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New Products Introduction

Development of "Network Power Manager"

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1. Introduction

These days, computers that constitute corporate network systems never cease to increase, with their power consumption rates becoming enormous. Under these circumstances, it is necessary to build a computer system that eliminates wasteful power consumption.

When computers are interrelated, the computer system is turned up and down by network administrators. Automating these tasks would save money.

On the other hand, communications operators use large numbers of hubs, routers, and other network components. When any of these devices crash (or fail due to a program malfunction), the operator goes to the site to power the system up again. There is much demand for minimizing the time required for such actions.

Sanyo Denki has thus developed the "Network Power Manager," a system that allows operators to power up and down and run various devices according to schedule, from a remote site, in order to meet the various requirements listed above.

This paper presents an overview and features of the system.

2. Overview

Figs. 1 and 2 present typical system configurations incorporating the "Network Power Manager."

The system configuration 1 illustrated in Fig.1 is so designed that the computer is connected to the output outlet and controlled and run as scheduled from a remote terminal, for reduced power consumption and automatic operation. In this case, type A is used.

Type A is based on a maximum operating load power of 1,500W to obviate the need for installation works for a power supply unit. The number of output outlets is set to four because each computer consumes several hundreds of watts. To power down the computers after a safe shutdown, a serial interface is provided to meet the respective output outlets.

The system configuration 2 shown in Fig. 2 is configured on the basis that type B is used to reboot the crashed hub, router or other device from a remote terminal. Like type A, type B consumes up to 1,500W. Type B is so designed that its output outlets are connected to a hub, router, and other devices that consumes less power than a computer, so that the number of output outlets is set to eight. Furthermore, since it is connected only to devices that need no shutdown control, they have no serial interface compatible with the respective output outlets.

The block configurations of types A and B are illustrated in Figs. 3 and 4. The system can be powered up and down by a relay, independently for each output outlet. The schedule, on/off timing for each output, and other parameters can be set easily from a Web browser on a remote terminal.

Table 1 compares types A and B in terms of functions.

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Function	Type A	Type B
Output control from a remote site	Yes	Yes
Scheduled operation	Yes	Yes
Interface with UPS	Yes	Yes
Output off control when UPS AC input fails	Yes	No
Shutdown control when output is off	Yes	No
Sending of power failure signal/battery voltage decline signal	Yes	No
Output control by close-at hand	Yes	No

3. Features

3.1 How to control the output outlets

(1)Rush currents can be prevented by setting a time delay for each output outlet and powering up the devices sequentially and automatically.

(2)Related devices (such as a PC and its peripherals) can be grouped together and that group can be controlled. This facilitates power-up and down and prevents power failures due to mishandling. The schedule can be set for each group, so that settings can be made easily with care given only to the running time of the main device.

3.2 Mountable on a 19″ rack

The system is compact and lightweight, thus mountable on a 19″ rack, which is widely used in computer systems, on the basis of 1U (each unit is 44.7mm wide).

3.3 Setting and control with a Web browser

All functions implemented on the ″Network Power Manager″ are programmed on Java, and incorporated into a board as Java applets (small programs that run on the browser). This obviates the need for special-purpose software and allows operators to make various settings and conduct various controls by means of ″Internet Explorer″, ″Netscape Communicator″, and other general-purpose browsers.

Fig. 5 shows how the setting screen typically looks on a Web browser.

3.4 Collective management by ″SAN GUARD Ⅳ″

The ″Ne twork Power Manager″ can be collectively managed by Sanyo Denki's UPS management software. A person-machine interface used for such a systemcan be used for a system that combines a UPS with the ″Network Power Manager.″

When ″SAN GUARD Ⅳ″ is used, multiple ″Network Power Managers″ can be grouped together to conduct collectively the settings of a schedule and the on/off control of output outlets.

When a serial signal is used to connect the system to a UPS, the status of the UPS can be monitored on ″SAN GUARD Ⅳ.″

3.5 Cascade connection of power failure signals

When the UPS undergoes a blackout or the battery voltage is low, the ″Network Power Manager″ not only receives that information but can also transfer that information to another ″Network Power Manager″ as a contact signal. For this reason, a large-capacity UPS can be used to feed multiple ″Network Power Managers,″ which can then be connected to PCs and workstations that need shutdown control in the

case of a blackout.

Since UPS-caused power failure signals and battery voltage decline signals can also be received ascontact signals, they can also be connected to a UPS produced by a different supplier. If the system is connected to a Sanyo Denki UPS, users can see detailed information as described in 3.4.

3.6 Control by a commercially available network manager

The "Network Power Manager" conforms to the Simple Network Management Protocol (SNMP). For this reason, support for a standard UPS Management Information Base (MIB) and a private MIB allows the "Network Power Manager" to be controlled with a commercial network manager.

3.7 Control of PCs and workstations

The "Network Power Manager" employs thesystem specified below to obviate the need for Windows NT and shutdown software for UNIX (and LINUX) computers.

Shutdown control is conducted in different manners depending on the type of OS. Windows NT sends a contact signal (power failure signal or battery voltage decline signal) to the PC and uses the standard UPS service included in Windows NT. On the other hand, UNIX and LINUX logs into the workstation from the serial port and performs shutdown control by executing the script.

4. Specifications of the "Network Power Manager"

Table 2 specifies the "Network Power Manager" of types A and B.

Table 2 Specifications of the "Network Power Manager"

Item	Type A	Type B	Remark
Input voltage	100V	100V	
Allowable input voltage	90-110V	90-110V	
Input frequency	50/60Hz	50/60Hz	
Overcurrent protection	Resettable breaker (15A)	Resettable breaker (15A)	
Output outlet	Non-lock outlet x 4 pcs	Non-lock outlet x 8 pcs	
Maximum total current capacity	15A	15A	
Dimensions	43(H) x 430(W) x 185(D)	43(H) x 430(W) x 185(D)	
Mountability on a 19" rack	Yes	Yes	
Serial port for connecting to PC/WS	4 ports	No	
Shutdown-compatible OS	WindowsNT, Windows98, UNIX	-	Note 1
DHCP compatibility	Yes	Yes	
Sending of ring signals	Yes	No	Note 2
Remote program update	Yes	Yes	
Collective management by "SAN GUARD Ⅳ"	Yes	Yes	
Close-at-hand switch	Yes	No	Outlet control at hand

Note 1: Windows NT and UNIX do not require software for installation on a PC or workstation. Windows 98 requires a PC equipped with "SAN GUARD Ⅰ A."
Note 2: A ring signal is a signal sent out to start a PC that will not get booted simply by power-up.

5. Conclusion

Power supply units for information systems are becoming even more important and complex as loads connected to them become more advanced. This means that personnel in charge of controlling such power supply units are required to have a certain level of skills. However, it is hard to assign a full-time technician as controller of such power supply units, because the budget is tight. It is therefore important to build run without special technical knowledge.

The authors are confident that their recently developed "Network Power Manager" can meet those requirements if combined with UPS systems and UPS management software long handled by the company.

The authors are determined to continue their efforts in developing new products in an attempt to facilitate further the control of power supply units used in information systems.

*The names of the companies and products mentioned in this paper are trademarks or registered trademarks of the respective companies.

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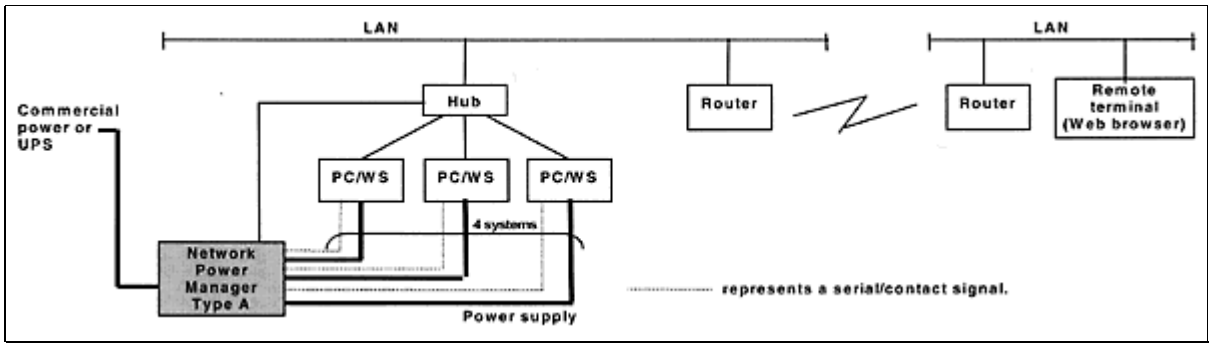


fig.1 Typical system configuration 1

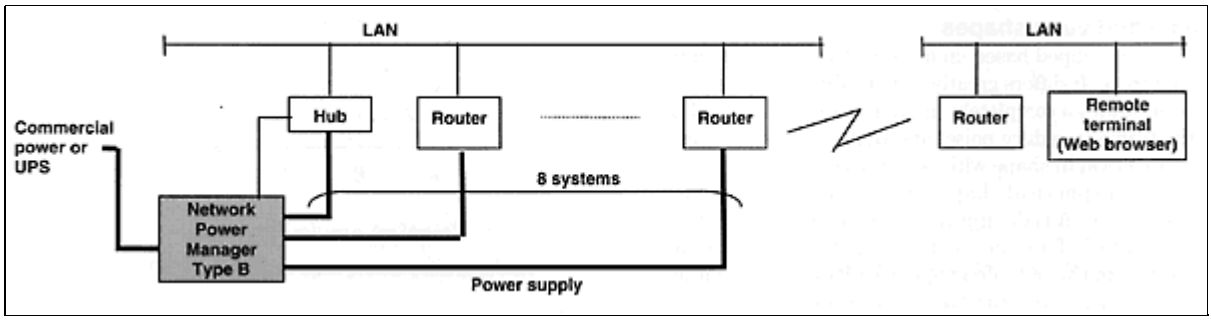


fig.2 Typical system configuration 2

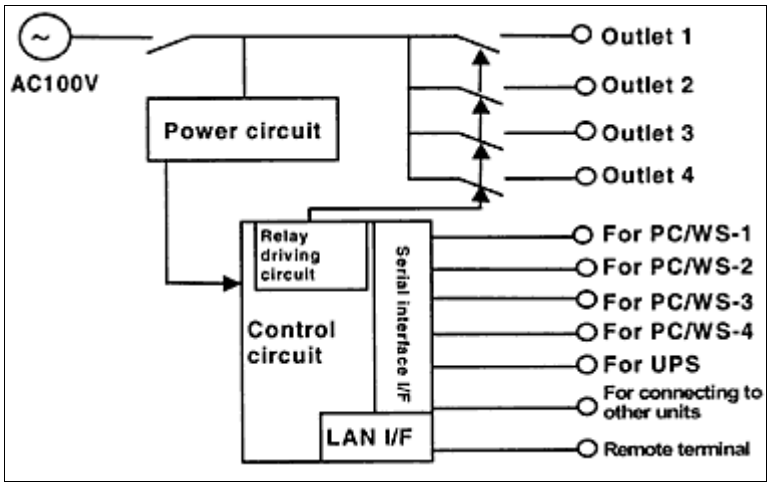


fig.3 Configuration of type A

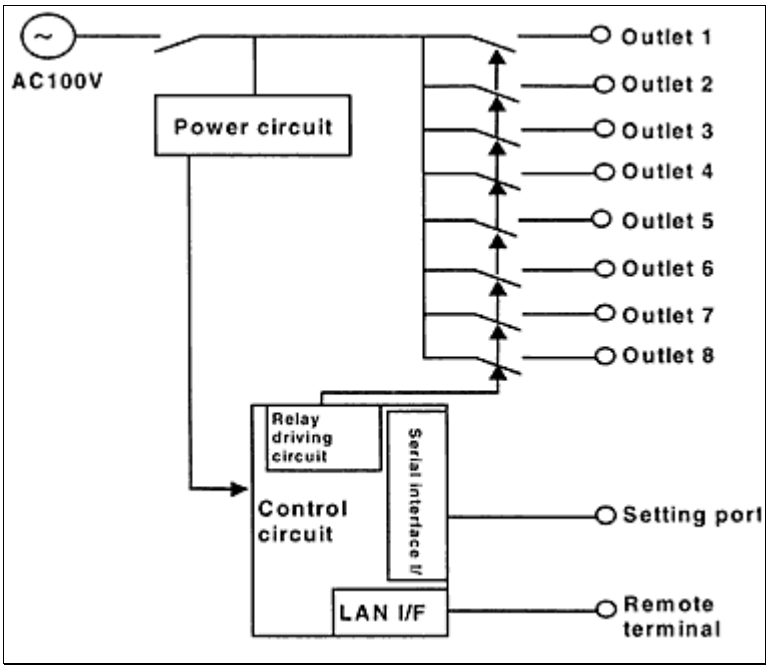
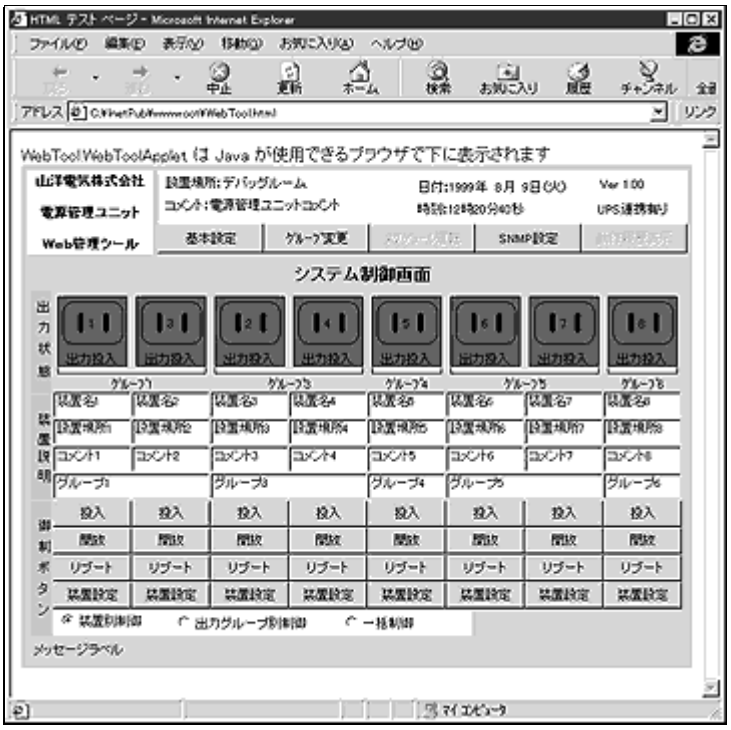


fig.4 Configuration of type B



Web browser screen