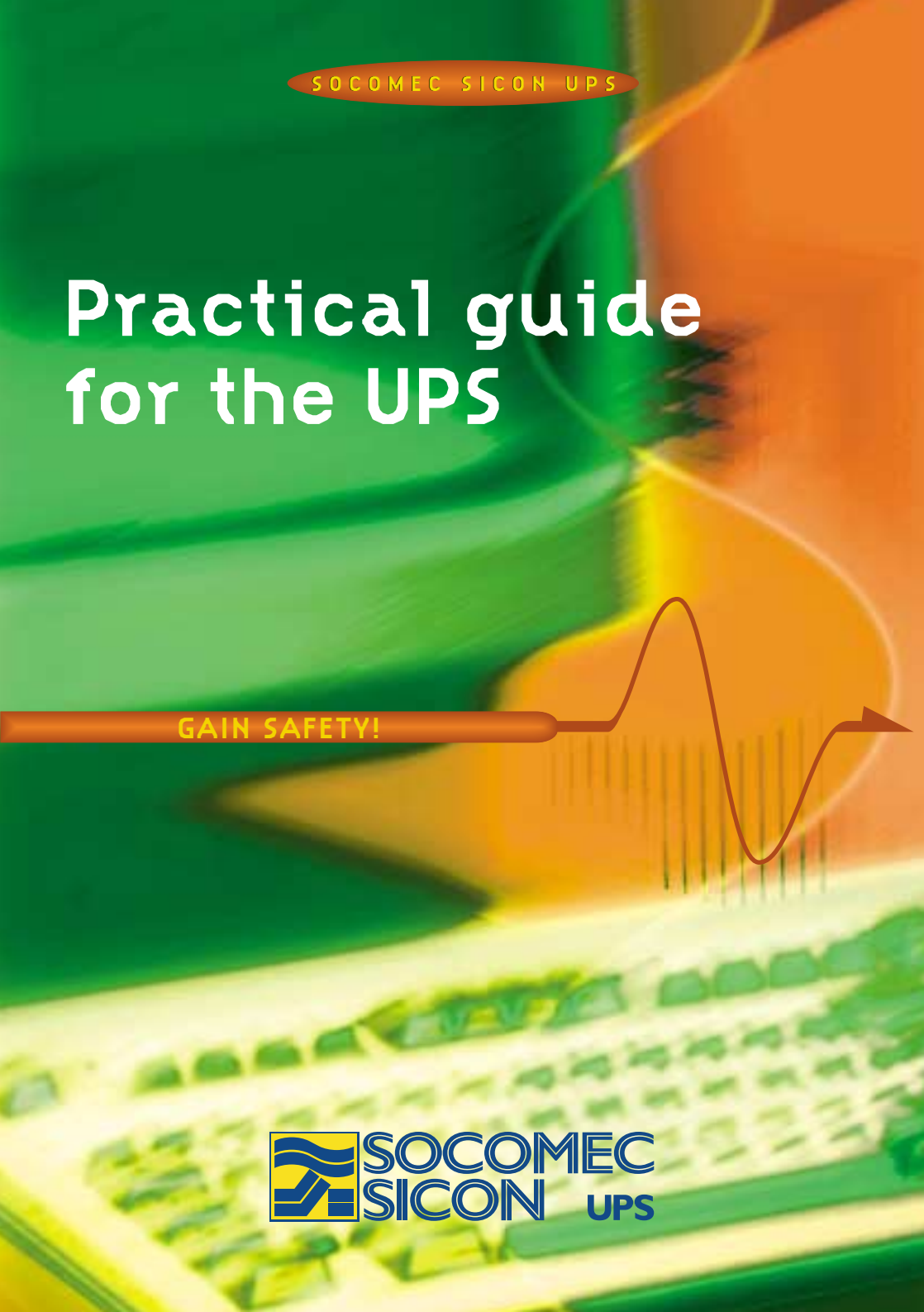
SOCOMEC SICON UPS

Practical guide for the UPS

GAIN SAFETY!



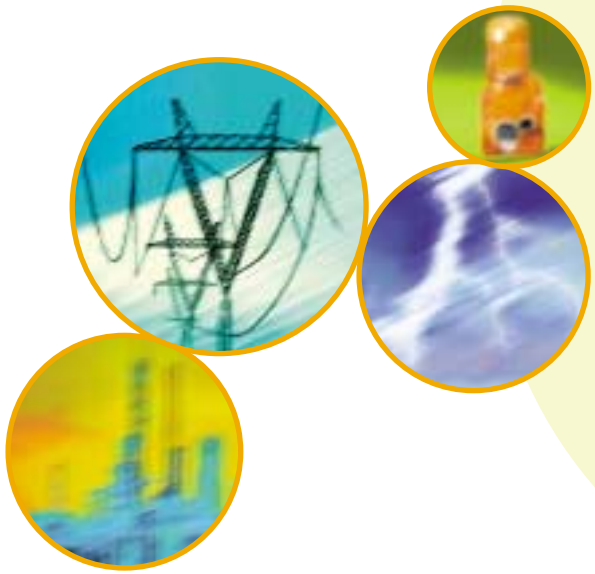
SOCOMEC SICON UPS

Why use a UPS to protect your IT equipment?

This guide is designed to help you to understand what a UPS is used for, in order to protect you more efficiently against electrical power supply problems. What are the technical elements to be considered? How to choose the right UPS which is adapted to your environment? ... Many questions for which we wanted to supply clear answers. You will then be able to make the best choice. We wish you good reading.

Electrical disturbances

The distribution of electric supply is often subjected to long or short duration which come from the industrial and atmospheric environment but also from your own environment.



Voltage variations

Voltage drops
Due to high power consumption demanded during the start-up of heavy equipment (engines, lifts, compressors...).

Surge voltages
Caused by lightning striking an electricity line or the sudden breakdown of high energy consuming equipment.

Consequences
- Malfunction of the systems which are supplied and destruction of the electronic components.
- Keyboard lockup, system faults leading to the alteration or the loss of data, reduction in the performance and the life expectancy of equipment.
- Faults, wearing of electronic components, destruction of hard disks.

Cut-offs

Due to work on the line, or to mains highly solicited.

Consequences
- Data loss, incorrectly closed applications, hardware destruction, difficulty to reboot applications.

Interferences and harmonics

Generated by the disturbances and the atmospheric variations, the transposition of loads, generators, radio transmitters, household appliances and industrial equipment.

Consequences
- Errors in the execution of programs and in the data files which lead to a premature ageing of the computing hardware.

Shock waves

Generally caused by lightning or when the mains supply is re-established after being interrupted during a storm or after a failure in the power distribution network.

Consequences
- Seriously damaged hardware components.
- Data loss.

Frequency variations

Due to the production of energy from electricity generators.

Consequences
- Errors in the execution of calculations, difficulty to read magnetic medium such as disks.

Summary

The UPS: the most effective solution for protecting the electric supply

In order to solve the many supply problems and benefit from good quality current, it is necessary to protect the supply of your computer system with the highest performance solution that exists: **the Uninterruptible Power Systems** (UPS)

What is a UPS?

It is a power supply system which is capable of assuring the service continuity of any installation in case of mains failure.
A real peripheral in your IT system, the UPS is inserted between the mains and your IT equipment.

The UPS offers:

- **A backup power supply** by battery with a minimum autonomy of 5 minutes.
- **A high quality energy**. Different solutions are offered to solve the electrical energy faults where it is used, but only the UPS effectively meets the voltage and frequency problems.
- **A backup of data and shutdown of your IT system** thanks to a communication software.

The UPS: necessary for everyone

The requirement for high quality power is a necessity, whether it is for:

- an individual station,
- a local server,
- a critical application server,
- a data-processing centre or specific industrial applications.

What should I protect? against what?

An individual station

- **Cut-offs**

Your PC is not protected against external events, which means that it could be victim of a total power supply loss at any moment.

Your workstation is a precious tool in which you have invested, so why run the risks !

- In case of a power cut, the UPS instantaneously supplies a power supply autonomy throughout the duration of the power cut in order to avoid the data loss and the destruction of your hardware.

A local server or a CAD, DTP workstation

- Cut-offs
- **Micro cut-offs and too large current variations**

The interruption in the supply to a server has catastrophic consequences given its file saving and information processing role. In the same way, your multimedia, CAD or DTP workstations contain vital data for your company.

One unprotected server means the organisation of your company risks to suffer the consequences !

- The UPS protects your server and your workstations against cut-offs, voltage drops, surge voltages.
  Using the battery, it supplies the appropriate autonomy to warn the users and stop the applications correctly.

A critical application server

- Cut-offs
- Micro cut-offs and too large current variations.
- **Interferences**

Your company server or your computer centre is the real centre of your company. The stored data is vital and you need the full availability of your applications.

One power supply fault and its all the company which is neutralised: Impossible to enter orders, to invoice, to start production orders...

- Whatever the computer architecture you have chosen – high availability (HA), RAID disks, ECC memory, redundant components – you will only be fully protected against power supply problems by a UPS which is dedicated to your server. In case of a cut-offs, the power will be supplied by the battery without any interruption.

What are the choice criteria for a UPS?

An individual station

- **Autonomy**

The UPS must have enough autonomy for a clean shutdown of a PC.

- **Installation**

The simplicity of the installation (Windows Plug & Play) and the ease of the UPS integration on the desk has been favoured.

A local server or a CAD, DTP workstation

- Autonomy • Installation
- **Power supply quality**

Certain IT equipment (high-grade workstations for example) requires good quality current when the UPS is running on the battery. Favour a UPS which produces a sinusoidal output signal.

- **Voltage regulation**

The UPS must be capable of regulating the voltage in case of too large variations.

- **The communication software**

In the case of computers operating on a network, an additional option must be available to assure the management of the UPS from the network.

A critical application server

- Autonomy • Installation • Power supply quality
- Voltage regulation • communication software
- **Perfect quality**

The availability of a critical server is primordial for your company. For example, one which supports your integrated management software. As for a local server, extreme care must be taken concerning the quality of the current supplied by the UPS.

- **Autonomy extension**

You may need a large autonomy where the requirement to be able to easily add additional batteries to your UPS.

- **No power cut**

The UPS must supply a high quality power supply without any interruption. To assure this function, a UPS must be chosen which constantly regulates the voltage and frequency. The transfer of the operation to the battery must be completely transparent, **without any power cut**.

Which technology to choose?

	Off-line Or on standby	Line interactive Or active standby	On-line Or continuous operation
Power supply in normal operation	The mains	The mains	The UPS
Power supply in case of power cut	The battery with switching < 10ms	The battery with switching < 4 ms	The battery without any interruption
Applications	Low powers	Recommended for powers < 2kVA	Medium and high powers
Environment	Tertiary, low disturbance	Tertiary, low disturbance	Tertiary or industrial
Transfer time on battery during a mains cut	Yes	Yes	no
Frequency regulation	no	non	Yes
Voltage regulation	no	Yes	Yes
Absorption of voltage spikes	no	Certain	All
	Advantages	**Advantages**	**Advantages**
	● Adapted to **low power applications.** ● Disadvantages of a permanent operation on the mains: With a poor quality or disturbed network, **the battery is used frequently.**	● The regulation of the output voltage allows **the batteries to be used more efficiently** than with off-line UPS. ● The quality of the signal supplied when running on the battery depends on the manufacturers' models. Certain supply a sinusoidal signal, others supply a pseudo-sinusoidal signal. This may be an important criteria depending on the equipment to be protected.	● This technology is **the highest performance and the most reliable.** ● It has been used for many years for medium and high power UPS's. ● Today, the technological innovations from SOCOMEC SICON UPS enable it to be implemented in small UPS's. Associated with an intelligent microprocessor (DSP), this technology allows SOCOMEC SICON UPS to supply the best solutions in small UPS's to assure the protection of applications and critical servers.

Test your knowledge

1- On-line = this is an outdated technology.
■ true ■ false

2- Off-line = this is a technology which enable to save the batteries
■ true ■ false

3- Line-Interactive = in normal operation (no mains problem), the power comes directly from the network.
■ true ■ false

4- If you have a gen-set, a UPS is not required.
■ true ■ false

5- On-line = this technology is best suited for the complete protection of important applications.
■ true ■ false

Answers p.11

The software solution

UPS VISION
UPS MANAGEMENT SOFTWARE

The software allows you to communicate with the UPS and protect your IT systems by saving the data and stopping your equipment.

Why a communication software?

In case of a mains fault, the UPS supplies a power supply autonomy. However, this may not be enough for a very long cut-offs and you are not necessarily present to correctly close your files and your IT system.

The communication software automatically performs all the necessary operations to completely stop the system before the end of the battery autonomy.

This software also allows you to remotely use the dialogue possibilities of your UPS's:

- Monitoring of the status,
- Customization of the commands,
- Drawing-up of statistics on the quality of the power supply,
- Remote warning by fax, Email, MS-Exchange or GSM,
- UPS management in an SNMP network.

The evolution of your requirements

The evolution to a centralised administration of all the IT equipment...
The computing evolution accentuates the importance of the network and at the same time increases the complexity of the architectures. From the system administration in the 1980s, we went through the network administration in the 1990s, into considering today all the IT equipment (network, systems, peripherals...) and to manage all the equipment connected to the network in a centralised manner which is as transparent as possible.

... requires a perfect integration of the UPS in IT networks.
Beyond a simple IT communication – sending a power supply absence message – the perfect integration of the UPS in an IT network therefore requires **real administration software** capable of adapting itself to the existing environment and of evolving with it – for example, possibility to evolve to Internet technologies.
To assure the best possible integration of the UPS in IT networks, the following must be favoured:

- the use of computer **communication standards** (TCP/IP, SNMP),
- **the service given** to the administrator of the IT network,
- the flexibility of the management tool by **personalisation to be adapted** to the environment.

The software solution which is adapted to your IT architecture

The increasing complexity of company networks, forces them into reinforcing their administration solutions, especially through dedicated stations (NMS: Network Management Station).

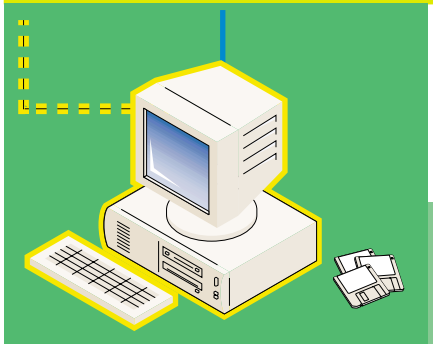
The choice recommended by SOCOMEC SICON UPS consists of being based on an administration software – ***UPS VISION*** – capable of managing according to the existing environment:

- **a centralised solution:** each server is protected by a UPS associated to the software,
- **a shared solution,** (for example an agency or a department): a UPS protects a main server and several other stations,
- **a centralised solution in terms of administration:** one or more UPS's protecting one or more servers and the administration is performed by the NMS.

The UPS VISION software allows you to evolve from a decentralised solution to a solution with administration station without modifying the existing one.

Architecture examples

Mono-station environment: individual station

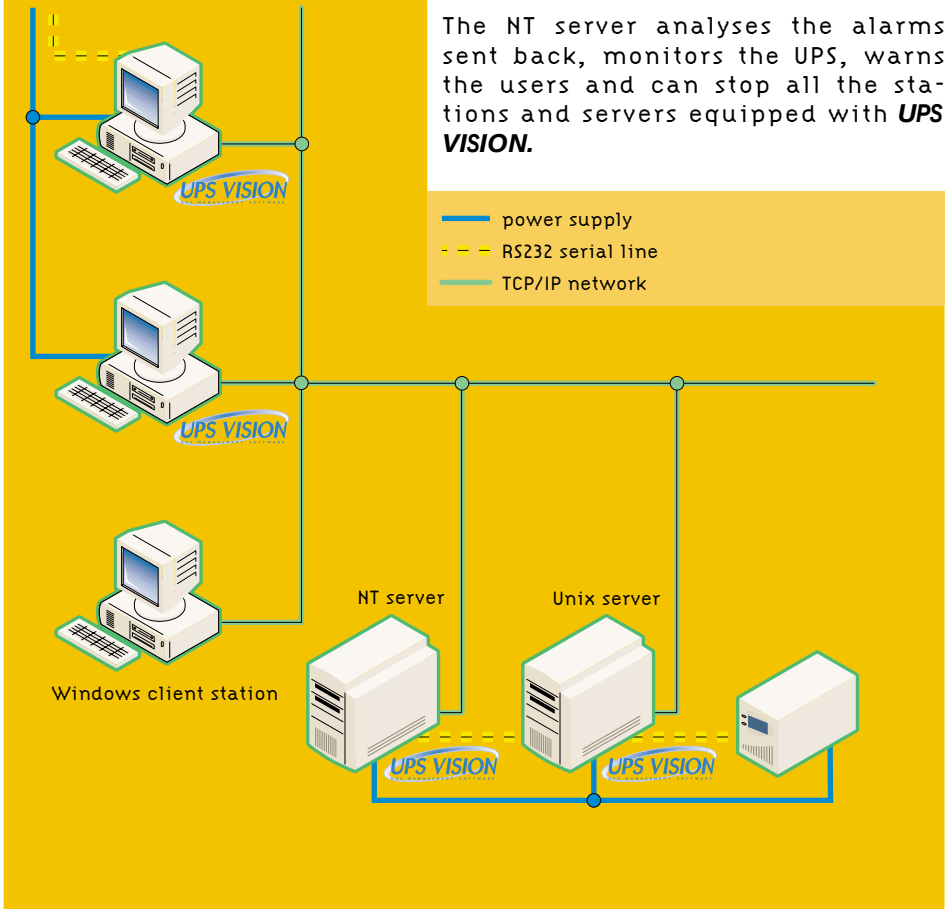


The software associated to the UPS assures the management of the UPS from the workstation via the serial port of the computer station.

power supply
RS232 serial line

Network environment: Local server or CAD, DTP workstation

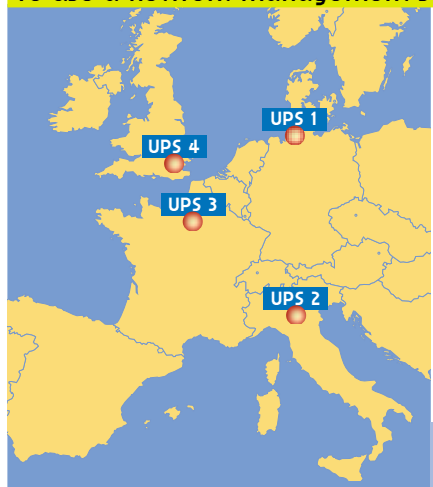
Critical application server



The NT server analyses the alarms sent back, monitors the UPS, warns the users and can stop all the stations and servers equipped with ***UPS VISION.***

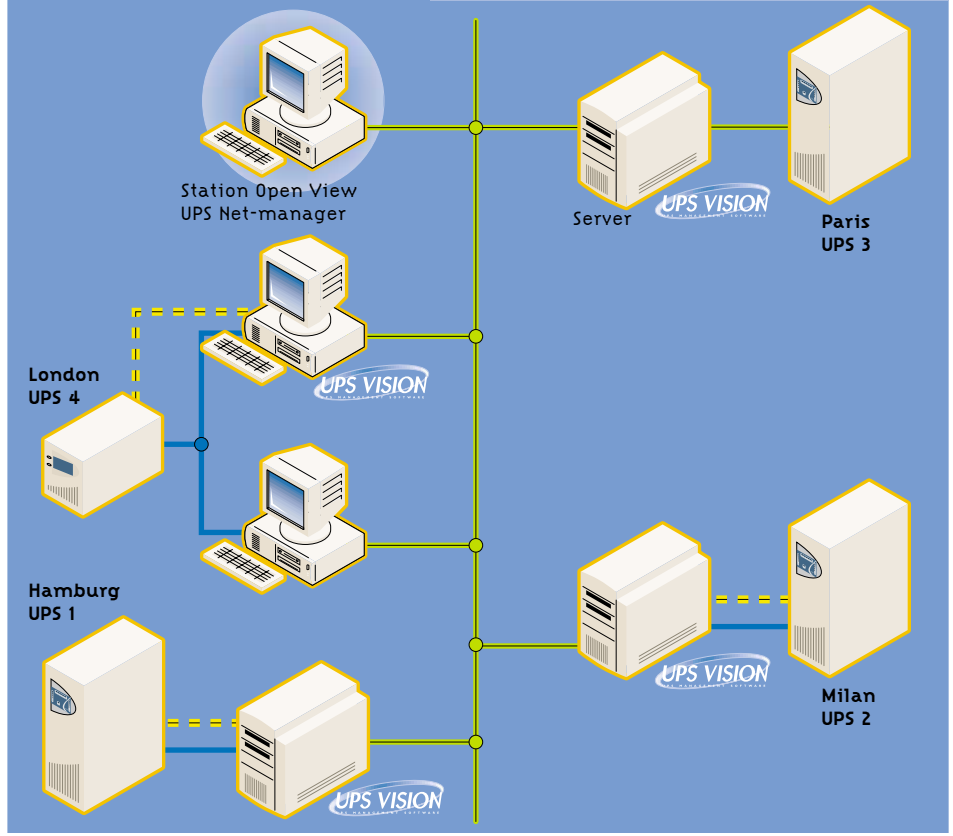
power supply
RS232 serial line
TCP/IP network

To use a network management station (NMS)



UPS VISION translates the alarm messages from the UPS into SNMP language and communicates with your administration station.
The software installed on a station in the remote network can be used to find out the status of the UPS in the local network. In the example below, the UPS's in Paris, London, Milan and Hamburg are monitored from London by an HP Open View station.

power supply
RS232 serial line
TCP/IP network



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réf. DIP 25033 - 3.527.3- 03/01 - Imprimerie de Wissembourg - F-67160 Wissembourg - Graphic design Matière Grise