THE NEXT GENERATION OF FLEXIBLE POWER DISTRIBUTION

# PowerWave Bus System™

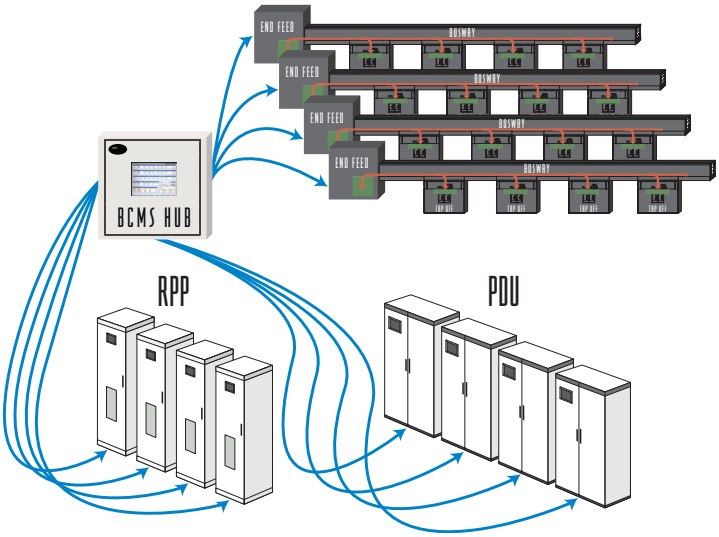

PDI
creating the perfect wave

# PowerWave Bus System™: designed specifically for the Critical Power Market

The PowerWave Bus System™ is specifically designed for the critical power market by PDI, a leading manufacturer of critical power equipment. With over 30 years serving the data, banking, processing centers and industrial markets, PDI has gained an unmatched level of expertise in the development of reliable products for critical power facilities. Through this extensive background and experience, we know that up time and clean power are critical to our customers and the customers these facilities serve.

Our structured bus design incorporates many new patent pending design features with specific patents driven by our integrated communications capability; our unique Camtough™ structured joint technology and our Toughrail Technology™ supporting structure. In an industry where up time, reliability, and serviceability are critical, isn't it time that a structured bus was designed specifically for you?

- **RELIABILITY** Tested at up to 200% of rating - our PowerWave Toughrail Technology™ is built to last.
- **TRACEABILITY** Clearly defined distribution with zero footprint allows for easy visible tracing of circuits.
- **RE-CONFIGURABILITY** Move it, re-use it, add to it, or change direction – all this without any waste, and all with only minor disruption.
- **CONFIGURABLE** Lay it out, change your mind, move an aisle ... no problem – everything is easier with a distributed bus system.
- **LOW HEAT SOURCE** Reduced power concentration within the busway system enables distributed heat dissipation.
- **RECYCLE** Made of 99% recyclable, environment-friendly components.
- **TAP OFF UNITS**
  Continuous bus allows for distribution of power tap off points at any location along the system with tap offs added or removed at any time. (*Proper safety procedure should always be used when working on live components*.)
- **LOAD-SPECIFIC** Tap Off Units are completely configurable to meet your load demands, and specific load requirements including monitoring.
- **VISUAL INSTALLATION INDICATORS** Our system is designed so that there are visible installation features that allow you to check that your configuration is securely installed prior to start up.
- **COMMUNICATIONS** Optional integrated communication through PDIQ provides all the features used in our power distribution unit or remote power panels without the foot print and with complete integration to our current Branch Circuit Monitoring System (BCMS) Hub which can collect power data from a total of 240 devices.




For less dense applications, the PowerWave Local Display can be utilized on installations using PowerWave Bus System only. This 7" touscreen can collect power data from a total of 96 devices.

An unlimited number of locations and devices can be monitored via PowerMap, PDI's cloud based monitoring. Power data can also be viewed on the latest smartphone and tablet form factors.

# PowerWave Bus System™
# SIMPLE. ROBUST. EFFICIENT.

From preliminary concept to final installation you can depend on PDI and PowerWave Structured Bus.

PowerWave Bus System™ design improves your installation, enhances system flexibility, and ensures the uninterrupted operation of your critical electrical system.

The PowerWave Bus System™ is tested and certified by ETL to the following standards: UL857 and IEC 60439-2.

## GENERAL

Busway systems have been available for years. Most systems applied to the data center are adaptations of industrial or commercial systems that have not been designed for critical power loads. Now, PDI has engineered a robust, elegant bus system designed specifically for critical power and data center installations.

The PowerWave Bus System™ with Toughrail Technology™ offers a complete line of fully compatible, continuous opening plug-in busway with all the required fittings to complete your job.

The PowerWave Bus System™ is a flexible, easy to install, highly efficient structured busway that safely distributes power for any critical power, industrial, or commercial application. The PowerWave Structured Bus is a continuous plug-in style rail rated at 160–800 amps with plated copper conductor and contacts. The patented PowerWave Toughrail Technology™ systems are available in the following configurations:

- three-pole and four-pole
- optional 150% fully rated neutral
- optional 100% rated isolated ground

System installations are performed quickly and easily. Our rugged, yet lightweight Toughrail Technology™ system design allows for easy handling and installation, with up to a 60% savings in time and labor over competitive cable and conduit methods of installations.

## TOUGHRAIL TECHNOLOGY AND CONSTRUCTION

PowerWave Toughrail Technology™ has a unique, inherently safe, yet open and accessible design that meets the IP2X - finger-safe safety standards. Tap Off Units can be located anywhere on the run, reducing cabling, and improving the functionality and aesthetics of your system. The oversized bus bars provide superior voltage drop characteristics. The extruded aluminum housing is a solid, one-piece design, with no welds or bolts, which reduces weight, improves the ground path, and enhances stability and strength while minimizing EMI of the system.

Toughrail Technology™ incorporates one of the most unique section-to-section joints available today. Our patented cam-action connection method assures you a secure, thermally efficient maintenance-free connection. Our design delivers minimal resistance and minimal voltage drops across the connection. And by utilizing 12 foot sections of bus versus the traditional 10 foot, two joint connections for every 96’ - 100' of run can be eliminated.

## HASSLE-FREE CONTINUOUS RUN DESIGN

The PowerWave Bus System™ open channel design provides the installer and end user the greatest flexibility on the market today. With no predetermined tap off points, you can place distribution as needed directly over your loads. The total system enhances the workability of the installation as well as improving the analysis of direct loads. With our integrated communications system, you can monitor individual loads remotely, improve visibility of critical loads, and precisely monitor thermal activity on the system or the room.

# Design Features

## RUGGED & COMPACT

The PowerWave Bus System™ with Toughrail Technology™ structured bus system is a rugged, yet compact system that eliminates any need for floor space, maximizing your server installation area. Our unique Toughrail Technology™ integrates power and communication in a single run, enhancing load communications, and reducing the space required compared to multiple cable and conduit runs.


## CONSTRUCTION AND FINISH

PowerWave Toughrail Technology™ system housing is created from a single piece aluminum extrusion with a black or silver anodized finish which enhances the dissipation of heat along the bus, reducing any hot spot concentrations. With optional finish colors to meet your needs, the PowerWave Bus System™ with Toughrail Technology™ is aesthetically pleasing and can enhance the look of your installation.

The insulation used in the PowerWave Toughrail Technology™ system is manufactured with a Class H (220) rated (150°C/302°F) material. The insulation wraps around each bus bar, giving perfect separation from phase-to-phase and phase-to-ground while enhancing the short circuit rating.


## PLATING

To improve system conductivity and reduce resistance, the PowerWave Bus System™ is only available with nickel-plated copper bus bars. This proven system improves the overall contact surface, reducing surface to surface resistance, and resisting corrosion in high humidity environments.

## POWERWAVE™ INTEGRAL GROUND PATH

PowerWave Toughrail Technology™ incorporates an integral ground system – a feature of its extruded, one-piece aluminum housing. By utilizing the housing design for the grounding system we ensure the path, improve the capacity, and encase the complete system.

## SHORT CIRCUIT STRENGTH

PowerWave Toughrail Technology™ system's unique design for low voltage distribution from 160-800 amps achieves an AIC rating for unprotected bus at up to 42,000 RMS symmetrical. Our testing was completed and certified by an independent third party.

## VOLTAGE DROP

PowerWave Toughrail Technology™ incorporates a low-loss design generating one of the lowest voltage drop ratings in the industry.

Low resistance is a key design criterion for power quality equipment in the critical power and data markets.

| SPECIFICATIONS | POWERWAVE BUS SYSTEM™ NOTATIONS | SYSTEM RATINGS | | | | | |
|---|---|---|---|---|---|---|---|
| AMPACITY SYSTEM | Six specific design options with the most common ampacity. | 160 | 225 | 250 | 400 | 600 | 800 |
| PROTECTION | Finger-safe indoor rated systems. | IP2X | | | | | |
| RATED VOLTAGE | All systems are rated at 208/480 volt, Tap Off Units will determine actual system voltage. | 208/480V | | | | | |
| RATED SHORT CIRCUIT CAPACITY | Tested and rated at 480V to 22-42 kAIC depending on amperage. | 22 kAIC | | | 22 kAIC* | 42 kAIC | |
| CONDUCTOR TYPE | All conductors and contact points are plated copper. | CU | | | | | |
| FREQUENCY RATING | | 50/60 Hz | | | | | |
| TESTING CRITERIA | ETL certified to UL rating for busway systems. | UL 857 | | | | | |
| IEC RATED | ETL certified to IEC rating for busway systems. | 60439.2 | | | | | |
| SYSTEM WEIGHT PER FOOT | Straight sections only. | 6.8lbs | | | 9.6lbs | 14.3lbs | 18.6lbs |
| SUPPORT DISTANCE | Max. on centers. All elbows, cross and tee come with built in supporting hardware. | 10' centers | | | 8' centers | 5' centers | 5' centers |

* 42 kAIC up to 208V

| COMPONENT LIBRARY | POWERWAVE BUS SYSTEM™ NOTATIONS | SYSTEM RATINGS | | | | | |
|---|---|---|---|---|---|---|---|
| | | 160 | 225 | 250 | 400 | 600 | 800 |
| STRAIGHT LENGTHS | All sections shipped with coupling on one end. | 12', 10', 6', 5' and 3' Sections | | | | | |
| ELBOWS | Elbows come standard with consistently aligned neutral phasing, cross neutral phasing is available on request. | Left<br>Right<br>Down<br>Cross | | | | | |
| TEES | Tee fittings will come standard with consistently aligned neutral phasing, cross neutral phasing is available on request. | Yes | | | | | |
| CROSS OR X | Cross fittings will come standard with consistently aligned neutral phasing, cross neutral phasing is available on request (special). | Yes | | | | | |
| END FEED UNITS | Feed boxes are used to bring power to the bus system; variations are available. | Right End<br>Left End<br>Center<br>Dual A&B | | | | | |
| HANGERS | Hangers are for universal mounting with various support hardware. | Top rail mount<br>Side rail mount | | | | | |
| TAP OFF BOXES | Tap off units can be mounted at any position along the busrail. Tap Off Units are configurable with many variations of breakers, receptacles, and corded connections available. Variations are available. | Max 100 Amp<br>Multiple Communications | | | | | |
| COMMUNICATIONS | A dedicated communication channel through PDIq within the busway enclosure can monitor each tap off device. | Yes (optional) | | | | | |

| MONITORING | POWERWAVE BUS SYSTEM™ NOTATIONS | SYSTEM RATINGS | | |
|---|---|---|---|---|
| | | LOCAL MONITOR | BCMS HUB | POWERMAP |
| END FEEDS | Number of End Feeds that can be addressed. | Up to 6 | Variable | Unlimited |
| TAP OFF BOXES | Number of Tap Off Boxes that can be addressed. | Up to 15 per End Feed | Variable | Unlimited |
| TOTAL DEVICES | Total Number of Addressable Devices | 96 | 240 | Unlimited |
| REPORTING | Real Time Reporting | No | Yes | Yes |
| DISPLAY SIZE | Diagonal Measurement of Display | 7" Touchscreen | 10.4" Touchscreen | Based on Device |

# RECYCLE

PowerWave Bus System™ gives you a highly recyclable and configurable system installation in your facility. From the simplest component to the most complex electrical infrastructure, PDI can help you at the beginning and the end of your project.

# ENERGY EFFICIENT

The potential for substantial energy savings is created by the patented design of the PowerWave Bus System™:

- Distributed bus eliminates energy-wasting hot spots from the data center due to electrical cable congestion.
- Distributed bus has less voltage drop then conventional wiring methods allowing for more efficient use of energy consumption.


- Distributed bus reduces the foot print allocated to electrical systems in your facility, allowing you to make power infrastructure sizing more accurate.
- Distributed bus enhances your power factor rating due to the low line-to-line voltage loss.

# SAFE

**NON TOXIC**: All components of the PowerWave Bus System™ are strictly made in accordance with all standards to eliminate any toxicity in case of a fire in your facility.

**NON PROPAGATING**: If a fire occurs in your facility, PowerWave Bus System™ is self extinguishing and will not propagate the flame.

# INTELLIGENT MONITORING

- Communications channel is integrated into busrail.
- Communication runs to all distribution power.
- High level data accumulation.
- Complete integrated communications control with PDIQ
- Multiple Local and Remote Monitoring Display Options.

BCMS Hub
Monitors up to 240 Devices

PowerWave Local Display
Monitors up to 96 Devices

POWERMAP
Cloud Based Power Monitoring
Monitors an Unlimited Number of Devices

PDI
creating the perfect wave
smiths interconnect