

TECHNICAL DATA SHEET

LPI® Bluetooth Surge Protection Range

Introducing LPI’s patented Bluetooth surge protection range of products. A state-of-the-art circuit designed to meet the latest IEC requirements combined with Bluetooth 4.1 low-power communication for cost-effective remote monitoring.

Key Benefits

- App-based operation removes the need for switchboards to be opened manually when undertaking maintenance checks for surge protection purposes
- The App-based operation allows for maintenance checks to be undertaken remotely by non-technical personnel
- Plug and base assembly for easy installation and maintenance
- Alarm Interface Modules (AIM) allow for standalone or integrated communication
- High performance surge protector for Class II applications
- Thermal and short-circuit disconnect
- 50 kA surge rating capacity



Key Features

- Bluetooth 4.1 communication provides feedback on critical operating elements
- Memory retention of the latest values stored in the SPD module
- Easy pairing and interrogation of SPD for quick and simple diagnostics
- Integrated surge counter in each module
- Individual device identifier tag
- Instant status indication for each module

Available for the following operating platforms:

Version 8 and above	Windows 10 / Windows 10 mobile	Version 4.3 and above

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With the aid of the optional Alarm Interface Module (AIM), we can now provide unprecedented connectivity between LPI SPDs. AIM can auto-detect up to 19 x SST150B modules within its range and provide individual data upon request.

Table 1.

Alarm Interface Module output options


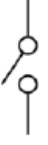
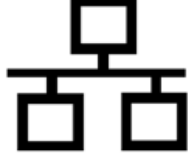

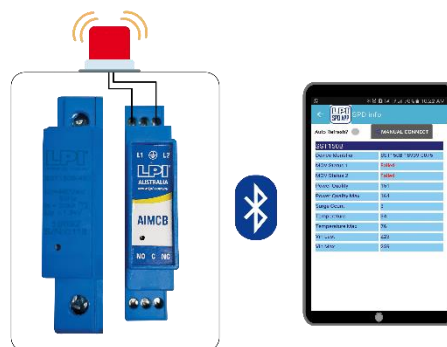
			
AIMCB		AIME	AIMW
1st Release		Future Release phase	Future Release Phase

Figure 1. Simple Bluetooth communication with SST150B inside enclosure using an external smart device to read back critical information.



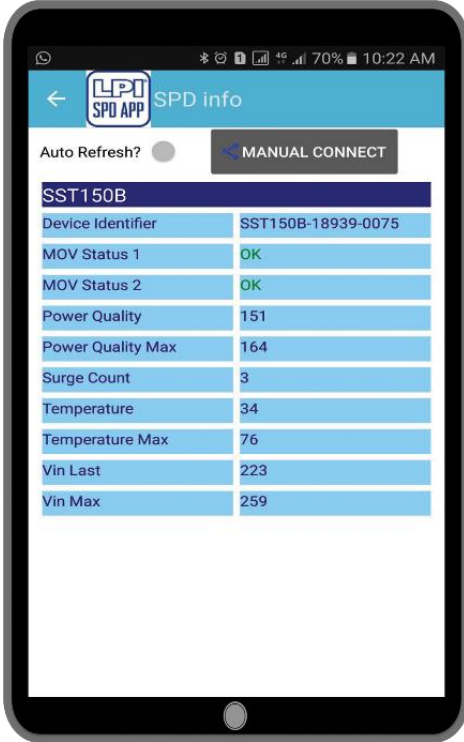
Figure 2. If local alarm indication is required, the AIMCB will auto pair to the SST150B and allow volt-free contacts to be initiated, with future releases allowing for simultaneous Bluetooth communication.



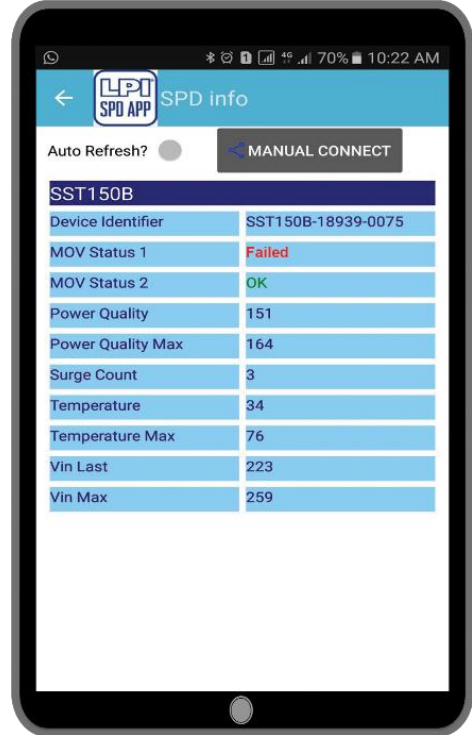
Note: LPI does not supply external warning lights or other associated accessories

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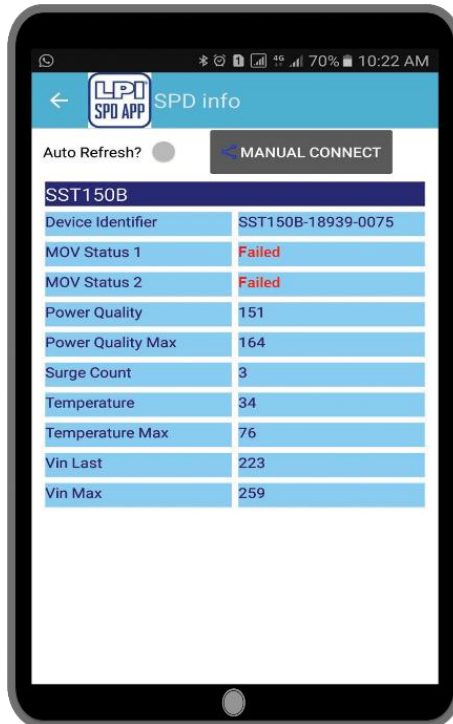
The following images provide a snap shot of the information provided to the user via LPI’s range of Bluetooth surge protection products.



Operational



Replace as protection is reduced



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LPI[®] SPD Module (Single Module and Base)

The LPI SST150B is a single mode power line shunt surge protection device rated for 50 kA 8/20 µs single shot surge capacity (I_{max}). The unit is designed for mounting at main power switchboards and distribution boards in category C locations as per the IEC and other international standards.

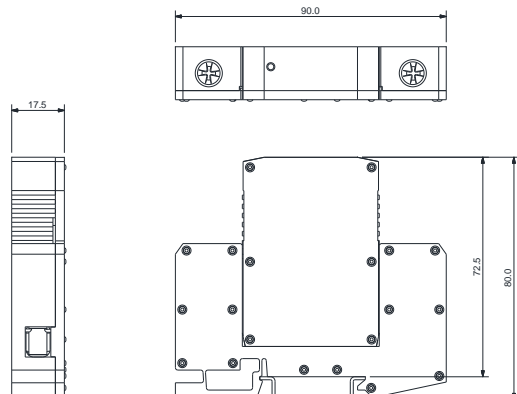
The LPI SST150B is designed to provide surge and transient protection in compliance with IEC 61643 international standards. The design allows it to be configured for Ph-N protection applications for single or multiple phases as required. It is also designed for easy mounting on standard 35 mm DIN rail.

The unit comes with fast, responsive Metal Oxide Varistors (MOV) to provide effective surge protection with low let-through voltage to protect sensitive electronics and electrical circuits.

The unit comes as a two-part item. The base is hardwired into the circuit to be protected, and the protection module is plugged into this base. This enables easy replacement of protection modules should they be degraded or damaged by excessive transient activity. The SST150B is supplied with Bluetooth connectivity as detailed in previous pages (refer to page 3).

Technical Specifications

Protection Modes:	Ph-N
Status Indication:	LED display: showing operational condition
Bluetooth Connectivity:	Status indication, operating voltage, Harmonic THD %, Internal temp & Surge Impulse Count
Mounting:	TS 35 mm – DIN43880 DIN rail
Weight:	Approx. 127 grams
IP Rating:	IP 20
Colour:	Blue
Conductor Size:	35 mm ² (Max)
Operating Temperatures:	-20 to +40 °C, 0 – 95 % humidity
Designed to Conform to:	IEC 61643-11 & UL 1449 Ed4 where applicable
Surge Withstand:	ANSI C62.41 Cat A, Cat B, Cat C, AS/NZS 1768-2007 Cat A, Cat B, Cat C
Application:	Main and sub-distribution boards
Configuration:	Hardwired base and pluggable module
Warranty:	5 years



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LPI® Bluetooth Surge Protection Range

Single Module and Base

Product Code:	Nominal Operating Voltage Un: @ 50/60 Hz	Surge Rating (Imax): @ 8/20 μ s	Nominal Discharge Current (In): @ 8/20 μ s	Max. Continuous Operating Voltage (Uc):	Voltage Level at 20 kA 8/20 μ s:	Response Time:	Power Distribution Systems:
SST150B-230	110-120Vac	50 kA	20 kA	230 Vrms	< 0.8Kv	<5 ns	TT & TN for L-N mode
SST150B-385	220-240 Vac	50 kA	20 kA	385 Vrms	<1.3 kV	<5 ns	TT & TN for L-N mode
SST150B-480	220-277 Vac	50 kA	20 kA	480 Vrms	<1.7 kV	< 5 ns	TT & TN for L-N mode

Replaceable Surge Module

Product Code:	Nominal Operating Voltage Un: @ 50/60 Hz	Surge Rating (Imax): @ 8/20 μ s	Nominal Discharge Current (In): @8/20 μ s	Max. Continuous Operating Voltage (Uc):
SST150B-230-Module	110-120Vac	50 kA	20 kA	230 Vrms
SST150B-385-Module	220-240 Vac	50 kA	20 kA	385 Vrms
SST150B-480-Module	220-277 Vac	50 kA	20 kA	480 Vrms

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Installation Guide for SST150B

All installation work must be carried out by licensed electrical personnel.

Location:

The shunt protection device should be installed at the “point of entry” of the power mains, but after the power meter and main breaker in order to protect downstream power connected equipment.

Installation:

Refer to table for recommended fuse and cable sizes.

1. Ensure power is disconnected prior to commencing installation.
2. The unit is labelled showing the incoming (point of entry) and outgoing (load) terminals to be used for enclosure and backplane units only.

PHASE IN and PHASE OUT are at the top of the unit whilst the EARTH and NEUTRAL are at the bottom.

3. Ensure that the “V” or Kelvin connections as per figure 3a. are observed.
4. Incoming cabling should enter the enclosure or backplane from the bottom.
5. The earth terminal must be connected to a low impedance earth (<10 Ω) deploying a single point earthing system, which should be connected to an equipotential earth plane. Integral to this is the elimination of earth loops. It is common, but incorrect from the point of lightning protection to have separate earths for various services. The use of single or multi core copper earth cable of not less than 25 mm² (max. 35 mm²) is recommended.
6. Once connections are completed apply power and observe correct operation, place the provided LPI APP sticker to the outside of the enclosure or cabinet as to indicate Bluetooth connection is available to the surge diverter.



LPI App Sticker

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Connection options:

1. It is recommended that the “V” or Kelvin connection be employed as shown at Figure 3a to minimise the over voltage applied on the protected equipment. Be sure not to run input and output wiring parallel.

2. If “V” connection is not possible, “T” connection is preferred as shown at Figure 3b. With this connection method, the input lead length should be kept as short and thick as possible and the wires should be bundled together.

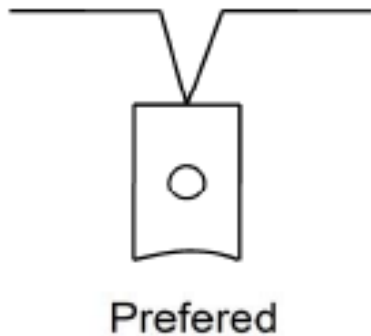


Figure 3a. Connection to Modules

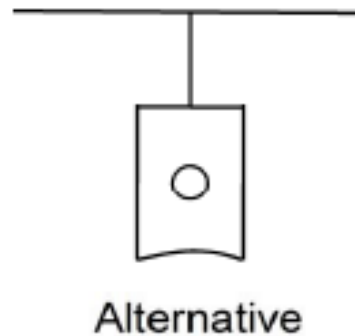


Figure 3b. Alternative Connection

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LPI® Spark Gap Shunt Protector - SG Range



Features

- Encapsulated Spark Gap Technology
- Low follow on current
- 35mm DIN rail mount

The LPI Spark Gap Protector is a high performance encapsulated spark gap offering a high surge rating with low follow on current, ideal for point of entry protection. It is intended for installation within the lightning protection zone concept at the boundaries LPZ O_{A(B)} -1 according to IEC 62305-4.

The LPI Spark Gap Protector has been designed for the protection of Phase-to-Neutral, Phase-to-Earth, or Phase-to-Neutral-Earth protection in LV supply systems.

Follow on current performance for these devices is kept within acceptable levels by the rapid extinguishment of the arc allowing transients to be clamped without activating upstream protection devices.

Ordering Code		SGT50-25
Nominal Operating Voltage:	U_N	230 Vac @ 50/60 Hz
Max. Continuous Operating Voltage:	U_C	255 Vrms (up to 480 Vrms, however with lower follow current extinguishing capability)
Follow current extinguishing capability at: U_c :	I_f	25 k Arms
Voltage protection level at: I_{imp} :	U_P	<2.0 kV
Max. lightning impulse current:	I_{imp}	50 kA (10/350 μ s)
Max. discharge current:	I_{max}	135 kA (8/20 μ s)
Max. lightning charge:	Q	25 As
Specific energy:	W/R	625 kJ/ Ω
Insulation resistance:	R_i	>100 M Ω
Response time:	t_a	<100 ns
Standard:		IEC 61643 and EN 61643
Recommended backup fuse:		315 AgL/gG
Operating temperature section of connected conductors range:		-40 to +70 °C
Recommended cross-section		50 mm ² (solid) or 35 mm ² (flexible) (at 4Nm clamping force)
Protection type:		IP 20
Mounting:		DIN rail 35 mm
Housing material:		SLOVAMID 6FRC2
Weight:		224 g
Application:		Main and sub-distribution boards (>100 A capacity)
Dimensions:		65 mm (H) x 35 mm (W) x 90 mm (L)
Warranty:		5 Years

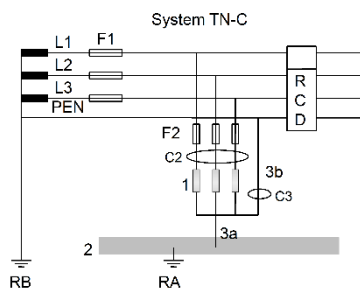
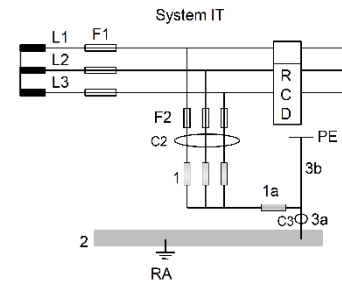
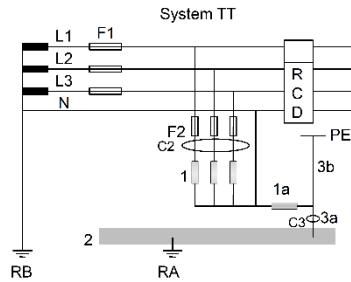
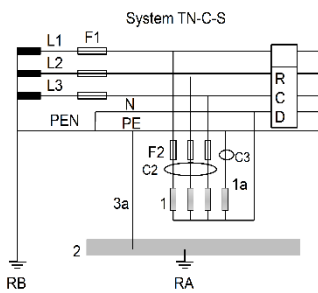
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Installation Guide for Spark Gap

The use of a closed, high performance spark gap (gas filled) renders the blow-out vent superfluous. A safety gap between adjacent components for fire protection reasons is unnecessary. The installation of this unit is normally in the main distributor at the building entrance. The protection circuit is contained in a snap-on housing for installation on 35 mm DIN rail (in compliance with EN 50022) with multi-function terminals for wires and wiring bridges.

As this protector has to discharge lightning currents of up to 50 kA or 60 kA (10/350 μs), we recommend the use of stranded copper cable of 35 mm². Connections should preferably be tightened to 3 Nm. The entire length of the cable should not exceed 0.5 m. However, if it does exceed 0.5 m, the PE line should be installed with a Kelvin connection. This device must not be bonded exclusively via the wiring bridge. Lightning currents must be discharged via a cable with an adequate cross-sectional area. Protected and unprotected lines must not be laid together.

The LPI® SGT range may only be mounted and installed by suitably qualified personnel in compliance with the applicable standards. This device may only be used in the 3 + 1 circuit as an N/PE lightning current protector. We recommend that after the period when thunderstorms are most frequent, the connections for this lightning current protector be re-tightened.



Legend

- 1 - LPI SGT50-25/ SG60
- 1a - LPI NE100
- 2 - Main equipotential bus bar
- 3a, 3b - Grounding wires for arresters
- F1 - Main back-up fuse of service main
- F2 - Recommended back-up fuse 315AgL/gG (only if the main back-up fuse F1 is fitted with back-up fuses >315AgL/gG)
- RA - Equipment grounding
- RB - Grounding system

Schematic Diagram for different distribution system

Fuse F1 gL/gG	C2 mm ² connection at F2	C3 mm ² connection to ground	Fuse F2 gL/gG
100 A-125 A	16	16	-
160 A	25	25	-
200 A-315 A	35	35	-
≥ 500 A	35	35	315 A

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LPI® Neutral / Earth Module



Features

- Encapsulated spark gap technology
- Low follow on current
- 35 mm DIN rail mount
- NE-15B Bluetooth Connectivity

The LPI NE range lightning arrester is intended for applications in unmeasured parts of electrical installations within the lightning protection zones concept at the boundaries LPZ 0 A(B) -1 (according to IEC 62305-4).

The LPI NE range of lightning arresters are constructed as encapsulated (non-venting) chamber carbon spark gaps.

The LPI NE range is a single pole neutral–earth high energy protection device to protect electronic equipment from lightning current surges.

Technical Specifications

Product Code:	NE-15B	NE-100
Nominal Operating Voltage: Un	230 V/50 Hz	
Max. Continuous Operating Voltage: U _c	255 V/50 Hz	
Voltage Protection Level at Limp: U _p	<1.5 kV	<2.0 kV
Max. Lightning Impulse Current: I _{imp}	15 kA (10/350 μs)	100 kA (10/350 μs)
Max. Lightning Impulse Current: I _{max}	80 kA (8/20 μs)	150 kA (8/20 μs)
Specific Energy: W/R	50 kJ/Ω	2500 kJ/Ω
Insulation Resistance: R _i	>1000 MΩ	
Response Time: t _A	<100 ns	
Standard:	IEC 61643 and EN 61643	
Operating Temperature Range:	-40 to +80 °C	-40 to +70 °C
Recommended Cross-Section of Connected Conductors:	10 mm ² (at 3 Nm clamping force)	50 mm ² (solid) or 35 mm ² (flexible) (at 4 Nm clamping force)
Status Indication:	LED display: showing operational condition	-
Bluetooth Connectivity:	Status indication, operating voltage, Harmonic THD %, Internal temp & Surge Impulse Count	-
Protection Type:	IP 20	
Mounting:	DIN rail 35 mm	
Housing Material:	SLOVAMID 6FRC2	
Colour:	Dark blue	
Weight:	107 g	374 g
Application:	Main and sub-distribution boards (between N&E conductors only)	Main and sub-distribution boards (between N&E conductors only)
Dimensions:	80 (H) x 17.5 (W) x 90 mm (L)	65 (H) x 35 (W) x 90 mm (L)
Warranty:	5 Years	

IMPORTANT INFORMATION:

NE-15B: The Neutral and phase terminals are polarity sensitive, installation to be completed as per illustrations on pages 15 & 16.

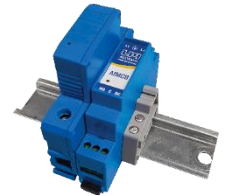
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LPI® Alarm Interface Modules



AIMCB

- Instant connection to surge units, no interaction required
- Ability to connect to 19 x SST150B units
- Combination of Bluetooth communication and volt free contact output



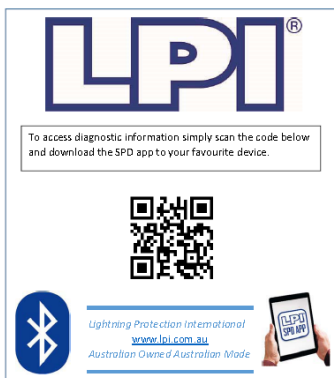
AIMCB for DIN mount use

Technical Specification

Product Code:	AIMCB
Status Indication:	LED showing operational condition
Bluetooth Connectivity:	Status indication
Mounting:	TS 35 mm – DIN43880 DIN rail
Weight:	Approx. 135 grams
IP Rating:	IP20
Colour:	Blue
Conductor Size:	2.5 mm ²
Operating Temperatures:	-20 to +60 °C, 0 – 95 % humidity.
Contact Rating:	Max switching voltage: 250 Vac / 220 Vdc Max switching current: 2 A Max carrying current: 2 A Max switching power: 60 W / 125 VA

Accessibility

The alarm and surge modules are accessible through the LPI SPD App. Simply scan the QR code below or from the LPI sticker located on applicable enclosures to be taken to the LPI website and choose from iOS, Android or Windows applications.



Sample sticker



LPI SPD APP QR code

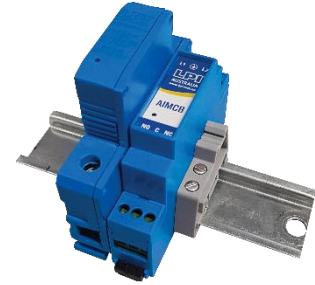
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DIN Mount and PPM Range

Module Combination DIN Mount (DR)

Single or 3 phase combinations

- Pre-wired, DIN-Rail mounted, ready for quick install
- Customisable to kA rating capacity
- Dedicated neutral-earth protector



Compact Enclosure (PPM)

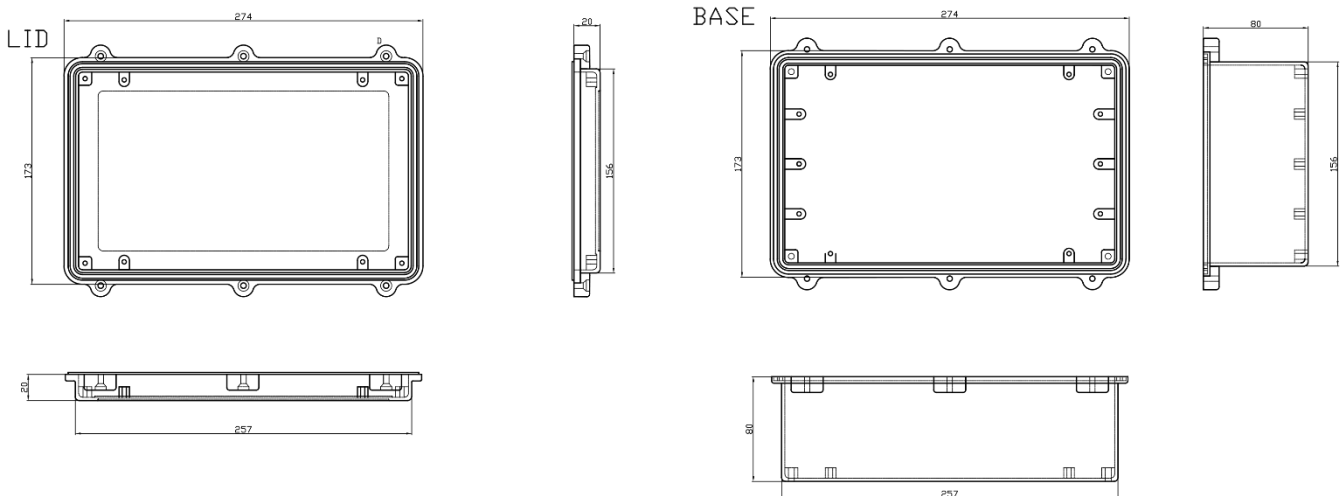
- IP67
- Surface mount
- Aluminium enclosure
- Single or 3 phase applications
- With or without integrated connection leads
- Small compact installation
- Connection leads Flexible multi-core (4 core + earth), 16 mm², Earth 4 mm², XHF-110 supplied as 1.5 m length. Installer should cut to length to suit installation
- Screw down lid



Notes:

1. Refer to Page 5 for SST150B specification detail.
2. Refer to Page 11 for neutral to earth protector specification detail.
3. Refer to page 12 for alarm module specification detail.

Enclosure



IP67 base complete with gasket, aluminium light grey painted, surface mount via external feet

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DIN Mount & PPM Part Number Key

Key	Connection Type	Code	Key	Mounting	Code	Key	Surge Rating	Code
A	Single Phase	1	A	Metal Enclosure	PPM	A	50 kA	50KA
B	3 Phase	3	B	Din Mounted (No Enclosure)	DR	B	100 kA	100KA
C	Split Phase	2	C	Backplane	BP	C	150 kA	150KA
						D	200 kA	200KA

Key	MCOV	Code	Key	Neutral / Earth	Code	Key	Alarm Module	Code
A	230 V	230V	A	NE15	NE15	A	Contact / Bluetooth	AIMCB
B	385 V	385V	B	NE100	NE100	B	Alarm Module Not Required	
C	480 V	480V	C	Neutral / Earth Not Required				

Sample

AAB-B-A-A = 1PPM100KA-385V-NE15-AIMCB

Connection Lead for PPM

- If connection lead is required to be supplied with PPM add "T" to product code following "PPM"
Example: 1PPMT100KA-385V-NE15-AIMCB
- Connection lead is supplied as a 1.5 m length
- Installation contractor should cut length of lead to suit installation

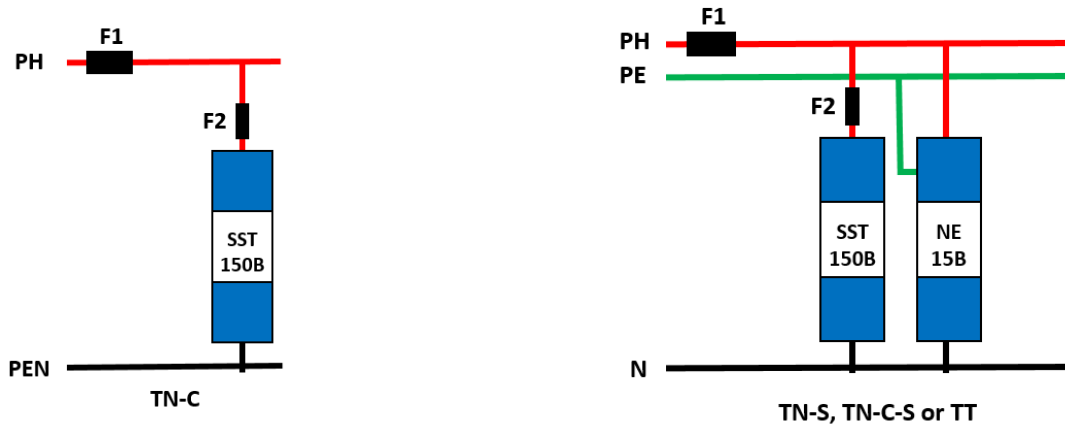
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Installation Guide for DR Product Range Including Neutral/Earth Range

IMPORTANT INFORMATION:

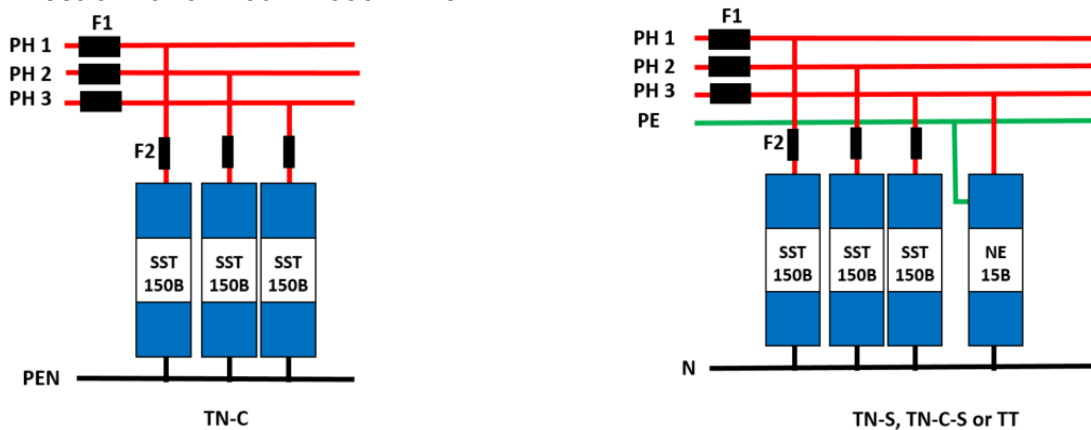
NE-15B: The Neutral and phase terminals are polarity sensitive, installation to be completed as per illustrations below.

Connection Diagram for 1DR50KA-385-NE15



Note: For 100 kA and above, connect the Ph1 to one of the SST150B modules only.

Connection for 3DR50KA-385-NE15



Note: For 100 kA and above, connect the Ph1, Ph2 and Ph3 to the first, third and fifth SST150B modules only

Recommended Fuse and Cable Sizes

Fuse F1 gL/gG	C2 mm ² connection at F2	C3 mm ² connection to gnd	Fuse F2 gL/gG
25 A-80 A	10	16	-
100 A	16	16	-
125 A	16	16	-
160 A	25	25	-
≥160 A	25	25	160 A

Fuse and cable size for NE-15B

Fuse F1 gL/gG	C2 mm ² connection at F2	C3 mm ² connection to gnd	Fuse F2 gL/gG
25 A-80 A	10	16	-
100 A-125 A	16	16	-
160 A	25	25	-
200 A-315 A	35	35	-
≥500 A	35	35	315 A

Fuse and cable size for NE-100

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Installation Guide for DR Product Range including Neutral/Earth Range

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Installation Guide for PPM Product Range

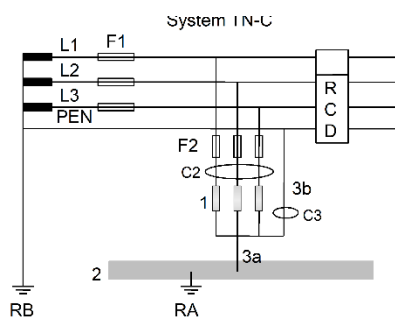
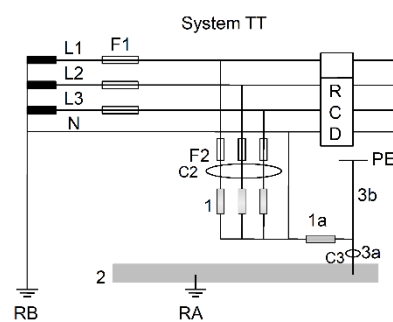
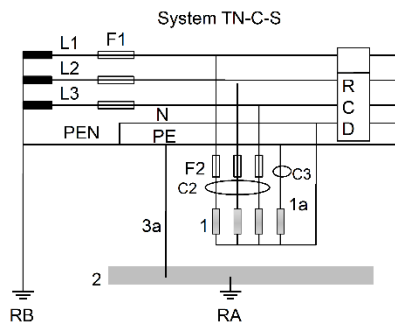
All installation work must be carried out by licensed electrical personnel

Location

The Shunt Protection device should be installed at the “Point of Entry” of the power mains, but after the power meter and main breaker so as to protect the downstream power connected equipment.

Ensure power is disconnected prior to commencing installation.

1. The unit is labelled showing the incoming (point of entry) terminals to be used. PHASE IN are at the top of the unit whilst the EARTH and NEUTRAL are at the bottom.
2. Ensure that the “V” or Kelvin connections, refer Page 8.
3. Incoming cabling should enter the enclosure on the left-hand side and load side cables should exit the enclosure on the right-hand side. This separation is important to ensure induction from “dirty” to “clean” lines does not occur.
4. The earth terminal must be connected to a low impedance earth (<10 Ohms) deploying a single point earthing system, which should be connected to an equipotential earth plane. Integral to this is the elimination of earth loops. It is common, but incorrect from the point of lightning protection to have separate earths for various services. The use of single or multi core copper earth cable of not less than 25 mm² (Max. 50 mm²) is recommended.
5. Once connections are completed apply power and observe correct operation.



Legend

- 1 - LPI SST150B
- 1a - LPI NE100
- 2 - Main equipotential bus bar
- 3a, 3b - Grounding wires for arresters
- F1 - Main back-up fuse of service main
- F2 - Recommended back-up fuse 315 AgL/gG (only if the main back-up fuse F1 is fitted with back-up fuses >315 AgL/gG)
- RA - Equipment grounding
- RB - Grounding system

Recommended Fuse and Cable Sizes

Fuse F1 gL/gG	C2 mm ² connection at F2	C3 mm ² connection to gnd	Fuse F2 gL/gG
25 A-80 A	10	16	-
100 A-125 A	16	16	-
160 A	25	25	-
200 A-315 A	35	35	-
≥500 A	35	35	315 A

All PPMs are supplied with cable ties securing SST150B modules for transport purposes only. Remove all cable ties when installing.

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LPI® DLSF Surge Filters

Features

- 3-Stage protection ensures lowest let-through voltage to protected equipment
- Suitable for single phase TT, TN-S and TN-C-S distribution systems
- Impulse discharge current rating of 25 kA + 25 kA 8/20 μs Ph-N
- Provides protection in all modes: L1-L2, L1-GND, L2-GND
- Designed to withstand fault and over-voltage conditions as per IEC 61643
- Non-saturating inductors – dv/dt of the incoming surge reduced by up to 100 times
- Internal thermal fusing of protection elements ensures safe end-of-life operation
- Power and status indication with voltage free alarm contacts

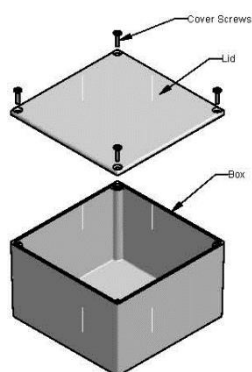


Technical Specifications

Description	DLSF-XXA-24V	DLSF-XXA-230V	DLSF-XXA-385V	DLSF-XXA-480V
Nominal Operating Voltage, U_n :	12-24 V AC or DC	110 V _{AC} (50/60 Hz)	240 V _{AC} (50/60 Hz)	277 V _{AC} (50/60 Hz)
Max Continuous Operating Voltage: U_c	30 V _{AC} / 38 V _{DC}	230 V _{AC}	385 V _{AC}	480 V _{AC}
Maximum Load Current: I_L DLSF-8A-xxxV DLSF-16A-xxxV DLSF-20A-xxxV			8 A 16 A 20 A	
Voltage Protection Level: U_P	< 80 V	< 700 V	< 1200 V	< 1500 V
Power distribution systems:	Low Voltage DC	TT, TN-S, TN-C-S (MEN)		
Maximum Surge Rating: $I_{MAX}(8/20\mu s)$ L – L L – GND	8 kA + 8 kA 8 kA	25 kA + 25 kA 25 kA		
Nominal Surge Rating, $I_n(8/20\mu s)$ L – L L – GND	4 kA + 4 kA 4 kA	10 kA + 10 kA 10 kA		
Operating time:	< 1 ns			
Protection status indication:	LED indicators for POWER and PROTECTION OK			
Remote Status indication:	Normally Closed voltage free alarm contact			
Operating Environment:	-40°C to +50°C, 0 – 95% humidity			
Warranty:	5 years - Contact LPI for full warranty details			

TECHNICAL DATA SHEET

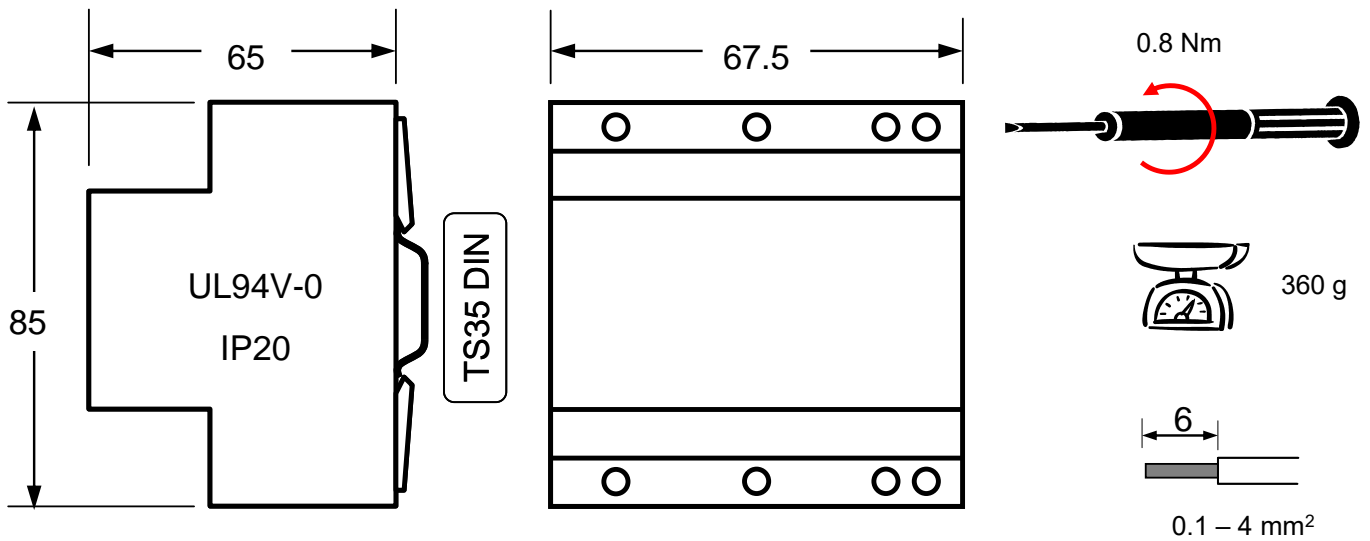
Ordering Code	Description	Rated Voltage L-L	Rated Current
DLSF-8A-24V	Surge Filter, 1Ph, 30 VAC, 8 A, 8 kA+8 kA 8/20 μ s L-L, Power & Status Indication, Alarm Contacts	12 – 24 V _{AC/DC}	8 A
DLSF-16A-24V	Surge Filter, 1Ph, 30 VAC, 16 A, 8 kA+8 kA 8/20 μ s L-L, Power & Status Indication, Alarm Contacts	12 – 24 V _{AC/DC}	16 A
DLSF-20A-24V	Surge Filter, 1Ph, 30 VAC, 20 A, 8 kA+8 kA 8/20 μ s L-L, Power & Status Indication, Alarm Contacts	12 – 24 V _{AC/DC}	20 A
DLSF-8A-230V	Surge Filter, 1Ph, 230 VAC, 8 A, 25 kA+25 kA 8/20 μ s L-L, Power & Status Indication, Alarm Contacts	100 – 120 V _{AC} (50-60 Hz)	8 A
DLSF-16A-230V	Surge Filter, 1Ph, 230 VAC, 16 A, 25 kA+25 kA 8/20 μ s L-L, Power & Status Indication, Alarm Contacts	100 – 120 V _{AC} (50-60 Hz)	16 A
DLSF-20A-230V	Surge Filter, 1Ph, 230 VAC, 20 A, 25 kA+25 kA 8/20 μ s L-L, Power & Status Indication, Alarm Contacts	100 – 120 V _{AC} (50-60 Hz)	20 A
DLSF-8A-385V	Surge Filter, 1Ph, 385 VAC, 8 A, 25 kA+25 kA 8/20 μ s L-L, Power & Status Indication, Alarm Contacts	200 – 240 V _{AC} (50-60 Hz)	8 A
DLSF-16A-385V	Surge Filter, 1Ph, 385 VAC, 16 A, 25 kA+25 kA 8/20 μ s L-L, Power & Status Indication, Alarm Contacts	200 – 240 V _{AC} (50-60 Hz)	16 A
DLSF-20A-385V	Surge Filter, 1Ph, 385 VAC, 20 A, 25 kA+25 kA 8/20 μ s L-L, Power & Status Indication, Alarm Contacts	200 – 240 V _{AC} (50-60 Hz)	20 A
DLSF-8A-480V	Surge Filter, 1Ph, 480 VAC, 8 A, 25 kA+25 kA 8/20 μ s L-L, Power & Status Indication, Alarm Contacts	220 – 277 V _{AC} (50-60 Hz)	8 A
DLSF-16A-480V	Surge Filter, 1Ph, 480 VAC, 16 A, 25 kA+25 kA 8/20 μ s L-L, Power & Status Indication, Alarm Contacts	220 – 277 V _{AC} (50-60 Hz)	16 A
DLSF-20A-480V	Surge Filter, 1Ph, 480 VAC, 20 A, 25 kA+25 kA 8/20 μ s L-L, Power & Status Indication, Alarm Contacts	220 – 277 V _{AC} (50-60 Hz)	20 A



Add M to prefix for separate metal enclosure

TECHNICAL DATA SHEET

Mechanical Details



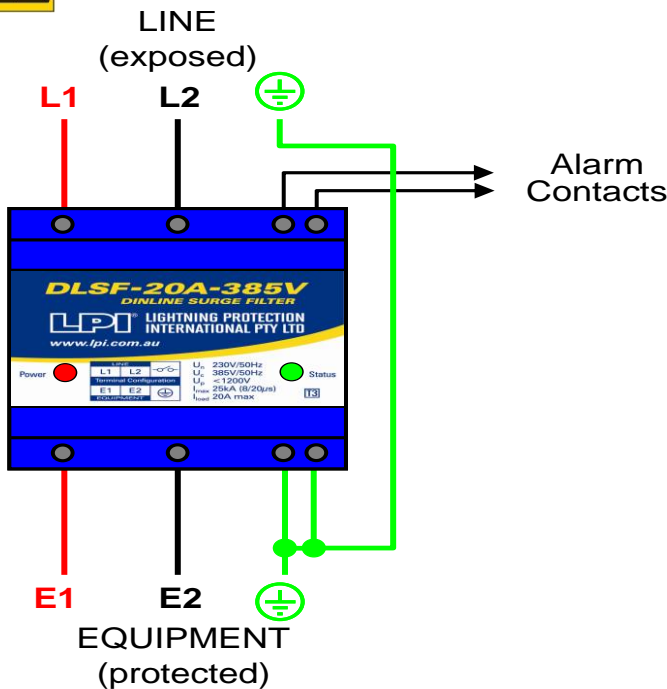
Installation Guide for DLSF



All installation work **must** be carried out by licensed electrical personnel in accordance with local standards and regulations.



The power **must** be disconnected. Ensure no dangerous voltages exist prior to commencing installation work.



	☺	☹
POWER	☀	○
STATUS	☀	○
ALARM CONTACTS	⏏	⏏

TECHNICAL DATA SHEET

LPI® Bluetooth Range of Surge Filters

Features



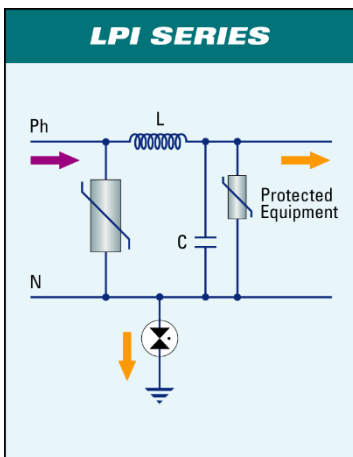
- High performance surge protector for an operating voltage of 220-277 Vac
- SST150B technology for primary and secondary protection 32 A- 125 A (1 Ph & 3 Ph)
- Encapsulated spark gap and SST150B technology capable of operation under fault/overvoltage conditions up to 480 Vrms for 200 A filter and above
- Three stage protection provides highest level of protection for sensitive electronic equipment

Product Description

- Designed to suit TT, TN-C, TN-S & TN-C-S distribution systems
- Inductors – dv/dt and di/dt of the incoming surge will be reduced by 1000 times
- 32 – 125 A filters primary (150 kA 8/20 μs) and secondary (50 kA 8/20 μs)
- 200 – 630 A filters primary (50 kA 10/350 μs, 135 kA 8/20 μs) and secondary (50 kA 8/20 μs) surge protection. (NOTE: For 800 A and above, primary protection is 100 kA 10/350 μs.)
- High N-E protection rating– 100 kA 10/350 μs, 150 kA 8/20 μs
- LED Indication, remote alarm contacts, MOV status indication.

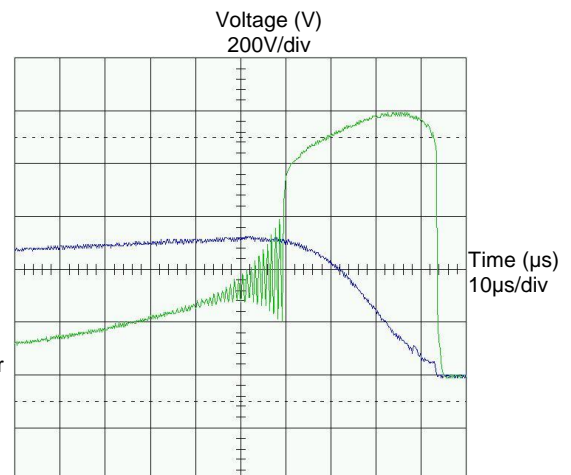
Electronic equipment is highly susceptible to damage from lightning and other transient pulses (including man made switching transients), which arrive via the powerlines through direct strike, or inductive and capacitive coupling.

The LPI Bluetooth series surge filter provides multiple stage protection against incoming surges & transients. Shunt-only clamping alone is not sufficient, as it does not limit the excessive wavefront characteristic of the pre-clamped waveform. The LPI surge filter will reduce the rate of rise of voltage (dv/dt) to below 15 V/μs as per AS1768 Cat B 3 kA (8/20 μs) applied impulse and to below 30 V/μs for AS 1768 Cat C 20 kA (8/20 μs) applied impulse.



- Low let-through voltage
- Wavefront slowed (low)
- Energy diverted and filtered
- Poor power conditions
- Based on load current
- Vital for sensitive electronics
- Fine protection
- Common & differential mode

Green: Shunt Protector
Blue: Series Filter



TECHNICAL DATA SHEET

**LPI® Bluetooth Range of Surge Filters 32-125 A
(Single and Three Phase)**

Technical Specifications

Description	LPI® Bluetooth Range of Surge Filters 32-125 A (Single and Three Phase)		
Nominal Operating Voltage U_n :	220 – 240	V AC P-N @ 50/60 Hz	220 - 277
Max Continuous Operating Voltages U_c :	385 Vrms	385 Vrms	480 Vrms
Operating Time:	< 1 ns		
Power Distribution Systems:	TT, TN-S, TN-C, TN-C-S (MEN)		
Primary Surge Protection Rating P-N:	Configurable 100 kA 8/20 μ s single-shot rating replaceable modules* ¹		
Secondary Surge Protection Rating P-N:	Configurable 50 kA 8/20 μ s single-shot rating replaceable modules* ²		
N-E Protection:	100 kA 10/350 μ s I_{imp} Class 1 to IEC 61643-11 255 V rms or 150 kA 8/20 μ s I_{max}		
Protection Modes:	Transverse and common mode		
Inductor:	Non-saturating, low pass, power and noise filtering		
Capacitor Type:	Separately-fused, self-healing, X-grade rating at high voltage ratings		
Surge Counter :	Build-in memory retained surge counter displayed via LPI SPD App		
Efficiency:	99 %		
Overload / Short Circuit Protection:	In-line circuit breaker, for 32 A, 40 A and 63 A only		
Performance:	Typical let-through voltage < 700 V		
Filter 3 dB Point:	Approximately 4000 Hz		
Standards (Primary and Secondary) :	Meets requirements of IEC 61643-11 and UL1449 Ed 3		
Standards (N-E):	Meets requirements of IEC 61643-11		
Surge Withstand:	ANSI/IEEE C62.41, AS/NZS 1768 Cat. A, B and C surge tests		
Protection Status Indication:	Bluetooth connectivity on status of MOV, surge counts, voltage and temperature. LED Status and voltage-free change-over contact output		
Environmental Rating:	IP 66		
Enclosure:	Metal enclosure with durable powder coat finish		
Colour:	Grey		
Mounting:	Wall mount		
Operating Temperatures:	-20 to +40 °C, 0 – 95 % humidity		
Conductor Size:	Accepts up to 35 mm ² (M8 Studs)		
Warranty:	5 years manufacturer's warranty		

*1 Configurable 50, 100, 150 or 200 kA 8/20 μ s

*2 Configurable 50 or 100 kA 8/20 μ s

TECHNICAL DATA SHEET

LPI® Bluetooth Range of Surge Filters 200 A and Above (Three Phase)

Technical Specifications

Description	LPI® Bluetooth Range of Surge Filters 200 A and Above		
Nominal Operating Voltage Un:	220 – 240	V AC P-N @ 50/60 Hz	220 - 277
Max Continuous Operating Voltage Uc:	385 Vrms		480 Vrms
Operating Time:	< 1 ns		
Power Distribution Systems:	TT, TN-S, TN-C, TN-C-S (MEN)		
Primary Surge Protection Rating per Phase:	135 kA 8/20 μ s single shot surge capacity between phase and neutral. 800 A and above, phase to neutral protection is 110 kA 10/350 μ s.		
Secondary Surge Protection Rating per Phase:	50 kA 8/20 μ s single shot surge capacity between phase and neutral, Bluetooth Technology		
Total Surge Protection per Phase:	185 kA 8/20 μ s		
N–E Protection:	100 kA 10/350 μ s, 150kA 8/20 μ s. For 800 A and above, neutral to earth protection is 100 kA 10/350 μ s.		
Protection Modes:	Transverse and common mode		
Inductor:	Air-Cored, low pass, power and noise filtering		
Capacitor Type:	Self-healing X grade		
Surge Counter:	Build-in memory retained surge counter displayed via LPI SPD App		
Current Crest Factor:	> 3:1		
Voltage Drop:	< 2 V at full load		
Efficiency:	99 %		
Frequency Response:	3 dB point below 3000 Hz		
Performance:	Typical let-through voltage for all models < 2 x mains peak voltage		
Standards (Primary and Secondary):	IEC 61643-1		
Standards (N-E):	IEC 61643-1		
Surge Withstand:	ANSI/IEEE C62.41 and AS 1768 Cat. A, B and C surge tests		
Environmental Rating:	IP 66		
Enclosure:	Metal enclosure with durable polyester powder coat finish		
Colour:	RAL 7032		
Mounting:	Wall mount		
Operating Temperatures:	-35 to +40 °C, 0 – 95 % humidity		
Warranty:	5 years manufacturer's warranty		

TECHNICAL DATA SHEET

Specification Detail for SPD Modules Used in Surge Filters

LPI® Bluetooth Connectivity for Surge Filters

Refer to Page 3 for further details.

Version 8 and above	Windows 10 / Windows 10 mobile	Version 4.3 and above



LPI® SST150B Module

Primary and Secondary protection for surge filters. Refer to page 5 & 6 for specification detail.

- Applicable to 32 A – 125 A surge filter, primary and secondary protection
- Applicable to secondary protection for 200 A surge filters and above

LPI® Spark Gap

Primary protection for 200 A surge filters. Refer to page 9 for specification detail.

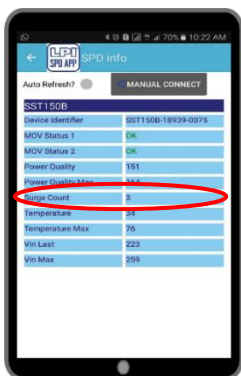


LPI® Neutral / Earth Protection for Surge Filters

Refer to page 11 for specification detail.

LPI® Alarm Interface Module (AIMCB)

Refer to page 12 for specification detail.



Surge Counter

The LPI Bluetooth range of SPD modules removes the need for a hardwired surge counter to be included with surge filters. As highlighted in the attached image a surge count is given via Bluetooth connectivity for each module. For three phase applications, this information assists in identifying problem issues where one phase may be carrying more current than other phases.

TECHNICAL DATA SHEET

Summary of Specification Detail for Surge Filters

Surge Filter Type	Enclosure Dimensions mm (Unpacked: W x H x D)	Weight kg (Unpacked)
SF132	300 x 300 x 150	5
SF140	300 x 300 x 150	6
SF163	300 x 300 x 150	6
SF1125	300 x 300 x 150	7
SF332	400 x 400 x 150	10
SF340	400 x 400 x 150	10
SF363	400 x 400 x 150	10
SF3125	400 x 400 x 150	11
SF3200	500 x 600 x 200	40
SF3315	600 x 700 x 200	64
SF3400	600 x 700 x 200	64
SF3630	1200 x 800 x 350	105
SF3800	1200 x 800 x 350	153
SF31000	1200 x 800 x 350	165
SF31250	1200 x 800 x 350	165
SF31500	1200 x 800 x 350	170
SF31750	1200 x 800 x 350	175
SF32000	1200 x 800 x 350	185

TECHNICAL DATA SHEET

LPI® Bluetooth Range of Surge Filters

Single Phase Surge Filters

Surge Filter Type:	Nominal Operating Voltage U_n : @ 50/60 Hz	Surge Rating (I_{max}): @ 8/20 μ s Per SST150B module primary/secondary	Secondary Nominal Discharge Current (I_n): @ 8/20 μ s	Max. Continuous Operating Voltage (U_c):	Response Time:	Power Distribution Systems:
SF1-230	110-120Vac	50 kA	20 kA	230 Vrms	<5 ns	WYE, L-N mode
SF1-385	220-240 Vac	50 kA	20 kA	385 Vrms	<5 ns	TN, TT & for L-N mode
SF1-480	220-277 Vac	50 kA	20 kA	480 Vrms	<5 ns	TT & TN

Split Phase Surge Filters (32A – 125A)

Surge Filter Type:	Nominal Operating Voltage U_n : @ 50/60 Hz	Surge Rating (I_{max}): @ 8/20 μ s Per SST150B module primary/secondary	Secondary Nominal Discharge Current (I_n): @ 8/20 μ s	Max. Continuous Operating Voltage (U_c):	Response Time:	Power Distribution Systems:
SF2-230	110-120Vac	50 kA	20 kA	230 Vrms	<5 ns	Split Phase L-N mode

3 Phase Surge Filters (32 A – 125 A)

Surge Filter Type:	Nominal Operating Voltage U_n : @ 50/60 Hz	Surge Rating (I_{max}): @ 8/20 μ s Per SST150B module primary/secondary	Secondary Nominal Discharge Current (I_n): @ 8/20 μ s	Max. Continuous Operating Voltage (U_c):	Response Time:	Power Distribution Systems:
SF3-230	110-120Vac	50 kA	20 kA	230 Vrms	< 5 ns	WYE for L-N mode
SF3-385	220-240 Vac	50 kA	20 kA	385 Vrms	<5 ns	TN, TT & for L-N mode
SF3-480	220-277 Vac	50 kA	20 kA	480 Vrms	<5 ns	TT & TN

3 Phase Surge Filters (200 A – 630 A)

Surge Filter Type:	Nominal Operating Voltage U_n : @ 50/60 Hz	Primary Surge Rating (I_{max}): @ 8/20 μ s	Secondary Surge Rating (I_{max}): @ 8/20 μ s	Secondary Nominal Discharge Current (I_n): @ 8/20 μ s	Max. Continuous Operating Voltage (U_c):	Response Time:	Power Distribution Systems:
SF3-230	110—230Vac	135 kA	50 kA	20 kA	230 Vrms	<5 ns	WYE for L-N mode
SF3-385	220-240 Vac	135 kA	50 kA	20 kA	385 Vrms	<5 ns	TN, TT & for L-N mode
SF3-480	220-277 Vac	135 kA	50 kA	20 kA	480 Vrms	<5 ns	TT & TN

TECHNICAL DATA SHEET

3 Phase Surge Filters (800 A – 2000 A)

Surge Filter Type:	Nominal Operating Voltage U_n : @ 50/60 Hz	Primary Surge Rating (I_{imp}): @ 10/350 μ s	Secondary Surge Rating (I_{max}): @ 8/20 μ s	Secondary Nominal Discharge Current (I_n): @ 8/20 μ s	Max. Continuous Operating Voltage (U_c):	Response Time:	Power Distribution Systems:
SF3-230	110—230Vac	100 kA	50 kA	20 kA	230 Vrms	<5 ns	WYE for L-N mode
SF3-385	220-240 Vac	100 kA	50 kA	20 kA	385 Vrms	<5 ns	TN, TT & for L-N mode
SF3-480	220-277 Vac	100 kA	50 kA	20 kA	480 Vrms	<5 ns	TT & TN

Surge Filter Part Number Key

Product Type	Phases	Load Current (A)	MCOV (V)	Primary Protection (8/20 μ s unless specified)	Secondary Protection (8/20 μ s)	Alarm Module
T	UU	VVVV	WWW	XXX	YYY	Z
SF	1	32	230	100 kA	50 kA	AIMCB
	3	40	385	150 kA	100 kA	
		63	480			
		125				
		200		≥ 200 A: 135 kA		
		315				
		400		≥ 800 A: 100 kA		
		630		(10/350 μ s)		
		800				
		1000				
		1250				
		1500				
		1750				
		2000				

Surge Filter Ordering Code:

Product Order Code: T-UU-VVVV-WWW-XXX-YYY-Z

Refer to above part number key.

1. First select product type which for surge filter = SF.
2. Select number of phases.
3. Select load current.
4. Select operating voltage.
5. Select primary protection. Note: for surge filters 200 A and above primary protection is 135 kA.
6. Select secondary protection.
7. Include alarm module.

Example product code for single phase filter = **SF132-385-100+50-AIMCB**

Example product code for three phase filter = **SF3125-385-150+50-AIMCB**

Example product code for three phase filter 200 A and above = **SF3630-480-135-50-AIMCB**

Example product code for three phase filter 800 A and above = **SF3800-480-100-50-AIMCB**

TECHNICAL DATA SHEET

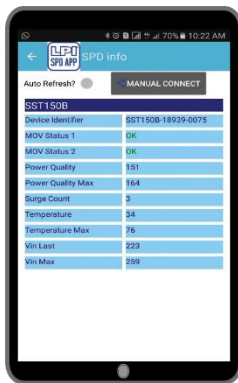
Notes:

- All filters are fitted with 100 kA 10/350 μ s or 200 kA 8/20 μ s neutral earth protection.
- 630 – 2000 A current ratings filters have had a redesign of the busbar network that provides the integral inductor (replacing a separate steel core inductor) that forms part of the L-C filter network within the product.
- Busbars are no longer tinned for filters rated at 1500 A and above
- All filters are supplied with cable ties securing SST150B modules for transport purposes. Remove all cable ties when installing.

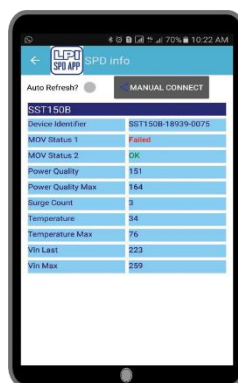
Installation & Maintenance for Surge Filters

All installation work *must* be carried out by licensed electrical personnel.

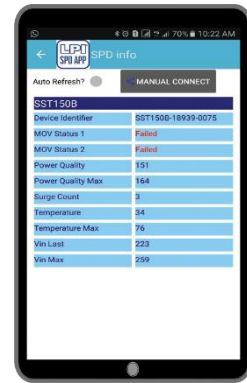
The power *must* be disconnected. Ensure no dangerous neutral to earth voltages exist prior to commencing installation work.



Operational



Replace as protection is reduced



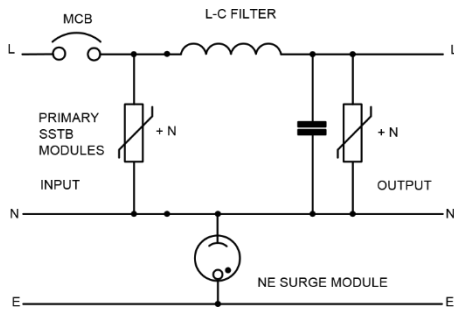
Replace as no protection is left

1. The surge filter should be installed as close as practical to the power distribution panel. Filters rated at 315 A and above are fitted with two mounting rails to assist with mounting the unit to the wall.
2. The input and output power cables that connect to the surge filter must have a current rating at least equal to that of the unit being installed.
3. All cables are routed through the bottom of the cabinet. Suitable cable glands should be fitted to the gland plates. All connection points are clearly labelled on the backplane.
4. Connect the input and output power lines as illustrated in figure 4 and figure 5. Input cables are considered “dirty” and must be physically separate by at least 300 mm from the “clean” output cables. This will prevent any over voltage carried by the incoming cables from being induced onto the outgoing or “clean” cables.
5. The earthing impedance of the electrical system should be less than 10 Ω , with 5 Ω recommended.
6. Connect the earth terminal on the surge filter unit to the nearest electrical main earth using the shortest possible route. Earthing cable should be a minimum of 16 mm² with 25 mm² recommended.
7. All connections must be rechecked to confirm that they are securely connected.

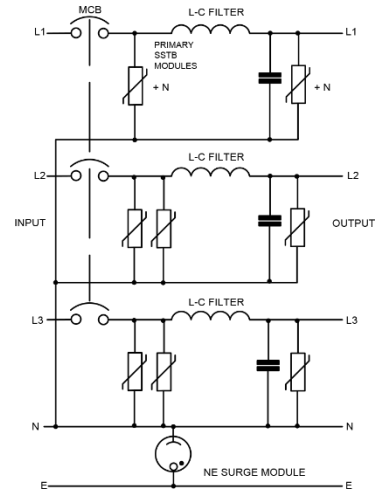
TECHNICAL DATA SHEET

- Connect power to the surge filter and confirm that power is being delivered to the load and that all status indicators are green. The surge filter is in series with the load and turning off the filter's internal circuit protection will disconnect power to the load.

- 32 A, 40 A and 63 A with MCCB built in
- 125 A and above no MCCB



Schematic of 1 Ø surge filter



Schematic of 3 Ø surge filter

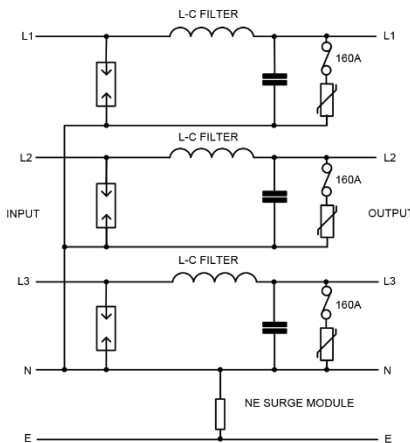


Figure 4

Schematic of 3 Ø surge filter (400 A and below, no 160 A fuse on filters below 125A)

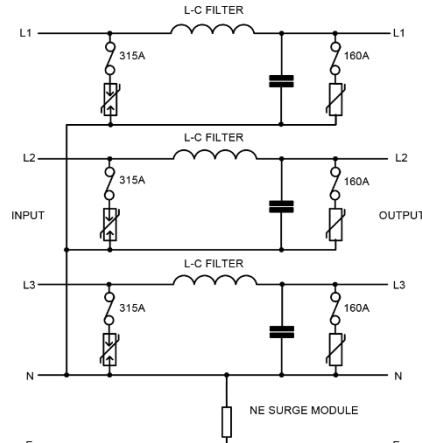


Figure 5

Schematic of 3 Ø surge filter (above 400 A)

Maintenance

- Use LPI Bluetooth connectivity to check the status of all modules.
- Do not** perform maintenance work until power to the surge filter has been disconnected.
- All surge protection devices will degrade and must be replaced at the end of their life cycle. The frequency of replacement is subject to the magnitude and number of incident surges applied to the device – therefore status indication is very important.

TECHNICAL DATA SHEET

All filters are supplied with cable ties securing SST150B modules for transport purposes only. Remove all cable ties when installing.

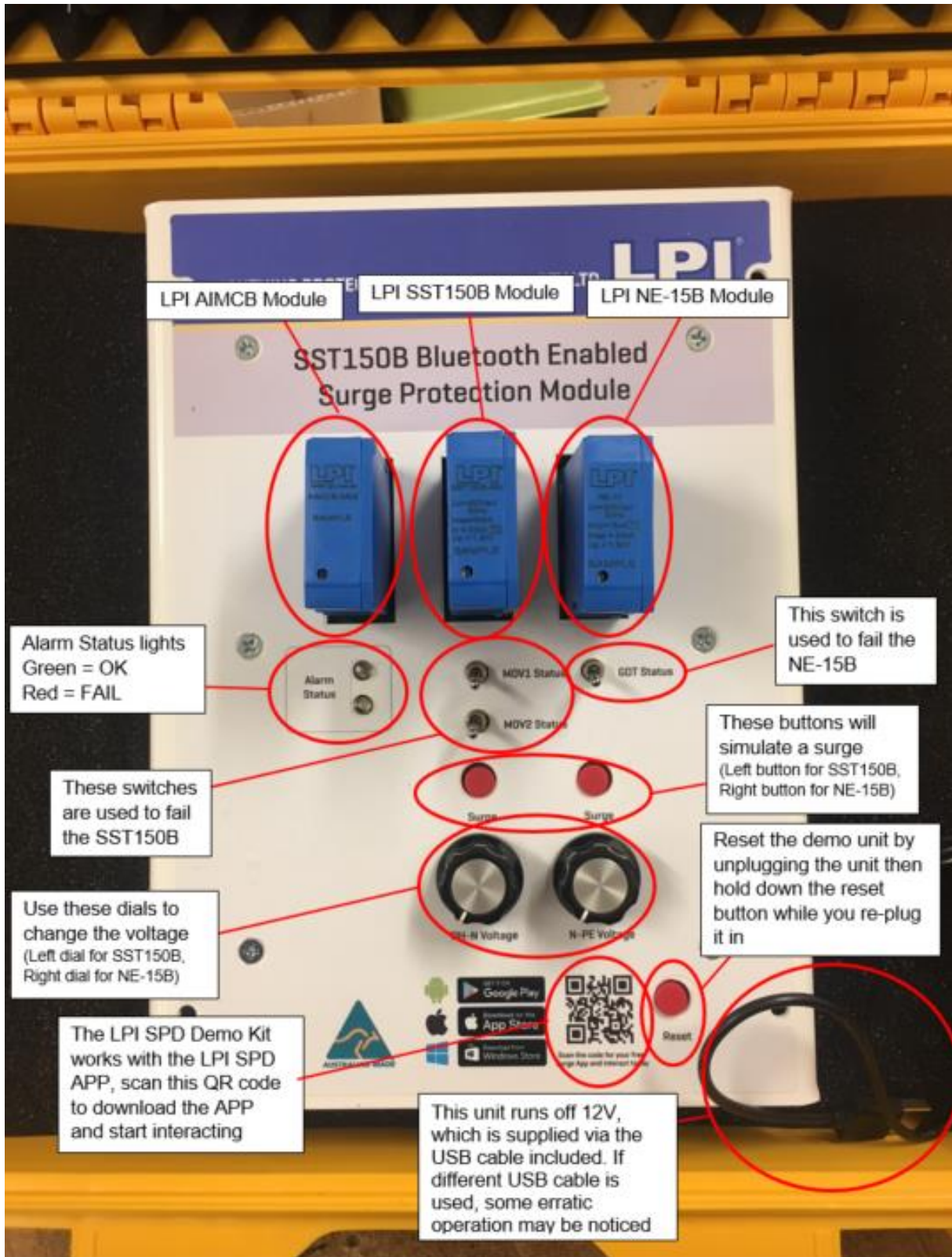
User Guide for LPI® Bluetooth SPD Demo Kit

1. Remove unit from case and ensure that SST150B and NE15B modules are seated correctly in the demonstration panel.
2. The demonstration panel comes complete with USB power cable to boost voltage, using a different cable will result in erratic operation.
3. The SPD modules in this demonstration kit are specifically designed for use with this demonstration panel only. The SPDs should not be sold as a finished product nor should finished product be swapped out for us with demonstration unit.
4. To reset information within the SST150B and NE15B, disconnect power and wait several seconds, while holding down the reset button reconnect power allowing 5 seconds and then release reset button. All values in both SST150B and NE15B will be zeroed out. **(this is not a feature of the production units)**
5. While the update of information is instant via the SPD APP, a time delay will be witnessed between failure activation and alarm trip on the demonstration panel. This is normal, the AIM module poles the connected units every 30secs to confirm failure to ensure nuisance tripping is eliminated.
6. The system uses a common alarm output so when a fault has been activated, subsequent faults will be indicated by red flashing LEDS on effected units.
7. Ensure SPD app is downloaded and is working on desired device.
8. Ensure Bluetooth is enabled on your device.
9. Ensure that both SST150B and NE15B have been reset.
10. On occasions the SPD app may become non-responsive or time out, to overcome this force quite the application to shut it down and then re-load.

The purpose of this demonstration is to show the Bluetooth capability of the SPD modules via interaction with the demonstration panel and the SPD app.

Contact LPI or local distributor for demonstration instructions for the SST150B Demo Kit.

TECHNICAL DATA SHEET



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