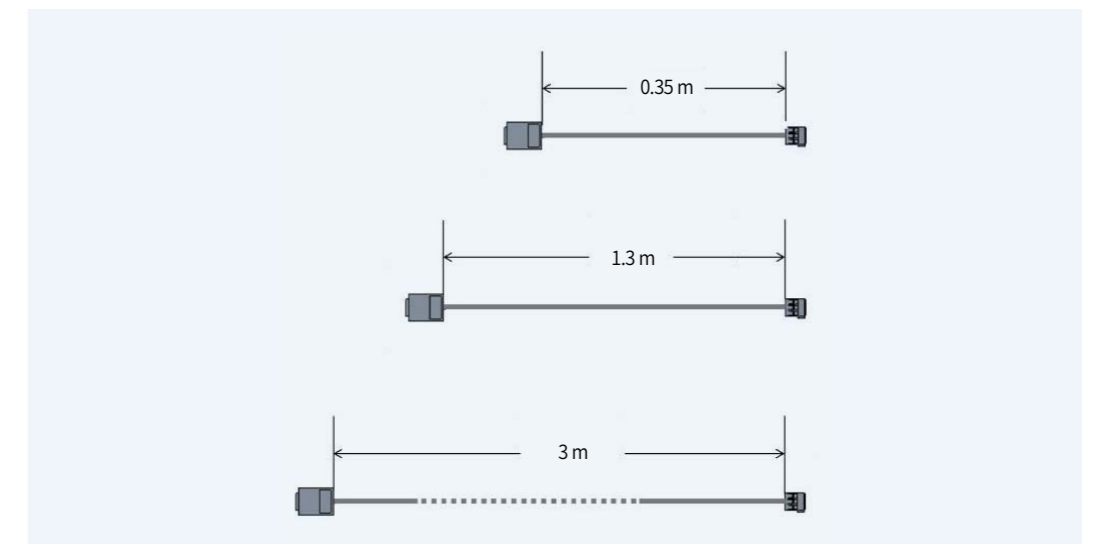
Communication / power connection cable

This is a communication / power connection cable used to connect Smart MCCB, T Connection Module and Panel Display (3.5 inch), etc.
There are three types : 0.35m, 1.3m, and 3m in length.

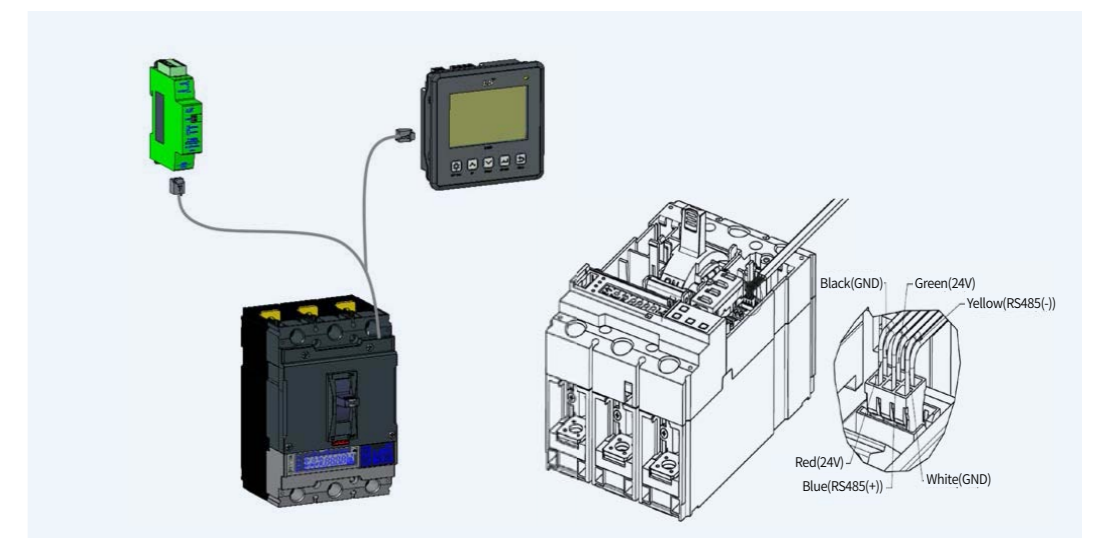
Specification

Type	0.35m	1.3m	3m
Model name	EXIO L350	EXIO L1300	EXIO L3000
Basic function	Communication / power connection		

Exterior description



Device usage example



Target device

Exclusive cable for Smart MCCB



i-Tester

The i-Tester (Intelligent Tester) is an accessory to test-drive ACB/MCCB. As a stand-alone type, it not only performs various relay tests such as manual/auto/user tests, but also has various functions such as self-calibration function, device information setting, relay setting, and device status checking. In addition, it supports 256 × 128 graphic LCD and supports not only English but also Chinese and Russian languages. It has the function to output the test and test results in the same way using the upper Manager S/W.

Features

- **Calibration function**
: The calibration function of i-Tester is used to calibrates the error using the output value set in i-Tester and the measurement current data.
- **Device H/W setting function**
: It consists of the part to set the system configuration and time of the device and the part to set the language and time of the i-Tester itself.
- **Relay setting function**
: It consists of the part to check the current relay element of the device and the part to set the relay.
- **Relay test**
: As a part for testing the relay, it is composed of manual/automatic/user tests so that various relay tests can be conducted.
- **Control function**
: It provides a function to clear or reset the device data and to control DO and CB.
- **System information**
: It consists of the device information, relay status, and tester system information.
- **Test history**
: It consists of a part to check the test history stored in i-Tester and a part to delete the saved history information.

Specification

Type	Details
Model name	IPOT
Rated voltage	DC24V adapter, 9V alkaline battery 3EA, USB or rechargeable battery (10000mAh or more)
HMI	Graphic LCD module (256 × 128 Graphic LCD)
Supported language	English, Chinese, Russian
Key functions	<ul style="list-style-type: none"> • Device information checking function (information, DI, DO, self-diagnosis) • Relay and H/W information setting function • Device control and reset function • Relay test function <ul style="list-style-type: none"> - Manual/auto/user test function • Test history storage (up to 255) and output (PDF) function
LCD composition	Navigation TREE configuration for all
Size	98 (W) × 210.5 (H) × 43.5 (D), unit : mm

Exterior description



Device usage example



Target device

Circuit breaker	Smart ACB (STU), Susol/Metasol ACB (OCR), Smart MCCB, TS1600
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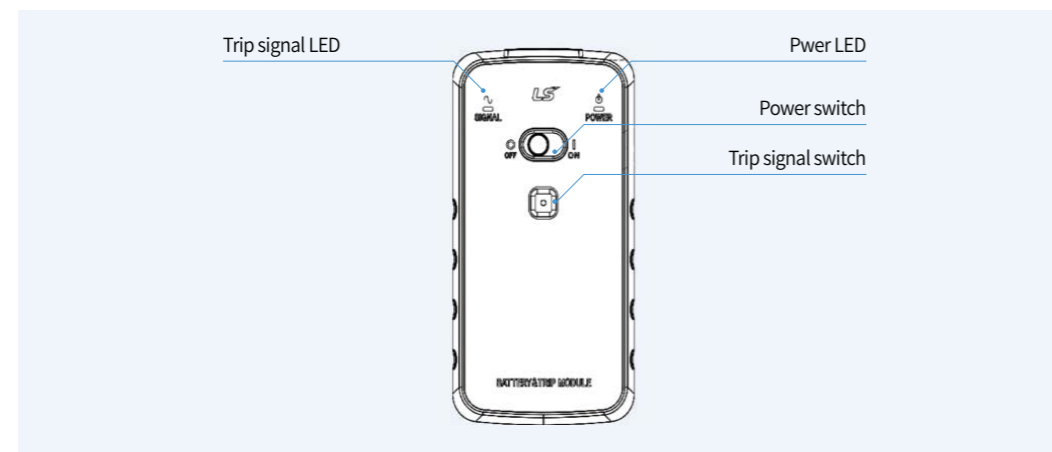
Portable Battery & Trip Module

It is a portable battery module that can power the Smart MCCB and test the trip function. The user can change and check the settings by applying power to the Smart MCCB while carrying this device, and easily check the trip function, which is the most important function.

Specification

Type	Details
Model name	IPBM
Target device	Smart MCCB
Input power	AA size serial battery 2EA (battery specification : DC1.5V)
Output	Power supply DC 12V (±5%) Trip signal AC 0.9V, 60Hz (±15%)
Device operating time (battery replacement time)	More than 8 hours of continuous use ※The usage time can be changed depending on the battery capacity
Switch	Power supply Slide switch, power supply On/Off Trip signal Tact switch, Trip signal On/Off
LED	Power supply Orange, DC 12V output status display Trip signal Green, AC 0.9V Trip signal output status display
Size	72 (W) × 135 (H) × 34.5 (D), unit : mm

Exterior description



Operation method

- 1) Check the power switch off status of the portable battery module.
※If the battery is connected while the power switch is on, an error may occur in the device.
- 2) Open the battery cover on the back and install 2EA of AA size batteries.
- 3) Close the battery cover and connect the tester cable.
- 4) Open the glass cover of Smart MCCB and connect the Tester cable to the TEST port.
※ If the direction of the tester cable does not match, an error may occur in the device.
※ If the Tester cable is connected while the power switch is on, an error may occur in the device.
- 5) Operate the power switch of the portable battery module to On.
- Check that the power is turned on to the Smart MCCB,
and check and operate the Smart MCCB settings using the Smart MCCB key.
- The Trip test of Smart MCCB can be performed using the Trip button of the portable battery module.
- 6) After using the portable battery module, operate the power switch to the Off status.



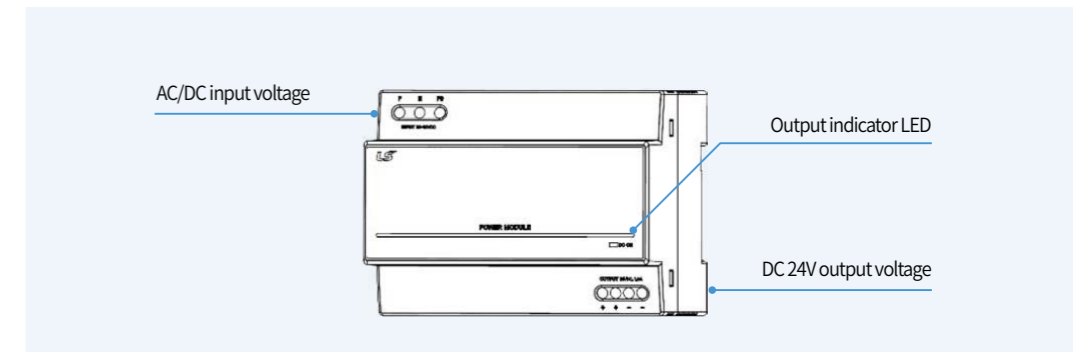
DC Power Module

The DC Power Module is a power supply device that supplies DC24V. It is composed of 5 types according to the rated voltage of the input.

Specification

Type	Specification				
Model name	IPM3P - AC240V /DC24V12W	IPM6P - DC30V /DC24V24W	IPM6P - DC125V /DC24V24W	IPM6P - AC415V /DC24V24W	IPM6P - AC240V /DC24V60W
Rated voltage	100 ~ 240Vac	24 ~ 30Vdc	48 ~ 125Vdc	380 ~ 415Vac	100 ~ 240Vac
Input range	85 ~ 264Vac	20 ~ 33Vdc	40 ~ 138Vdc	323 ~ 457Vac	85 ~ 264Vac
Frequency	50/60Hz	-		50/60Hz	
Output voltage	24Vdc (±5%)				
Output current	0.5A	1A		2.5A	
Size (mm)	54 × 81 × 65	108 × 81 × 65			
Use temperature	-25 ~ +60 °C				
Storage temperature	-40 ~ +80 °C	-40 ~ +85 °C			
Mounting method	DIN-Rail, Screw (screws not included)				

Exterior description



Device combination

It can be used for the device that uses DC 24V as an input power supply and can be combined with Smart LV panel components. It can be combined with 12 ~ 60W DC Power Module.

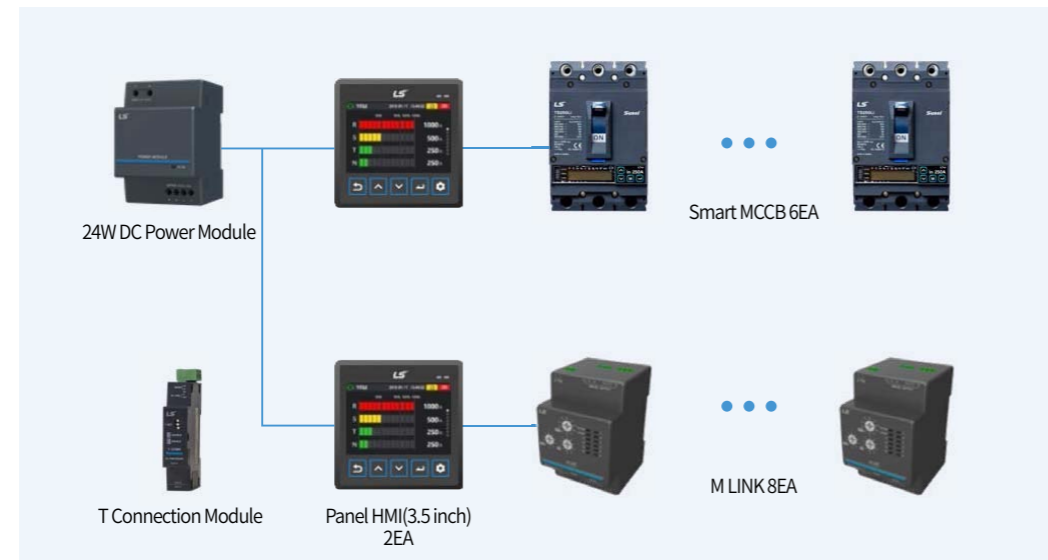


DC Power Module

Device usage example

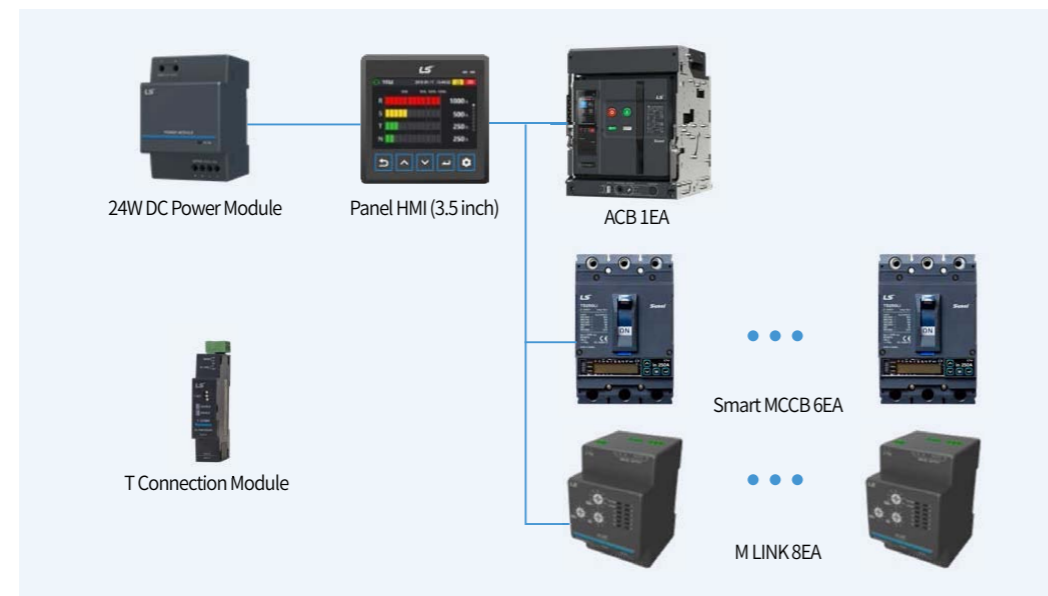
1) Composition of Smart MCCB + M LINK panel

- If Smart MCCB 6EA, M LINK 8EA and Panel HMI (3.5 inch) 2EA are connected to 24W DC Power Module ((6 × 1W) + (8 × 1.3W) + (2 × 3W)), it can be used stably.
- The T Connection Module is a necessity for device branching. The power consumption is close to zero.



2) Composition of ACB+Smart MCCB+M LINK panel

- If ACB 1EA, Smart MCCB 3EA, M LINK 4EA and Panel HMI (3.5 inch) 1EA are connected to 24W DC Power Module (5W + (3 × 1W) + (4 × 1.3W) + 3W), it can be used stably.
- The T Connection Module is a necessity for device branching. Power consumption is close to zero.



Target device

Common device

Composition of Smart accessory device

Device composition by application

Accessory device	Function	Switchboard				Distribution board			
		Energy monitoring	Circuit breaker monitoring	Circuit breaker remote control	Power facility preventive diagnosis	Energy monitoring	Circuit breaker monitoring	Circuit breaker remote control	Power facility preventive diagnosis
Gateway / Data Logger / Ethernet Converter ^{Note1)}		○ ^{Note3)}	○ ^{Note3)}	○ ^{Note3)}	○ ^{Note3)}		○ ^{Note3)}	○ ^{Note3)}	○ ^{Note3)}
TRIO				○ ^{Note4)}					
Thermal CAM				○					○
M LINK			○ ^{Note5)}	○ ^{Note5)}		○	○		
T Connection Module		○ ^{Note6)}	○ ^{Note6)}	○ ^{Note6)}	○ ^{Note6)}				
E TAG					○				
E COLLECTOR					○				
i-Tester / Portable Battery&Trip Module ^{Note2)}					○				
DC Power Module		○	○	○	○		○	○	○

Note 1) Choose 1 from Gateway/Data Logger/Ethernet Converter

Note 2) Choose 1 from i-Tester/Portable Battery & Trip Module

Note 3) Gateway/Data Logger/Ethernet Converter is excluded from required installation devices when GridSol CARE host system is not used.

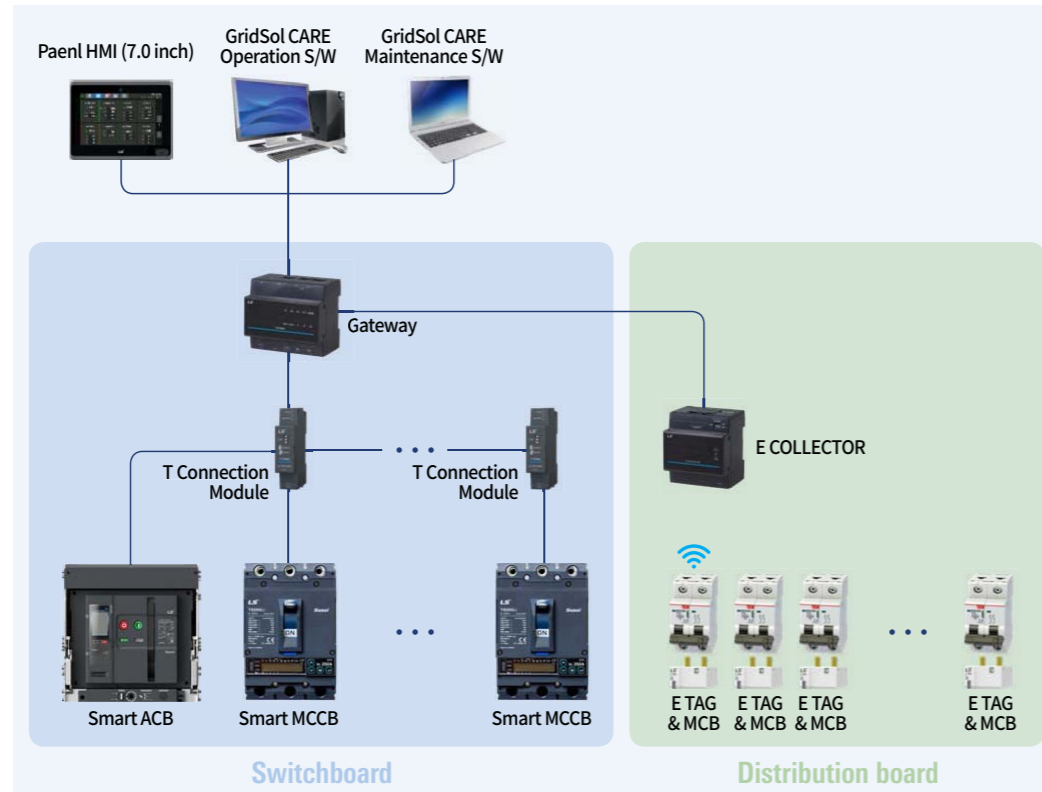
Note 4) TRIO is used with Smart ACB.

Note 5) M LINK is used with Smart MCCB.

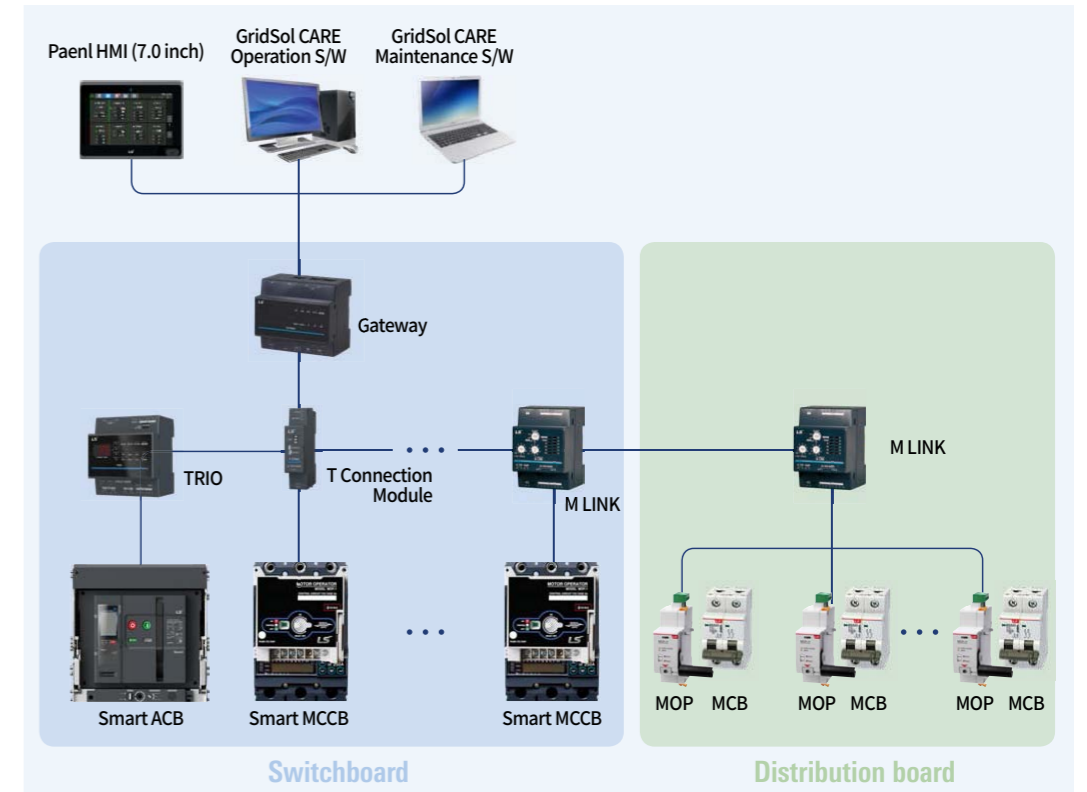
Note 6) This accessory is used when communication expansion is required.

Sample composition

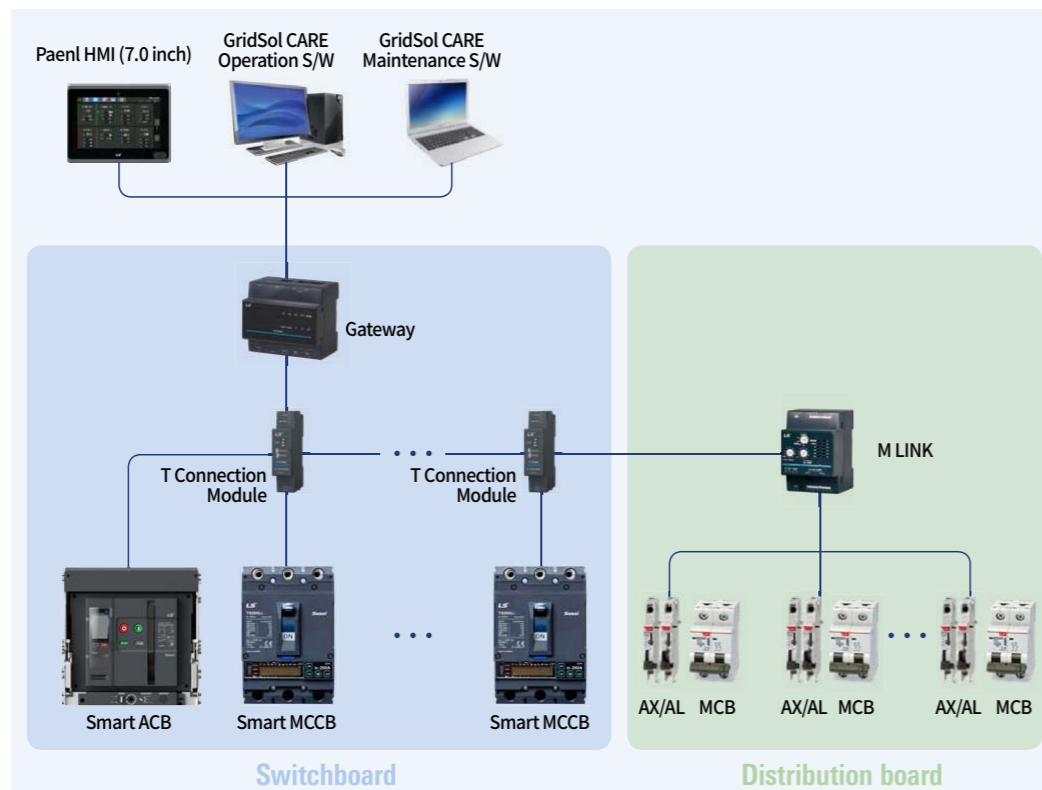
Sample 1
: Energy monitoring



Sample 3
: Circuit breaker remote control



Sample 2
: Circuit breaker status monitoring



Sample 4
: Prevention and diagnosis of power facilities

