Raycap

ProGRID Series

Surge and Lightning Counters
Surge Protection Device Monitoring

About Raycap

Raycap was founded in 1987 with a vision of creating and providing solutions that protect the world's infrastructure. From telecommunications to new and traditional energy networks, and from transportation systems to industrial applications of all types, Raycap is there with solutions to ensure equipment uptime in spite of harsh electrical environments. The company strives to keep its customers' sophisticated, mission-critical equipment running seamlessly and continuously, and is driven to make ongoing advancements in its surge protection technologies and product offerings.

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Surge and Lightning Counters

Electrical surges are high frequency current events that present potential danger to sophisticated electronic devices. Electrical surges can occur at almost any time, and the most common causes are lightning strikes, the switching of inductive loads, power grid disturbances, general fault or arcing conditions. In the case of a direct lightning strike the damage caused by surge current is clearly felt and often visible, however many other electrical surge events can go unnoticed. The consequences of such 'quiet' disturbances can be just as detrimental to the operation.

Surge currents can cause loss of data transmission, switch tripping, disturbance of machine control systems and a slow degradation of circuit elements. In addition, a surge can be an indicator of a short circuit which causes currents of power to travel along unintended paths with little or no electrical impedance, for example after a blackout or wiring insulation damage.

Raycap's ProGRID surge and lightning counter solutions have different capabilities that can sense, record and transmit the occurrence of otherwise undetectable surge currents, enabling users to take preventive measures and plan appropriate maintenance.

ProSEC II+

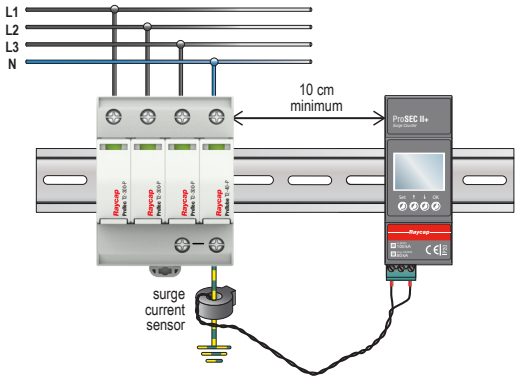
ProLEC Basic

ProSEC II+

Features

- LCD screen displays number of surges, hour, minute and date of surge event
- Buttons for TIME/DATE setting and log viewing
- Replaceable battery, lifetime up to two years
- Easy to install, snap-on surge current sensor
- Complies with: EN/IEC 61000-6-2, EN/IEC 61000-6-4
- EN/IEC CATEGORY: Type I, Type II

Typical Installation

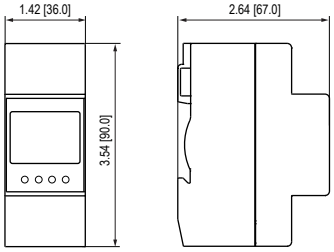


The ProSEC II+ is a surge counter with additional functionality. Besides counting the number of surges, it also logs the hour and date of each surge counted. This additional time and date logging function makes it possible to pinpoint the exact time of every surge and correlate it with equipment and power supply problems inside of a facility or structure.

Technical Data

inches [mm]

Electrical	
ProSEC II+ Order Code	**130 100**
Nominal Discharge Current (8/20) [I_n]	100 kA
Minimal Discharge Current (8/20) [I_{min}]	100 kA
Maximal Discharge Current (8/20) [I_{max}]	100 kA
Impulse Discharge Current (10/350) [I_{imp}]	80 kA
Minimum Impulse Discharge Current (10/350) [$I_{imp\ min}$]	100 kA
Maximum Impulse Discharge Current (10/350) [$I_{imp\ max}$]	80 kA
Power Supply	Replaceable CR17335 lithium battery Lifetime up to two years
Maximum Events Logged	999
Mechanical	
Mounting Method EN 60715	35 mm DIN rail
Maximum Wired Diameter through Current Sensor	0.55" [14 mm]
Sensor Cable	19.7" [0.5 m]
Temperature Range	-4 °F to +158 °F [-20 °C to +70 °C]
Environmental Ingress Protection (IP) Rating	IP 20
Enclosure Material	Thermoplastic; Extinguishing degree UL 94 V-0
Packaging Dimension (L × W × D)	4.33" × 1.56" × 3.27" [110 × 42 × 83 mm]
Dimensions DIN 43880	2 TE
Weight	.33 lbs [150 g]
Standards Compliance & Certifications	
Standards	EN/IEC 61000-6-2, EN/IEC 61000-6-4
EN/IEC Category	Type I, Type II
Certification	RoHS, CE
Product Diagram	



ProLEC Basic

Features

- LCD screen shows the number of lightning strikes, hour, minute and date of lightning events
- Buttons enable TIME/DATE setting and log viewing
- Replaceable battery, lifetime up to four years
- Contact-less sensor is installed easily with no change to existing installation
- Complies with: IEC/EN 62561-6

Typical Installation

ProLEC Basic is a basic lightning current sensor. It senses and logs lightning discharges flowing through the down-conductor. The ProLEC Basic is capable of measuring and withstanding currents up to 100 kA (10/350 µs).

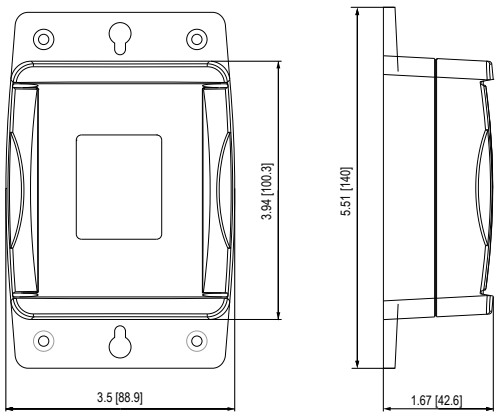
Installation of the ProLEC Basic on the exterior of a building or structure gives users vital information on the frequency, date, time and atmospheric discharges that affect the structure, enabling repairs or preventative measures.

Technical Data

inches [mm]

Electrical	
ProLEC Basic Order Code	**130 523**
Threshold Current (10/350 µs) [I_{tc}]	1 kA
Maximum Withstand Current (10/350 µs) [I_{mcw}]	100 kA
Power Supply	2 Replaceable CR17335 lithium batteries Lifetime up to four years
Maximum Events Logged	999
Mechanical	
Mounting Method	Direct on down-conductor
Temperature Range	-4 °F to +140 °F [-20 °C to +60 °C]
Enclosure Material	Polycarbonate: UL 94 V-Z
Environmental Ingress Protection (IP) Rating	IP 65
Packaging Dimension (L × W × D)	6.5" × 3.4" × 4.13" [165 × 87 × 105 mm]
Weight	.97 lbs [440 g]
Standards Compliance & Certifications	
Standards	IEC 62561-6
Certification	RoHS, CE

Product Diagram



Notes

Surge Protection Device Monitoring

Most Surge Protective Devices (SPDs) are designed to be self-sacrificial, often failing in order to protect more expensive equipment downstream. In essence, their life is based on the magnitude and frequency of surges they have diverted and absorbed. This means that at some point in time they will reach their end-of-life. This will be due to many small surges, or one large surge which exceeds the specified rating of the SPDs maximum discharge or impulse current. Upon reaching end-of-life, a correctly designed SPD will safely disconnect itself from the power supply. Such disconnection usually goes unnoticed since the indicator light is located directly on the SPD, which may not be frequently inspected due to remote location.

With Raycap's SPD life status indication devices it is easy for users to receive information about a failed SPD device immediately, or more importantly, to get a warning when a SPD is nearing its end-of-life. With these devices installed, power supply network operators know when to replace their SPD protection, which is just as important as having surge protection installed in the first place.

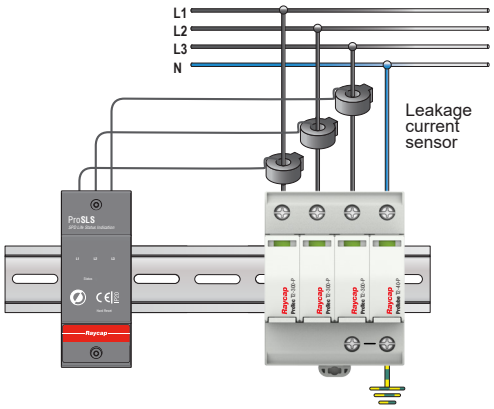
ProSLS **ProAlarm II** **ProSCT**

ProSLS

Features

- Automatic adjustment to all SPD sizes and models
- Replaceable battery, lifetime up to two years
- Continuously monitors leakage current of an SPD

Typical Installation



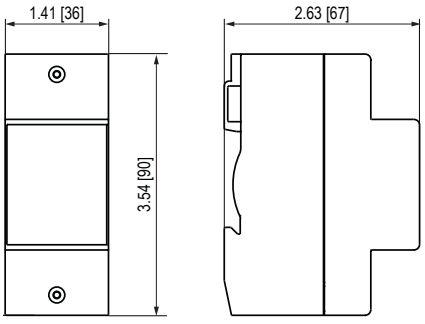
ProSLS is a device that continuously monitors the leakage current of an SPD, which is the most accurate predictor of a SPD's life status. Using measured current, ProSLS is able to predict the advanced degradation of a SPD and convey this information to the user.

Technical Data

inches [mm]

Electrical	
ProSLS Order Code	**130 551**
Lowest Measurable Current (SPD Leakage)	100 µA
Power Supply	Replaceable 3.6 V (ER AA) battery Lifetime up to two years
Remote Contacts	1 A 45 VAC / 30 VDC
Mechanical	
Mounting Method EN 60715	35 mm DIN rail
Maximum Wired Diameter through Current Sensor	0.47" [12 mm]
Sensor Cable	39.4" [1 m]
Temperature Range	-22 °F to +158 °F [-30 °C to +70 °C]
Enclosure Material	Thermoplastic; Extinguishing degree UL 94 V-0
Environmental Ingress Protection (IP) Rating	IP 20
Packaging Dimension (L × W × D)	4.33" × 4.53" × 2.95" [110 × 115 × 75 mm]
Dimensions DIN 43880	2 TE
Weight	.88 lbs [440 g]
Standards Compliance & Certifications	
Standards	IEC / EN 61326-1:2021
Certification	RoHS, CE

Product Diagram

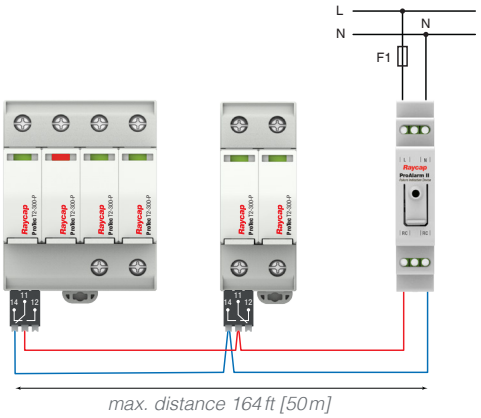


ProAlarm II

Features

- Audio alarm SPD failure indication
- Red LED visual SPD failure indication
- Button for acknowledging and silencing the alarm
- Multiple SPD connected to one ProAlarm II
- Rated voltage AC: 110 V-230 V

Typical Installation



ProAlarm II is a failure indication device that informs a user of the need to replace a failed SPD. It can be quickly and easily installed next to the SPD on the same rail, by making a connection between the RC contacts of the SPD and the alarm unit.

If an SPD fails, the user is informed by a loud audible beeping sound and the illumination of a red LED.

The alarm can be silenced with the press of a button, leaving the LED illuminated until the SPD has been replaced.

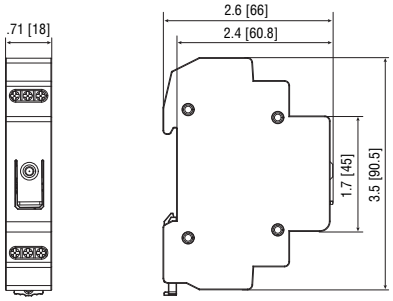
Technical Data

inches [mm]

Electrical	
ProAlarm II Order Code	**130 562**
Rated Voltage (AC)	110 - 230 V
Rated Frequency	50 Hz - 60 Hz
Rated Current	0 mA
Rated Current (Beeping)	10 mA (110 V); 21 mA (230 V)
Overcurrent Protection (max)	16 A
RC Rated Current	10 mA (110 V); 21 mA (230 V)
TOV Withstand 120 min(1)	442 V
Maximum Discharge Current [I_{max}] (8/20 µs)(1) (2)	50 kA
Impulse Discharge Current [I_{imp}] (10/350 µs)(1) (3)	12.5 kA
Mechanical	
Overvoltage Category	III
Mounting Method EN 60715	35 mm DIN Rail
Operating Temperature	-20 °C to +70 °C [-4 °F to + 158 °F]
Enclosure Material	Thermoplastic; Extinguishing Degree UL 94 V-0
Environmental Ingress Protection (IP) Rating	IP 20
Operating State / Display	Red LED / Audible Alarm
Sound Power Level [L_{WA}]	70 dB
Dimensions DIN 43880	1TE
Packaging Dimension (L x W x D)	3.1" x 0.9" x 4.3" [77.8 x 23 x 108 mm]
Weight	.12 lbs [53 g]
Standards Compliance & Certifications	
Standards	IEC 61010-1:2010+A1:2016, EN 61010-1:2010+A1:2019
Certification	RoHS, CE

(1)per IEC/EN 61643-11 (2)Only in parallel with T2 SPD where Uc ≤ 350V. (3)Only in parallel with T1 SPD where Uc ≤ 350V.

Product Diagram

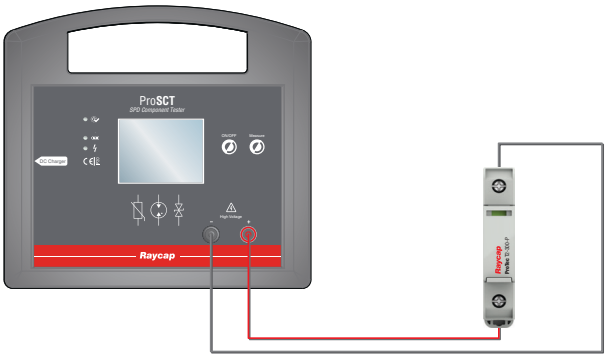


ProSCT (with SPD Adapter)

Features

- Measurement of MOVs, GDTs and TVSs
- Test GDTs and MOVs up to 1500 VDC
- Auto-detects type of component connected
- Displays list of successive measurements using LOG Mode
- Color TFT display and touch screen interface
- Rechargeable battery included

Typical Installation



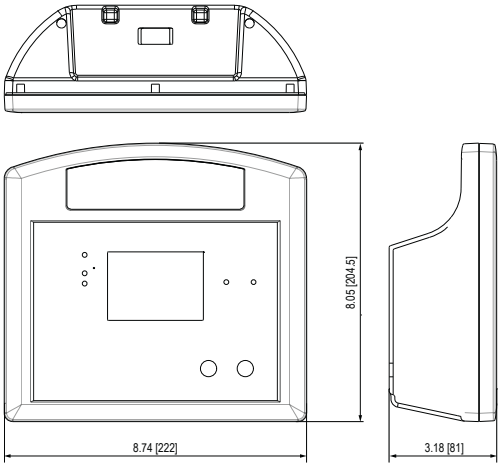
The ProSCT (SPD Component Tester) tests the components commonly used in surge protective devices, such as Gas Discharge Tubes (GDT), Metal Oxide Varistors (MOV), and Transient Voltage Suppressors (TVS).

It is a portable, battery operated instrument with an integrated battery charger housed in a robust enclosure. The instrument features a 320 × 240 pixel TFT color display with touch screen interface.

Technical Data

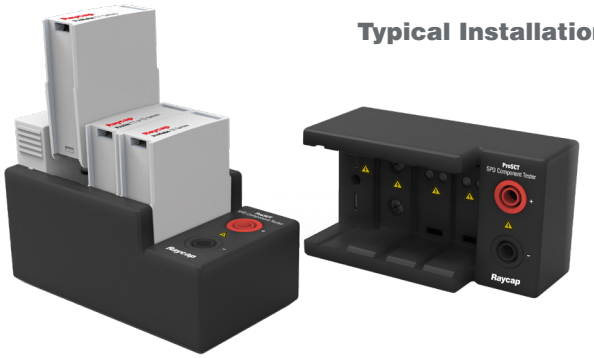
inches [mm]

Electrical	
ProSCT Order Code	**130 574**
ProSCT in Suitcase	**130 576**
ProSCT in Suitcase with SPD Adapter Order Code	**130 572**
MOV & ABD Test Current	0.1 mA; 0.5 mA; 1 mA
GDT Voltage Ramp	100 V/s; 1000 V/s
Maximum Test Voltage	1500 VDC
MOV Measurement Error	1.5% +/- 2 digit counts
GDT Measurement Error	3.5% +/- 2 digit counts (1 kV/s) 1.6% +/- 2 digit counts (100 V/s)
Mechanical	
Operating Temperature (°C)	-10 °C to +50 °C
Enclosure Material	UL-94-HB ABS
Environmental Ingress Protection (IP) Rating	IP 20
Packaging Dimension (L × W × D) - Suitcase	4.5" × 10.1" × 14.3" [115 × 256 × 363 mm]
Weight	2.43 lbs [1100 g]
Standards Compliance & Certifications	
Standards	EN 61626-1:2021 IEC 61010-1:2010+A1:2019
Certification	RoHS, CE
Product Diagram	

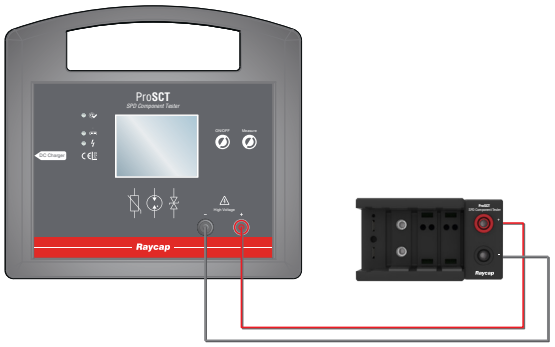


Features

- Connected to the ProSCT instrument via means of cable with banana jack plugs
- 4 connection sockets for different types of SPD modules
- Typical width of SPD modules is 1TE or 2TE (2TE width available only for New SPD spring contacts)



Typical Installation

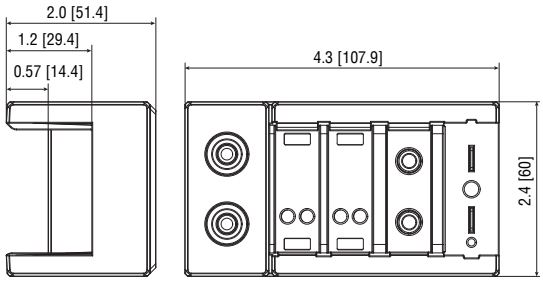


The ProSCT SPD adapter is intended as an accessory for the ProSCT (SPD Component Tester) instrument developed by Raycap. It is used to interface a DIN rail base assembly to the ProSCT instrument. The base assembly is designed to accommodate various generations of Raycap SPD modules.

Technical Data

inches [mm]

Electrical	
SPD Adapter	**130 575**
Connections towards SPD tester	Banana jack
Connections towards SPD modules	Old SPD flat contacts, NPE bullet contact, 2 New SPD spring contacts (for 1TE and 2TE modules)
Operating temperatures	-10 °C to +50 °C
Packaging Dimension (L × W × D)	4.0" × 2.5" × 4.3" [102 × 64 × 110 mm]
Weight	.38 lbs [175 g]
Standards Compliance & Certifications	
Standards	IEC 61010-1:2010+A1:2019
Certification	RoHS, CE
Connections	



Wind Turbine Lightning Strike Monitoring

The ProLEC FO lightning strike monitoring system helps in the optimization of operations and maintenance procedures at the wind turbine. The system consists of a sensor and optical electrical converter that communicate via fiber optic cable. The optical electrical converter sends data to the external device using a simple signaling protocol.

The user's equipment receives alarms transmitted by the optical electric converter.

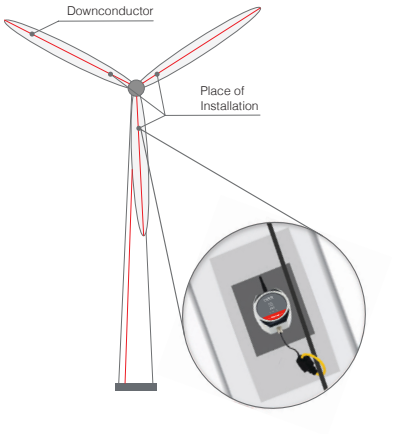
ProLEC FO Series

ProLEC FO System

Features

- Senses a direct lightning strike to a wind turbine's Lightning protection system, LPS
- Detects lightning strikes above 2kA amplitude
- Simple mounting
- High voltage isolation

Typical Installation



Technical Data

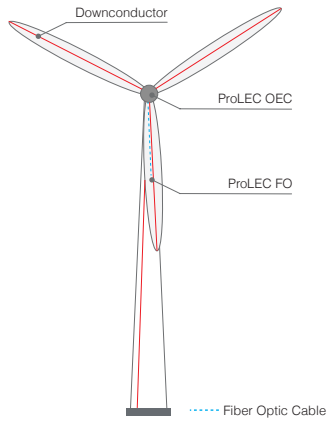
inches [mm]

Electrical		
ProLEC FO System		**130 533**
ProLEC FO Sensor		**130 535**
ProLEC FO		**130 534**
Threshold Current [I_{tc}]		2 kA
Maximum Withstand Current [I_{mwc}]		100 kA
Threshold Detection Error		+/-200A
Power Supply		Replaceable battery 3.6 V (Size D) Battery Life 3 Years typical
Communication		Fiber optic
Mechanical		
Temperature Range	Sensor	-40 °C to +55 °C
Environmental Ingress Protection (IP) Rating		IP 65
Housing Material of Sensor		GD-Al Si 12 (DIN 1725)
Dimensions		156 × 119 × 65 mm
		[6.15" × 4.7" × 2.6"]
Weight per Unit	Without Battery	1.52 lbs. [690 g]
	With Battery	1.74 lbs. [790 g]
Standards Compliance & Certifications		
Standards		EN/IEC 62561-6:2018, IEC 61326, EN 60068-2
Certification		RoHS, CE

Features

- Isolated fiber optic communications - 10m optic cable
- High voltage isolation

Typical Installation



Technical Data

inches [mm]

Electrical		
ProLEC OEC		**130 537**
Power Supply		DC 5-30V
Communication		communication to sensor fiber optic
		communication to external device see user manual appendix A
Mechanical		
Temperature Range	Sensor	-40 °C to +55 °C
Environmental Ingress Protection (IP) Rating		IP 20
Housing Material of Sensor		PA (polyamide) V0 (UL94)
Dimensions		124 × 99 × 22.6 mm
		4.9" × 3.9" × 0.9"
Weight per Unit		0.24 lbs. [110 g]
Standards Compliance & Certifications		
Standards		EN 61326-1
Certification		RoHS, CE

Technical Data

Mechanical	
Fiber Optic Cable	**130 536**
Cable Type	1 mm diameter, Standard POF grade
Attenuation	0.22 dB/m typical (-40°C to 85°C)
Construction	Duplex plastic fiber, with black polyethylene jacket
Flame rating	Comply with UL VW-1 flame retardant specification
Termination	Unterminated
Max. operational length	20m

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