Dual-system redundant UPS power supply



Overview

We have two UPSes powering all servers. One each server, power supply A is connected to UPS A; and power supply B goes to UPS B.

Key Takeaways

A dual-system redundant UPS setup ensures continuous power to critical loads by using two independent or parallel UPS units, providing high reliability, fault tolerance, and maintenance flexibility.

Overview of Dual-

System Redundancy

A dual-system redundant UPS configuration involves two UPS units supplying power to the same critical load. This design ensures that if one UPS fails, the other can continue to supply full power without interruption, maintaining uptime for sensitive equipment such as servers, PLCs, or DCS systems. Redundancy can be implemented in several ways: Split Operation: Each UPS operates independently, supplying separate loads or dual-input devices.

This provides true redundancy, fault isolation, and simplified maintenance, as one UPS can be taken offline without affecting the other. Parallel Operation: Both UPS units are electrically connected to share the same load. This allows for N+1 redundancy, where one UPS can fail while the other supports the full load, and also increases total capacity.

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However, it requires careful synchronization and matching of UPS models to avoid circulating currents or control issues. Redundancy LevelsN+1 Configuration: One extra UPS module is added beyond the required capacity. If a single UPS fails, the remaining units continue to support the load.

2N Configuration: Two independent UPS systems supply separate power paths (A-side and B-side) to the critical load. Failure of one system does not affect the other, providing maximum reliability.

Operational Benefits

Continuous Power Supply: If one UPS or its battery fails, the other UPS maintains full power to the load. Maintenance Flexibility: One UPS can be serviced or replaced without impacting the critical load. Fault Tolerance: Parallel systems can switch to bypass or alternate power sources if both inverters fail, ensuring uninterrupted operation.

Software Integration: Networked UPS units can communicate with servers to manage graceful shutdowns only when both UPS units are depleted, preventing unnecessary downtime.

Considerations for Implementation

Compatibility: Parallel operation requires UPS units of the same model and manufacturer to ensure proper synchronization. Instrumentation Systems: For sensitive industrial equipment, split operation is often preferred due to higher reliability and reduced risk of cascading failures. Monitoring and Management: UPS network management cards and software like PowerChute Network Shutdown allow configuration of shutdown triggers and monitoring of battery health.

Conclusion

A dual-system redundant UPS provides robust protection against power interruptions, offering both operational continuity and flexibility for maintenance. Choosing between split or parallel operation, and selecting the appropriate redundancy level (N+1 or 2N), depends on the criticality of the load, system complexity, and the need for fault isolation or load sharing. Proper configuration and monitoring ensure maximum uptime and reliability for critical IT or industrial systems.

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Article Content

Solved: Multiple Power Supplies and Multiple UPS

We have two UPSes powering all servers. One each server, power supply A is connected to UPS A; and power supply B goes to UPS B. This creates a redundant power source in case an

Dual UPS Power Supply in Instrumentation Systems: Split Operation

However, one key engineering decision is whether to operate these UPS systems in split (independent) mode or parallel (synchronized) mode. This article explores both strategies in detail, compares their

Parallel UPS systems

In paralleling, two or more UPSs are electrically and mechanically connected to form a unified system with one output— either for extra capacity or redundancy. In an N+1 redundant configuration, you

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Solved: Redundant power options for single power devices

Question: I would like to know what options are available to provide dual (redundant) power capabilities to single power (one power supply) devices in our racks.

Parallel UPS System: Basics & Benefits | Parallel

Understand parallel UPS system basics and benefits. Learn how a parallel redundant UPSsystem ensures high reliability, scalability, and

Classification and Types of UPS – Part Four

Eliminating these from a design is a key component of redundancy. An STS has two inputs and one output. It typically accepts power from two different UPS systems,

Comparing UPS System Design Configurations

Using the techniques of Probabilistic Risk Assessment (PRA), MTech developed quantitative models for both an isolated redundant UPS system and a non-redundant (capacity) system.

The Critical Role of UPS Parallel Redundancy in Power Infrastructure

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This is where UPS parallel redundancy becomes a critical architectural approach, enabling multiple uninterruptible power supply units to operate in a coordinated system that ensures

Why UPS Power Redundancy Is Essential for

Why is UPS Power Redundancy Important? Ensure System Uptime and Reliability Multiple UPS units working in redundancy configurations, along with generators,

Dual Supply vs. UPS

Dual supply systems typically involve two separate power sources that work in tandem to provide continuous power, while UPS systems use a battery backup to provide power during outages. Dual

Redundant Power Supplies Keep Machines Up When Power Goes

Standard power supplies are available in all voltages from 0v to 30 kV and up to 1200W. Standard models include single, dual, triple and wide adjust output power supplies; switching, linear, regulated

Parallel Redundant Uninterruptible Power Supply

Introduction The parallel redundant system allows two UPS modules to operate in parallel and as backup for each other. When one UPS module is taken out of service for maintenance or is not

What is Dual Power Supply: Exploring the Benefits and Applications

From providing redundant power sources that ensure uninterrupted operation in critical environments, to enabling increased flexibility and scalability, dual power supply systems have

UPS Design & Redundancy to Reduce Downtime | Mitsubishi Electric

UPS Redundancy will minimize downtime “N” Configuration An “N” configuration, typical in single module UPS, where N represents the size of the critical load, has an MTBF of 2.6M hours,

Connecting a server with dual power supplies to UPS

I have a server that is going in our equipment room that has dual power supplies. Our vendor ordered the dual power supplies with the idea that if one physically failed that the second one

Data Centers Explained: How Does Redundant Power Supply Work?

The UPS system itself is redundant for additional protection and impact-free maintenance. Dual UPS paths create two completely independent power protection systems for your

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Maximizing Availability: How Redundant Power Systems Keep IT

1. Redundant Power Supplies: Many servers and network devices feature dual or multiple power supply units (PSUs). Each PSU can independently power the device so that if one

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