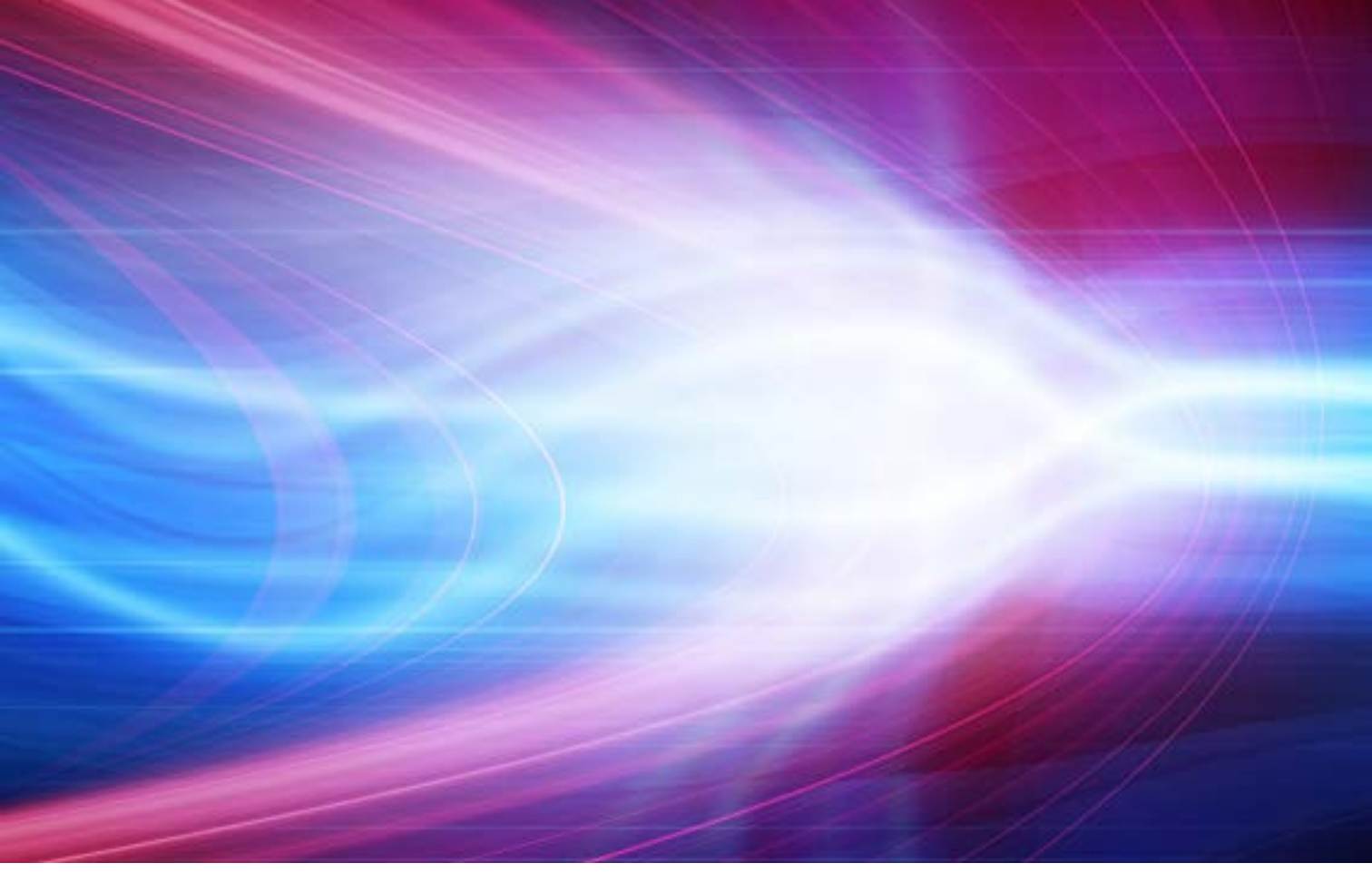
CONTROL
PROMOTING EXCELLENCE IN PROCESS AUTOMATION • CONTROLGLOBAL.COM

DEEP KNOWLEDGE:
FIELD GUIDE TO POWER SUPPLY RESOURCES

These three Resource columns from *Control* contain numerous tutorials, white papers, videos and other instructional materials for learning about and applying power supplies. They can help users find the best ways to bring in, condition, and deliver power that's best suited to the needs of their individual process applications.

BEGIN

PutmanMedia®



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The Best In Power Quality

Online resources on power supply safety

UPS MANAGEMENT FUNDAMENTALS

From plug and receptacle charts and facts about power problems to an overview of various UPS topologies and factors affecting battery life, you'll find a wealth of pertinent resources designed to help you develop the optimum solution. *The UPS and Power Management Fundamentals Handbook* also includes valuable, real-world case studies that showcase exactly how you can develop the best power protection solution. The handbook is a one-stop source for essential information, whether you need power protection for small, medium or large data centers, healthcare facilities or other environments in which ensuring uptime and safeguarding data are critical. Download the handbook.

Eaton Corp.

www.powerquality.eaton.com

SPECIFYING YOUR IDEAL DC UPS

Microprocessor-based industrial controls—PLCs, industrial computers, HMI, drives, motion controllers and sensors—are the foundation of high productivity, quality and competitiveness. If there is one universal factor that can and will disrupt microprocessor-based controls and cause downtime, it is power quality. Since industrial electrical systems frequently experience voltage fluctuations, harmonic distortions, noise and short- or long-term power outages, it is essential to ensure maximum uptime by specifying an uninterruptible power supply (UPS) for the application.

Specifying the optimum UPS for a control system can be one of the most cost-effective investments available. But how do you do it? This white paper outlines the advantages and disadvantages of AC and DC UPSs, important things to know about batteries, key features for operations and diagnostics, and more important information to help you choose the best UPS for your purposes. The white paper is free, but registration is required.

EGS Electrical Group

www.emersonindustrial.com

REDUCING INPUT CURRENT HARMONICS

Non-linear loads are loads in which the current waveform does not have a linear relationship with the voltage waveform. Non-linear loads generate voltage and current harmonics, which can have adverse effects on equipment used to deliver electrical energy.

Power delivery equipment is subject to higher heating losses due to harmonic currents consumed by non-linear loads. Harmonics can have a detrimental effect on emergency or standby power generators, telephones and other sensitive electrical equipment. When reactive power compensation in the form of passive power factor improving capacitors are used with non-linear loads, resonance conditions can occur that may result in even higher levels of harmonic voltage and current distortion, thereby causing equipment failure, disruption of power service and fire hazards in extreme conditions.

This white paper discusses ways to control and reduce these dangerous harmonics. Download it now.

Yaskawa America Inc.

www.yaskawa.com

Perfecting Power Supplies

EFFICIENT POWER SUPPLIES

"Efficiency—the Forgotten Feature" discusses the role efficiency—the difference between the input and the output power—should play in selecting a power supply. Any loss here is reflected in dissipated heat, which in turn affects the lifetime and reliability of the power supply unit, and can also lead to increasing the size of enclosures or installing some form of cooling. The paper discusses the heat loss formula, considerations for choosing the properly sized enclosure, de-rating and energy savings. Here is a direct link.

PULS Power Supplies
630-587-9780
www.puls-power.com/us

RELIABILITY TESTING

Choosing a power supply based on mean time between failure (MTBF) ratings alone is not a guarantee of the unit's reliability. This white paper examines the methods that can be used to correlate MTBF test data with calculated values. It discusses a variety of test methods, including MTBF, (demonstrated mean time between failure (DMTBF), and accelerated MTBF. The reliability equation is also explained. Download the white paper.

SolaHD
800/377-4385
www.solahd.com

MAGNETICS BASICS

This white paper, "Magnetics Design for Switching Power Supplies" from Texas Instruments, covers basic design principles, including magnetic field principles, the energy plane, waveforms and more. It includes numerous diagrams, formulas, definitions and equations to assist users in the design of switching power supplies. The paper is free, and no registration is required.

Texas Instruments
www.ti.com

POWER QUALITY MONITORING

This tutorial provides an overview of three-phase electricity basics and then discusses three of the most common power quality events: leading/lagging power, saq/swell/interruptions, and harmonics. Access the tutorial.

National Instruments
www.ni.com

SIGNAL CONDITIONING

This free, no-registration-required tutorial, "Industrial Signal Conditioning," covers, among other subjects, the industrial measurement environment, loops and analog signals, signal integrity, and design examples such as servo control, aluminum smelting and grounded thermocouples. Download it now.

Dataforth
www.dataforth.com

UL RATINGS for SPDs

Specifiers and users of Surge Protective Devices (SPDs) are adjusting to new terminology and requirements. UL revised its 1449 Safety Standard for Surge Protective Devices to increase safety. The National Electrical Code (NEC) incorporated specific language to require the use of these safer products. This tip sheet will explain some of the changes affecting specifiers and users.

Mersen
978/462-6662
www.mersen.com/en/

PREVENT 24 VDC OVERLOADS

This white paper discusses one of the problems of using switch-mode power supplies: the way they respond to overloads or short circuits. It shows causes of the problem and suggests a possible solution: a device installed between the power supply and its loads that provides adjustable over-current protection, selective coordination of load circuits and current limiting. Download the white paper.

Siemens Industry
www.sea.siemens.com

POWER ELECTRONICS GUIDE

This website contains a wealth of materials on switched moded power supply (SMPS) basics. It covers circuits, schematics, PCBs, software, inverters, generators, topologies, software, transformers and more. It also contains an electrical engineering reference guide, formulas, information on PSUs, UPSs, thermal design, power for solar and other resources, including links to other SMPS design sites, freeware, tutorials and news.

Lazar's Power Electronics Guide
http://www.smps.us

Power Supply Online

ALL THINGS POWER

Lazar's power electronics guide

www.smps.us

Lazar's Power Electronics Guide is a website full of free information about power supplies and converters. It contains a basic tutorial with sections on topologies, switching power supply (SMPS) design, software, circuits, UPSs, PCB design, transformers, inverters, generators, thermal design, electrical engineering references and formulas, and a guide to solar energy.

DC-DC CONVERTER TUTORIAL

Maxim Integrated Products

888/629-4642

www.maxim-ic.com

Switching power supplies offer higher efficiency than traditional linear power supplies. They can step-up, step-down, and invert. Some designs can isolate output voltage from the input. This article outlines the different types of switching regulators used in DC-DC conversion. It also reviews and compares the various control techniques for these converters. Read the article.

SMPS DESIGN WEBSITE

SMPS design

www.smpstech.com

This site is billed as "a website about power supply design for power supply designers. It contains a wealth of information, including "An Introduction to Power Supply Design," a power supply design blog, a resource menu including lists of books, a recommended power supply design personal library, websites, vendors, seminars, full-text papers and design aids related to switching-mode power supply design.

MOTOR LOAD SLIDE RULE

Load Controls Incorporated

888/600-3247

www.loadcontrols.com

A perennial favorite on our Resources page, this free slide rule shows why measuring power is more effective than measuring just amps. Monitoring power gives you valuable information about mixture viscosity, pump or fan flow, beginning or end of a process and optimum feed rate. This easy-to-use tool visually demonstrates the relationship between power, the power factor, amps and motor power.

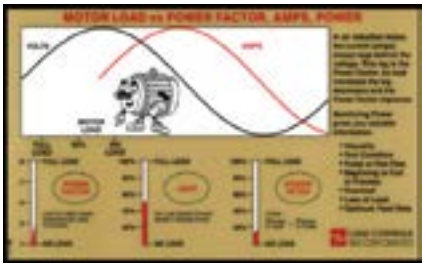
POWER QUALITY INFORMATION

Electrotek Concepts

865/470-9222

www.powermonitoring.com

This website lists resources for engineers seeking information on power quality. There are links to IEEE and CIGRE/CIRED sites, power quality standards, monitoring power quality, harmonics, voltage interruptions and sags, transients, power electronics, uninterruptible power supplies, wiring and grounding, and industrial and commercial power systems. Visit the website.



OPTIMIZE BIOMASS POWER GENERATION

GE Intelligent Platforms

www.ge-ip.com

This white paper discusses how biomass power—generating electricity from renewable feedstocks—offers a potential escape from the fossil-fuel trap. More sustainable sources of biomass and efficient conversion processes, as well as more flexible control technologies, together offer the potential to offset growing energy demands on a carbon-neutral basis. Download the white paper.

POWER OVER ETHERNET

Ethernet Direct

www.ethernetdirect.com

This whitepaper describes how PoE technology enables end devices, such as wireless access points, IP phones, cameras, access control terminals, RFID readers and other IP-based appliances to get power from a Cat-3, Cat-5/5e or Cat-6 LAN cable without extra power connection needed. This is particularly useful in environments that may not have convenient power sources for this equipment, or in places where installing the extra power outlet may not be feasible or too expensive. Download the white paper.