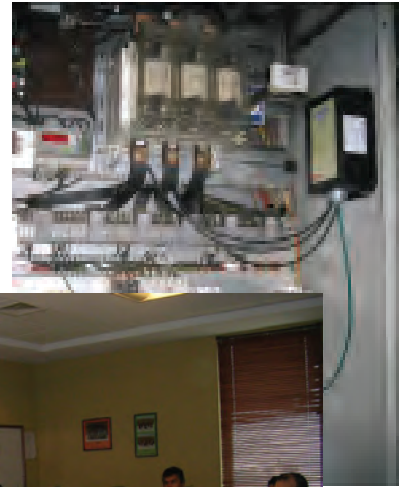


# *Performance and Design* *Surge Suppression for the 21st Century*



# The TVSS Industry's Most Complete and Capable Product Line

**Energy Control Systems** is proud to offer the industry's most complete and capable line of high quality Surge Protective Devices (SPD's) for Industrial, Commercial and Department of Defense applications. Our high quality, **ISO 9001** manufactured devices cover the full range of applications for AC/DC power, data, current loop, and telecommunications applications from .5V volts to 7200V.

Our twenty years of hands on, real world field experience can be seen in the simplicity, functionality, and user friendly design of all our products. Simply stated, these are the finest, highest quality, best performing surge suppression products available anywhere in the world today. We not only set the standard...

**"We ARE the Standard®"**

## Industry Leading Design & Performance

A Surge Protective Device is only as good as it's durability, let-through voltage capability and user friendly functionality. Our engineering and design emphasis has always been focused on these simple yet critical factors and they are what separates our products from all others. A few of the key features include:

- **Voltage Responsive Circuitry™**

Designed to mitigate repetitive high energy impulse transients generated by lightning, power system faults and load switching, the Optimal Response Circuitry™ is standard on all **SineTamer®** models. This multi-level hybrid network provides the brute strength and durability needed to handle repetitive high amplitude transients. **Patented**, internal, over-current fusing and component level thermal fusing assure these are the safest TVSS devices available today.

- **Frequency Attenuation Network™**

Protecting critical electronics and microprocessors requires the most advanced and capable suppression circuit available - The **Frequency Attenuation Network™** circuit. Employing multi-stage hybrid technology, this circuit blends the high energy handling capability of the **Voltage Responsive Circuitry™** with advanced frequency attenuation performance. The resulting hybrid circuit suppresses internally generated ringwave transients down to harmless levels, yet it is still capable of handling thousands of repetitive high energy surges. This combination provides a level of durability and performance that is unmatched. It is the absolute best suppression circuit available today.

- **Circuit Encapsulation**

All **SineTamer®** devices utilize advanced circuit encapsulation technology. Circuit encapsulation is widely used in high-end mil-spec, industrial and commercial applications as a means of enhancing the performance and durability of electronic and electrical circuits.

## The Discrete "All Mode" Protection Advantage

**Energy Control Systems** is the only TVSS company to offer a complete line of products featuring Discrete "All Mode" Protection (10 modes for 3 phase, 4 wire Wye and Delta circuits). This advanced circuit provides important benefits and performance advantages over "Reduced Mode" (7 or 4 modes ) devices that are supplied by other manufacturers. A few of these benefits include:

- Increased Surge Current Sharing
- Improved Durability
- Increased Operational Life
- Bonding All Modes To The Same Potential
- Lowered Component Stress
- Improved Let-through Voltage

Leading Industry Guidelines Support the Need For "Discrete All Mode" Protection

### IEEE Std 1100

(Emerald Book section 8.6.1)

"Surge protective devices used for three phase, four wire circuits are generally recommended to be connected in all combinations of line to line, lines to neutral, line to ground and neutral to ground".

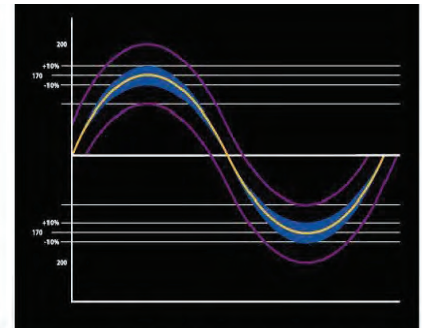
### NEMA LS-1 (section 2.2.7)

"Protection Modes - This parameter identifies the modes for which the SPD device has directly connected protection elements, i.e. Line-to-Neutral (L-N), Line-to-Line (L-L), Line-to-Ground (L-G) Neutral-to-Ground (N-G)".

## Your One Stop For Total Protection

- AC Parallel - 120VAC to **7200VAC**
- DC Parallel - 24VDC to 650VDC
- AC Series - Dedicated Loads up to 480V
- DC Series - Dedicated Loads up to 240V
- Telecom - POTS to T1
- Data - Up to 100mb/sec
- Current Loop - Up to 200kb/sec
- Point-of Use - 120-250V, 15A-60A
- OEM & Custom Apps. - **Give Us A Call!**

## Frequency Attenuation Network™ Performance Curve



This curve represents the effects of sine wave tracking. The low pass filter reacts to a change in frequency created by a surge and removes the surge from the system to protect sensitive electronics and microprocessors

## Fig.1 - Frequency Attenuation Network™ Circuit Performance Envelope Graphic

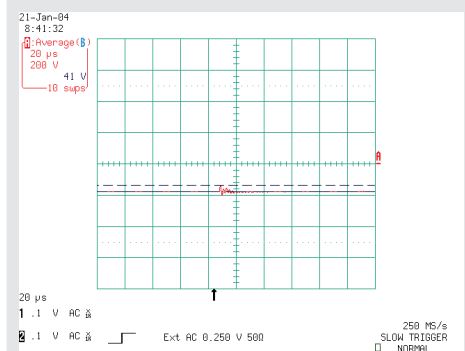


Fig. 2 - Actual scope trace illustrating the effectiveness of the Frequency Attenuation Network™ circuit on a ANSI/IEEE C62.41 specified 2kV, Cat A1 standard test wave @270 degree phase angle .

## Parallel Connected Panel Models

### Brute Strength *Plus* Refined Performance

**Energy Control Systems** parallel connected panel devices have, time after time, provided the brute strength and unsurpassed durability needed to protect mission critical systems during lightning strikes and severe power system faults. These models provide the refined performance levels necessary to safeguard delicate microprocessor based electronics, allowing your critical systems to stay up and running. This capability has literally kept companies in business when neighboring facilities (often competitors) have suffered extensive damage, extended downtime and lost revenue. This is a Competitive “**Advantage**” that is critical to your companies well-being, bottom line and future.



### The Most Advanced Surge Suppressor Available Today

The **SineTamer®** series of parallel connected panel models represent the state of the art in surge suppression design and performance. The project started with one very simple goal - designing the best performing, safest, surge suppression device in the world. The design team met this goal by blended advanced computer circuit modeling with the tried and true design principals learned over the past twenty-five years. One key design goal, established at very start of the project, was that the Advantage must have the absolute lowest **Measured Limiting Voltage**. No other performance metric is as critical to the survival of your mission critical electronics. Advanced, low impedance surge paths and high quality suppression components assure that the **SineTamer®** product will exceed your required protection levels.

Our product lines have continued to evolve to meet the widest range of needs. Our **LA & RM** series of panel mounted products are designed to meet the ever expanding International market requirements. We also have a complete line of Variable Frequency Drive, Programmable Logic Controller (PLC) and industrial power supply products designed specifically for these applications that will not only provide best in class surge and transient protection but work to prevent software confusion as well! Simply put the **SineTamer® Series of surge protective devices is the absolute best suppression device available today!**

### Advantage Series Standard Features

- UL1449 3rd Edition  
UL1283 Listed, CE Certified
- ISO 9001 Manufactured Quality
- Industry Leading Measured Limiting Voltage (let-through) Performance
- Circuit Encapsulation
- Phase Level Current Fusing
- Voltage Responsive Circuitry™
- Discrete “All Mode” Circuitry
- Advanced Internal Diagnostics
- Component Level Thermal Fusing
- Peak Surge Current Levels From 60kA To 900kA per phase

### 25-year Free Replacement Warranty

#### Optional Features

- Multi-stage, Hybrid Frequency Attenuation Network™ Circuit
- Integral Surge Counter
- Form “C” Dry Relay Contacts
- Internal & Remote Audible Alarm
- External Remote Lights
- External Alarm Module
- Integral Disconnect
- External Disconnect
- NEMA 12 or 4X Enclosures
- Application Specific Design
- Modifications Upon Request
- Recessed Wall Mounting cabinets
- Integral Panel Mounting Options

“If you can dream it... we just might be able to build it!”

*Energy Control Systems*  
Fort Worth, Texas U.S.A.

## Dedicated Circuit Protection

Sophisticated and highly integrated microprocessor based equipment and systems are utilized across every sector of today's fast paced commercial and business world. Protecting these mission critical systems must be given the highest priority. By the very nature of their design, these systems are increasingly prone to damage from even low level transient activity. The **Dedicated Load Circuit Protection** models provide the level of protection needed to assure these mission critical systems survive and perform as designed.

## Data Line & Current Loop Models

Data communications lines and current loops are the very life blood of highly integrated systems and networks. By the very nature of their design, these circuits are extremely susceptible to failure from even very low level transient activity. Protecting these circuits is another key element of the Optimal Protection Network™.

## Telecom Line Models

Telecommunication lines are very often the overlooked "back door" for transients to enter your facility. Protecting these vital circuits provides another key piece of the Optimal Protection Network™ system.

## Custom and Specialty Models

Our experienced staff of professional design and application engineers have the experience and knowledge needed to successfully solve your most difficult surge protection applications. We are very proud of our ability to solve **ANY** surge protection problem. If one of our thousands of standard models will not fit your unique requirements, we will work hand in hand with you to make whatever modifications and design changes needed to provide the right protection solution. From a single unit to an entire protection system, no job is too small, too large or too complex.

- Voltage Repsonive Network™ **and** Multi-stage Hybrid Frequency Attenuation Network™
- Series Connected Dedicated load circuit protection
- Compact Size
- Terminal and Hardwire
- Simple Installation
- Lowest Let-through Voltage Levels

- Multi-stage hybrid design
- Data Rates to 100M/bps
- Low Impedance/insertion loss
- Terminal, Coax and Hardwire
- Lowest Let-through Voltage Levels

- POTS, T1, fax, and modem lines
- Terminal strip, modular jack and punch-down block configurations
- Lowest Let-through Voltage Levels

- Medium Voltage Applications (up to 7200VAC)
- External Lighting & Audio Controls
- Casino and Gaming Controls
- Amusement Ride Controls



**"Surge Protection Is Our Business".**



UL1449  
UL1283



ISO 9001  
Manufactured



## Energy Control Systems

PO Box 330607  
Ft. Worth, Texas 76163  
[www.sinetamer.com](http://www.sinetamer.com)  
817.483.8497

For more information contact: