1000 Park Drive • Lawrence, PA 15055-1018 • 724-746-5500 • Fax 724-746-0746

FEDERAL COMMUNICATIONS COMMISSION AND INDUSTRY CANADA RADIO FREQUENCY INTERFERENCE STATEMENTS

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

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Any other trademarks mentioned in this manual are acknowledged to be the property of the trademark owners.

NORMAS OFICIALES MEXICANAS (NOM) ELECTRICAL SAFETY STATEMENT

INSTRUCCIONES DE SEGURIDAD

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.

2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.

3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.

4. Todas las instrucciones de operación y uso deben ser seguidas.

5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc.

6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.

7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.

8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.

9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.

10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.

11. El aparato eléctrico deberá ser connectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.

12. Precaución debe ser tomada de tal manera que la tierra fisica y la polarización del equipo no sea eliminada.

13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.

14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.

15. En caso de existir, una antena externa deberá ser localizada lejos de las lineas de energia.

16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.

17. Cuidado debe ser tomado de tal manera que objectos liquidos no sean derramados sobre la cubierta u orificios de ventilación.

18. Servicio por personal calificado deberá ser provisto cuando:

    A: El cable de poder o el contacto ha sido dañado; u

    B: Objectos han caído o líquido ha sido derramado dentro del aparato; o

    C: El aparato ha sido expuesto a la lluvia; o

    D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o

    E: El aparato ha sido tirado o su cubierta ha sido dañada.

Contents

1. Specifications

Compliance — FCC Class A, IC Class/classe A

Interfaces — (2) RS-232 compatible serial (DTE): (1) IBM PS/2, AT style, (1) proprietary

Protocol — Asynchronous

Data Format — Receive: Either 7 data bits, even or odd parity, and 1 stop bit, or 8 data bits, no parity, 1 stop bit (autosensing);
Transmit: 8 data bits, no parity, 1 stop bit (fixed)

Flow Control — None

Data Rate — 9600, 2400, 1200, or 300 bps (user-selectable)

Maximum Distance — 50 ft. (15.2 m) from control port to master device

User Controls — Commands from master device;
(2) Rear-mounted:
(1) 4-position configuration DIP switch,
(1) ON/OFF rocker switch

Indicators — (7) Front-mounted LEDs: (1) POWER ON, (1) DATA INPUT, and (5) BOOT IN PROGRESS

Connectors — Data: (2) Rear-mounted: (1) DB9 female for connection to PC or modem, (1) RJ-11 female for connection to Port Manager Switch;
AC Power Inlet:
SWI020A: (Nondetachable power cord with NEMA 5-15P plug);
SWI020AE: IEC 320 male;

Connectors (continued) —	AC Power Outlets: SWI020A: (5) NEMA 5-15R sockets; SWI020AE: (5) IEC 320 female
Leads Supported —	On DB9 connector: Pins 1, 2, 3, 4, 5, and 7 (RLSD [DCD], RD, TD, DTR, SGND, and RTS respectively); On RJ-11 connector: Pins 1, 2, 3, 5, and 6 (DTR, SGND, TD, RD, and CTS respectively)
Input Power —	SWI020A: 115-VAC, 60 Hz directly from outlet through nondetachable 6-ft. (1.5-m) power cord; SWI020AE: 230-VAC, 50 Hz directly from outlet through detachable power cord (not included)
No-Load (Standby) Current Draw (Consumption) —	SWI020A: 500 mA; SWI020AE: 250 mA
Output Power —	SWI020A: 115-VAC, 60 Hz, up to 5 amps on one outlet (but not more than 10 amps total for all outlets); SWI020AE: 230-VAC, 50 Hz, up to 2.5 amps on one outlet (but not more than 5 amps total for all outlets);
Temperature Tolerance —	32 to 122 F (0 to 50˚C)
Humidity Tolerance —	20 to 80% noncondensing
Size —	1.8" (1U) H x 17"W x 6.5"D (4.4 x 43.2 x 6.5 cm); when rackmount brackets are added, the unit is 19" (48.3 cm) wide
Weight —	5 lb. (2.3 kg)

2. Introduction

2.1 General Overview

The Pow-R-Boot 5 (PRB 5) is a convenient tool you can use to reboot as many as five AC-powered devices from a remote location. Normally, when a computer or peripheral device locks up, it must be manually reinitialized by on-site personnel. But when you plug pieces of equipment into the PRB 5, you can send a command from a remote site—even from half a world away across a modem link—to reset any or all of them by toggling AC power ON and OFF.

The Pow-R-Boot 5's RS-232 Control Port will accept commands (in the form of ASCII character strings) to select the desired port and initiate the reboot routine. You can connect the PRB 5 to a master or control device such as a PC or one of our Port Manager Switches, either directly (with a serial cable) or indirectly (through a modem).

The unit also has a DIP switch you can set to (a) select the appropriate data rate for communication between the unit and the master device, (b) choose a short or long reboot cycle, and (c) enable or disable "Quiet Mode."

If the unit receives and carries out a command, it will respond with a "PRB OK" message so that you can verify proper communication with the master device. (You can turn off these messages by enabling Quiet Mode.)

2.2 Features

- Remotely toggle AC power to any of the unit's five separate outlets.
- Connect a PC to the RS-232 Control Port either directly or indirectly (across a modem link).
- Directly connect one of our Port Manager Switches (product codes SW545A and SW546A) to the Control Port.
- Set the length of the "downtime" or "offtime" part of the reboot cycle (that is, how long the unit denies power to the rebooting device before restoring it).
- Receive status messages from the unit (or, if you don't want these, enable Quiet Mode).

2.3 The Pow-R-Boot 5 Illustrated

2.3.1 The Front Panel

Both models of the Pow-R-Boot 5 share the same front panel, which is shown in **Figure 2-1** below.

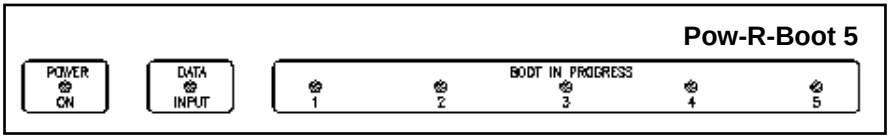

Figure 2-1. The front panel of the Pow-R-Boot 5.

The unit's front-panel LED indicators have these functions:

- **POWER ON**: Lights when the Pow-R-Boot 5 is receiving AC power and is therefore ready to receive commands.
- **DATA INPUT**: Flashes when the Pow-R-Boot 5 receives commands through one of its Control Ports.
- **BOOT IN PROGRESS 1** through **5**: Light when a reboot cycle is in progress at the Pow-R-Boot 5's corresponding AC outlet.

2.3.2 The Rear Panel

The two versions of the Pow-R-Boot 5 have slightly different rear panels, as shown in **Figures 2-2** and **2-3** below.

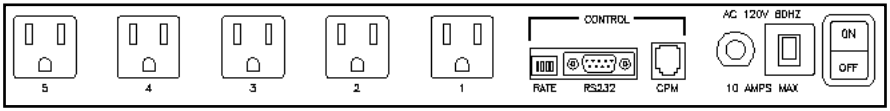

Figure 2-2. The rear panel of the 115-VAC model of the Pow-R-Boot 5 (SWI020A).

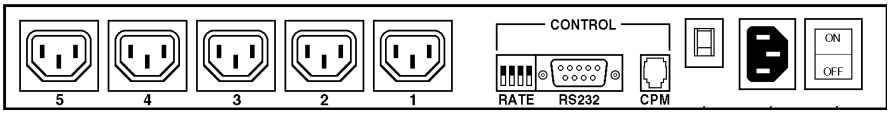

Figure 2-3. The rear panel of the 230-VAC model of the Pow-R-Boot 5 (SWI020AE).

The rear-panel components have these functions:

- **AC Outlets 1** through **5**: The devices whose rebooting you want to control must be plugged into these outlets. On the 115-VAC model (SWI020A), the outlets are North American standard NEMA 5-15R sockets; on the 230-VAC model (SWI020AE), they are international standard IEC 320 female connectors. Each outlet can deliver up to 5 amps (SWI020A) or 2.5 amps (SWI020AE) of current, but the total current drawn from all five outlets must not exceed 10 amps (SWI020A) or 5 amps (SWI020AE). See **Section 3.4** for more information.

- **Control Area**: The master device from which you want to want to send reboot commands should be connected to one of the two Control Ports in this area: the DB9 female connector labeled "RS232" if the master device is a PC or modem, or the RJ-11 connector labeled "CPM" if the master device is one of our Port Manager Switches (product code SW545A or SW546A). See **Section 3.3** for more information.

  The Control Area also contains a 4-position DIP switch labeled "RATE"for setting the data rate and other parameters as described in **Section 3.1**.

- **The Input-Power Components**: The 115-VAC model (SWI020A) gets its AC power through a nondetachable 6-ft. (1.5-m) power cord; the power cord has a North American standard NEMA 5-15P plug. The 230-VAC model (SWI020AE) has an international standard IEC 320 male inlet to which you can connect a power cord appropriate for your geographic area.

  Both models also have a fuse (rated at 10 amps for SWI020A and 5 amps for SWI020AE) and an ON/OFF switch. Refer to **Section 3.5** for more information.

3. Installation

3.1 Setting the RATE Switch

Use the DIP switch labeled "RATE" on the Pow-R-Boot 5's rear panel to set the PRB 5's data rate and other options, as described below.

Data Rate

Set switch positions 1 and 2 to select the data rate you want the PRB 5 to use for Control-Port communication. (The device attached to the Control Port must be set to the same data rate.)

Switch Position		Data Rate in bps
1	2	
Down	Down	9600 (default)
Up	Down	2400
Down	Up	1200
Down	Down	300

Downtime

Set switch position 3 to select the "downtime" involved in the reboot cycle; that is, how long the PRB 5 will keep AC power off before restoring it when you send the PRB 5 a reboot (toggle power) command.

When position 3 is set "down" (the default setting), downtime is 2 seconds. When position 3 is set "up," downtime is 5 seconds. Select the 5-second downtime if the attached device needs to be off longer than 2 seconds to properly reinitialize. If you need a downtime longer than 5 seconds, call Black Box for technical support—we may be able to give you a special quote on a unit with such a capability.

Quiet Mode

Set switch position 4 to turn "Quiet Mode" on or off. In Quiet Mode, the Pow-R-Boot 5 will suppress all the status messages that it would normally send.

When position 4 is set "down" (the default setting), Quiet Mode is off and the PRB 5 will send status messages as normal. When position 4 is set "up," Quiet Mode is on and the unit will not send any status messages.

3.2 Rackmounting the Unit

You can use the included screws and rackmount brackets to mount the Pow-R-Boot 5 in any standard 19" rack. If you would rather mount the PRB 5 in a 24" rack, call Black Box; we may be able to give you a quote on special brackets.

3.3 Connecting the Master Device

The Control Area of the rear panels of the Pow-R-Boot 5 consists of a DB9 male connector labeled "RS232" and an RJ-11 jack labeled "CPM." Use either of these inputs to connect the PRB 5 to the master device. **Figures 3-1** and **3-2** on the next page show interface schematics for both connectors and summarize the cable layout for a typical Pow-R-Boot 5 installation respectively.

3.2.1 Connecting Devices to the RS232 Port

The PRB 5's RS232 port is a DB9 male connector wired in a DTE configuration similar to that of an IBM® PS/2®, AT® computer. Use standard AT modem cable (our product code EVMBMC) to connect this port directly to a modem.

3.2.2 Connecting Devices to the CPM Port

The PRB 5's CPM port is an RJ-11 jack, pinned so that you can run a straight-through-pinned 6-wire twisted-pair cable (our product code EYN725MS) or flat-satin cable (our product code EL06MS) from the CPM port to the RJ-11 jack on one of our Port Manager Switches (product codes SW545A and SW546A).

NOTE

Do not connect devices to both the RS232 Port and the CPM Port at the same time.

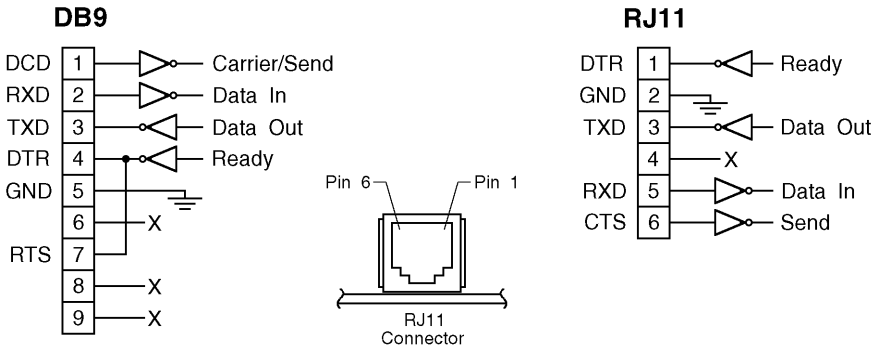

Figure 3-1. Pinouts of the RS232 and CPM ports.

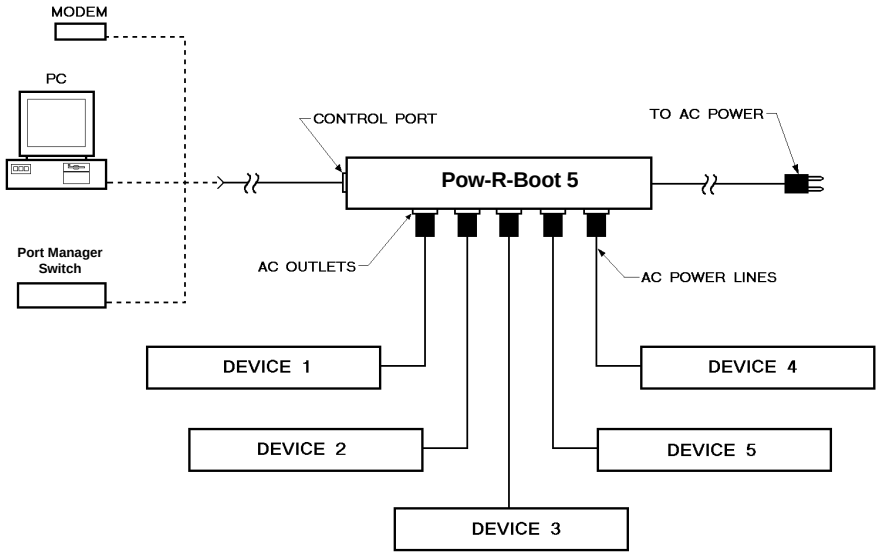

Figure 3-1. Typical application for the Pow-R-Boot 5.

3.4 Connecting the Switched Devices

Now plug the power cords or the power-supply input cords of each of the devices whose rebooting you want to control into one of the five AC outlets on the rear panel of the Pow-R-Boot 5. Make sure that the power switches of these devices are all turned ON. Once you plug in the PRB 5, each time you turn it ON with its ON/OFF switch it will immediately provide AC power to all of its outlets (see the next section).

Each of the PRB 5's AC outlets is capable of switching up to 5 amps of AC power. The total current load on all five outlets cannot exceed 10 amps for the 115-VAC model (SWI020A) or 5.2 amps for the 230-VAC model (SWI020AE).

3.5 Powering Up the System

If your Pow-R-Boot 5 is the 230-VAC model (SWI020AE), connect an appropriate power cord to the IEC 320 male power inlet on its rear panel.

Now plug the PRB 5's power cord into a working AC outlet and turn ON the PRB 5's ON/OFF switch. The PRB 5 and the devices plugged into it should begin functioning immediately. (Any time the unit is OFF and is turned ON, it will provide power to all five of its outlets instantly.) The PRB 5's POWER ON LED should light.

The unit is now ready for continuous operation.

4. Operation

The Pow-R-Boot 5 will transmit "Pow-R-Boot 5 Ready" out of its Control Ports approximately 8 seconds after it is powered up (turned ON). If the Pow-R-Boot 5 is connected to a modem, it will also send the "Pow-R-Boot 5 Ready" message to the modem approximately 8 seconds after each time the modem detects carrier. This message indicates that the Pow-R-Boot 5 is ready to receive commands.

The command character-string that you will use to control the PRB 5 consists of eight contiguous (not separated by spaces) ASCII characters. The first six characters are ASCII control codes that constitute a "fixed password" that restricts access to the PRB 5 system. The seventh character is the code for the operation (what you want the Switch to do). The last character in the command string is an ASCII carriage return ("^M").

1. Establish a connection to the Pow-R-Boot 5. If you are contacting it across a modem link, the PRB 5 will (unless Quiet Mode is on) wait for eight seconds after the attached modem raises Carrier Detect, then respond with the "Pow-R-Boot 5 Ready" message.

2. Send the ASCII command string for what you want the Pow-R-Switch system to do. (When you send the string, the PRB 5's DATA INPUT LED should light.) The command string must be in this format:

   ^B^X^X^B^X^Xn^M

   Where:

^B^X^X^B^X^X	is the Pow-R-Switch's fixed password. "^B" is an abbreviation for the [CTRL] [B] character (the ASCII control code [STX] that you can generate by pressing the [CTRL] and [B] keys simultaneously). "^X" is an abbreviation for the [CTRL] [X] character (the ASCII control code [CAN] that you can generate by pressing the [CTRL] and [X] keys simultaneously).

n	is the single-digit operation code: If you enter 0 (zero) for the n value, the PRB 5 will (unless Quiet Mode is on) respond with a "PRB OK" message (followed by a carriage return and line feed) to show that it is operating properly. (This feature is useful for diagnostic testing.) If you enter a number from 1 to 5 for the n value, the PRB will toggle power (turn it OFF, wait for the selected downtime period, then turn it back ON) to the corresponding AC outlet and will light the corresponding BOOT IN PROGRESS LED. Unless Quiet Mode is on, at the appropriate moments it will respond with "Plug n Off" (followed by a carriage return and line feed) and "Plug n On" (followed by a carriage return and line feed). If you enter 9 for the n value, the PRB 5 will toggle power to *all* of its AC outlets and light *all* of its BOOT IN PROGRESS LEDs. Unless Quiet Mode is on, at the appropriate moments it will respond with "Plug n Off" (followed by a carriage return and line feed) and "Plug n On" (followed by a carriage return and line feed).
^M	is an abbreviation for the [CTRL] [M] character (the ASCII carriage return, [CR]), which you can generate by pressing the [ENTER] or [RETURN] key.

For example, you would send the command ^B^X^X^B^X^X3^M to tell the PRB 5 to toggle the power to AC outlet number 3.

5. Troubleshooting

5.1 Common Concerns

5.1.1 No Power Output

If the Pow-R-Boot 5 does not seem to be providing power to one or more of your devices, make sure all of them are actually plugged into the PRB 5 and are turned ON. Also make sure that the PRB 5 itself is plugged in. Now turn the PRB 5 OFF and then ON again using its master power switch.

If this doesn't help, try unplugging the PRB 5, then unplugging the switched devices from the PRB 5 and plugging them directly into the AC outlet that the PRB 5 was plugged into. If any devices still don't seem to get any power, try plugging them into an outlet you know is working. If they get power then, the outlet you were using is probably not working; have it examined by a certified electrician. If they still don't seem to get power, there is probably something wrong with the devices themselves.

If all of the switched devices get power when they are plugged directly into the wall outlet you had the PRB 5 plugged into, check how much current each of the switched devices is drawing. If any individual device is drawing more than 5 amps (for the 115-VAC model, SWI020A) or 2.5 amps (for the 230-VAC model, SWI020AE), or if all of the devices put together are drawing more than 10 total amps (SWI020A) or 5 total amps (SWI020AE), you might have blown the PRB 5's fuse. If this is the case, replace the fuse with a new one of the same type. After you replace the fuse, or if the old fuse is OK, try reducing the current draw to the PRB 5's specified limits, then plug everything back in the way it was when you started. If any devices still don't seem to get power, there is probably something wrong with the PRB 5; call Black Box Technical Support at 724-746-5500.

5.1.2 Unit Does Not Respond to Commands

If the Pow-R-Boot 5 doesn't seem to carry out the commands you send it, and you are judging this by the fact that you get no electronic responses from the unit, make sure that Quiet Mode is off (RATE switch position 3 set to "down").

If this is not the problem, make sure that both the master device and the PRB 5 are actually plugged in and turned ON. Then make sure that the cable running from the master device to the PRB 5 is pinned straight-through and is securely attached at both ends. Also make sure that both the master device and the PRB 5 are set to the same data rate (see **Section 3.1**), that the master device is actually sending your commands out of the port that is connected to the PRB 5, and that the master device is sending ASCII in the format of 7 data bits (even or odd parity) or 8 data bits (no parity).

If these checks turn up nothing, make sure that neither the cable nor the master device's serial port are broken (this might require a cable tester and/or an ohmmeter). If these seem OK, call Black Box for technical support.

5.2 Calling BLACK BOX

If you determine that your Pow-R-Boot 5 is malfunctioning, *do not attempt to alter or repair it.* Contact Black Box Technical Support at 724-746-5500. The problem might be solvable over the phone.

Before you do, make a record of the history of the problem. We will be able to provide more efficient and accurate assistance if you have a complete description, including:

- The nature and duration of the problem.
- When the problem occurs.
- The components involved in the problem.
- Any particular application that, when used, appears to create the problem or make it worse.

5.3 Shipping and Packaging

If you need to transport or ship your Pow-R-Boot 5:

- Package it carefully. We recommend that you use the original container.
- Before you ship a unit for repair or return, contact Black Box to get a Return Materials Authorization (RMA) number, and make sure you include everything you received with the unit when you ship it.

NOTES

BLACK BOX®
NETWORK SERVICES

FEBRUARY 1998
SWI020A
SWI020AE

Pow-R-Boot 5

CUSTOMER SUPPORT INFORMATION

Order **toll-free** in the U.S. 24 hours, 7 A.M. Monday to midnight Friday: **877-877-BBOX**
FREE technical support, 24 hours a day, 7 days a week: Call **724-746-5500** or fax **724-746-0746**
Mail order: **Black Box Corporation**, 1000 Park Drive, Lawrence, PA 15055-1018
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