

Operation of the Chloride Vector Control Inverter and Paralleling System

Modern parallel UPS technology such as Chloride's offer a much higher level of capability and reliability than legacy approaches. The elimination of master/slave architecture and other single points of failure, plus highly responsive IGBT inverters governed by advanced DSP technology provide robust, easily scalable solutions for the modern data center.

Basic inverter operation

Chloride's Vector Control technology is driven by a digital signal processor (DSP). The high speed processing power in this system is used as follows:

1. The inverter controller takes measurements of load voltage and current demand between 4000 and 8000 times per second (depending on model) and uses a sophisticated algorithm to adjust and control the output.
2. Based on this data and algorithm, the inverter changes the available current to maintain the proper voltage waveform based on the demands of harmonic currents and other changes in the load.

Paralleling system

In a Chloride 90-NET, CP3150, or CP3020 parallel system, the modules operate in a peer-to-peer arrangement, linked by a redundant cable in a complete loop (each module has two connections.) There is no impact on system operation if the cable is cut in any one place.

Parallel operation

The cable between units carries information related to the current being supplied by each module and a series of signals to ensure that the individual UPS modules operate as a single system (for example, they all operate in phase and they all transfer to and from inverter simultaneously.) The information provided by each module about its current is used by all modules to incrementally adjust their inverters, ensuring that the total load is shared equally amongst all modules. If demands change, the system can respond in a small fraction of a cycle to provide more or less current. This technology has been successfully used for over ten years in large and small installations and has a demonstrated record of reliability.

About the author

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Chuck Heller is currently product manager for three-phase UPS systems at Chloride North America. He has over 18 years of experience in the UPS industry and holds an MBA from the University of Chicago.

Among his responsibilities in his current role, Chuck is responsible for product development initiatives and the development and delivery of educational programs for users and specifiers.

