STATIC POWER

SMART | SOLID | SAFE

iSTS Applications

December 18

Single Cord Power Distribution

iSTS

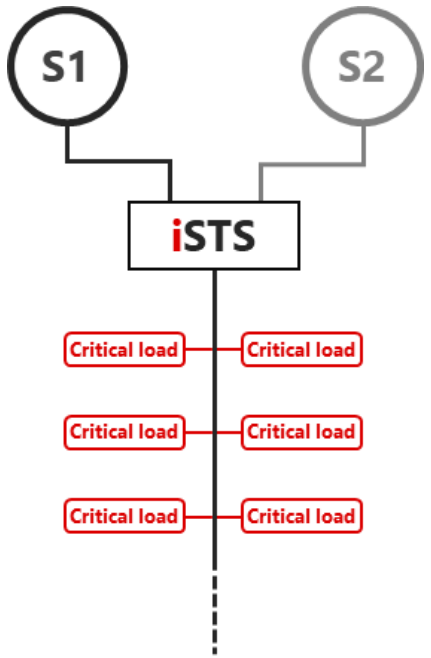

Fig 1: Single Cord

The configuration described by *Fig 1* is the typical application where there are two sources available for powering a critical item equipment/infrastructure and where it has only one power inlet receptacle. Reliability and redundancy can be improved by having a second source available to per the load in case one fails.

This is achieved by the iSTS to transparently transfer power to the critical equipment from the alternate source - standby source, whenever one of the sources presently powering the load fails.

The STS does this change-over so quickly - sub cycle, that the load continues to operate protecting your production and profitability. Our iSTS is a true Solid-State-Static-Transfer-Switch.

The STS has no wear-out and transfers your critical load at the point of zero current in the AC waveform. As such this is at a point where there is no net-flow of power to the load and is therefore the best opportunity to undertake the switch-over. All componentry is liberally rated with large safety margins to ensure a long life and reliable operation.

Depending on the capacity of your installed STS you can feed multiple equipment within a rack or enclosure with just one iSTS. Larger STSs can supply many racks of equipment.

Nota: ATS - Automatic Transfer Switch, claim to do this also, however, these are inferior devices and do not protect your load under all conditions OR are as fast as a true Solid State STS. The relay types transfer at any point in the waveform and cause arching and sparking across the gaps of the contact of the internal relays that are used to undertake the change-over. This results in deterioration of the contacts - limiting their useful life, and the generation of dangerous voltage spikes to your critical piece of equipment. Further these ATSs have limited internal protective mechanisms to protect your load under arduous conditions of brown-out, overload, load fault and asynchronous change-overs.

Some manufacturers offer their products as an STS, however, these are hybrid versions of the ATS described above. They utilize relays with bridging semiconductors. These are slower than a true iSTS Static Transfer Switch because they have to wait for the relay to open before switching to the alternate source, however, they use very small short time rated solid state components which will fail under fault and overload conditions.

Dual Cord Power Distribution

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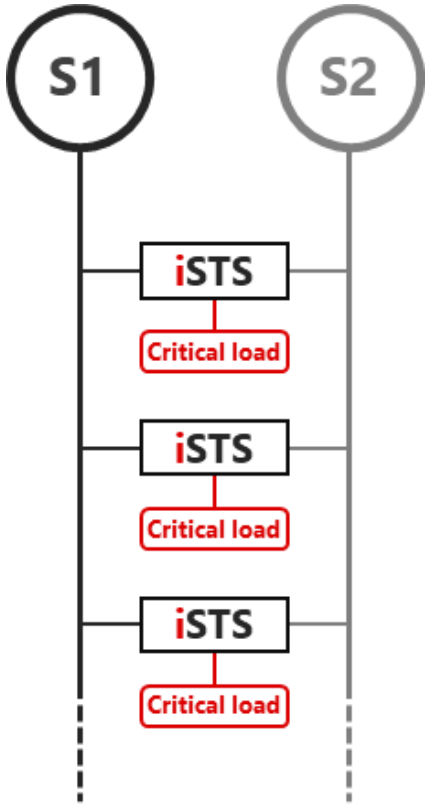

Fig 2: Dual Cord

In dual cord systems there are two sources of power and if your critical equipment has two power inlets power can be source from either or both inputs. The operating equipment then doesn't depend solely on the existence of both sources being available. This greatly improves the availability of your critical equipment.

Unfortunately not all equipment has two inlet sources. The same level of power redundancy can be achieved by using an iSTS that seamlessly transfers between the two sources should one fail or degrade beyond useful limits. This is indicated in *Fig 2*. This is a de-centralized system - typical of say within the computer room or control room.

Usually the sources would be of a secure nature like UPS - Uninterruptible Power Supply, although any sinewave sources would equally apply. The UPS has a low MTBF - Mean Time Between Failures - especially if you take the battery bank into account. A typical failure rate would be between 30,000h to 80,000h. You have then typically a 10% to 5% chance that in any year that your system will go down. The chance of a loss of power on any one source becomes even greater when you take the infrastructure into account (Room air-conditioning, cooling and power distribution, human error, ...).

This arrangement is typically implemented when there are large single point loads or at the "point of distribution", e.g. in the data or IT rack close the loads. This provides the best protection against loss of power due to upstream power loss issues.

That's why we offer our iSTS true Solid State Static Transfer Switches to your infrastructure. Adding these between your dual cord buses for your single corded equipment will provide them with an equivalent reliability to a dual corded system and will protect your business and reputation by maintaining power to those critical pieces of infrastructure that do not have dual cord capability.

Redundant Dual Feed - Dual Cord Power Distribution

iSTS

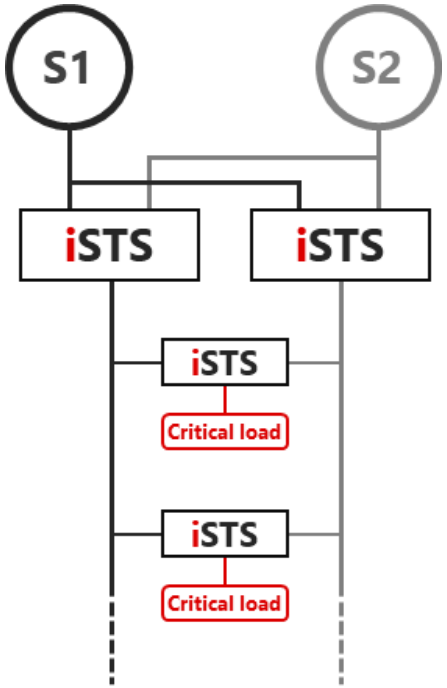

Fig 3: Dual Cord Redundant

When an item of critical power infrastructure fails it is best that it has the least affect possible on your critical power equipment. *Fig 3* shows a typical centralized system. Here the STSs protect the power distribution systems integrity by maintain power on both distribution (dual cords), buses even when one of the sources fail. These are typically large STSs - somewhat the same size as the UPS or source capacity -, and seamlessly switch from one source to the alternate source should one fail. Thus maximizing the availability of power.

Additional protection against human error, or infrastructure power distribution tripping can be achieved by installing iSTS units close to the point of distribution. This offers the very best protection for your critical loads.

Peak demand & Emergency Generator

iSTS

Due to unprecedented growth the utility grid is finding it difficult to keep up with the changing and increasing power demand in many inner city, rural and industrial areas. Because an iSTS transparently and seamlessly transfer power between two sources it is ideal for suppling additional capacity during times of peak-loading, power restrictions and building infrastructure testing.

Imagine a situation where the normal street supply has insufficient capacity to provide for your operations - which may occur only once or twice a day for 2-3 hours -, however, the additional demand makes your operations less reliable due to the uncertainty of maintaining power. It may be possible to run your sites Auxiliary/Emergency generator plant during the day, however, this switch-over in itself usually comes with an short but significant power break during the change-over so it is avoided or the generating plant is run for extended periods being costly.

Imagine if you could seamlessly start the generators transfer to them as the utility demand increases and as it falls or stabilizes you could again sexlessly transfer off generator back to the grid: with an iSTS you can.

You have multi-story building with 1000's of people working on IT using personal computers, maintaining security systems but you do need to ensure that your Auxiliary/Emergency generator plant is operational if and when needed. Unfortunately due to the nature of the change-overs a seamless change-over may not be possible - as most ATSs are break-before-make -, this even small interruption of power will cause many 10's of 1000's of man hours of lost production as peoples computers shutdown, security systems go into lock down and people can't get up and running efficiently.

With an iSTS you can manage the process and change-over your whole building, hospital, airport,… load between mains/utility and generator seamlessly and test your infrastructure whenever and whatever time of day without affecting operations.

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