

# GE Consumer & Industrial Power Quality

GE provides RPA™, a unique technology that can parallel UPS modules with true redundancy by eliminating any single point of failure.

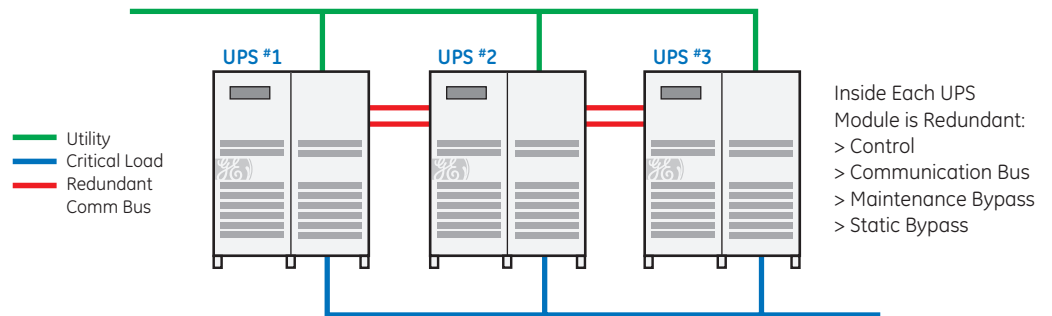
RPA provides a scalable paralleling technique that reduces operating footprint and increases system reliability by eliminating the need for external paralleling equipment and cabinets (centralized bypass and master control).

One of the UPS modules in the system intelligently takes the leadership role, while the other UPS modules have access to all control parameters. If one UPS fails to operate, the load is automatically redistributed among the others. If the lead UPS fails to operate, then another UPS automatically takes on the leadership role. GE's RPA technology is implemented by distributing the control electronics within each UPS module in the system.

## RPA™ Advantages

GE

### Standard RPA™ Configuration: True Redundancy with Decentralized Control & Bypass



## RPA™ Features and Benefits

### > No Single Points of Failure

The RPA system provides complete redundancy of all critical components, allows paralleling of up to eight units for increased load capacity or redundancy, and ensures excellent dynamic behavior based on shared output voltage regulation. This provides the highest system reliability and availability for mission critical applications.

### > Scalable and Modular

The system can be easily expanded for higher capacity and redundancy without any interruption to the critical load or transfer to bypass.

### > Redundant Communication

Redundant high speed bus and control electronics provide higher system reliability.

### > Decentralized Control Logic

Each module in an RPA system has its own operational controller. Each one continuously communicates with all others in order to manage the entire system like a team. No master-slave relationships exist.

### > Online Maintenance

N+1 configurations allow maintenance on any single module in the system while other modules provide online protection with battery backup.

### > Sequential Soft Start

Provides sequential soft start of each module to reduce instantaneous load on input feeders during mains recovery. This avoids over-rating of generator and over heating of cable and fuses.

### > Load Sharing and Phase Synchronization

With each module utilizing SVM, inverter switching, Load Sharing and Phase Synchronization between modules in RPA is the tightest in the industry (0.03 ms), providing better control of output voltage.

### > Smaller Footprint

RPA eliminates centralized control and external bypass cabinet.

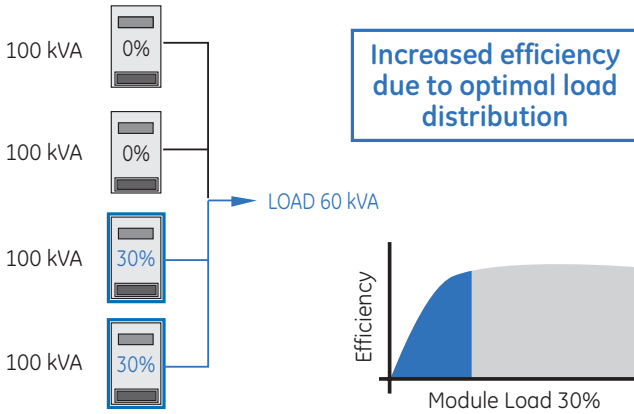
# Redundant Parallel Architecture™ Digital Energy™ RPA™



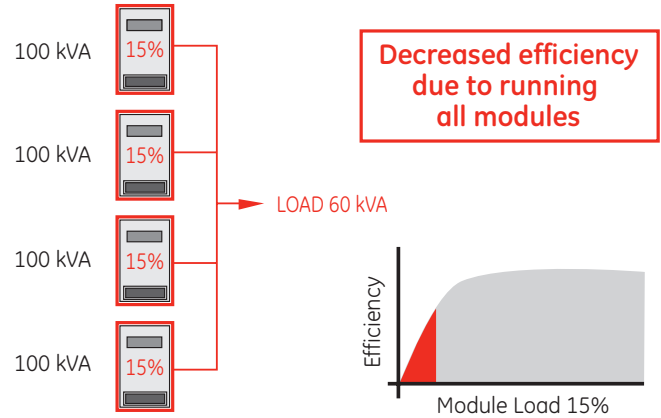
# Intelligent Energy Management (IEM)

IEM is a software package which allows RPA systems to save energy and reduce operating costs during low load conditions. Individual inverters, which are not required to support the load, can automatically be switched off to save energy. The IEM mode can be programmed for various operating modes and the customer defines the degree of redundancy required.

## IEM Partial Load Condition



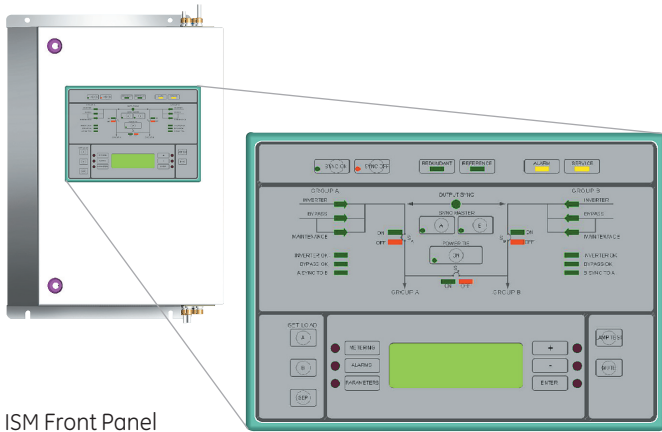
## Legacy System Partial Load Condition



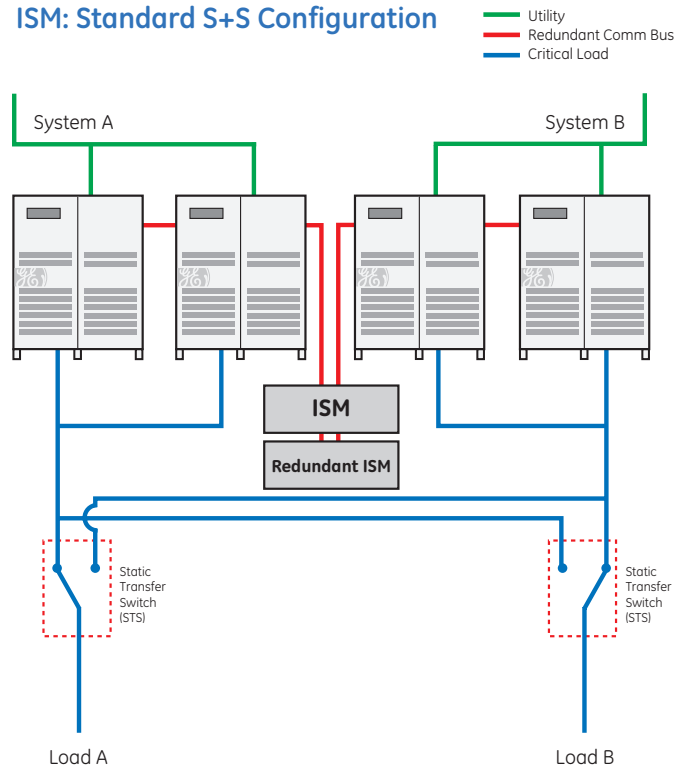
# Intelligent Synch Module (ISM)

For System + System applications, the ISM module is utilized to synchronize the outputs of two UPS's or two groups of UPS's that are fed from separate and independent sources. This allows the two systems to be synchronized for downstream switching. The ISM is an intelligent control that is mounted external from the UPS module. It has the ability to

select which system is master and can also send/receive permissive signals from downstream devices. Additionally, the ISM follows the same tradition as RPA with redundancy in all critical components. The ISM communicates via redundant communication cables and has options for redundant power supplies and control circuitry.



## ISM: Standard S+S Configuration



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