

## IPN

### Intelligent AC Power Node

Remote AC Power Control

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#### 2. AUTOMATIC HEARTBEAT METHOD

RS232 - Win 95 or greater is required.

This feature will automatically recycle the AC power on the OUT AC connector if the PC or a linked application hangs (no Heartbeat is detected on the serial port). The target PC system should be configured to restart the software after a reset occurs.

Connect the IPC to the serial port in the same manner as previously described and load the Heartbeat Software.

Two versions are available. One runs as an application out of the system tray and the other runs as service on NT or newer machines. Download your choice from:

[www.cpscom.com/software](http://www.cpscom.com/software)

Start the application version from the program menu. It will install in the System Tray of the Task Bar (lower right hand corner). The configuration window will appear the first time it is run. Follow the prompts.

You will be asked several questions in both versions. They are explained in the 'help file'. The following is an overview:

**Com Port?** Which one you intend to use.

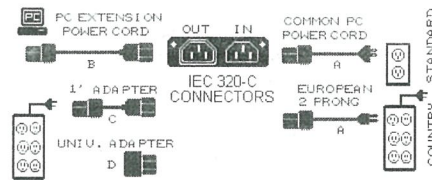
**Beat Period?** - The time interval between each

#### INTRODUCTION

The IPN (Intelligent Power Node) base unit is an AC power control device. It automatically recognizes AC power voltages from 110 to 250 volts and has two standard IEC 320 connectors. This combination makes it easy to install anywhere in the world with the proper locally available power cord ends. Connect the AC Power Cords to the IN and OUT connectors according to the diagram below.

The AC connectors are relay controlled to interrupt or maintain the current flow base on "control commands" that it receives through the 9 pin RS-232 port or the RJ-11 ports.

#### AC POWER SIDE OPTIONS



The RS-232 serial port is normally used to configure the unit. See Serial Port "Set Up Commands", but it may also be used to receive "control commands" during normal run time operation.

The two RJ-11 ports are primarily used to receive the

heartbeat. It is important that this be less than the REBOOT TIME OUT. In fact, set it to about 1/2 of the TIME-OUT

**Initial Delay?** The time allowed to reload your program(s) after a reset occurs, if operating in the Automatic Mode. Be sure to set this to a longer time than it takes to reload your programs.

**Reboot time-out?** The "dead time" that the rebooter will wait for a "heartbeat" before recycling the AC power on the AC OUT connector, normally 2 minutes.

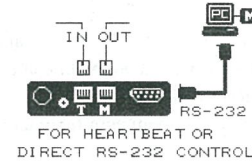
In the application version, the Heart Beat icon in the system tray exhibits the current state of the program. Click the left mouse button to display the settings. A Right click stops the program.

#### Heartbeat Theory

Each time the Heartbeat Rebooter software writes to the com port (the heartbeat), it resets the IPC timer. If the Heartbeat is not received in the designated time, the timer expires and a reset occurs. The IPC then enters the STAND-BY mode. If the AUTOMATIC Start Mode is selected, the program will send a message to return the IPC to RUN mode when the system comes backup. See "Initial Delay".

"control commands". They are also used for an "upstream" and "downstream" daisy chain type connection when multiple IPNs are required. To control each unit separately, it is necessary to assign an address to each unit. All IPNs with the same address will react to the same control command. The daisy chain should not exceed 1500 feet of telephone or Cat-5 cable and 20 devices.

#### CONTROL SIDE OPTIONS



A minimum of four-conductor cable is required. Pins 3&4 of the RJ-11 carry the telephone signal and pins 2&5 carry the control signals. Other CPS Addressable rebooting devices may be intermixed in the "daisy chain". Signal boosters or HUBs may be used for additional devices. Note that both the RS-232 port and the RJ-11 ports can be used together on each IPN, but the 9pin serial port on the IPN may NOT be used to begin a "daisy chain"

For custom programming applications, any of the Heartbeat codes may be used in a user written application. The status of the configuration can be returned through the serial port. See *Configuration Status chart*. As an additional monitoring or debugging tool, you can monitor the IPC events as they occur through the serial port:

- P - Power up with relay ON
- p - Power up with the relay OFF
- M - Push button control to ON
- m - Push button control to OFF
- T - Reset due to Auto Re-Arm
- R - Reset via ARM time Out
- r - Reset via Ring Count
- S - Reset via Command port
- C - Command port power change to ON
- c - Command port power change to OFF
- 54321 - Ring Reset countdown.

A Serial DLL is also available to help with the command calls and the serial port setup.

#### 3. RING COUNT RESET METHOD (Telco RJ-11s)

Connects to the phone line and the modem. If the modem does not answer, and the ring count is met (\*RCx command, default 6), the AC power on the OUT connector will recycle. After a Ring Reset, additional

#### 1. DIRECT RS-232 CONTROL METHOD

The "Control PC" can transmit commands directly to the IPC through the RS-232 port. This is normally used for custom programming applications or used with the Heartbeat software. It is also used to reconfigure other settings if necessary.

Connect the 9 pin RS-232 cable and configure the serial port on the PC for 300 baud, 8-N-2 and no flow control. DTR must be ON.

DTR is connected to CTS in the IPC.

Tip: The PC can use the CTS/DTR to determine if the IPC is connected to the com port.

DIRECT RS-232 Control Commands.

Use any ASCII terminal emulator, such as HyperTerminal, to transmit the following commonly used Control Commands.

- \*PON - Power ON (LED = ON)
- \*POF - Power OFF (LED = OFF)
- \*PRC - Recycle AC power

See Chart for complete RS-232 Control, Setup and Heartbeat Commands.

rings are ignored for 60 seconds. Note that an answering device is not necessary for dedicated resets.

Connect the telephone phone line to the RJ-11 Port labeled "Telco" and the modem, if used, to the "Modem" Port.

#### 4. MANUAL PUSH BUTTON METHOD

Pressing the push button momentarily, toggles the AC power outlet to its opposite state (ON/OFF). It can be left in the OFF state and powered ON with any of the reset methods or a serial \*PON command.

#### LEDs (Operational)

AC IN ON = Power on the main  
AC OUT ON = Power ON the OUT connector  
STATUS

- GREEN = Standby
- RED = Armed
- RED FLASH FAST = Auto -re-ARM
- RED FLASH SLOW = Power Reset
- FLASH .5 SEC. = Command received from the RS-232 port (heartbeat)
- RAPID FLASH = Ring signal
- RED/GRN FLASH = Standby ring reset

### Troubleshooting

If the AC OUT LED fails to illuminate, try pushing the Manual push button switch. If it still does not illuminate, the fuse has probably blown. Replace it.

### Replacing the Fuse

CAUTION: Disconnect the input power cord from the unit before replacing the fuse.

For 110/120V operation, use only a 250VAC 10A or 6.3A SLO-BLO fuse. For 220/240V operation, only use a 250VAC 6.3A SLO-BLO fuse.

When using the IPC on 110VAC Circuits, the 6.3A fuse may be used or the 10A for heavier load requirements. DO NOT USE THE 10A FUSE on 220/240VAC MAINS.

Note: Some countries may require government approval before connection to the telephone network.

### Specifications

The maximum load rating for this device is:

- a. 250 volts 6.3 amps at 50 Hz.
- b. 120 volts 10 amps at 50/60 Hz.

### Software

The CPS software that is compatible with this product:

|             |                                                                                  |
|-------------|----------------------------------------------------------------------------------|
| HEARTBEAT   | Runs as an application.                                                          |
| HEARTBEAT-S | Runs as a service.                                                               |
| SERIAL NET  | For remote serial port control over a network.                                   |
| SERIAL DLL  | Provides programming calls and serial port configuration for custom programming. |

www.cpscom.com/software

### Programming Notes

The IPC will return a "\$" sign to acknowledge a good command and a "!" as a negative acknowledgement to a bad command.

There is a three-second time-out for each character and all data is echoed back to the source (serial port only).

There are times when the IPC cannot receive/echo data, i.e. during a reset, so the source must be able to re-transmit the data and wait for a time exceeded by the \*PR time.

*HyperTerminal comment:* When using HyperTerminal, it may be necessary to close it and save your settings, then reopen it.

### Controllers

The CPS Controllers that are compatible with this product are:

SP-RRC - Touch-Tone Controller  
3P-RRC - Touch-Tone Controller  
N-RRC - TCP/IP Network Controller  
MP-RRC - Touch-Tone Controller  
C-RC - Cellular Controller  
K-RRC - Security Key based Controller

You can use any of the RS-232 or manual methods of control (not Ring Count) along with control events initiated by a Remote Controller.

www.cpscom.com/rebooters

### IPC COMANDS CHART

#### Inquiry Commands

\*?PS Current Configuration - See Status  
\*?PI Current State of Timers and States

#### Power Control Commands

\*PON Power On  
\*POF Power Off  
\*PRC Power Recycle  
\*FRT Factory Reset - Resets Configuration to Default and Recycles Relay

#### Setup Commands

\*DRx Serial Data Rate  
x = 0 = 300BPS (Default)  
x = 1 = 600BPS  
\*PDx Power On Delay after Power Loss (See note e.)  
x = 0 = Disabled/Instant On (Default)  
x = 1-9 = 5 \* x minutes  
\*PRx Change Recycle Time, the OFF time  
x = 0 = 5 seconds (Default)  
x = 1-9 = 10 \* x seconds  
\*PUx Power Up State  
x = 0 = Off  
x = 1 = On (Default)  
x = 2 = Last Power State  
x = 3 = Last Power State  
x = 4 = Off and Auto ReArm is Enabled  
x = 5 = On and Auto ReArm is Enabled  
\*RCx Ring Count Trigger, Number of Rings that cause a reboot  
x = 0 = Disable Ring Count  
x = 1-9 Rings (Default = 6)  
\*RDx Ring Reboot Repetitive Delay (See note c.)  
(exceed Server boot-up time)  
x = 0 = 1 minute (Default)  
x = 1-9 = 2 \* x minutes  
\*RTx Ring Timing (See note a.)  
x = 0 = Long  
x = 1 = International (Default)  
\*RVx Handling of On/Off Commands (See note b.)  
x = 0 = Normal (Default)  
x = 1 = Reversed

#### Heartbeat Commands

\*ARM Arms the Heartbeat Timer (LED = RED)  
\*STB Standby Mode, Pauses the Heartbeat Timer (LED = GREEN)  
\*D00 Reboot Timeout Disabled - Status # is 0  
\*D.5 .5 minute Reboot Timeout - Status # is 1  
\*D1. 1 minute Reboot Timeout - Status # is 2  
\*D2. 2 minutes Reboot Timeout - Status # is 3  
\*D4. 4 minutes Reboot Timeout - Status # is 4  
\*D8. 8 minutes Reboot Timeout - Status # is 5  
\*D16 16 minutes Reboot Timeout - Status # is 6  
\*D32 32 minutes Reboot Timeout - Status # is 7  
\*SRx Auto ReArm Timeout (See note f.)  
x = 0 = Disabled (Default)  
x = 1-9 = x minutes  
\*PAx Power Up Arm (See note d.)  
x = 0 = Disabled (Default)  
x = 1-9 = x minutes

Notes:

- a. Extends the ring time for valid ring recognition.
- b. Reverses the action of a command received through the RJ-analog port. Allows the connection of two IPCs to one line.
- c. Time to wait before another ring will be recognized. Gives the server a chance to boot-up without a second ring interfering.
- d. Similar to the Heartbeat Auto ReArm, but only occurs after initial power up.
- e. Will delay IPC power up for an extended period of time after power is restored. Isolates equipment from repetitive disturbances such as lightning strikes.
- f. Entered if the IPC has issued an ARM timeout caused RESET and an Auto ReArm timeout (\*SRx) is greater than 0. In this mode, if an ARM or STANDBY command is not received within the Auto ReArm timeout period, the RESET is issued again.

### Configuration Status Sequence Chart \*?PS

|        |                                            |
|--------|--------------------------------------------|
| x,y    | Software Revision                          |
| 0 or 1 | Current State of Relay, 0 = Off and 1 = On |
| 0 to 5 | See *PUx                                   |
| 0 or 1 | See *RTx                                   |
| 0 or 1 | N/A                                        |
| 0 to 9 | See *RCx                                   |
| 0 to 7 | See *D00 to *D32                           |
| 0 to 9 | See *PRx                                   |
| 0 to 9 | See *SRx                                   |
| 0 or 1 | See *RVx                                   |
| 0 or 1 | See *DRx                                   |
| 0 to 9 | See *RDx                                   |
| 0 to 9 | See *PAx                                   |
| 0 to 9 | See *PDx                                   |
| \$     | End of Configuration Repsonse              |