



# LAYERZERO POWER SYSTEMS, INC.

The Foundation Layer

**Basic Meters**

Last Update: 5-15-2015 09:03:24 AM

Parameter	Units	Output	Input 1	Input 2
V <sub>Ln</sub>	Volts, RMS	117	115	115
V <sub>Ln</sub>	Volts, RMS	117	115	114
V <sub>Ln</sub>	Volts, RMS	117	115	115
I <sub>a</sub>	Amps, RMS/Peak	0.73	0.73	1.73
I <sub>b</sub>	Amps, RMS/Peak	2.73	0.73	2.73
I <sub>c</sub>	Amps, RMS/Peak	2.73	0.73	1.73
f	Hz	60.0	60.0	60.0
Real Power	kW	0	0	0
Reactive Power	kVAR	0	0	0
Apparent Power	kVA	0	0	0
Power Factor		0.15	0.89	0.37
Power Factor		1.0	3.3	1.7
Voltage THD	%	3.7	3.7	3.7
Current THD	%	108.8	104.5	147.8
Current Imbalance	%	52.4	11.5	11.1
Phase Rotation		ABC	ABC	ABC

Parameter Units Source 1-2  
Phase Angle Degrees 0

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LAYERZERO  
POWER SYSTEMS, INC.



Monitoring & Communications System

# Zen Monitoring & Communications System Maximizes Infrastructure Awareness

## Zen from LayerZero Provides Advanced Power Quality Monitoring Capabilities

Zen is being aware. Zen from LayerZero is being aware of all activity in your critical power distribution systems. It is an all encompassing monitoring system with local and remote communications options. From basic monitoring & alarm reporting, to advanced power quality monitoring functionality, Zen from LayerZero provides a wide-range of options to help you be aware, be vigilant, be proactive in your quest to create a safe, stable and reliable operation.



**Zen Monitors the Static Switch, Transformer/Subfeeds, and Panel Boards**

## Zen From LayerZero Provides Answers

Zen captures every millisecond of voltage and current, giving you a “Birds Eye” view of your entire critical power distribution infrastructure. Zen lets you know if a source has quality issues, if a UPS output is bad, or if there are any warnings or alarms. In addition, Zen empowers users with the capability to go back in time to retrace the exact sequence of historical events. No other tool in the mission-critical industry empowers users with this robust capability.



Zen SSQM (Static Switch Quality Monitoring) provides power quality monitoring in LayerZero eSTS Static Transfer Switches and in STS-enabled ePODs Power Distribution Units. Zen SSQM monitors Voltage, Current, and Power Quality.



Zen DPQM (Distribution Panel Quality Monitoring) provides power quality monitoring in LayerZero ePODs Power Distribution Units with Distribution, and in LayerZero Power Panel products. Zen DPQM monitors Voltage, Current, and Power Quality.



Zen ECM (Enclosure & Component Monitoring) enables facilities with the option to monitor enclosures and system components, such as circuit breaker status, doors, and alarms. Zen ECM is available in all LayerZero products, either as an add-on or standalone monitoring system.

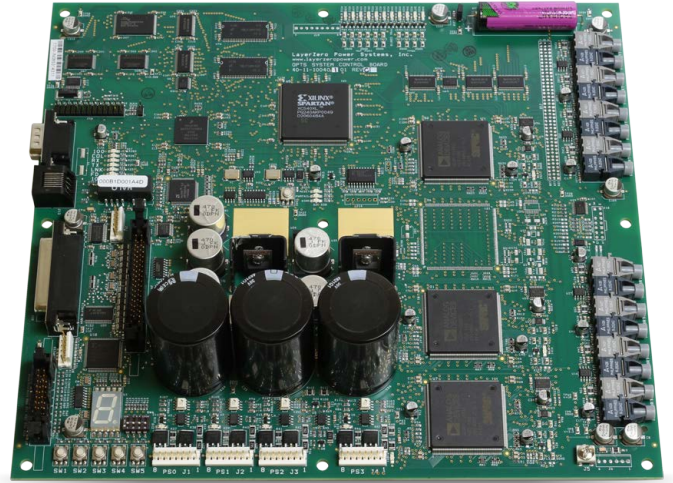
### Zen: Power Quality Innovation from LayerZero Power Systems

Since 2001, LayerZero Power Systems has been the technology leader in critical power distribution systems. Zen from LayerZero was introduced in 2015 as a single, comprehensive solution for monitoring and management of critical power distribution devices.

### Zen SSQM Overview

Zen SSQM monitors voltage, current, and power quality at the Static Transfer Switch. Zen SSQM actively captures power quality information at the STS and PDU - permitting thorough post-event analysis.

Waveform captures of voltage and current for every pole of every circuit breaker are stored immediately before and after an event. Critical information is stored in battery backed non-volatile memory. The data is preserved in the event of a power loss.



The Zen SSQM System Control Board



Zen SSQM is Equipped Standard with a 15" Color Touch Screen



Remote Viewing of Zen SSQM Data Is Accessible Over http

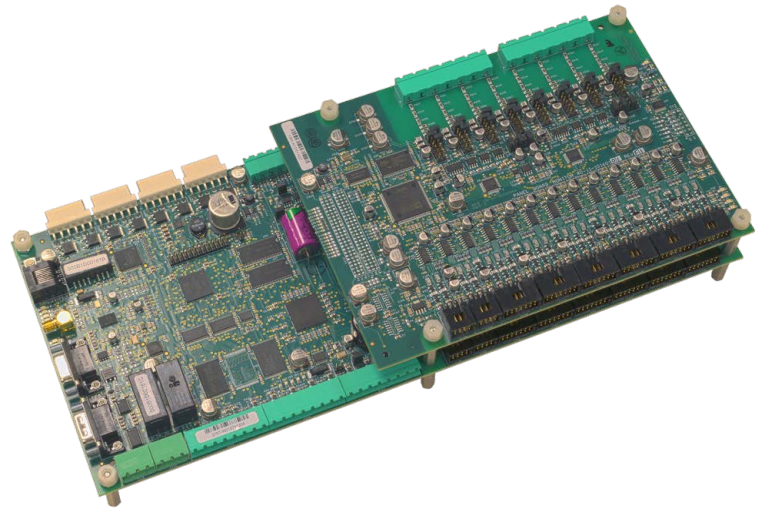
Zen SSQM STS Monitoring Specifications		Zen SSQM ePODs Monitoring Specifications		
Voltage Inputs (S1, S2, S3) and Output	Mains	Voltage Meters 1 Per 2 Sides	Mains	Subfeed or Branch Circuits
Voltage (Volts)	✓	Voltage	✓	
Voltage Average of Phases (Volts)	✓	Frequency (Hertz)	✓	
Frequency (Hertz)	✓	Phase Rotation	✓	
Total Harmonic Distortion (Percent VTHD)	✓			
Phase Rotation	✓			
<b>Current Inputs</b>		<b>Current Inputs</b>		
Current (Amps)	✓	Current (Amps)	✓	✓
Current Average of Phases (Amps)	✓	Current Fraction of Rating (Percent)	✓	✓
Current Imbalance (Percent)	✓	Current Imbalance (Percent)	✓	✓
Real Power (kilowatts)	✓	Real Power (kilowatts)	✓	✓
Apparent Power (kilovolt-amperes)	✓	Apparent Power (kilovolt-amperes)	✓	✓
Reactive Power (kilovolt-amperes reactive)	✓	Reactive Power (kilovolt-amperes reactive)	✓	✓
Power Factor	✓	Power Factor	✓	✓
Crest Factor	✓	K Factor	✓	✓
Crest Factor Average of Phases	✓	Crest Factor	✓	✓
Phase Difference Between Sources	✓			
Phase Difference Between Sources and Output	✓			
<b>Alarms</b>		<b>Alarms</b>		
Summary Alarm	✓	Summary Alarm	✓	
On Source (1/2/3)	✓	Voltage (High, Low)	✓	
Source Fail (1/2/3)	✓	Overload	✓	
Source Preferred (1/2/3)	✓	Thermostat (High, Low)	✓	
Source 1st Alternate (1/2/3)	✓	THD Over Limit	✓	
Source Over/Under Voltage (1/2/3)	✓	Frequency (Over, Under)	✓	
Source Over/Under Frequency (1/2/3)	✓	I A/B/C K-Factor Over Limit	✓	
Source Not Available (1/2/3)	✓	Average K-Factor Over Limit	✓	
Output Failure	✓	Incorrect Phase Rotation	✓	
Source Overcurrent (1/2/3)	✓	Voltage Failure	✓	
Source Exceeds Manual Limit (1/2/3)	✓	I G1/G2 Over Ground Fault Limit	✓	
Source Exceeds Automatic Limit (1/2/3)	✓	I G1/G2 Over Ground Overcurrent Limit	✓	✓
Bypassed to Source (1/2/3)	✓	TVSS 1/2/3/4 Failure	✓	

All product specifications are subject to change without notice.

### Zen DPQM Overview

Zen SSQM monitors voltage, current, and power quality at Power Distribution Units and at Power Panels.

Zen DPQM is based on a Panel Board Monitor (PBM) with modular expansion boards. Branch circuit monitoring is available from one to six 42-circuit panel boards. Sub-feed circuit monitor is available for up to (14) 3-pole sub-feed circuit breakers, 100AF - 800AF.



The Zen DPQM Panel Board Monitor with Expansion Board



Zen DPQM is Equipped Standard with an LCD Display Panel



Zen DPQM is Available With An Optional Color Touch Screen



An LCD Panel Permits Local Display of Meters & Alarms



An LCD Membrane Panel is Standard, Color Touch Screen Optional.

Zen DPQM Technical Specifications		
Voltage Monitor	Mains	Subfeed or Branch Circuits
Volts (L-L) Phase A/B/C (volts RMS)	✓	
Volts (L-N) Phase A/B/C (volts RMS)	✓	
Phase Rotation	✓	
Current Monitor		
CT Reversed Phase A/B/C/N	✓	✓
Current Phase A/B/C/N (amperes RMS)	✓	✓
Power Monitor		
Frequency (hertz)	✓	
Real Power (kilowatts)	✓	✓
Apparent Power (kilovolt-amperes)	✓	✓
Reactive Power (kilovolt-amperes reactive)	✓	✓
Power Factor	✓	✓
Energy (kilowatt-hours)	✓	✓
Block Demand (kilowatts)	✓	✓
Block Demand Peak (kilowatts)	✓	✓
Rolling Demand (kilowatts)	✓	✓
Rolling Demand Peak (kilowatts)	✓	✓
Power Quality		
Percent VTHD (percent)	✓	✓
Waveform Capture	✓	✓
Alarms		
Phase - Under Voltage A/B/C (Alarm)	✓	
Phase - Over Voltage A/B/C (Alarm)	✓	
Phase - Low Voltage A/B/C (Warning)	✓	
Phase - High Voltage A/B/C (Warning)	✓	
Phase - Over Current A/B/C (Alarm)	✓	✓
Phase - High Current A/B/C (Warning)	✓	✓
Under Frequency (Alarm)	✓	
Over Frequency (Alarm)	✓	
High VTHD (Warning)	✓	
Over VTHD (Alarm)	✓	
Phase Rotation (Alarm)	✓	

## Zen ECM Overview

Zen ECM monitors door status, alarms, and circuit breaker status. Zen ECM can be used with Zen DPQM, or as a standalone enclosure and component monitoring solution.



Door Status



Circuit Breaker Status



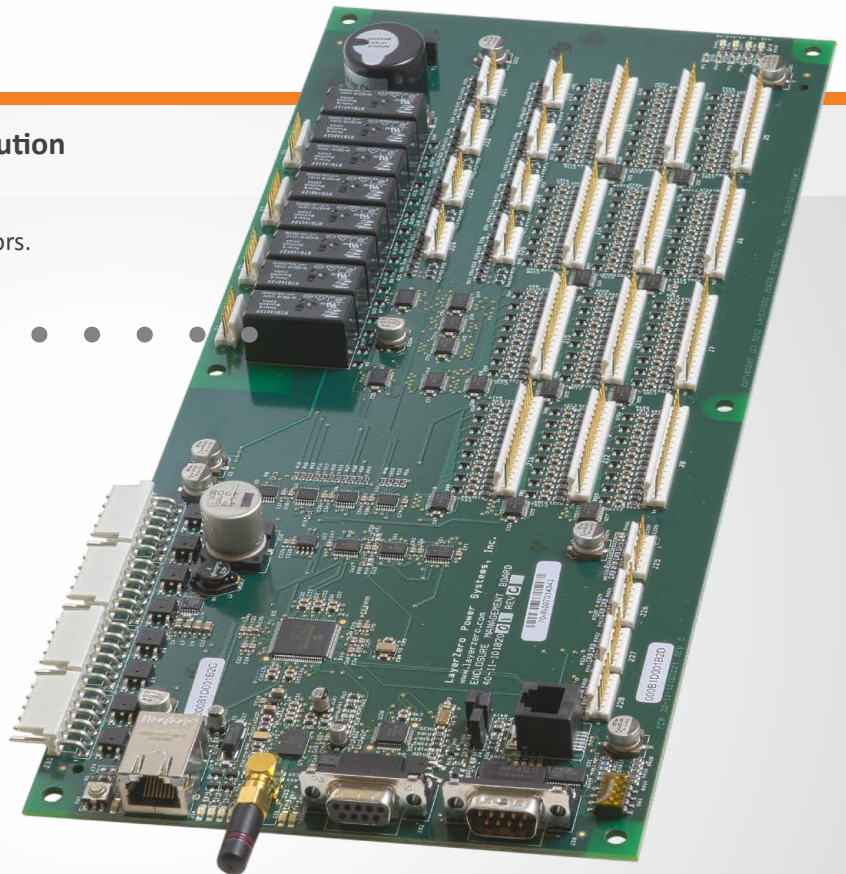
Alarms

## Zen ECM is a Flexible, Highly Configurable Solution

Zen ECM includes digital inputs for connectivity to sensors.

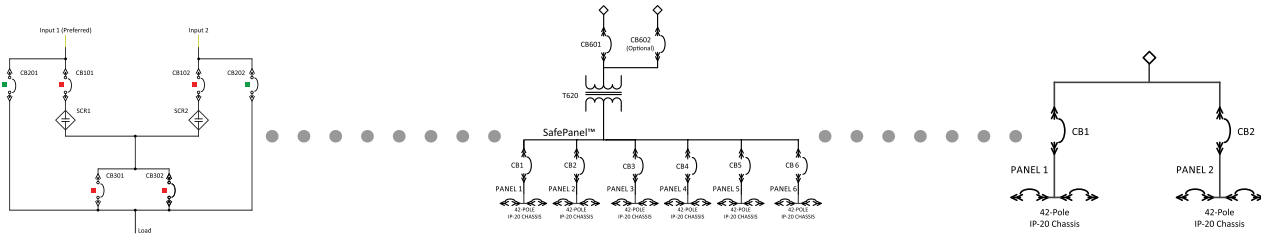


CB Status Can Be Remotely Monitored with Zen





# 1 Select The Data Acquisition Points



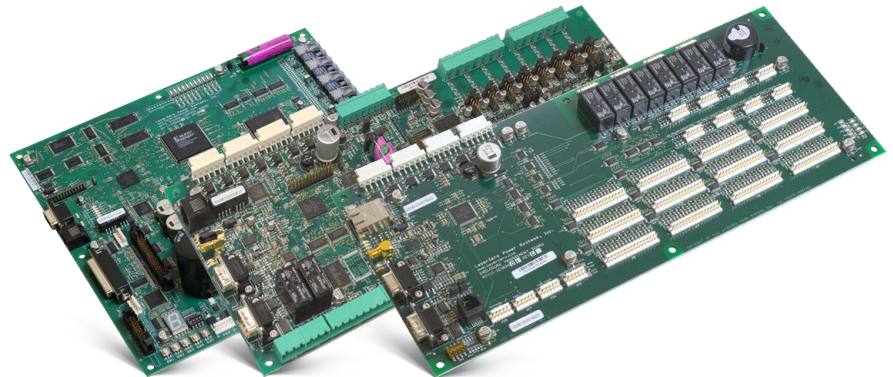
Static Transfer Switches

Power Distribution Units

Power Panels

# 2 Choose The Types of Data You Need To Monitor

- STS Inputs Current
- STS Inputs Voltage
- STS Power Quality
- PDU Subfeeds
- Power Panel Branch Circuits
- CBs/Alarms/Doors



# 3 Configure Your Local/Remote Display Options



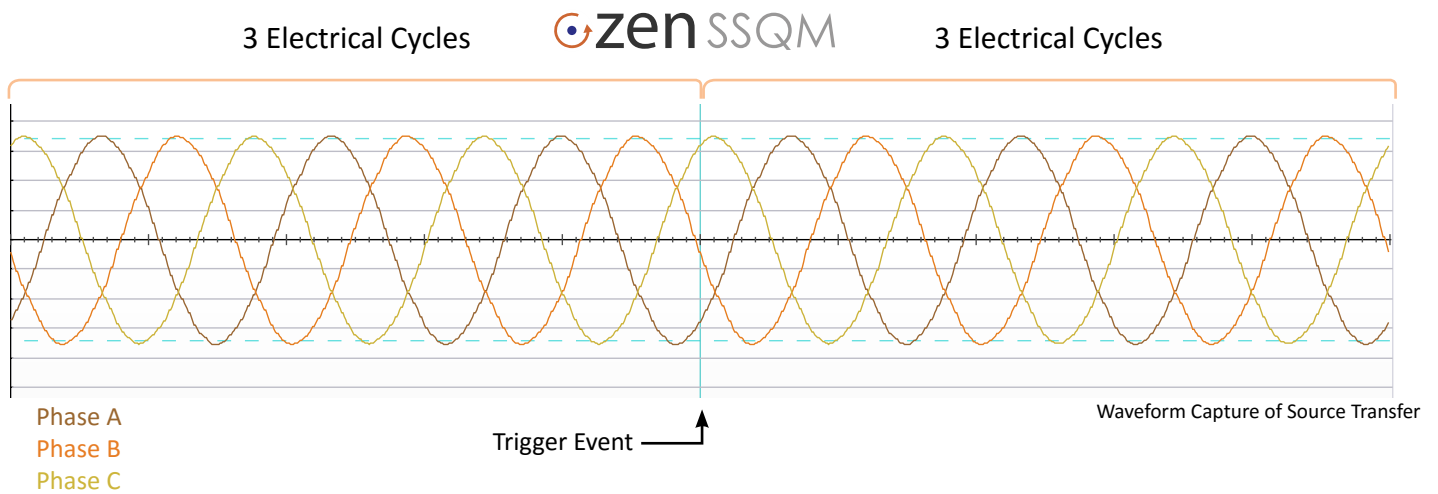
Local Display Types  
(15" Only For STS Products)

Remote Display Options  
(SNMP, Modbus, http)

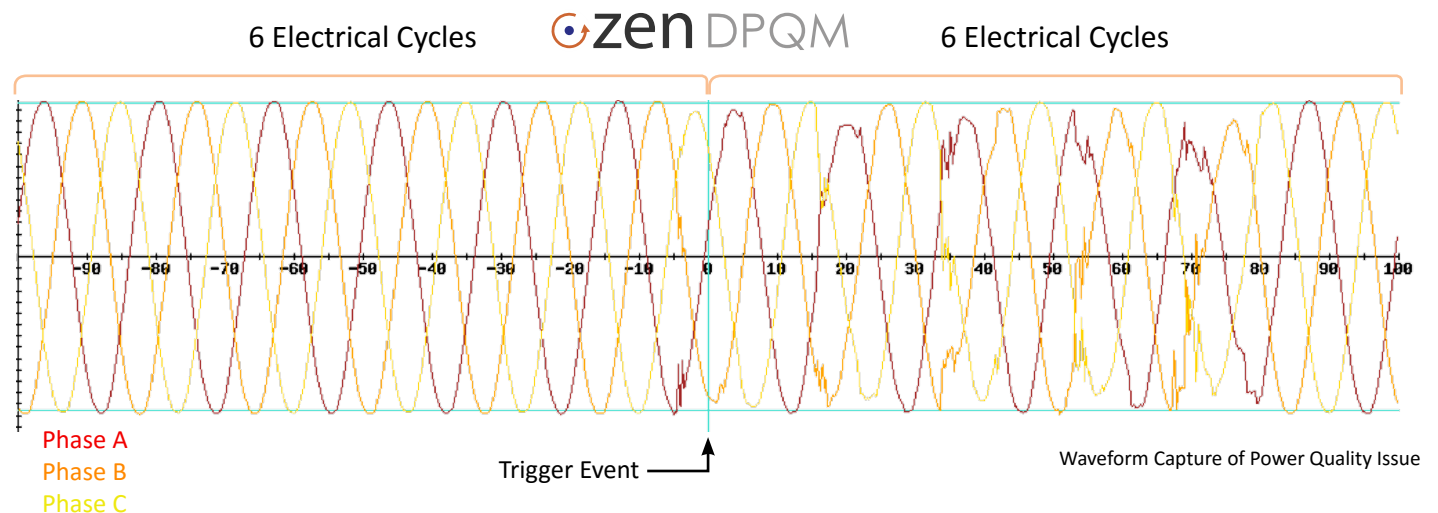
# Zen Captures And Gives You The Data You Need For Root Cause Analysis

## Zen SSQM Provides Waveform Capture Three Cycles Before and After Events

Events include bus voltage anomalies, instantaneous bus overcurrent, and single sub-feed circuit overcurrent.



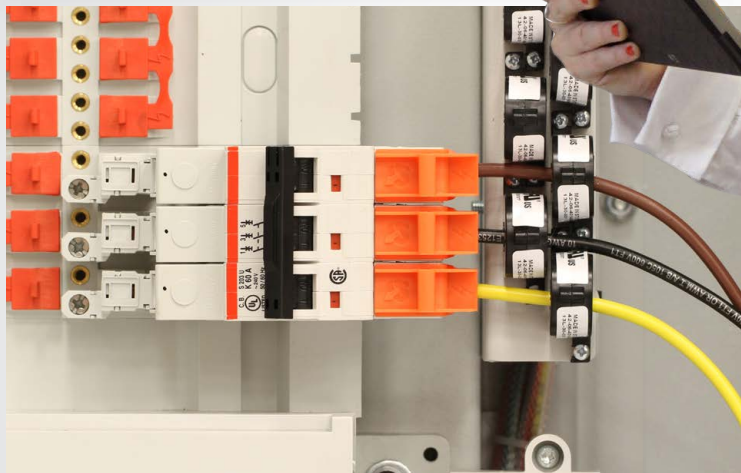
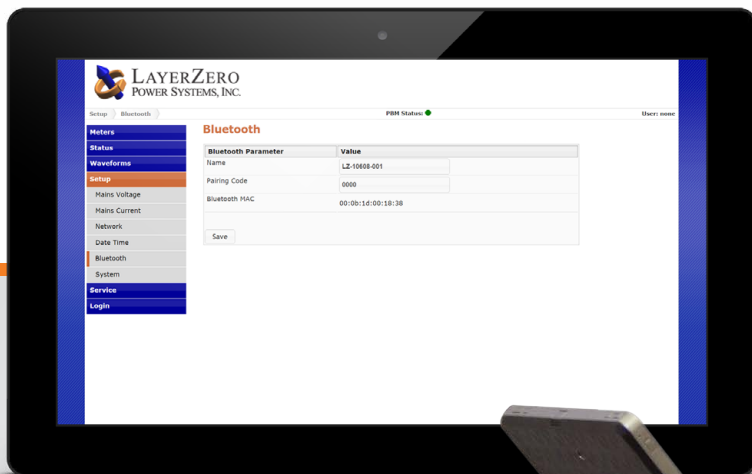
## Zen DPQM Provides Waveform Capture Six Cycles Before and After Events



# Keep Panel Names Accurate & Up To Date With Bluetooth Connectivity

Zen's DPQM and Zen ECM provides Bluetooth connectivity for connected devices. Bluetooth connectivity permits panel names to be set up immediately after installation.

Configure Panel Names At The Point Of Impact!





Zen produces real-time waveform captures for every pole of every breaker.



Zen synchronizes its clock with an external reference via the network



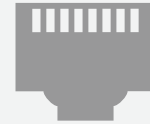
Zen allows you to pinpoint the exact moment that power quality events happen.



Zen display provides local viewing of all parameters via touch screen display.



Zen equips you with the ability to view meters and waveforms remotely.



Zen connects to the network with an Ethernet connection.



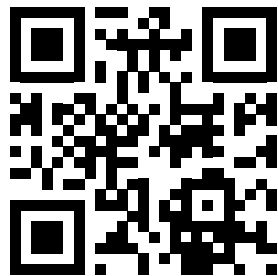
Zen supports Modbus/TCP for open connectivity.



Zen permits connectivity to SNMP for Remote Monitoring.



Bluetooth Connectivity enables panel designation at point-of-impact



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Learn more at [www.LayerZero.com](http://www.LayerZero.com)

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