

DC In-bay Power Filters.

Introduction

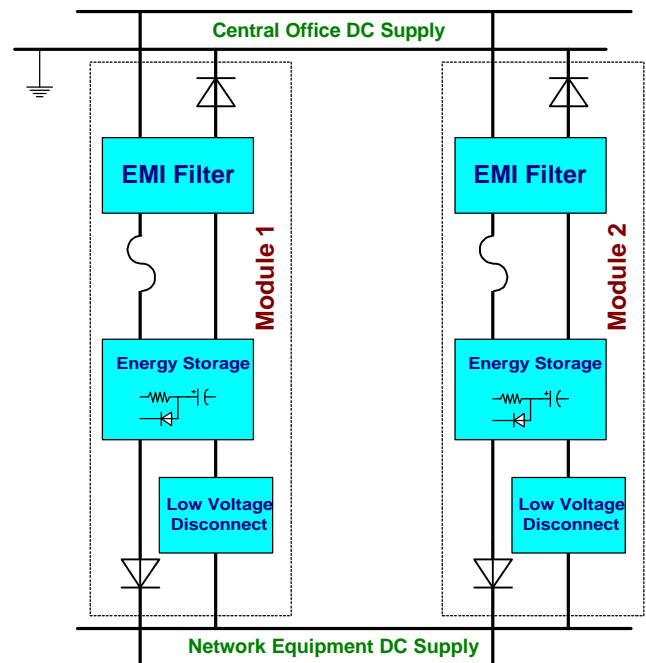
Powering the Information age..... TDI – Modular power Systems is a “Tour De Force” in the design of DC In-bay Power Filters. With the Internet expanding at the rate of 100% every six months, powerful network equipment is finding its way into the domain of the Plain Old Telecom System (POTS) Central Office.

TDI is powering this revolution and providing innovative solutions to new problems.

Application

A typical Central Office , CO Installation includes a distributed power buss, this –48Vdc Power system will also provide battery back-up and distribution protection. The installation of critical Networking Equipment in the Central Office environment is a fairly recent phenomenon, there are few specifications which describe this application as well as AT+T practices AT&T 802-010-100. The AT+T paper addresses the needs for DC In-Bay power filters and the requirements the filter must meet. These are some of the key functions of In-bay Power Filters from the Network Equipment Manufactures Point of view:

- Provide **EMI filtering** between the customer's equipment and the -48V buss. This filter can be in addition to customer supplied filtering at the card level or the prime method of preventing the down line equipment from injection noise on to the central office -48V system.
- Provide the necessary capacitance to **ride-through a zero-voltage transients** (such as those specified in the AT&T 802-010-100) . Ensures that momentary power disruptions do not affect down line equipment.
- Provide **diode isolation** between central office feeds A and B. Allows down line equipment to continue to operate in the event of a single point failure of the -48V buss.
- Provide **input surge protection** to down line equipment. Prevents input transients from damaging the filter and down line equipment.



Block diagram, Redundant In-Bay Power Filter modules

Filter types

There are three types of DC Power Filter commonly employed today.

1. Passive EMI Filter and Energy Storage.
2. Active "DC/DC" with EMI Filter and Energy Storage.
3. Active "DC/DC Multi-output" with EMI Filtering and Energy Storage.

Network Equipment powering topologies

The filter type chosen for a particular application will depend on the overall system topology employed. The level of functionality that can be included in the DC filter ranges from total system responsibility for providing:

- inrush current limiting,
- EMI filtering,
- over-current protection via filter mounted circuit breaker or fuses
- Low voltage disconnect,

too simply providing the necessary capacitance to meet the line hold-up requirements of the AT&T 802-010-100 requirement.

In addition to meeting these requirements MPS can tailor the design of the filter to provide customer additional functions as necessary in their particular equipment /application.

- **Low Voltage-Disconnect or LVD:** This feature will disconnect customer equipment from the -48V distribution network if the -48V falls below a preset voltage usually -38 to -40V. This feature is offered to prevent damage to connected equipment due to low input voltage.
- **Inrush Limiting:** The In-Bay power filter can be configured to provide inrush current limiting for the customers entire system or just itself.
- **Overload Protection:** A circuit breaker or a fuse can be provided.
- **System Shelf or direct Back-plane plug-in modules:**
- **Hot-Plug capability:** provided by either a mechanical or electrically operated "switch" will interrupt power to the down-line equipment upon removal of the filter from the system, independent of the input power being removed from the IBPF module, thus preventing damage to connector pins due to arcing.

- **Thermal protection:** The In-Bay filter can be configured to disconnect the down-line equipment in the event of an over temperature condition.
- **Signals and alarms:** Various signals and alarms can be provided typically examples are: Input under-voltage, Output under-voltage, reverses connection alarm, over-temperature alarm, over-current alarm and fan fail alarm.

Future developments

Our latest MPS product has been designed to add increased functionality and simplicity for equipment, which may be used either in stand-alone or central Office environments. The MP2400 has dimensions of 3U x 19" rack mount x 14", the shelf may be installation with either three MP2400W AC/DC PSU front-ends or 2400W In-Bay filter modules. The ability to install either AC/DC or DC/DC modules in the shelf will allow uncommon flexibility of AC or DC input to Network equipment without changing the mechanical or electrical configuration. This feature will play an important role as Network Equipment moves from installation in the Central Office to the "edge" of the network. The solution also provides stocking flexibility by reducing the parts necessary to install equipment in either scenario.

About Modular Power Systems

Modular Power Systems is a Division of Transistor Devices, Inc. Operating from an ISO9001 certified, 146,000 Sq. Ft. facility in Hackettstown, NJ, the company specializes in fault tolerant DC power supplies and systems for the Computing, Networking and Telecommunications markets.

Other Equipment

The Modular Power Systems Division manufactures a broad range of power products for the Computing, Networking and Telecommunications markets. The product range includes Rectifiers, Power Supplies and DC/DC converters. MPS specializes in "Tailoring" products to specific custom requirements. If you require features not mentioned here please contact Modular Power Systems Sales department.

Check our web site at www.mpspower.com

TDI – Modular Power Systems..... Powering the Information Age

Richard Jones
Scott Denecke