LayerZero Power Systems, LLC.

The Foundation Layer

# Series 70 ePanel-HD1

High-Density Wall-Mounted Remote Power Panel

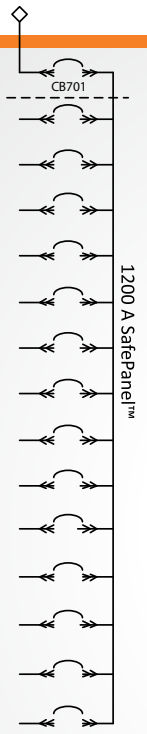
Product Brochure

# Be Ready For *Ultra* High-Density Requirements With ePanel-HD1 High-Density RPP

**ePanel-HD1 Is Inspired by NFPA-70E**

The Series 70 ePanel-HD1 is a high-density remote power panel designed for critical environments. Featuring an NFPA 70E-friendly layout and the IP-20 rated Finger-Safe SafePanel®, it prioritizes operator protection and safe operation. With a focus on reliability, safety, connectivity, and power quality monitoring, the ePanel-HD1 delivers dependable performance for mission-critical facilities.

The Series 70 ePanel-HD1 is built for flexibility, making it ideal for facilities that are expanding or frequently reconfiguring their infrastructure.




One Line Diagram

## Reliability

**Convection Cooling:**
Natural Convection-Cooled Heat Dissipation System is Maintenance-Free

**Machined Hardware:**
Machined Cap Screws and Engineered Disc Springs Maintain Constant Torque Throughout Product Life

**Serialized Critical Board Tracking:**
Critical Boards Are Serialized And Cataloged in an Active Database For Traceability

## Safety

**INSIGHT IR® Cameras:**
Built-in Infrared Cameras to Continuously Scan Bolted Connections For Irregular Rises In Temperature

**Sectionalized Components:**
Separations Between Each Section To Maintain Maximum Operator Safety

**Polycarbonate Windows:**
Allows Critical Board LEDs To Be Viewed With The Dead-Front Door Closed

**Guided Wireways:**
Helps Keep Wires Organized

**Dead Front Hinged Doors:**
Barrier To Provide A Safe Working Area With No Exposed Live Parts

**SafePanel® Distribution:**
IP-20 Rated Finger-Safe Panel Board with No Exposure to Exposed Live Parts

## Connectivity

**Ethernet Connectivity:**
Secure VPN Router Connects To Network For Advanced Remote Monitoring Capabilities

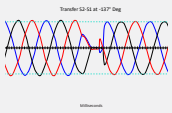
**Modbus/TCP:**
Open Connectivity to Existing Monitoring Systems Without Proprietary Limitations

**NTP Time Clock Synchronization:**
Facilitates Timeline-Based Logging For Post-Event Reconstruction

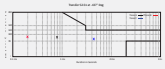
**SNMP Connectivity:**
Permits Remote Management Via Simple Network Management Protocol

**Dry Contacts:**
Access Alarms Data with Dry Contacts Connections

## Power Quality Monitoring



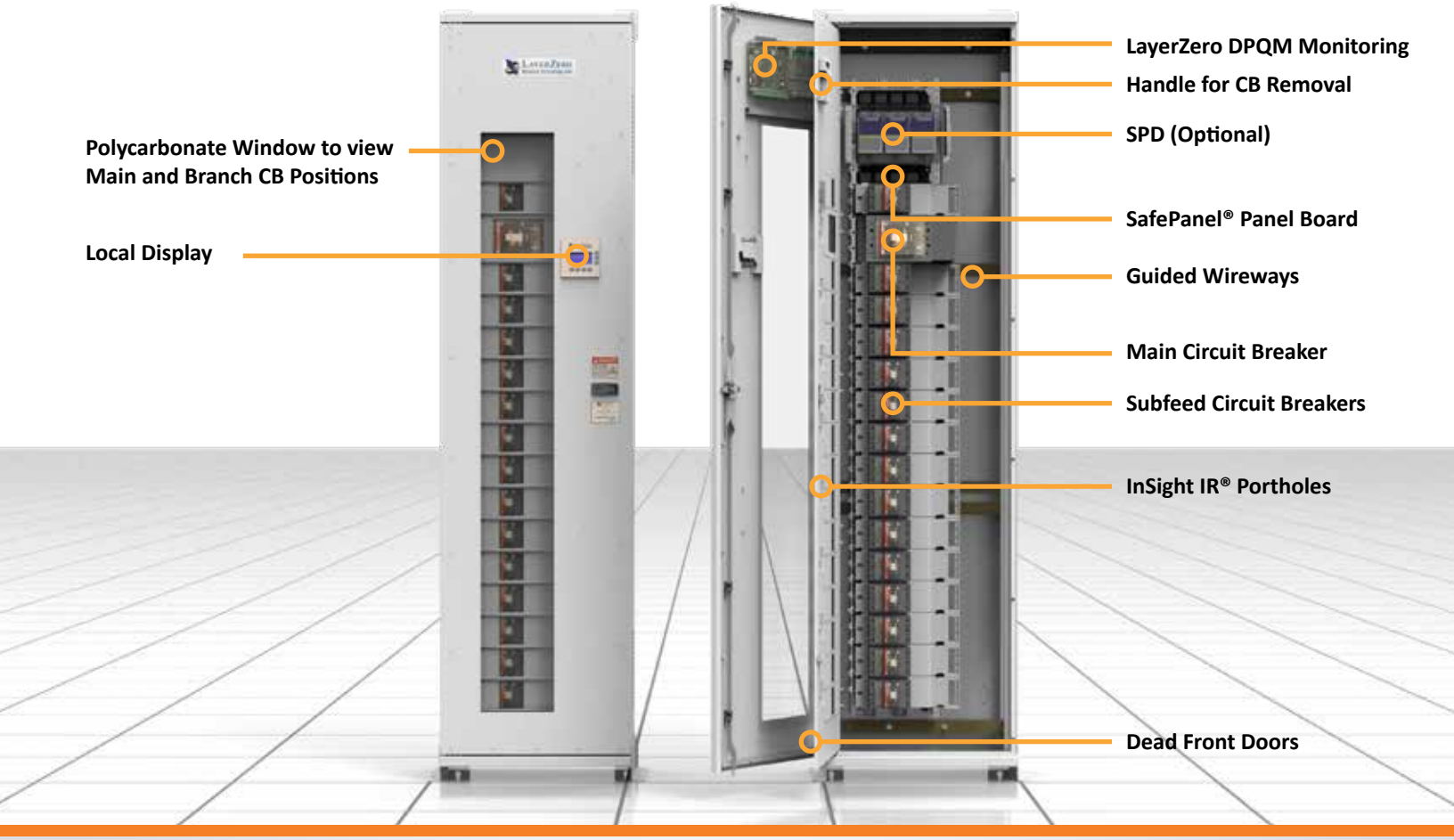
**Real-Time Waveform Capture:**
Automatically Captures A Picture Of The Power Six-Cycles Before and After Every Event

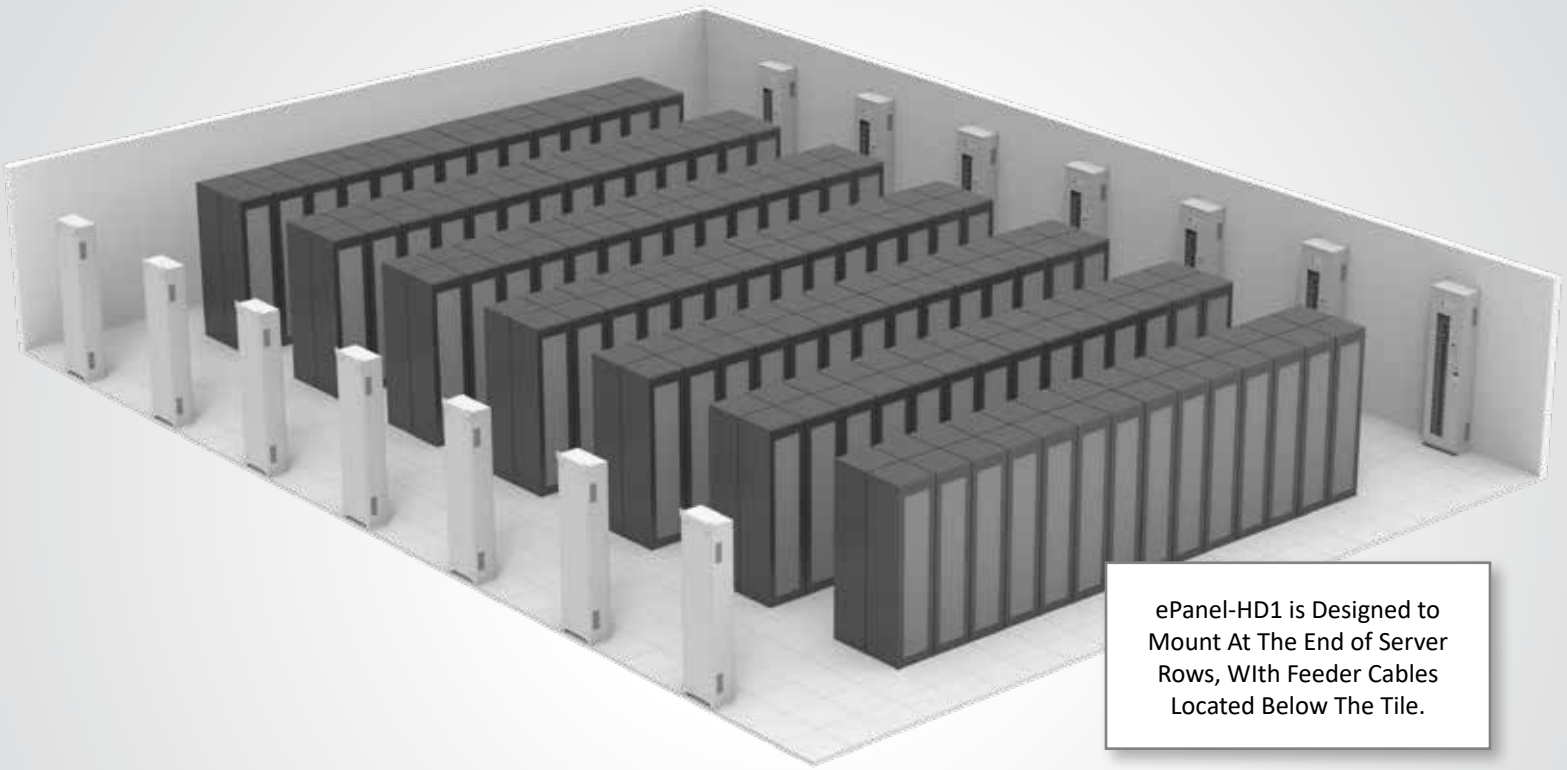


**ITIC Plotting:**
Generate ITIC Plots To Determine if Connected Equipment Was Affected by Power Quality Events

**Optional Local Touch-Screen Interface:**
Password-Protected Color Touch-Screen GUI For Local STS Setup/ Operation/Administration

## Equipment Layout



ePanel-HD1 is Designed to Mount At The End of Server Rows, WIth Feeder Cables Located Below The Tile.

## Reliability Features/Safety Features

### Floor or Wall Mounted Distribution

The ePanel-HD1 can be either floor-mounted or wall-mounted, offering installation versatility to meet a variety of space and operational needs.

### Dead-Front Hinged Doors Maximize Operator Safety

The Series 70 ePanel-HD1 is equipped with dead-front hinged doors, allowing circuit breakers to be operated safely while maintaining a physical barrier between the user and energized components.

## Safety Features

### View CB Positions With Dead-Front Doors Closed

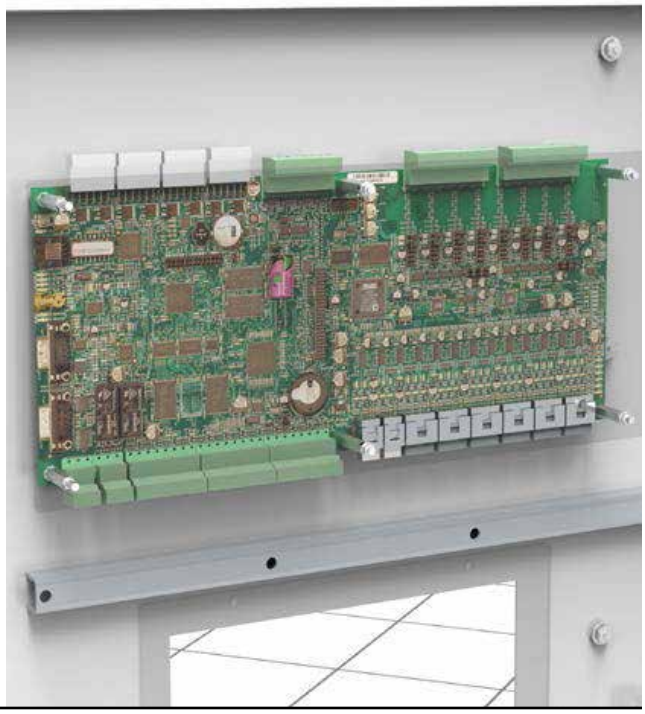
Inspired by NFPA-70E design principles, the Series 70 line helps data centers significantly reduce electrical risk in their power distribution systems.

SafePanel® circuit breaker positions are visible even with the dead-front doors closed, allowing operators to verify breaker status without exposure to live components.

### Serialized Circuit Boards

All critical circuit boards and memory cards are serialized and tracked through LayerZero's eBOSS portal. Customers can view detailed component information, including manufacturing data, testing records, and technician notes.

This serialization enables advanced predictive maintenance. If a component fails, it can be cross-referenced with similar parts in the field to identify potential trends. This proactive approach supports preventive maintenance and ensures maximum system uptime.



## Safety Features

### The LayerZero SafePanel®

The Series 70 ePanel-HD1 incorporates the IP-20-rated Finger-Safe SafePanel®, designed for maximum operator protection. The design prevents ingress of a ½-inch (12.5 mm) probe, ensuring that live components remain fully enclosed.

When two energized conductors are separated, such as during live circuit breaker removal, an electrical arc can occur. The SafePanel® design contains any potential arc within the connection well, so even if a branch breaker is removed, the arc remains confined. With insulated, deeply isolated components, removing a breaker is both safe and straightforward.

Finger-Safe SafePanel® Subfeed Panel Board

### ePanel-HD1 1200 A Circuit Breaker Installation Process

The Breaker Is Inserted Into The SafePanel

The Handle Is Unlocked

Screws Help Secure The Breaker

For Maximum Safety, The SafePanel Has Recessed Bus Work and Finger Safe Lattice.

## Convenience Features

### High Density Distribution

The LayerZero Series 70 ePanel-HD1 is a high-density remote power panel designed for mission-critical environments, such as data centers and other applications where reliability is essential.

Designed to handle high-density power distribution, the ePanel-HD1 delivers dependable performance and scalability for today's most demanding facilities.

High-Density Power Panel Circuit Breakers

### Guided Wireways

Built-in guided wirewars help keep cables and wiring neatly organized, supporting efficient installation, serviceability, and long-term reliability.

## Power Quality Monitoring

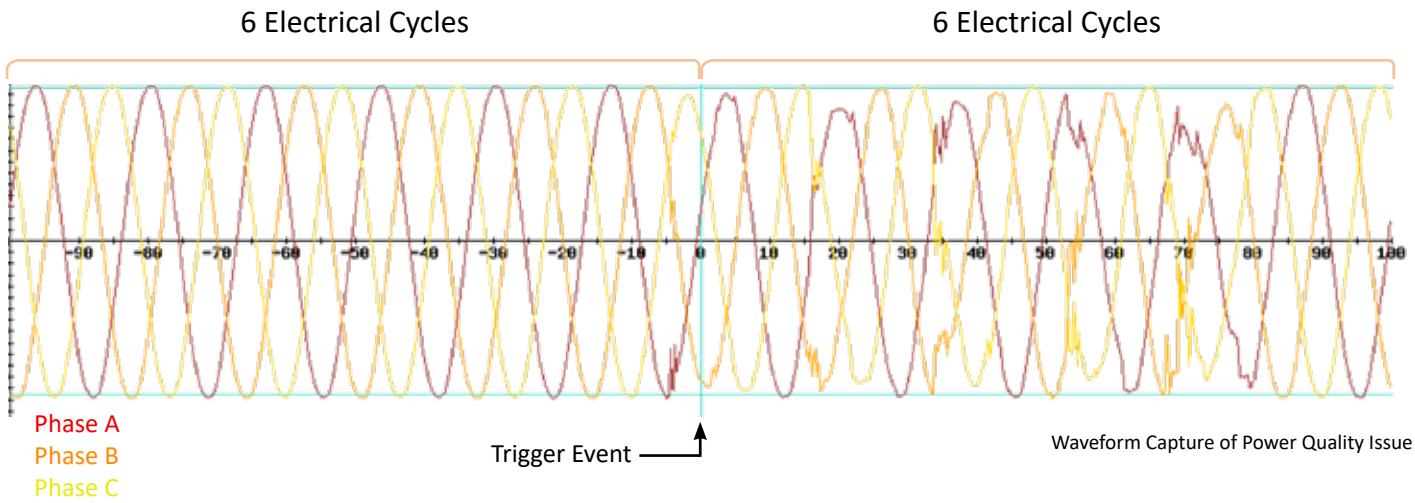
LZ DPQM

The Series 70 ePanel-HD1 includes LayerZero DPQM (Distribution Power Quality Monitoring), an advanced monitoring system offering both local and remote communication capabilities.

From basic alarm reporting to comprehensive power quality analysis, LayerZero DPQM provides a full range of tools to help operators stay aware, vigilant, and proactive in maintaining a safe, stable, and reliable operation.


### LayerZero DPQM Provides Answers

DPQM captures timestamped waveform images before and after power events, enabling teams to review data, identify root causes, and take corrective action with precision. LayerZero systems record and analyze power quality information across the STS, PDU, and RPP, supporting thorough post-event investigation and continuous improvement in system reliability.



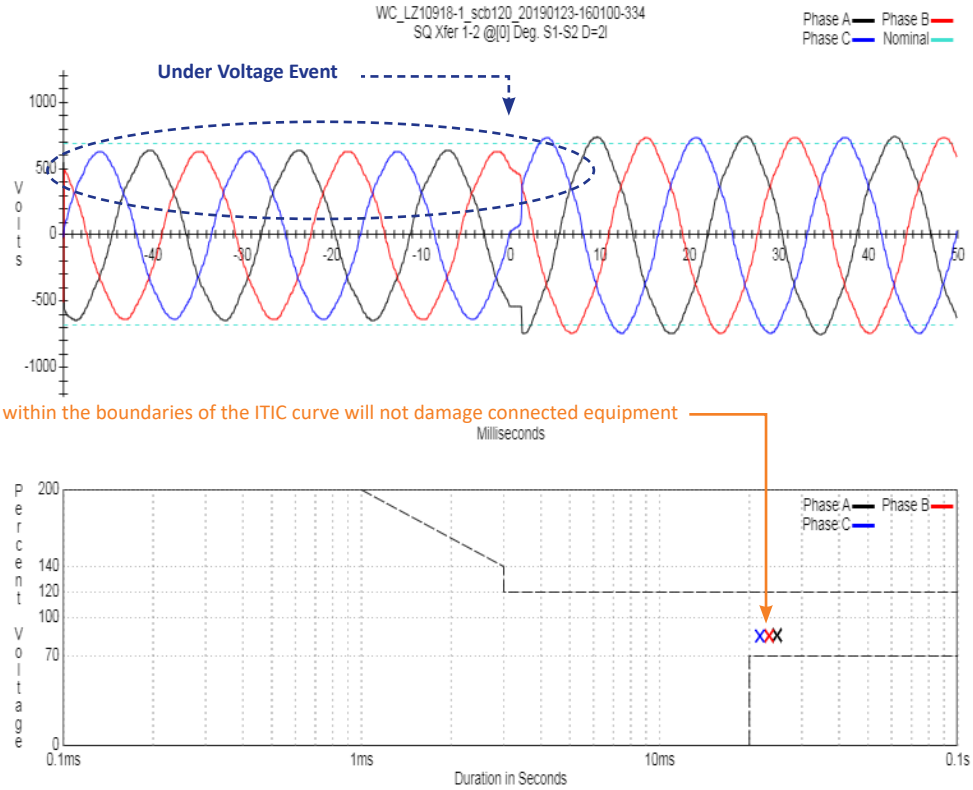

Waveform Capture of Power Quality Issue

All LayerZero products continuously sample and analyze power sources to monitor quality in real time. This data can be accessed remotely through a secure web browser connection.

The “voltage sag” factory test example below illustrates this capability. During the test, each phase, represented by a separate line, shows voltage plotted over time. When all three phases dropped below the user-defined threshold, the system automatically triggered an undervoltage event, captured the corresponding waveform, and generated an ITIC plot for review.

LayerZero PDUs and RPPs automatically generate waveofrms and ITIC plots for every phase, on every circuit, and for every event, providing complete visibility into system performance.

ePODs: Type-X SF PDU

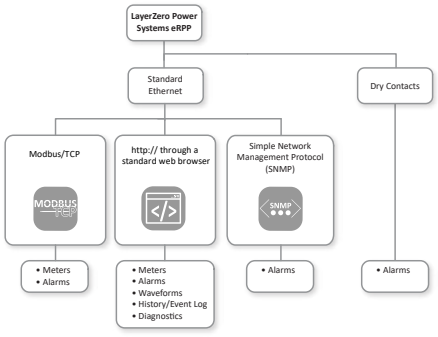



**How to Read the Curve**

On the y-axis you will see the % of nominal voltage, and the x-axis represents time typically shown using a logarithmic scale. As long as the voltage is contained within the boundaries the load will be maintained and there will be no damage to connected equipment. The examples above events plotted both within the boundaries.

## Technical Specifications

| LayerZero DPQM Parameters | | Mains | Subfeeds or Branch Circuits |
|---|---|---|---|
| **Voltage Monitor** | 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 VTHD1 (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 VTHD1 (Warning) | ✓ | |
| | Over VTHD1 (Alarm) | ✓ | |
| | Phase Rotation (Alarm) | ✓ | |




All product specifications are subject to change without notice.

## Technical Specifications

| ePanel-HD1 Models with System Withstand Ratings | |
|---|---|
| | Fault Rating at Rated Voltage - Electronic Trip, Molded Case Switch Main Circuit Breaker |
| 120/208 V, 3-Phase, 4-Wire + Ground | 65kAIC |
| 220/380 V, 3-Phase, 4-Wire + Ground | 25kAIC or 65kAIC |
| 230/400 V, 3-Phase, 4-Wire + Ground | |
| 240/415 V, 3-Phase, 4-Wire + Ground | |
| 277/480 V, 3-Phase, 4-Wire + Ground | |
| 480 V, 3-Phase, 3-Wire + Ground | |

| Mechanical Characteristics | |
|---|---|
| Dimensions: | 24”W x 95”H x 12”D (609.6 mm W x 2286mm H x 304.8 mm D) |
| Weight | 450 lbs (204 kg) |
| Enclosure Mounting | Wall-Mounted or Free Standing |
| Color | Textured Powder Coat White (RAL 7035), Blue (RAL 5017), Black, Custom |
| Sectionalization | Hinged Dead Front Doors with IR Ports |
| Circuit Breaker Identification | Labels Viewable Through Polycarbonate Window |
| **Electrical Characteristics** | |
| Panel Board Withstand | 65 kA |
| Frequency | 50 Hz, 60 Hz |
| Poles | 3-pole |
| Phases | 3-Phase, 3-Wire (Input); 3-Phase, 4-Wire + Ground (Output) |
| Neutral Rating | 100%, 200% |
| Input Feeder Termination | Main Circuit Breaker Mechanical Lugs |
| Distribution | SafePanel® Distribution |
| Main Circuit Breaker Type | 400 AF (100% Rating Available) Electronic Trip, or Molded Case Switch |
| Branch Circuit Breakers Type | 15 A-100 A Thermal Magnetic |
| Selective Trip Coordination | Guaranteed Selective Trip Coordination up to 25 kAIC |
| **Power Quality Monitoring** | |
| Power Quality Monitoring Technology | LayerZero DPQM (Distribution Power Quality Monitoring) |
| Waveform Capture | Local Display, Remote Display via Web Browser; Includes Disturbance Analyzer |

| Operational Characteristics | |
|---|---|
| Cooling | Convection Cooling |
| Cable Access | Top/Bottom |
| Service Access | Front Only Access |
| IR Scan Port Type | INSIGHT IR® Portholes |
| Display Type | 3.2” LCD with Membrane, 10.5” Color Touch Screen GUI (Optional) |
| **Connectivity** | |
| Meters | Local Display, Ethernet, Modbus/TCP, http via Web Browser (Non-Proprietary) |
| Alarms | Local Display, Ethernet, Modbus/TCP, http via Web Browser (Non-Proprietary) |
| Summary Alarm | Dry Contacts |
| Waveforms | Local Display, Ethernet, http via Web Browser (Non-Proprietary) |
| History/Event Log | Local Display, Ethernet, http via Web Browser (Non-Proprietary) |
| Diagnostics | Local Display, Ethernet, http via Web Browser (Non-Proprietary) |
| Time Synchronization | Network Time Protocol (NTP) |
| **Standards Conformance** | |
| UL | ETL listed to UL 60950 |
| CSA | cETL listed to Std C22.2 No. 107.1 |

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Learn more at www.LayerZero.com

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