

Smart Electric Safety Supervision And Power Management System

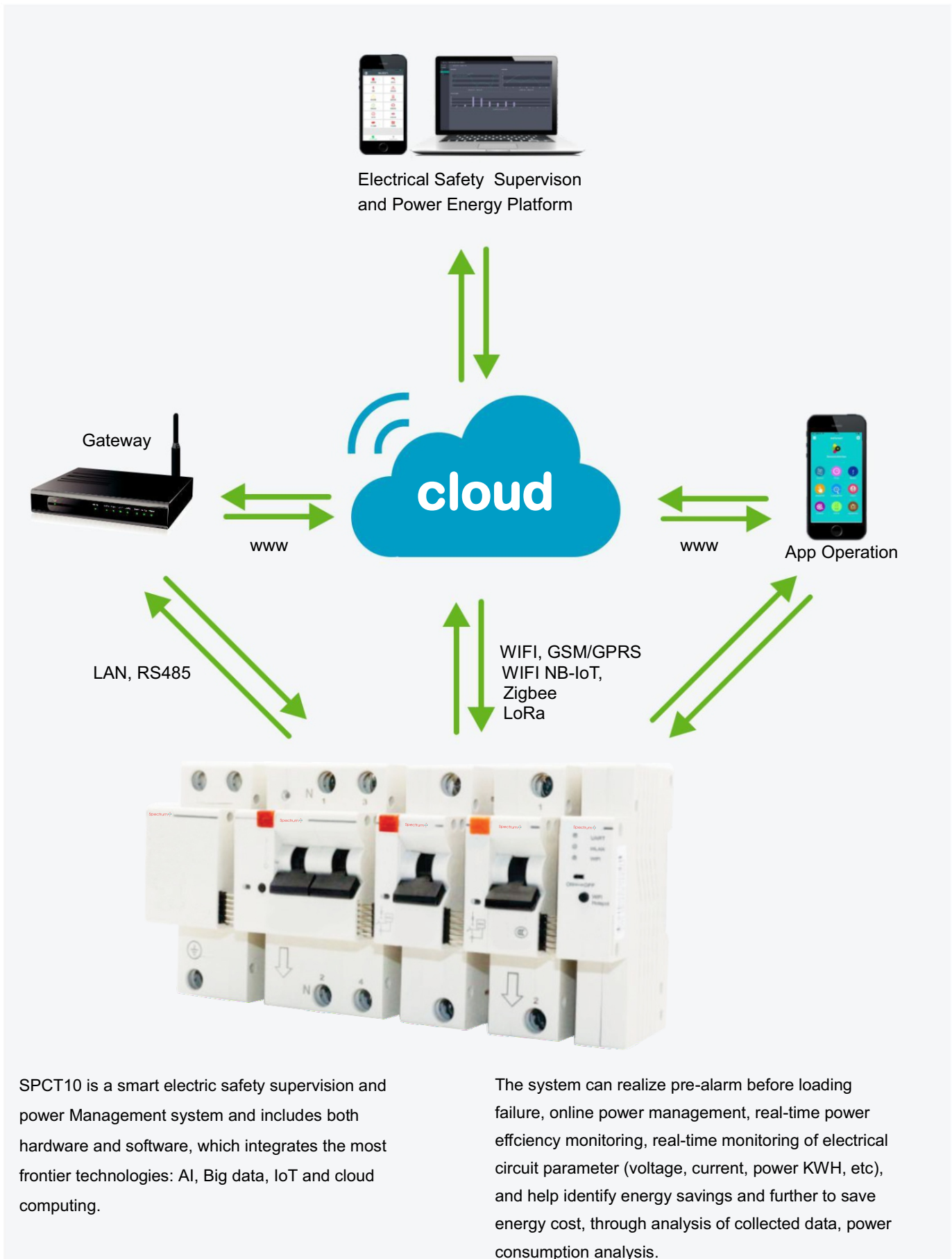
SPCT10



Focus on Smart Electricity

Smart Electric Safety Supervision and Power Management System

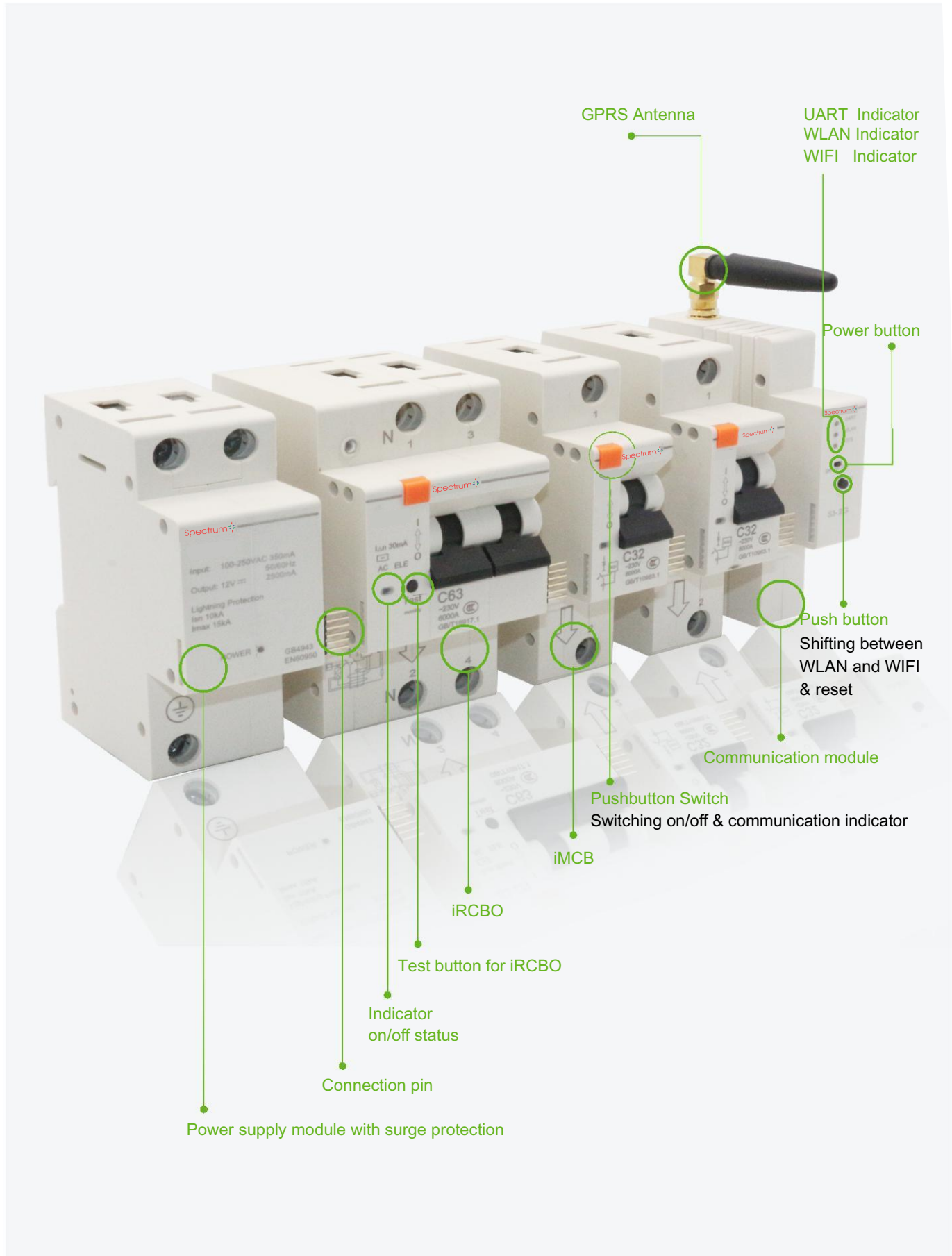
Overview



SPCT10 is a smart electric safety supervision and power Management system and includes both hardware and software, which integrates the most frontier technologies: AI, Big data, IoT and cloud computing.

The system can realize pre-alarm before loading failure, online power management, real-time power efficiency monitoring, real-time monitoring of electrical circuit parameter (voltage, current, power KWH, etc), and help identify energy savings and further to save energy cost, through analysis of collected data, power consumption analysis.

Structure



Smart Electric Safety Supervision and Power Management System

Hardware introduction

Power supply module with surge protection



- Providing DC power for smart circuit breaker and communication module.
- Providing lightning protection and surge protection.
- Main technical parameter:
Input voltage: 100-250 V AC
Input current: 3.5 A
Output voltage: 12 VDC
Imax for lightning protection: 15 kA
- Working with max.10pcs iRCBO or iMCB

Smart Metering Breaker - iMCB



- Full protection :
Overload, Short circuit, Over/under voltage
Arcing fault, Phase loss, Unbalance, High temperature
- Main technical parameter:
Poles: 1P, 2P, 3P, 4P
Rated Current (A): 10, 16, 20, 25, 32, 40, 50, 63, 80
Breaking Capacity: 6000 A
Curve: B, C, D

Smart metering breaker - iRCBO



- Full protection :
Earth leakage, Overload, Short circuit, Over/under voltage,
Arcing fault, Phase loss, Unbalance, High temperature
- Main technical parameter:
Poles: 2P, 4P
Rated Current (A): 10, 16, 20, 25, 32, 40, 50, 63, 80
Rated Residual Current: 30 mA
Curve: C

Communication module



- Voltage: 12VDC
- Communication:
WiFi, LAN, Rs485, NB-IoT, GSM/GPRS, Zigbee, LoRa
- Protocol: UDP, TCP/IP, Modbus
- Working with max.24pcs iRCBO or iMCB



Connection pin

Connection is extremely simple and requires no special tools, all the modules in one row can be connected by connection pins



Flexible flat cable

Flexible flat cable is used for connection of multi-rows in power cabinet.

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Benefits



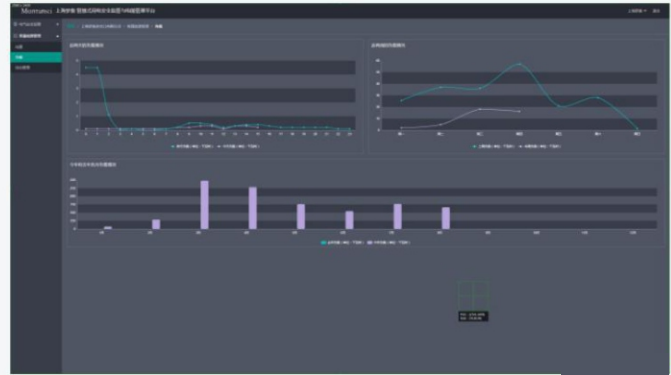
Early warning system and alarm
(Pre-alarm Maintenance)



Continuous monitoring of electrical circuit parameters of each breaker including both main and branch lines (such as current, voltage, earth leakage current, power and temperature) makes it possible to detect the early electrical faults and make early-warning before any unforeseen event. It improves the safety and reliability of electrical system and may be used widely in building as fire system solution.



Power management and cost analysis to reduce and schedule energy costs.



The cost of energy will rise continuously. In order to cut costs, we first have to know where they arise. The smart power management system helps illustrate and analyze the instantaneous energy consumption levels and realize the real-time power efficiency monitoring. Furthermore, the calculated active energy can be used to roughly allocate the costs at the output level. Therefore, it helps identify energy saving, and further to save energy cost, through analysis of collected data and power consumption.



Remote control



The hardware device may be controlled by App and software anytime and anywhere, to make life easier and safer.



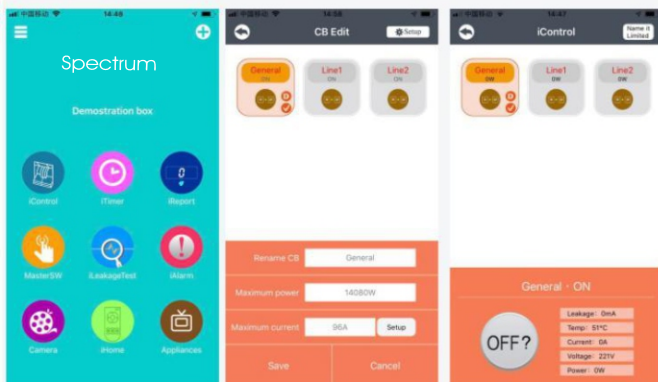
Software Introduction

The Spectrum smart electric safety supervision and power management system is an innovative cloud-computing platform designed to monitor, optimize and control the electrical system. This system also provides access to multi-site level, simultaneously monitoring and comparing the performance of different of different facilities. It also can provide personal user profiles depending on the level of access they require. It mainly include App operation version in smart phone and software platform for Electric safety supervision and power management.

APP

It includes six functions:

Remote control, Real-time monitoring, Event alarm and push, Power consumption curve, Timer, Max. Power and Current setting, auto-test of Residual Current.



Remote Control

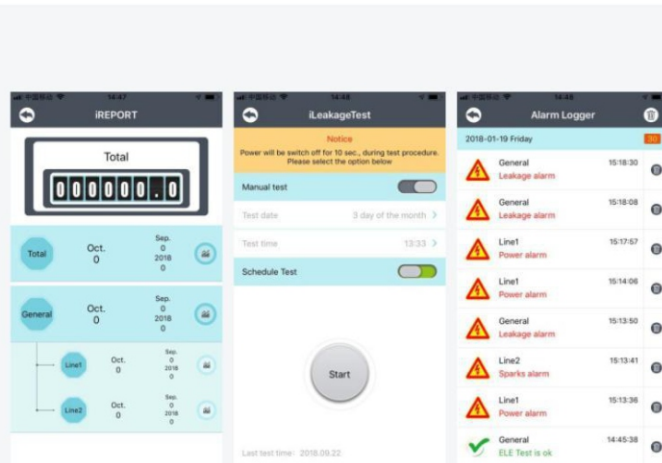
iMCB and iRCBO may be operated individually or be switched on/off all together through App remotely. And for safety, it can not be switch on through APP after switching off manually.

Real-time Monitoring

The system monitors electrical circuit parameters : voltage, current, Power ,temperature, Residual Current and KWH and these parameters may be showed in APP.

Max. Power and Current Setting

The max. power and current may be set through APP and the seting value must lower than rated current and power.



Power Consumption

Power consumption curve of main lines and each sub lines may be showed in APP monthly and hourly.

Event Alarm and Push

All the events recorded and fault alarm will be pushed through App.

Auto-test of Residual Current

Auto-test of earth leakage current in fixed date each month in the App instead of manual test monthly

Timer

Users are able to remotely set the power demand they want to target with a weekly,daily or hourly resolution



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Software Platform

The software platform includes two main parts: electrical safety supervision and power management.

Electrical Safety Supervision

The system will monitor all the electrical circuit parameter of all main and branch lines in real-time such as voltage, current, Power ,temperature, residual current and KWH and it may do pre-judgement and action through these electrical data collection and analysis.

Device location monitoring

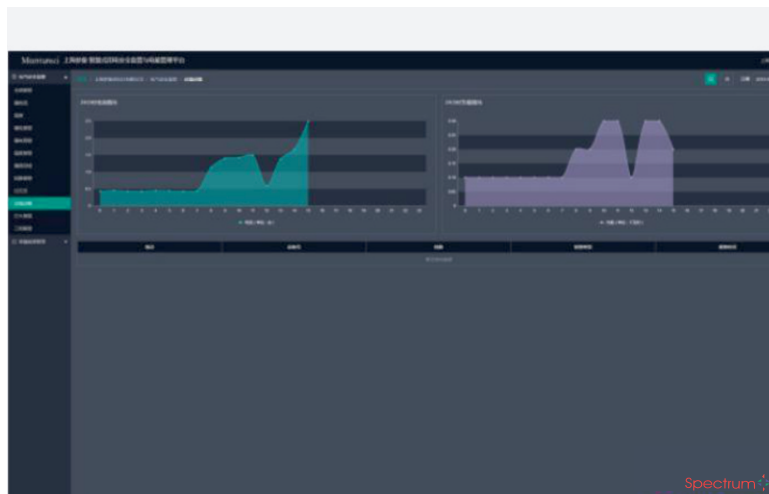
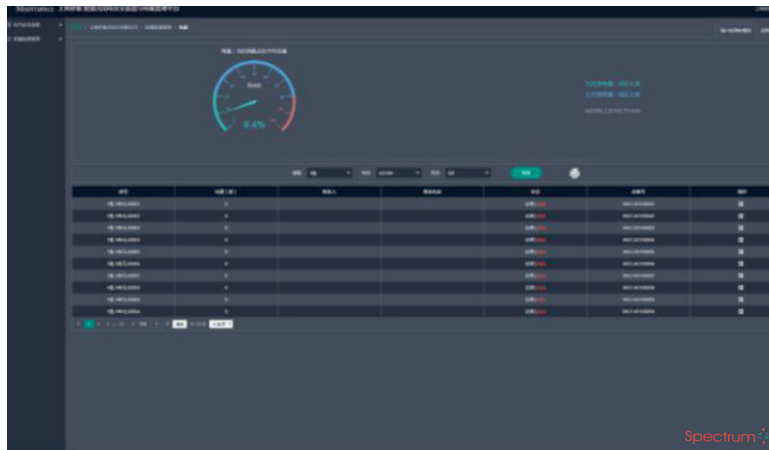
After installation, the location information of each device will be recorded and showed in the map in software platform. The software platform may monitor the real-time status of all device installed all over the world, in case early warning or fault alarm happened, the supervisor may find the device and its location quickly, then solve it accordingly before any unforeseen event.

Early warning and alarms

The system may make the following early warning and alarms:
Alarm of earth leakage current, Early warning of temperature, Alarm of short circuit
Early warning and alarm of over and under voltage, earth warning of over current, early warning and alarm of aging fault Early warning and alarm of three phase unbalance.

Information management

Through software platform, you can easily view contact information of technician of each project management site. If any warning and alarms happens, the software platform will inform the contact person to deal with it immediately.



Software platform

Power Management

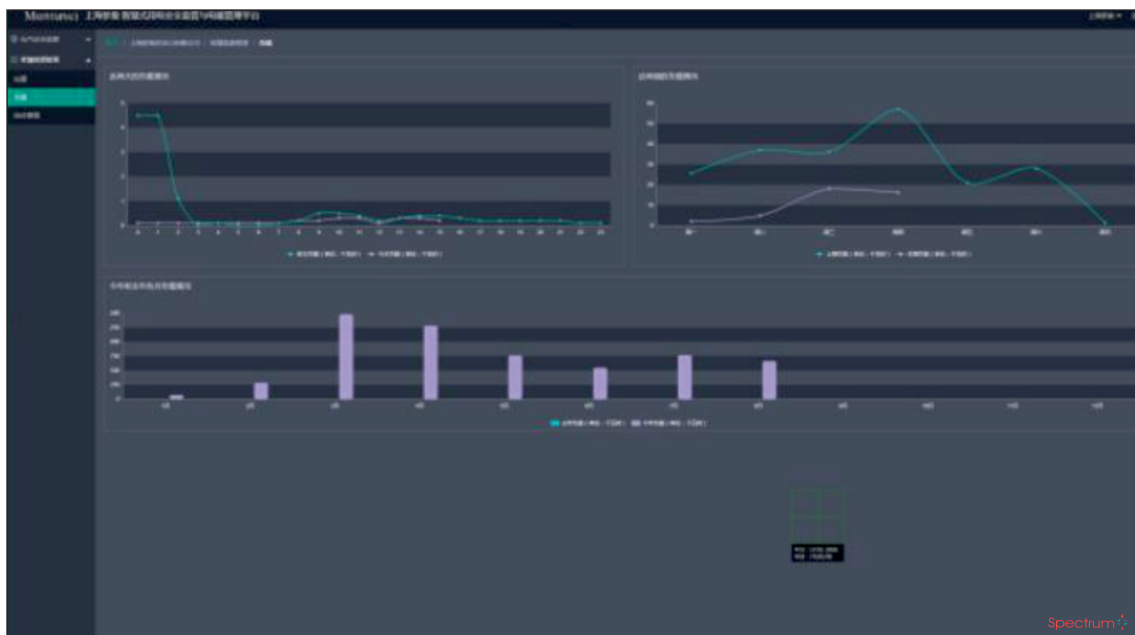
In this software platform, the user may find the basic analytic functions such as a dashboard data, instantaneous values, comparison functions and cost allocation by consumer group.

The building energy flows and costs are transparent, therefore, this solution is suitable for energy management and energy cost allocation application seeking energy efficiency improvement and cost reductions.

The platform realizes the collection, storage, management and efficient use of the terminal energy information. It analyzes, processes, handles all energy data, and output to keep the system run in best state, after system intelligent configuration.

It can reduce the operation cost of electrical terminal system, simplify the management of energy operations, decrease manpower of daily power management, and save human resources cost.

In order to further provide conditions for mining, analyzing, processing and handling energy data, The energy efficiency management system we built, can not only effectively solve real-time energy balance and monitoring management, but also build up condition to further dig, analyze, process, handle data, through filing and management of a large amount of historical data.



Smart Electric Safety Supervision and Power Management System

Applications

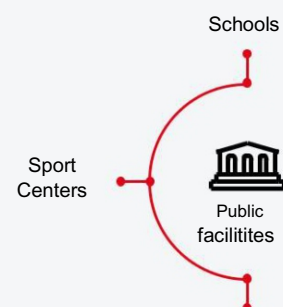
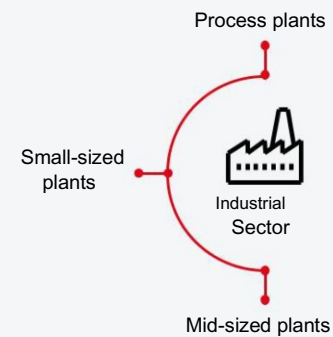
The device is based on a simple, integrated architecture. It guarantees high levels of flexibility, making it suitable for applications in different sectors.

In the industrial sector, solutions can be installed in small to mid-sized plants, in infrastructure facilities and process plants to monitor operations, using data analysis to minimize downtime.

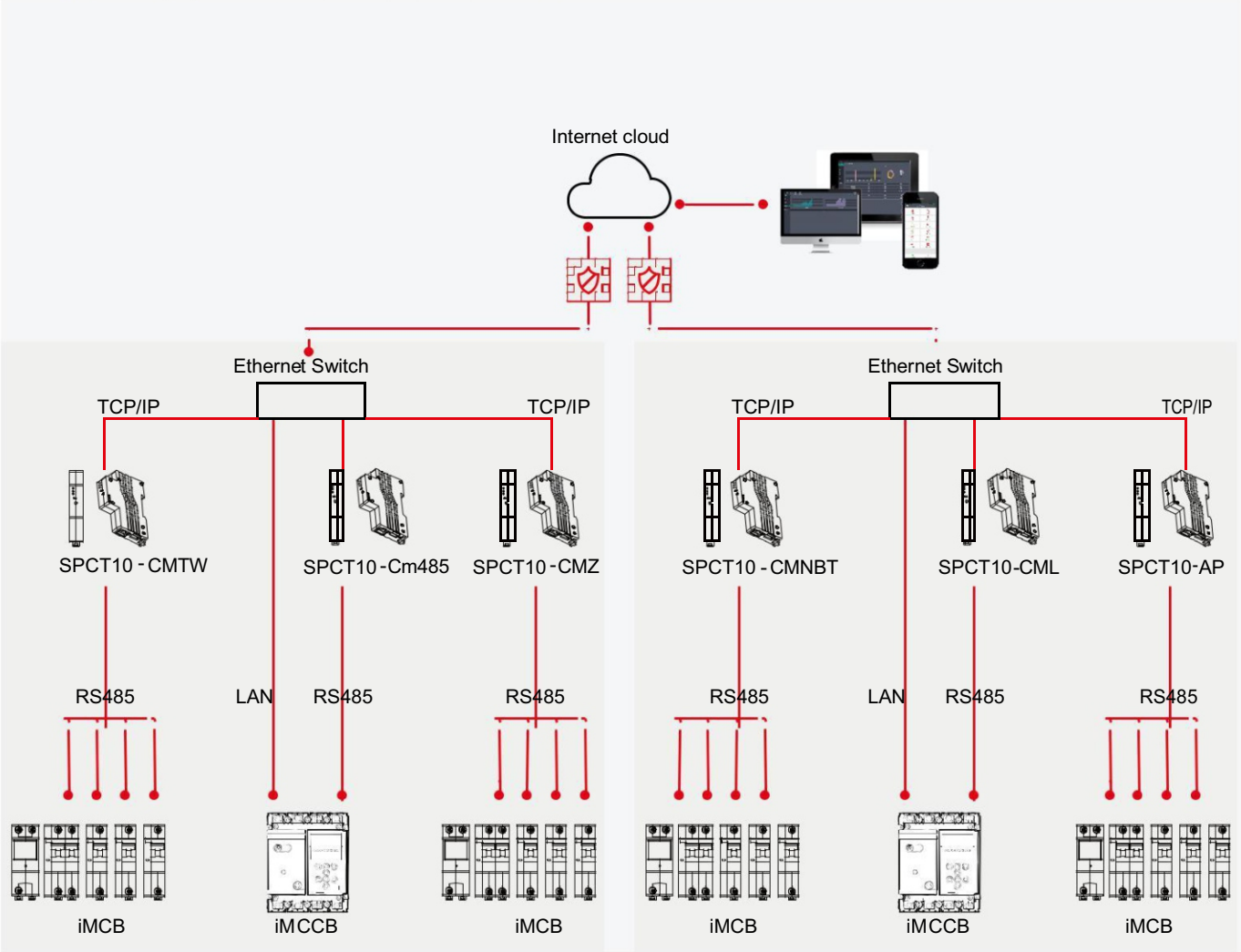
Optimized management of assets creates a competitive advantage that enables customers to maximize business opportunities.

Commercial and public buildings can also leverage the scalable solution to achieve higher energy efficiency and to have more detailed monitoring and control of their facility. Offices, shopping malls, hotels, retail or chain stores can increase their awareness of energy consumption and cost allocation to improve performance.

Public facilities, such as schools, sport centers and healthcare facilities, can secure service continuity and develop predictive maintenance forecasts.



Applications



Applications

This smart electrical safety supervision and power management system has changed the traditional operation and maintenance mode. By establishing an automatic monitoring and management platform, it is easier to use electrical safety supervision to eliminate potential safety hazards and achieve scientific energy management.



Hospital/Offices



The “Smart Electricity” APP helps hospitals to realize terminal power collection, store large amounts of data in real time, acquire first-hand data in real time, develop data center to extract, dig, analyze and summarize data, and finally provide proof for important decisions.

University/Schools



The “Smart Electricity” system can realize 7×24-hour school monitoring, get out of the limit and low efficiency of human work, and monitor the device operation status in real time through IoT system.

Shopping Mall



The mobile operation APP, with big data system, can digitally visualize all shop's power consumption, to graphically show and monitor the electrical operation.



Bank



To realize the smart electrical management in bank, the system will activate alarm in time while there are potential hazard, such as abnormal lines or overload circuit. It will accurately report the fault cause, and timely check the safety hazards through technical means.

Technical specification of power supply module

Power supply module may offer stable DC power for smart breaker SPCT10 and owns class II surge protection. It is also the necessary part for smart breaker SPCT10 system.


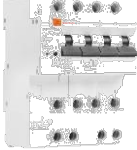
Item Code:	SPCT10- 12S	SPCT10-12T
Picture		
Functions	Power supply, surge protection	
Rated voltage Ue:	Vac	220
Rated input voltage range:	Vac	100-265
Frequency (HZ):	Hz	50/60
Rated input current	mA	350
Rated output voltage	Vdc	12
Rated output current	A	2.5
Type / test class of surge protection:		2 / II
Numbers of Modules(1 module=18mm)	mm	36(2 P)
Max.Cont. operating voltage Uc:	Vac	175, 275
Max.discharge current I _{max} (8/20) per pole I _{max} :	KA	15
Nominal discharge current I _n (8/20) per pole I _n :	KA	10
Max. working capacity (Max.numbers of breakers)		10*(iRCBO/ iMCB)
Conductor cross-sections	mm ²	38
Pollution degree		2
Ambient temperature:	°C	-15 - +40
Storage temperature:	°C	-25--+70
Humidity		< 95%
Altitude:	m	<=2000
Terminal connection		Cable/Pin-type busbar
Mounting		Din rail En60715(35mm) by means of fast clip device
Connection		From top to bottom



Smart Electric Safety Supervision and Power Management System





Technical specification of iRCBO

Smart RCBO may be used as main switch and line protection in Smart Breaker SPCT10 system. It is also the necessary part for Smart Breaker SPCT10 system as main switch.

Item Code:		SPCT10 - RC2	SPCT10-RC4
Picture			
Poles		2P	4P
Rated voltage Ue	Vac	230	400
Frequency (HZ):	Hz	50/60	
Rated current	A	16,20,25,32,40,50,63,80	
Type (wave form of the earth leakage sensed)		AC	
Rated residual current (I Δ n)	mA	30	
Rated insulation voltage Ui	Vac	500	
Rated Breaking capacity acc.to IEC61009 ultimate Icn	A	6000	
Breaking time under I Δ n		<=0.1 S	
Breaking time under Icn		<=0.04S	
Triping characteristic		C (5-10In)	
Other functions		Over/under voltage protection , warning and alarm Max.power and current setting Auto test of earth leakage current High temperature protection, warning and alarm Monitor of current, power and voltage in real-time Arcing fault protection, warning and alarm Remote control Timer Meter Event record and notice	
Breaking time when voltage is over 265Vac		10S	
Over/undder voltage warning		when voltage is higher than 250Vac or lower than 190Vac	
Breaking time when the current reach the max.current or power setup		5s	
The time for switching on automatically after auto-test of earth leakage current		5s	
Electric life	Times		
Mechanical life	Times		
Conductor cross-sections	mm ²	38	
Pollution degree		2	
Numbers of modules(1 module=18mm)		3 (54mm)	5 (90mm)
Ambient temperature:	°C	-15 - +40	
Storage temperature:	°C	-25---+70	
Humidity		< 95%	
Altitude:	m	<=2000	
Terminal connection		Cable/Pin-type busbar	
Mounting		Din rail En60715(35mm) by means of fast clip device	
Connection		From top to bottom	

Technical specification of iMCB


Smart Breakers are the core part of SPCT10 smart system, it combine protection, metering, monitor, timer, automation, event record and notice.

Item Code:	SPCT10- MC1	SPCT10-MC2	SPCT10-MC3	SPCT10-MC4
Picture				
Poles	1P	2P	3P	4P
Rated voltage Ue	Vac	230/400-240/415		
Operational voltage	Vac	Min.90 Max:250/440		
Frequency (HZ):	Hz	50/60		
Rated Current	A	10,16,20,25,32,40,50,63,80		
Rated insulation voltage Ui	Vac	500		
Rated impulse withstand voltage (1.2/50) Uimp	Vac	2500		
Rated Breaking capacity acc.to IEC60899 Icn	A	6000		
Breaking time under Icn		<=0.04S		
Tripping Characteristic		B (3-5In) C (5-10In) D (10-14In)		
Other Functions		Over/under voltage protection , warning and Alarm Max.Power and Current Setting Auto test of earth leakage current High Temperature protection, warning and Alarm Arcing Fault Protection, warning and Alarm Monitor of Current, power, voltage in real-time Remote control Timer Meter Event record and notice		
Breaking time when voltage is over 263Vac		10S		
Over/under voltage warning		when voltage is higher than 250Vac or lower than 190Vac		
Breaking time when the current reach the max.current or power setup	Times	5s		
Electric Life	Times	10000		
Mechanical life	mm ²	20000		
Conductor cross-sections		38		
Pollution Degree		2		
Numbers of Modules(1 module=18mm):	°C	1.5 (27mm)	2.5 (45mm)	4 (72mm) 5(90mm)
Ambient temperature:	°C	-15 - +40		
Storage temperature:		-25---+70		
Humidity	m	< 95%		
Altitude:		<=2000		
Terminal Connection		Cable/Pin-type busbar		
Mounting		Din rail En60715(35mm) by means of fast clip device		
Connection		From top to bottom		

Smart Electric Safety Supervision and Power Management System

Technical specification of communicaiton module



Communicaiton module includes wireless and wire communications, it also has function of hotspot.

Item Code:	SPCT10 - CM	
Picture		
Types	TCP/IP, RS485, Wi-Fi, GPRS-2G, NB-IoT, Zigbee, LoRa	
Rated input voltage	Vdc	12
Numbers of modules(1 module=18mm)		1 (18mm)
Max. working capacity (Max.numbers of breaker powering)		(iRCBO+ iMCB) x 32pcs
Conductor cross-sections	mm ²	38
Pollution degree		2
Ambient temperature:	°C	-15 - +40
Storage temperature:	°C	-25---+70
Humidity		< 95%
Altitude:	m	<=2000
Terminal connection		Cable/Pin-type busbar
Mounting		Din rail EN60715(35mm) by means of fast clip
Connection		From top to bottom




Ordering information



Power supply module

Pictures	Rated input voltage (Vac)	Rated output voltage (Vdc)	Rated input Current(A)	Type Code	With/Without LCD screen	Numbers of Modules(1 module=18mm)	Weight Unit: g
	110-265	12	2.5	SPCT10- 12S	Without LCD screen	2(36mm)	187
	110-265	12	2.5	SPCT10 - 12T	With LCD screen	2(36mm)	187



Communication Module

Pictures	Rated input voltage (Vdc)	Communication type	Type Code	Numbers of Modules(1 module=18mm)	Weight Unit: g
	12	TCP/IP, Wi-Fi	SPCT10- CMTW	1(18mm)	2.43
		RS485	SPCT10- CM485		
		Zigbee	SPCT10 - CMZ		
		NB-IoT	SPCT10 - CMNBT		
		LoRa	SPCT10 - CML		
		GPRS-2G	SPCT10 - CMGP2		

Accessory

Pictures	Accessory name	Communication type	Type Code
	Connection pin	6 pins	SPCT10-AP
	flexible flat cable	40mm	SPCT10- A40C
		60mm	SPCT10- A60C
		80mm	SPCT10-A80C
		100mm	SPCT10-A100C





Smart module iRCBO

Pictures	Curve	Number of poles	Rated residual current (mA)	Rated current In (A)	Type of RCD	Type Code	Numbers of Modules(1 module=18mm)	Weight Unit: g
	C	2P	30	16	AC	SPCT10-RC2PC16A	3(48mm)	367
				32		SPCT10-RC2PC32A		
				63		SPCT10-RC2PC63A		
				80		SPCT10-RC2PC80A		
	C	2P	30	32	AC	SPCT10-RC4PC32A	3(48mm)	787
				63		SPCT10-RC4PC63A		
				80		SPCT10-RC4PC80A		

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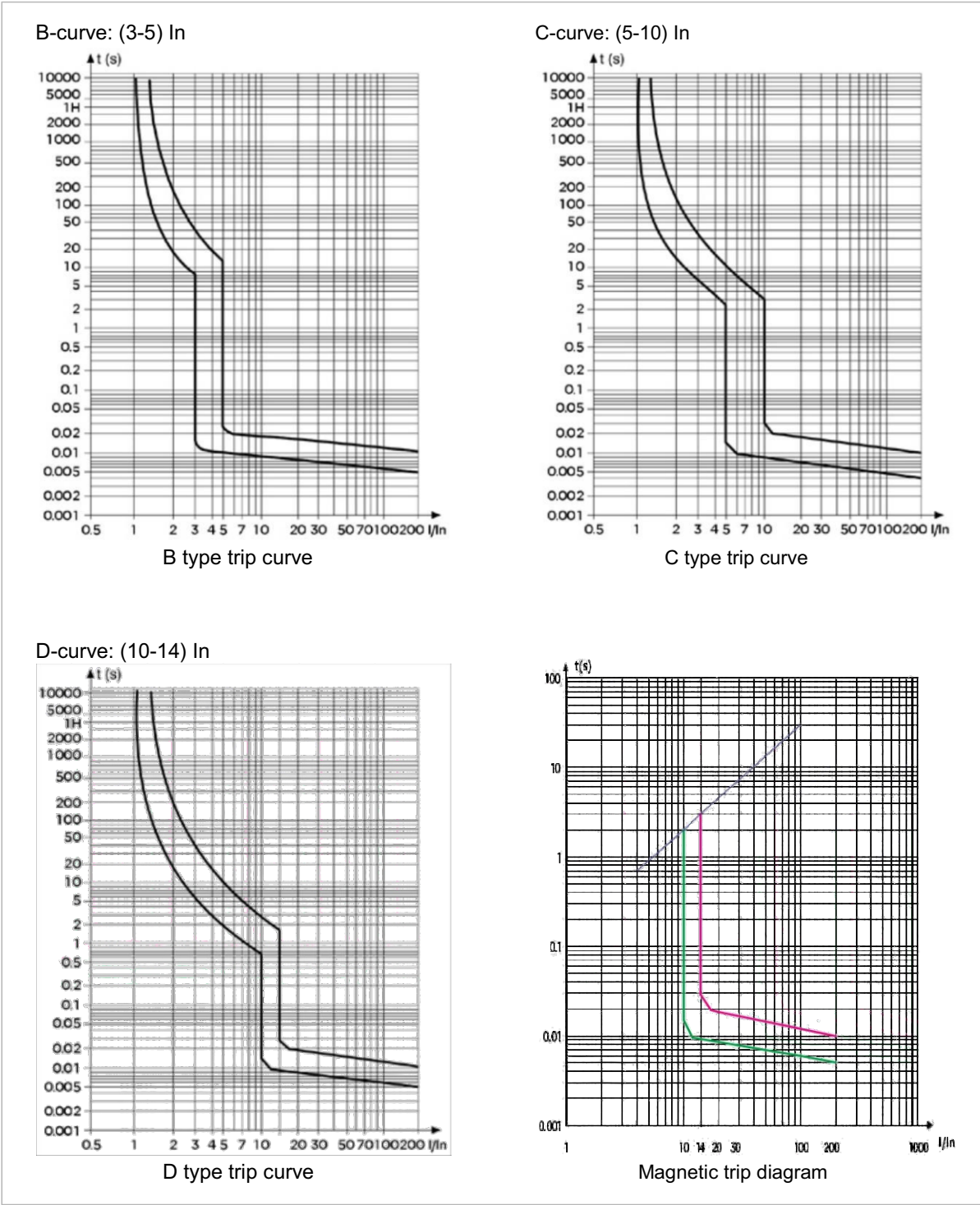
Ordering information

Smart module iMCB

Pictures	Number of poles	Curve	Rated current In (A)	Type Code	Numbers of Modules(1 module=18mm)	Weight Unit: g
	1P	B	16	SPCT10-MC1PB16A	1.5(27mm)	174
			32	SPCT10-MC1PB32A		
			63	SPCT10-MC1PB63A		
			80	SPCT10-MC1PB80A		
		C	16	SPCT10-MC1PC16A	1.5(27mm)	
			32	SPCT10-MC1PC32A		
			63	SPCT10-MC1PC63A		
			80	SPCT10-MC1PC80A		
		D	16	SPCT10-MC1PD16A	1.5(27mm)	
			32	SPCT10-MC1PD32A		
			63	SPCT10-MC1PD63A		
			80	SPCT10-MC1PD80A		
	2P	B	16	SPCT10-MC2PB16A	2.5(45mm)	368
			32	SPCT10-MC2PB32A		
			63	SPCT10-MC2PB63A		
			80	SPCT10-MC2PB80A		
		C	16	SPCT10-MC2PC16A	2.5(45mm)	
			32	SPCT10-MC2PC32A		
			63	SPCT10-MC2PC63A		
			80	SPCT10-MC2PC80A		
		D	16	SPCT10-MC2PD16A	4(72mm)	
			32	SPCT10-MC2PD32A		
			63	SPCT10-MC2PD63A		
			80	SPCT10-MC2PD80A		
	3P	B	16	SPCT10-MC3PB16A	4(72mm)	502
			32	SPCT10-MC3PB32A		
			63	SPCT10-MC3PB63A		
			80	SPCT10-MC3PB80A		
		C	16	SPCT10-MC3PC16A	4(72mm)	
			32	SPCT10-MC3PC32A		
			63	SPCT10-MC3PC63A		
			80	SPCT10-MC3PC80A		
		D	16	SPCT10-MC3PD16A	5(90mm)	
			32	SPCT10-MC3PD32A		
			63	SPCT10-MC3PD63A		
			80	SPCT10-MC3PD80A		
	4P	B	16	SPCT10-MC4PB16A	5(90mm)	637
			32	SPCT10-MC4PB32A		
			63	SPCT10-MC4PB63A		
			80	SPCT10-MC4PB80A		
		C	16	SPCT10-MC4PC16A	5(90mm)	
			32	SPCT10-MC4PC32A		
			63	SPCT10-MC4PC63A		
			80	SPCT10-MC4PC80A		
		D	16	SPCT10-MC4PD16A	5(90mm)	
			32	SPCT10-MC4PD32A		
			63	SPCT10-MC4PD63A		
			80	SPCT10-MC4PD80A		

Technical information

Tripping characteristic curves





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