NPC-1

TCP/IP Network Projector Control

QuickLogix™ NetControl 1.0 Starter Package

Getting Started Guide

EIKI

AUDIO VISUAL / VIDEO PRODUCTS

NPC-1
Network Projector Control
and
NetControl™ 1.0 Starter Package

Getting Started Guide

First Edition, March 2003

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Table of Contents

Introduction

Welcome to NPC-1, a compact palm-sized control device that allows you to control and maintain projectors and other audiovisual equipment over a TCP/IP based Ethernet connection.

This chapter is an introduction to NPC-1 and includes the following sections:

• Technical Specifications
• Package Checklist
• TCP/IP Description

NetControl is a software tool for the audiovisual market to assist in controlling and maintaining projector equipment over a regular TCP/IP network. You can track projectors on a network using NetControl along with the NPC-1 device. An easy access interface will give you important information about the projector status. Basic control features are provided through the control and input selector screen. You can easily switch to different input sources with just one-button-click. NetControl basic control features give you the ability to do remote maintenance from your computer without actually seeing the projector.

NetControl and NPC-1 are designed to run in 24/7 applications. The unique design of the NetControl software allows you to control your equipment from another building, town, country or continent. Enjoy the freedom of easy projector control through your TCP/IP network.

If you require more features in your software such as multiple projector control you should use the NetControl Advanced Package. The Advanced Package allows you to manage events, do e-mail reporting and supervise your equipment through a powerful theft control. Please see our website www.quicklogix.com to get more information.

Technical Specifications

Hardware
Processor   16 bit processor, 80186
Memory   512 KB
Serial Connector   Male DB9, DTE

Interface
LAN   Auto-detecting 100Base-T (10/100 Mbps)
Serial   RS-232
Signals   RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Performance
Speed   50 bps – 230 Kbps

OS supported
NPC-1   Windows XP, Windows 2000,
                       Windows NT (SP5), Windows 98SE and Windows ME

Protocol   TCP, IP, UDP, DHCP, ICMP

Operation Mode   TCP Server

Management   QuickLogix™NetControl Starter Package
                       QuickLogix™NetControl Advanced Package (optional)

Power and Environment
Power requirements   NPC-1: DC 9V to 30V, 300 mA (max.) at 9V
Operating temp.   0 – 55°C, 32 – 131°F
Operating Humidity   5 – 95%RH
Storage Temp.   -20 – 85°C, -4 – 185°F
Dimensions   90 x 100.4 x 22 mm (W x D x H, including ears)
                       67 x 100.4 x 22 mm (W x D x H)
                       3.54 x 3.95 x 0.87 inch (W x D x H, including ears)
                       2.64 x 3.95 x 0.87 inch (W x D x H)
Surge protection   15KV ESD protection for serial port
Magnetic isolation   1.5KV for Ethernet
Regulatory approvals   FCC, CE, UL, CUL

Package Checklist

If you purchased the NetControl software along with the NPC-1 device you should find the follwing items in your shipping box:

- NPC-1 device
- Getting started guide
- Power adapter (100-240 V, 50/60 Hz)
- European power plug adapter
- CD with NetControl installation software
  for Windows 98SE/NT/ME/2000/XP systems

TCP/IP Description

You should be aware of the following basic network terminology before installing and setting up the software for the NPC-1.

Ethernet Address
Also referred to as the product's MAC address, this is a unique 6-byte (48-bit) number assigned by the manufacturer. Devices use each other's MAC address to maintain point-to-point communication over the Internet.

IP Address
This is a 4-byte (32-bit) number assigned to a network device for communicating over an Ethernet. Depending on how a device connects to the network (over a LAN, via modem to an ISP's server, etc.) the IP address my not be fixed, i.e., it could change each time the device is plugged into the network.

Subnet Mask
A subnet mask is a 32-bit number that is notated by using four numbers from 0 through 255, separated by periods. Typically, default subnet mask number uses either 0 or 255 as values (such as 255.255.255.0), but other number values can appear, they indicate that subnetting of a single TCP/IP network is in use. This number is combined with the IP address to identify the network to which the NPC-1 device is connected.

Gateway Address
A gateway address is the IP address of a local IP router on the same network as the NPC-1 device. It is used to forward traffic to destinations beyond the local network. A gateway is the connection or interchange point that connects seperate IP networks. A local area network (LAN) may need a gateway to connect in to a wide area network (WAN) or to the Internet.

Getting Started

Now that you have been introduced to NPC-1's features and specifications, it is time to set up the hardware, install the software, and get your system up and running. This section describes briefly how to connect NPC-1 to your projector or other audiovisual equipment, how to connect to the Ethernet and how to install the software.

Serial Connection
NPC-1 has one male DB9 serial port on the back panel. Depending on your audiovisual equipment and serial interface, there are two options:

1. The NPC-1 device has a standardized RS-232 DTE interface like the one you find on your computer. This serial interface provides all of the features of a regular computer RS-232 interface. Please use the RS-232 cable provided by your projector manufacturer to connect your projector or other audiovisual equipment. Connect one side of the cable to the NPC-1 device serial port and the other side to the serial port on the projector.

2. Refer to Serial Pinouts for details of NPC-1's DB9 pinouts to make your own serial interface cable.

My projector manufacturer did not deliver a RS-232 cable?
Please order the right cable from your supplier. Almost every projector uses a special RS-232 cable with different connectors. You can use a regular 9 pin serial cable in only a few cases. Check the user manual of the projector. Most manufacturers publish detailed RS-232 information.

What should be the position of the three DIP switches on NPC-1?
Next to the RS-232 connector on the NPC-1 device you can see three DIP switches. These switches are in the OFF-Position by default. Please make sure that the DIP switches are in the OFF-Position. Because the NPC-1 device can support different protocols (RS-422, RS-485 by RTS or ADDC) it is necessary to have access to the DIP switches.

Power Connection
Please check the content of your shipping box. All items should be included. Take the following steps to connect NPC-1's power adapter:

1. Plug the power adapter's DC plug into NPC-1's DC-IN jack
2. Plug the power adapter into an electrical outlet

Note that there is no ON/OFF switch. The NPC-1 device automatically turns on when plugged into the outlet, and the red power light will glow to indicate that it is receiving power.

Connecting the NPC-1 to a network
There are two ways to use the 10/100BaseT Ethernet jack located on NPC-1's front panel:

1. For most applications using NPC-1, you will simply plug one end of an Ethernet cable (RJ45) into NPC-1's 100BaseT jack, and plug the other end into a hub connected to your network. In this case, use a regular *straight-through* Ethernet cable.

2. In some cases, you may connect NPC-1 directly to your computer's Ethernet card. To do this you will need to use a *cross-over* Ethernet cable.

The orange/green link light will flicker when NPC-1 is properly connected to a live Ethernet.

LED Indicators
NPC-1's top panel contains three LED indicators, as described in the following list.

LED Name	LED Function
Power	Red indicates that the power is ON
Link	Orange indicates a 10 Mbps Ethernet connection Green indicates a 100 Mbps Ethernet connection
Ready	Green indicates NPC-1 system is ready

NetControl software installation
Insert the CD into your CD ROM drive. The installation routine will start automatically. If it does not start please run "setup.exe" manually.

The installation requires a software registration code. The registration code for the NetControl software in printed on the back of the CD cover.

System requirements
• Intel® Pentium® II/400 MHz or compatible
• Microsoft® Windows® 98SE, ME, NT (SP5), 2000 (SP3), or XP
• 128 MB RAM
• Network adapter
• Access to TCP/IP network
• 23 MB hard disk space (full install)
• CD-ROM drive
• XGA or higher resolution monitor (1024x768, 256 color)
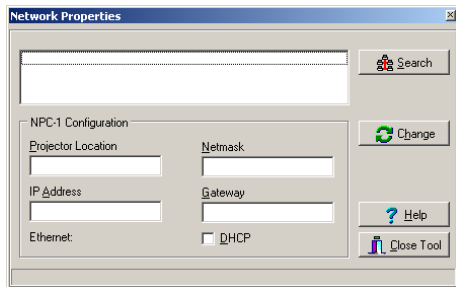• Mouse or other pointing device

Changing Network Properties
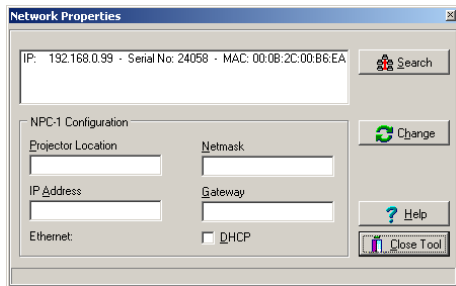
Selecting a NPC-1 device
Click on the menu **Tools|Network Properties** to get a list of all NPC-1 devices on your network.
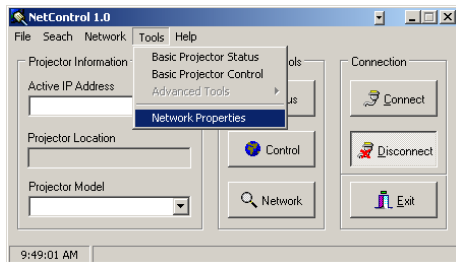
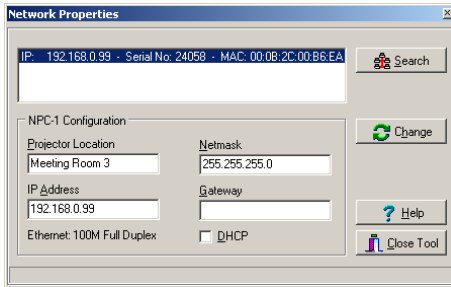If this list is empty click the **Search** button to perform an actual search.

Pick an IP address in the NPC-1 list to change the network properties.

Changing the projector location
Change the projector location to the location where the projector is installed. E.g. "Meeting Room 3" or "Building 1, Level 2, Room 17". Click the **Change** button to save the new location.


You can close the window by clicking on the **Close Tool** button.

Changing the IP address
The NPC-1 device is shipped with the following default private IP address: **192.168.0.99**

IP addresses of the form 192.168.xxx.xxx are private in the sense that they are never assigned by ISPs. Applications of NPC-1 that require sending data over a public network, such as the Internet, require providing the NPC-1 with a valid public IP address. Public IP addresses are generally purchased or leased from a local ISP.
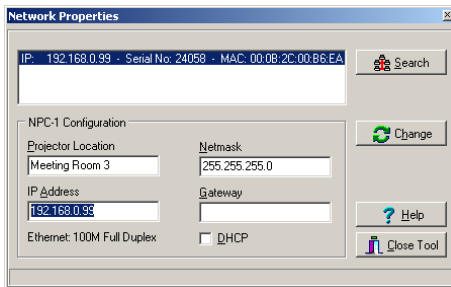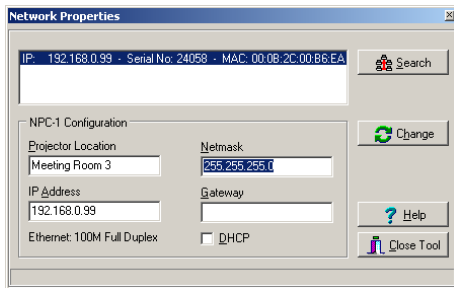

Change the IP address of the NPC-1 to a valid IP address. If you are unsure about changing the IP address please ask your system administrator. Click the **Change** button to save the new IP address.

Perform a new search by clicking on the **Search** button to see the updated IP address on the network.
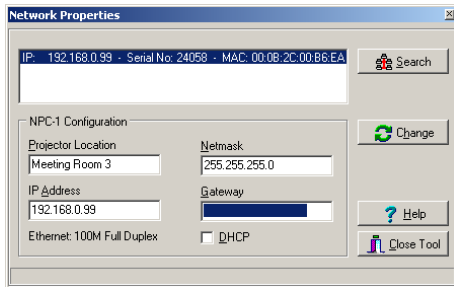
Changing the subnet mask
The NPC-1 device is shipped with the following default subnet mask: **255.255.255.0**

Change the subnet mask of the NPC-1. If you are unsure about changing the subnet mask please ask your system administrator. Click the **Change** button to save the new subnet mask.

Changing the gateway
The NPC-1 device is shipped with no default gateway address.

There is no need to use a gateway address for simple private networks. If you are unsure about changing the gateway please ask your system administrator. Click the **Change** button to save the new gateway.
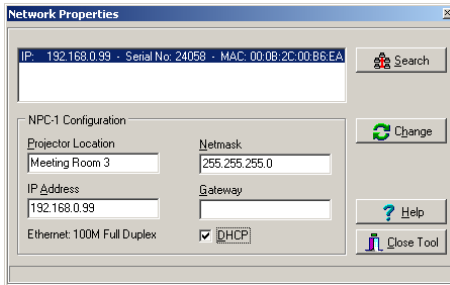
You can close the window by clicking on the **Close Tool** button.

DHCP setting

This topic is applicable if you are using a DHCP (Dynamic Host Configuration Protocol) server in your network. This type of server is set up to provide IP addresses for new devices as they log onto a network. As the operation of the NPC-1 requires a fixed IP address, we strongly recommend that you establish an IP reservation list in DHCP to maintain fixed IP assignments based on the NPC-1's MAC address. The MAC address can be found on the bottom panel of the NPC-1 or by accessing the MAC address through a search function in the NetControl software.

Follow the instructions for selecting a NPC-1 device to pick a NPC-1 device from the search list. You will see the actual data for the projector location, IP address, netmask, gateway and DHCP setting in the edit fields.

The NPC-1 device is shipped with DHCP setting off (check box is NOT checked).


If you are unsure about changing the DHCP setting please ask your system administrator. Click the **Change** button to save the DHCP setting.

You can close the window by clicking on the **Close Tool** button.

Searching the network

Search the Network
Click on the menu **Search|Search Network** to do a network search for NPC-1 devices.
You can perform the same network search if you click the **Network Tool** button under the
Projector Tools category.
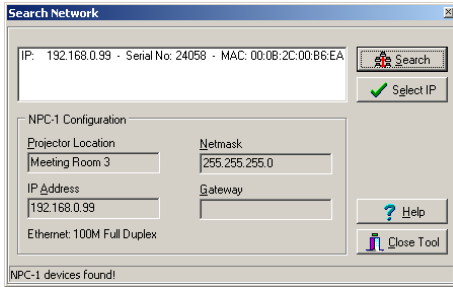
Hit the **Search** button in the Search Network window to get a list of all NPC-1 devices on
your network. Mark the IP address of the NPC-1 device that you want to use in the
search list. Click the **Select IP** button to pass the selected NPC-1device to the main
application window.

View a list of all NPC-1 devices
Click on the menu **Search|View|View NPC list** to get a list of all NPC-1 devices on your
network. If this list is empty select the **View** button to perform an actual search.
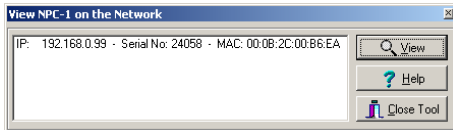
You can close the View NPC window by clicking on the **Close Tool** button.
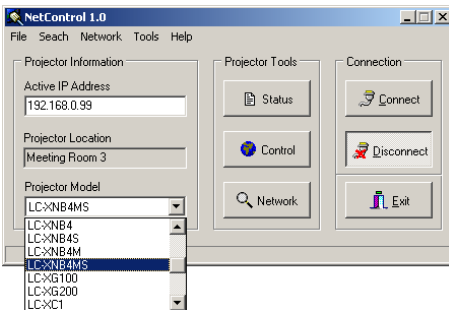
Connecting to a Projector

Choosing a valid IP address

Before you can work with your projector on the network you have to type a valid IP address into **Active IP Address** field in the main application window. We recommend that you use the search function to pick an existing NPC-1 device. The default factory IP address is **192.168.0.99**. You can find the default IP address on the bottom panel of the NPC-1 device. Do not use two or more NPC-1 devices with the same IP address. The network will not work properly and you will not have access to a projector you need to control.
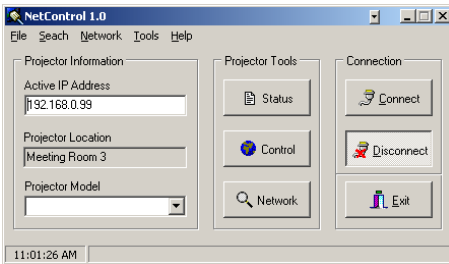
Selecting a projector

Before you can work with your projectors on the network you have to pick a projector model from **Projector Model List** in the main application window. If you cannot find your exact projector model please select the closest model name you can find. Most projector manufacturers use the same control codes for their projectors.

If you need a specific projector brand and model please contact QuickLogix at info@quicklogix.com. We probably can include your requested model in the NetControl software. It is very important to pick the right model to use all available projector functions.

Connecting to a projector
Before you can work with your projectors on the network you have to pick a valid IP address and a projector model from the **Projector Model** list in the main application window.
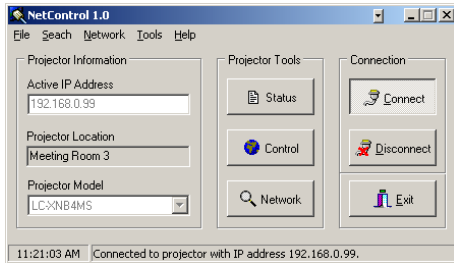
Click the **Connect** button to establish the actual connection between the NetControl software and a projector.

Disconnecting procedure
Click the **Disconnect** button to close the actual connection between the NetControl software and a projector. All projector control functions will be deactivated automatically.
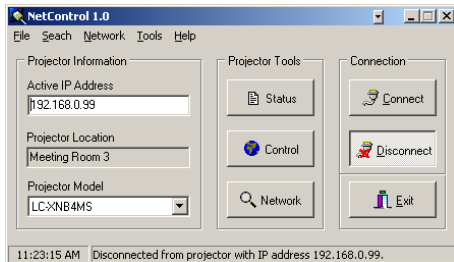
Reading the Status of a Projector

Am I connected?

To get a status reply from your projector you have to be connected to a projector. If your are not connected to a projector the **Get Status** button in the Projector Status window is deactivated.

You can close the Projector Status window by clicking the **Close Tool** button.

Understanding the status reply

Click on the **Get Status** button to receive the current projector status. The NetControl software requests all status data from the projector in real time. You can be sure that all data are up-to-date.

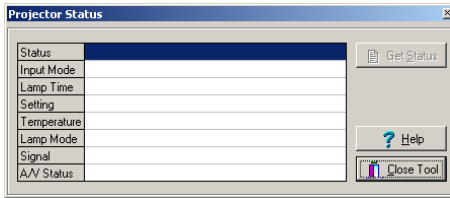| Request	Possible Reply
Status	Shows the current working condition of the projector.
Input Mode	Tells the user the active input source.
Lamp Time	This data show the hours of lamp usage.
Setting	Returns the actual picture setting (e.g. up-side-down).
Temperature	Temperature sensors return the actual temperature in the projector.
Lamp Mode	If more than 1 lamp is used this data shows information about the lamps.
Signal	Returns the actual signal type.
A/V Status	Returns actual status of video/audio mute functions.

Not all status requests are available with every projector model.

Status	Projector is in stand-by mode.
Input Mode	Computer input 2 ANALOG/DVI/wI/MCI is selected.
Lamp Time	0002 h
Setting	Picture is set to normal projection.
Temperature	Temp A: 28.5°C; Temp B: 37.4°C; Temp C: 53.1°C
Lamp Mode	No device reply for this command.
Signal	No device reply for this command.
A/V Status	No device reply for this command.
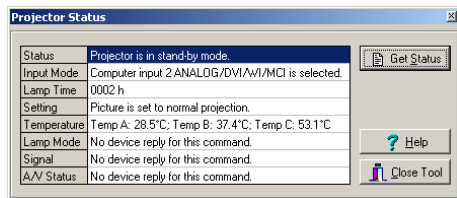
Missing replies will be indicated.

Controlling the Projector

Using control features of the projector

To control a projector the NetControl software has to be connected to a projector. If you are not connected to a projector all control buttons are deactivated. If the NetControl software is connected to a projector you receive direct feedback from the projector's screen after pressing a function button.
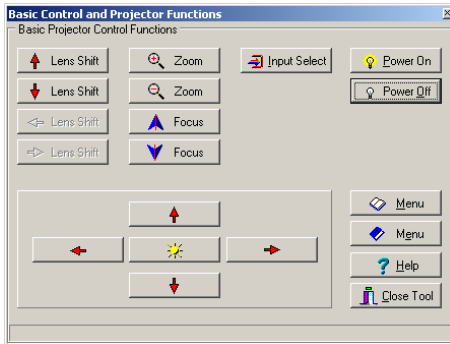
Selecting different inputs

Click the **Input Select** button in the control window. The Input Control Center window pops up.
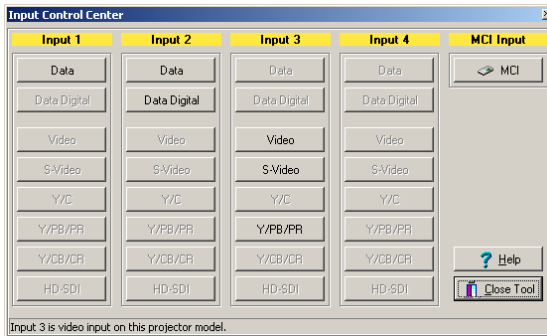
Select a valid input. If the projector is connected to a video or data source the input will be switched to that specific input source. Most projectors need some time to recognize the new input signal. Switching to a different input can take between 1 and 2 seconds.

Why are some buttons deactivated?

Buttons are normally deactivated when the NetControl software is not connected to a projector. You have to connect to a projector before using the Control window.
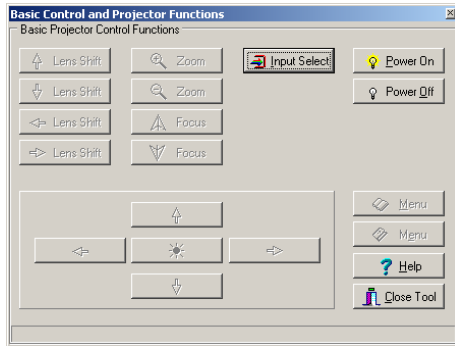
Another reason for the a deactivated button could be that the function of the button is not supported on the selected projector model.

Cable Pinouts

RS232

RS232 standards are defined by EIA/TIA (Electronic Industries Alliance /Telecommunications Industry Association). RS232 defines both the physical and electrical characteristics of the interface. RS232 is practically identical to ITU V.24 and V.28 (electrical). RS232 is an Active LOW voltage driven interface and operates at +12V to -12V where:

Signal = 0 (LOW) > +3.0V
Signal = 1 (HIGH) < -3.0V

Signal voltages in the range >-3.0V to +3.0V is regarded as the 'dead area' and allows for absorption of noise.

Please watch carefully the terms DTE (Data Terminal Equipment - e.g. a terminal or PC) and DCE (Data communications Equipment - e.g. a modem) the meaning and use of certain pins may differ. The diagrams below define the interface from the DTE perspective. The NPC-1 has a RS232 DTE connection.

RS232 on DB9 (EIA/TIA 574)

Pin No.	Description
1	DCD, Data Carrier Detect
2	RxD, Receive Data
3	TxD, Transmit Data
4	DTR, Data Terminal Ready
5	GND, Ground
6	DSR, Data Set Ready
7	RTS, Request To Send
8	CTS, Clear To Send
9	RI, Ring Indicator
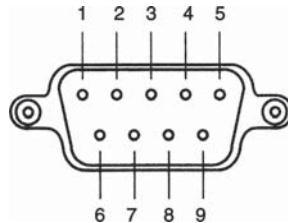
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QUICKLOGIX INTERNATIONAL LLC
Cross Roads, Texas

Declaration of Conformity

We,

EIKI Industrial Co., Ltd.
4-12 Banzai-Cho, Kita-Ku
Osaka 530-0028
Japan

declare under our sole responsibility that the product

NPC-1, Network Projector Control

to which this declaration relates, is in conformity with the following standards and/or other normative documents.

EMC: FCC Class B
            EN55022: 1994 class B
            EN61000-3-2: 1995 class B
            EN61000-3-3: 1995
            EN55082-1: 1997
            EN61000-4-2: 1995
            Contact Discharge 4kV, Air Discharge 8kV
            EN61000-4-3: 1995
            EN61000-4-4: 1995
            AC/DC Power supply 1kV, Data/Signal lines 5kV
            EN61000-4-5: 1995
            AC/DC Line to Line 1kV, AC/DC Line to Earth 2kV
            EN61000-4-6: 1995
            EN61000-4-8: 1993
            3 A/m at 50 Hz
            EN61000-4-11: 1994

Safty: UL/CUL
            EN60950

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