

PROBLEM:

Rural electronic sites are particularly exposed to lightning GPR in spite of the best conventional protection. Severe storm tracks and resistive earth (sandy clay, limestone, granite) combine to momentarily saturate grounding systems with high frequency energy. Lightning then creates a path to lower ground through the conductive electronics.



SOLUTION: LIGHTNING SHIELD

- Detects imminent lightning and eliminates the potential fault path through the electronics for the duration of the threat
- Remote management to monitor events and routinely test the site generator or battery plant
- Low cost of ownership; payback in one lightning storm



ALSET CORP
GPR PROTECTION

...when conventional protection is not enough

TECHNOLOGY

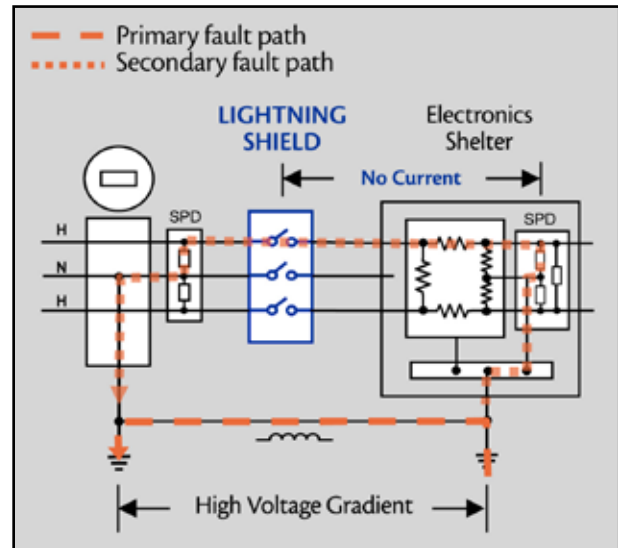
Lightning Shield completes the protection puzzle, providing the most effective protection for rural electronic sites.

Lightning energy is not instantly dissipated in the strike area. High voltage gradients (Ground Potential Rise) are propagated across the earth's surface. Grounding systems are designed and measured based on 60Hz AC models, but react inductively to lightning energy that ranges from KHz to MHz.

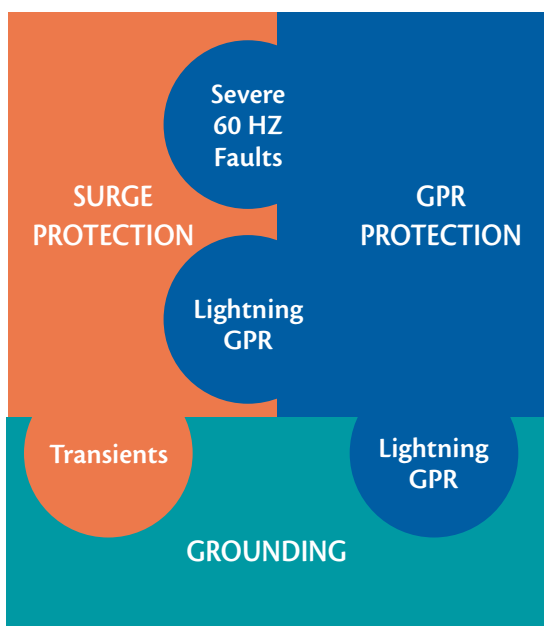
During lightning GPR fault conditions the grounding system is elevated thousands of volts. Grounding and surge protection conduct in both directions, allowing the elevated voltage on the grounding system to impress high voltage across the equipment, seeking the lower utility ground. This "back door" fault path follows the power circuits through the electronics, producing damaging voltage gradients across modules and components.

Lightning Shield detects the impending lightning threat and opens the utility power circuit to eliminate the potential fault path. Opening the AC circuit creates a single point ground condition - the site ground voltage rises and falls with the GPR, but current cannot flow across the open circuit. The lightning energy is forced to dissipate in the site grounding system.

During the protected isolation, operations safely continue on the site battery plant, and AC power is automatically reconnected after the threat passes. The safety ground is always maintained.



Lightning Shield augments surge protection and grounding systems.



Quality surge protection is required to quickly shunt power and telecom transients to the grounding system.

Lightning Shield assures that surge protection does not provide a "reverse" path for elevated voltage on the ground system. Lightning Shield also isolates equipment from 60Hz GPR (down power lines) that is caused by lightning strikes. And Lightning Shield provides "back-up" protection for severe AC power surges that fatigue and fail the surge protection. Lightning Shield requires AC power to normalize before re-connecting, protecting the electronics from power recovery transients.

Low resistance grounding is required to sink fault current to the earth. Lightning Shield assures the voltage rise during GPR fault conditions does not create differential voltages across the electrical and electronic circuits.

Grounding enhancements may not be effective for lightning energy in resistive earth. A lower ground resistance for 60Hz AC does not significantly reduce the ground impedance to the much higher lightning frequencies. Lightning Shield forces GPR to dissipate in the grounding system, whether it measures 2, 5 or 25 ohms resistance or higher.

FEATURES & BENEFITS

- Uniquely augments surge protection and grounding systems
 - Improves operating efficiencies
- Proven and cost effective solution with short term payback

Lightning Shield reduces site down-time and repair - the investment is recovered in one lightning storm

Lightning Shield responds to significant changes in the electrostatic field – the unique signature of lightning .

PROTECTIVE ISOLATION IS ACTIVATED FOR:

- Lightning formation before an imminent strike
- Lightning GPR from approaching storms
- Power line flashovers

Lightning Shield incorporates AC surge protection and voltage comparators to monitor AC power.

PROTECTIVE ISOLATION IS ACTIVATED FOR:

- Surges that breach the SPD
- Sags and re-powering transients
- Initial power-up & AC power loss

Lightning Shield improves the efficiency of field staff – sites may be remotely interrogated to evaluate alarms or test standby power rather than rolling a truck.

USER CONTROLS

DETECTION

- Adjust the GPR sensitivity for local conditions
- Adjust the high and low AC voltage

ISOLATION

- Adjust the GPR isolation timer for typical storm conditions
- Synchronize the AC isolation and ATS timers



REMOTE MANAGEMENT

**Configure protection parameters
Monitor, log and download events**

- GPR & AC faults
- Changes to protection parameters

Run tests

- Battery discharge under load, or
- Generator activation
- GPR simulation

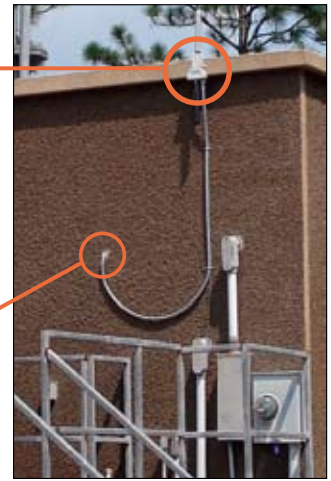
Configure communications and security

- POTS/modem port – dial-up IP
- Ethernet data port – IP and SNMP



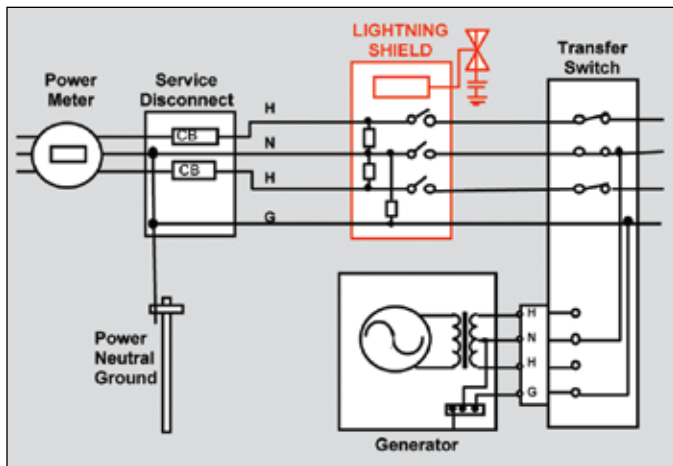
Wire-line
LS -200

Wire-line
LS -50



Wireless LS-200

INSTALLATIONS



SPECIFICATIONS

			LS 50	LS 200
Service	120/240 Vac-60Hz	Isolation	6kV Impulse<20mSec	10 kV Impulse<15mSec
Power Consumption	30W Connected 23W Isolated	Current Capacity	32 FLA 50 Amp Resistive	115 FLA 200 Amp Resistive
Controls	Power, Service Bypass Hi-Low VAC Isolation Timers	MTBF -Contractor	8,000,000 Cycles	15,000,000 Cycles
Alarms	4 Dry Contact - NC & NO	Wire Guage	14-6 AWG	8-4/0 AWG
Enclosures	Controller - NEMA 4x Detector - Aluminum	Shipping	10 Lbs 14" x 14" x 10"	45 Lbs 20" x 20" x 15"
Standards Compliance	UL 60950-1 CSA C22.2	RUS Listing	Lightning Shield - 50 Amp	Lightning Shield - 200 Amp

