

BLUEmax

S M A R T C O M P R E S S O R

USERS MANUAL

Version 1.0

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1 OVERVIEW

A Word About Compression....

Punch, apparent loudness, presence... just three of many terms used to describe the effects of compression/ limiting.

Compression and *limiting* are forms of dynamic range (volume) control. Audio signals have very wide peak to average signal level ratios (sometimes referred to as dynamic range which is the difference between the loudest level and the softest level). The peak signal can cause overload in the audio recording or reproduction chain resulting in signal distortion. *A compressor/limiter is a type of amplifier in which gain is dependent on the signal level passing through it.* You can set the maximum level a compressor/limiter allows to pass through, thereby causing automatic *gain reduction* above some predetermined signal level or *threshold*.

Compression refers basically to the ability to reduce the output level of an audio signal by a fixed ratio relative to the input. It is useful for lowering the dynamic range of an instrument or vocal, making it easier to record without distorting the recorder. It also assists in the mixing process by reducing the amount of level changes needed for a particular instrument. Take, for example, a vocalist who moves around in front of the microphone while performing, thus making the output level vary up and down unnaturally. A compressor can be applied to the signal to help correct this recording problem by reducing the 'louder' passages enough to be compatible with the overall performance.

How severely the compressor reduces the signal is determined by the compression *ratio* and compression *threshold*. A ratio of 2:1 or less is considered mild compression, reducing the output by two for signals greater than the compression threshold. Ratios above 10:1 are considered *hard limiting*. Limiting refers to the point at which the signal is restrained from going any louder at the output.

The level of input signal at which the output is reduced is determined by the compression *threshold*. As the compression threshold is lowered, more and more of the input signal is compressed (assuming a nominal input signal level). Care must be taken not to 'over compress' a signal. Too

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much compression destroys the acoustical dynamic response of a performance. ('Over compression', however, is used by some engineers as an effect, and with killer results!)

Compressor/limiters are commonly used for many audio applications. A kick drum can get lost in a wall of electric guitars. No matter how much level is increased, the kick drum stays 'lost in the mud'. Add a touch of compression and tighten up that kick drum sound allowing it to 'punch' through without having to crank the level way up.

A vocal performance usually has a wide dynamic range. Transients (the very loudest portion of the signal) can be far outside the average level of the vocal signal. It is extremely difficult to ride the level with a console fader. A compressor/limiter automatically controls gain without altering the subtleties of the performance.

A solo guitar can seem to be masked by the rhythm guitars. Compression can make your 'lead' soar above the track without shoving the fader through the roof .

Bass guitar can be difficult to record . A consistent level with good attack can be achieved with proper compression . Your bass doesn't have to be washed out in the low end of the mix . Let the compressor/limiter give your bass the punch it needs to drive the bottom of the track .

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1.1 INTRODUCTION

Thank you for purchasing the PreSonus Blue Max smart compressor/limiter with presets. Your Blue Max was designed with you, the end user in mind. As far as we know, it is the only compressor in the world with built-in compression presets. The presets were created not only to assist in setting up the compressor but to offer you the experience of professional engineers in using compression. If this is your first compressor, you will instantly gain valuable insight into what can be a confusing experience. The experienced user will gain a few tricks of the trade usually kept in the arsenal of professional engineers.

This dynamics processor was built with state of the art components to deliver crystal clear compression for an infinite period of time. We believe the Blue Max to be an exceptional sounding unit at an exceptional price. We hope you agree. Feel free to contact us at 1-800-750-0323 anytime for any reason. We value your comments and suggestions.

Please pay close attention to how you connect your Blue Max to your system. Improper grounding is the most common cause of noise problems in both live and studio applications. We suggest you look at the connection diagrams which are part of this manual to insure optimum operation.

Good luck and enjoy your Blue Max!

1.2 FEATURES

The following is a summary of the features of the Blue Max:

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- **PRESETS.** There are 15 studio proven settings for voice, percussion, fretted instruments, keyboards, stereo processing and effects.
- **VARIABLE INPUT CONTROL.** In addition to normal stereo inputs the input control allows low signal levels such as direct output of electric guitars and basses to be increased to optimum levels.
- **MANUAL MODE.** Full operator control of ratio, attack and release is offered in manual mode.
- **STEREO INPUTS/OUTPUTS.** ¼ inch unbalanced stereo inputs (left side mono) and ¼ inch unbalanced stereo outputs (left side mono) for stereo recording and mix down use.
- **FULL METERING.** Full metering for input and output levels are available as well as separate meters for gain reduction.
- **VARIABLE OUTPUT.** Output control allows gain changes from -20dB to +20dB.
- **SIDECHAIN INSERT.** Sidechain insert allows the Blue Max to be used for special processing applications such as de-essing and ducking.
- **+4dBu Or -10dBV OPERATION.** Internal operating levels are switchable from +4dBu to -10dBV for system matching requirements.
- **INTERNAL POWER SUPPLY.** No Wall Wart!

2 CONTROLS & CONNECTIONS

2.1 FRONT PANEL BASIC LAYOUT

The front panel on the Blue Max is divided into three sections. These are:

1. Presets:

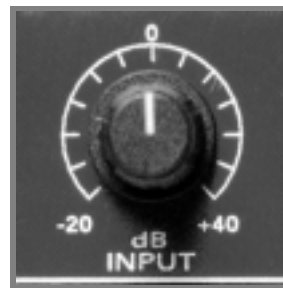
Fifteen detented preset positions and Manual select.



The **Presets** for the Blue Max are controlled by this sixteen position rotary encoder. As the encoder is rotated, parameters are digitally switched, simultaneously controlling attack, release, ratio and threshold.

2. Controls: & Meters

Input



CONTROLS & CONNECTIONS

The **Input** control adjusts the gain on the input amplifiers for both channels. Amplification gain varies widely from -20dB to +40dB. The large range is necessary to amplify instruments such as guitar. Thus the input stage to the Blue Max is actually a pre-amp.

Note: The input control is always active, even in manual mode.

Ratio



Ratio sets the compression slope. This is defined as the output level versus the input level. For example, if you have the ratio set to 2:1, any signal levels above the threshold (note: threshold is a preset parameter in the Blue Max) will be compressed at a compression ration of 2:1. This simply means that for every 1dB of level increase into the compressor, the output will only increase 1/2dB, thus producing a compression gain reduction of 0.5dB. As you increase the ratio, the compressor gradually becomes a limiter. A limiter is defined as a processor that *limits* the level of a signal to the compression threshold. For example, if you have the ratio set to 20:1, input set at 0dB, the output of the Blue Max will be limited to the internal threshold of the compressor, which is set to -10dB in manual mode.

Note: The ratio control is only active in manual mode.

CONTROLS & CONNECTIONS

Attack and Release



Attack sets the speed at which the compressor ‘acts’ on the input signal. A slow attack time (fully clockwise) allows the beginning envelope of a signal (commonly referred to as the initial *transient*) to pass through the compressor uncompressed, whereas a fast attack time (fully counter-clockwise) immediately subjects the signal to the ratio and threshold settings of the compressor.

Release sets the length of time the compressor takes to return the gain reduction back to zero (no gain reduction). Very short release times can produce a very choppy or ‘jittery’ sound, especially in low frequency instruments such as a bass guitar. Very long release times can result in an over compressed sound, sometimes referred to as ‘squashing’ the sound. All ranges of release can be useful at different times however and you should experiment to become familiar with the different sound possibilities.

Note: The Attack and Release controls are only active in Manual mode.

Input / Output Meter

The Input/Output meter shows the signal level being processed by the Blue Max. Input refers to the signal level being processed by the Blue Max before processing. Output refers to the signal level

CONTROLS & CONNECTIONS

after processing. '0dB' on the meter is referenced to the +/-10 switch on the rear of the unit. In +4 mode, 0dB = +4dBu. In -10 mode, 0dB = -10dBV.

Gain Reduction Meter

The Gain Reduction meter indicates the amount of gain being reduced by the compressor in dB.

3. Output & Pushbuttons

Output Level Control



The Output control is used to set the desired output of the Blue Max. It is sometimes referred to as 'gain makeup' control. This term is derived from the fact that as the compressor lowers the output level during gain reduction, the overall signal level is lowered, requiring the user to 'makeup' the gain thereby restoring the original signal level.

Input / Output Meter Select

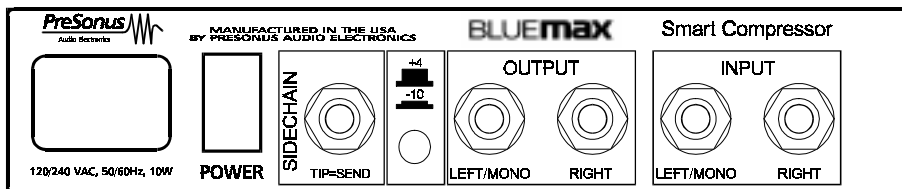
This button selects the function of the Input/Output meter. Pushed in, the meter gives you the level of the input signal. Pushed out, the meter gives you the level of the signal after compression; the output level.

CONTROLS & CONNECTIONS

Process In/Out

The Process button is similar to a bypass button except that the signal is still effected by the Input of the Blue Max. Pushed in, the Blue Max is processing the signal (compressing). Pushed out, the Blue Max is no longer compressing the signal, however the input gain setting remains active.

2.2 BACK PANEL LAYOUT



Input

The input jack accepts unbalanced tip-sleeve connectors. The input can handle up to +24dBu unbalanced levels. The left input is a dedicated mono input.

Output

The output jack accepts unbalanced tip-sleeve connectors. The output will deliver up to +24dBu in signal level unbalanced. The left output is a dedicated mono output.

Sidechain

The sidechain jack on each channel interrupts the signal that the compressor is using to determine the amount of gain reduction to apply. When no connector is inserted into this jack, the input signal goes directly to the compressors control circuitry. When a connector is inserted into this jack, the signal path is broken. If you have inserted a tip-ring-sleeve connector, the input signal is sent back out of the Blue Max via the tip of the connector. This

CONTROLS & CONNECTIONS

signal can then be processed by an equalizer for example to reduce sibilance (de-essing) in a vocal track. The signal is then returned to the unit via the sleeve of the connector.

The signal sent to the sleeve could be that of a narrator or vocalist. In this application, the audio that you are passing through the compressor will automatically 'duck' when the narrator speaks or vocalist sings.

+4/-10 Switch

This switch adjusts the internal operating level of your Blue Max when it is connected to line level (0dB = -10dBV) gear. With the switch in the '-10' position, the signal is raised internally so that it is processed at the lower noise floor of your Blue Max's internal circuitry. The signal level is lowered on the way out to match up with your line level gear's input. When the switch is in the '+4' position, the signal is not changed since this matches the internal operating level of your Blue Max.

This function may also be useful in creating special effects with the compressor and gate of the channel by 'overcompressing'.

2.3 PRESETS

Vocal

1 SOFT - Easy compression. A low ratio setting for ballads allowing a wider dynamic range. Good for 'live' use. This setting lets the vocal sit 'in the track'.

Threshold	Ratio	Attack	Release
-8.2dB	1.8:1	0.002mS	38mS

2 MEDIUM - More limiting than preset 1 for a narrower dynamic range.

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It moves the vocal more up front in the mix.

Threshold	Ratio	Attack	Release
-3.3dB	2.8:1	0.002mS	38mS

3 SCREAMER - For loud vocals. Fairly hard compression for a vocalist who is 'on' and 'off' the microphone a lot. It puts the voice 'in your face'.

Threshold	Ratio	Attack	Release
-1.1dB	3.8:1	0.002mS	38mS

Perc.

1 SNARE/KICK - Allows the first transient through and compresses the rest of the signal giving a hard snap up front with a longer release.

Threshold	Ratio	Attack	Release
-2.1dB	3.5:1	78mS	300mS

2 L/R (Stereo) OVERHEAD - A low ratio and threshold gives a 'fat' contour to even out the sound from overhead drum mics. Low end is increased and the overall sound is more present and less ambient. More 'boom' less 'room'.

Threshold	Ratio	Attack	Release
-13.7dB	1.3:1	27mS	128mS

Fretted

1 ELECTRIC BASS - A fast attack and slow release to tighten up the

CONTROLS & CONNECTIONS

electric bass and give you control for more consistent level.

Threshold	Ratio	Attack	Release
-4.4dB	2.6:1	45.7mS	189mS

2 ACOUSTIC GUITAR - This setting accentuates the attack of the acoustic guitar and helps maintain an even signal level keeping the acoustic guitar from disappearing in the track.

Threshold	Ratio	Attack	Release
-6.3dB	3.4:1	188mS	400mS

3 ELECTRIC GUITAR - A setting for 'crunch' electric rhythm guitar. A slow attack helps get the electric rhythm guitar up close and personal and gives punch to your crunch.

Threshold	Ratio	Attack	Release
0.1dB	2.4:1	26mS	194mS

Keyboards

1 PIANO - A special setting for an even level. Designed to help even up the top and bottom of an acoustic piano. Helps the left hand be heard with the right hand.

Threshold	Ratio	Attack	Release
-10.8dB	1.9:1	108mS	112mS

2 SYNTH - Fast attack and release for synthesizer horn stabs and for bass lines played on a synthesizer.

Threshold	Ratio	Attack	Release
-11.9dB	1.8:1	0.002mS	85mS

CONTROLS & CONNECTIONS

3 ORCHESTRAL - Use this setting for string ‘pads’ and other types of synthesized orchestra parts. It will decrease the overall dynamic range for easier placement in the mix.

Threshold	Ratio	Attack	Release
3.3dB	2.5:1	1.8mS	50mS

Stereo

1 STEREO LIMITER - Just as the name implies. A hard limiter setting (brick wall) ideal for controlling level to the 2 track mixdown deck or stereo output.

Threshold	Ratio	Attack	Release
5.5dB	7.1:1	0.001mS	98mS

2 CONTOUR - A contoured setting for use on the stereo output to fatten up the mix.

Threshold	Ratio	Attack	Release
-13.4dB	1.2:1	0.002mS	182mS

Effects

1 SQUEEZE - Dynamic compression for solo work, especially electric guitar. It gives you that glassy ‘tele/strat’ sound. A true classic.

Threshold	Ratio	Attack	Release
-4.6dB	2.4:1	7.2mS	93mS

CONTROLS & CONNECTIONS

2 PUMP - Make the Blue Max 'pump up the prime'. A setting for making the compressor pump in a desirable way. This effect is good for snare drum to increase the length of the transient by bringing the signal up after the initial spike. Very contemporary.

Threshold	Ratio	Attack	Release
0dB	1.9:1	1mS	0.001mS

3 BASIC SETUP & OPERATION

3.1 QUICK START

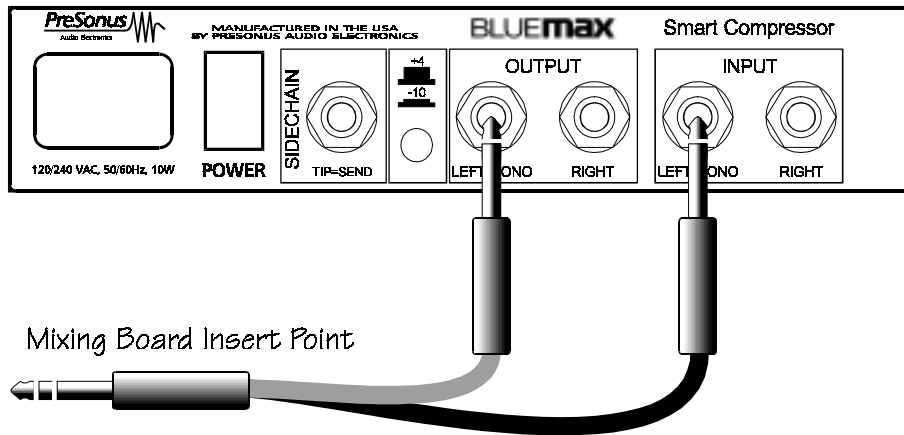
1. Connect your Blue Max using one of the diagrams below.
2. Select either +4 or -10 operating level. (Reminder: +4 is for 'pro' levels such as consoles, -10 is for 'consumer' levels or instruments)
3. Select your preset. (Refer to the preset descriptions above. Remember that the Ratio, Attack and Release knobs are only active in Manual mode.)
4. Push the Process button *in*.
5. Turn the Input knob all the way to -20 (counter-clockwise).
6. Set the Output knob on 0.
7. Slowly turn the Input knob up (clockwise) until the Gain Reduction meters begin to move. Continue to rotate the Input knob until the Gain Reduction meters read between -5 and -7.
8. Adjust the Output knob to the desired output level.

You should now have a very natural sounding compressed signal. Of course you should experiment with the settings to suit your taste.

BASIC SETUP & OPERATION

3.2 BASIC CONNECTIONS

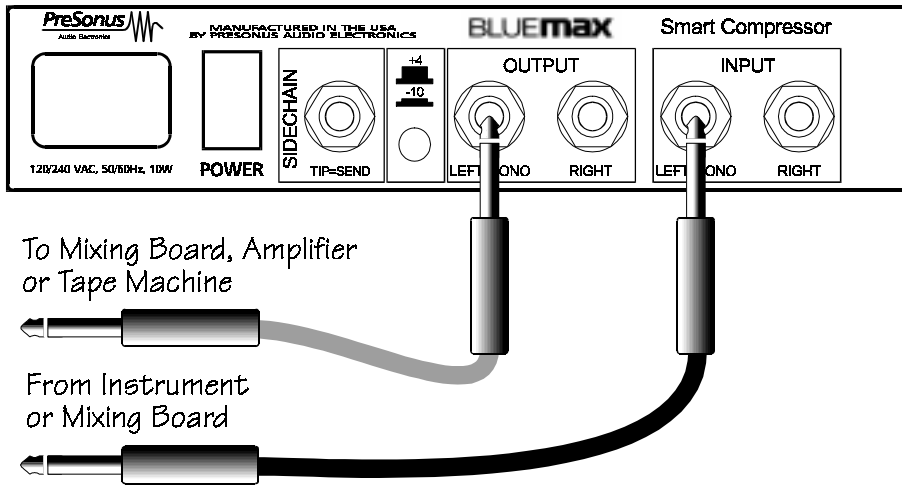
Inserting into your mixers insert point.



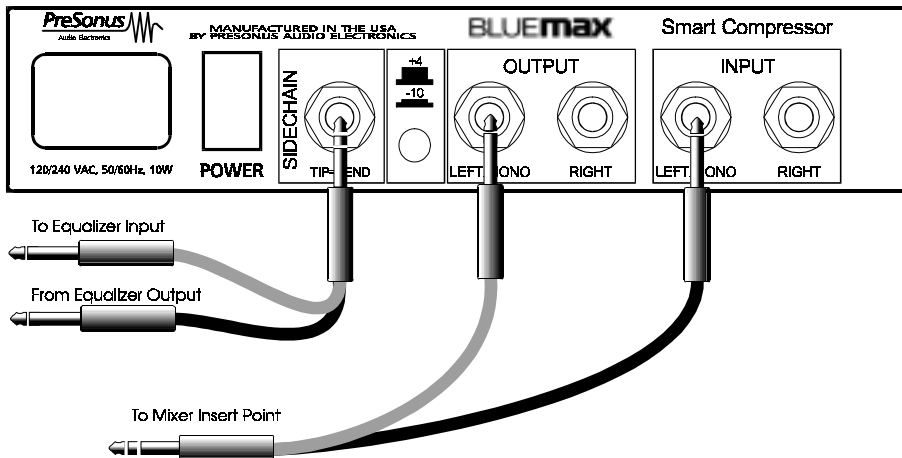
Note: If you don't get any signal flow at first, try swapping the input and output connections.

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Connecting your instrument, mixer or tape machine.

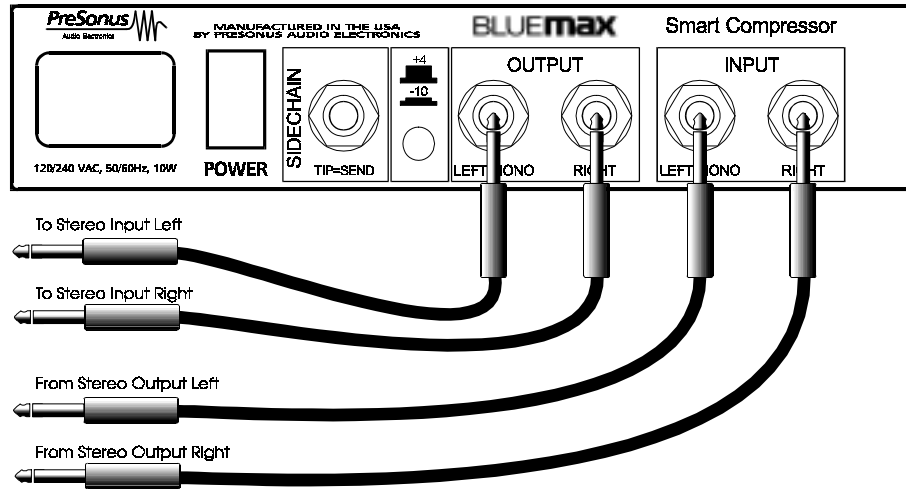


Connecting for de-essing or spectral processing.



BASIC SETUP & OPERATION

Connecting for stereo operation.



3.3 BASIC OPERATING PROCEDURES

Setting Compression Amount

Your Blue Max was designed with a *fixed threshold* mode of operation. This differs from other compressors in the fact that there is no threshold control. This offers the unique ability to immediately hear the sometimes subtle differences between presets which each have unique threshold settings. In setting the compression amount, always begin with the Input control all the way counter-clockwise (-20dB), and slowly increase the input until the Gain Reduction meters begin to register the compression activity. The more you crank up the Input the more compression your signal will experience. Always pay close attention to the best judge of your sound, your ear. You should also frequently remove the compression

BASIC SETUP & OPERATION

from the signal using the Process button to listen to the changes in your sound. In modern recording practice, it is customary to adjust the Output control such that the Input and Output level are of equal amounts according to the Input/Output meter. This gives you an equal level output so that you can switch processing in and out to compare difference.

Mono Operation

Your Blue Max was designed with a high gain mono input to act as a pre-amp for instruments such as guitar and bass. Of course, you can also connect your keyboards, etc. in this mode.

Note: It is very important not to rely on the high input gain of the Blue Max to boost the level of a signal too low to record or amplify, other than that of instruments such as guitar and bass. Be sure that you are sending the Blue Max at least a moderate level before setting the compression. In this manner you avoid unnecessary input amplifier noise.

Stereo Operation

Your Blue Max is operating in a linked stereo mode at all times. In this mode, both signals are used to create the gain reduction amount. This insures proper stereo imaging in stereo compression applications. The stereo presets were optimized for two basic settings, however *all* of the presets will work in stereo mode.

Manual Mode

With the Preset selector set in the Manual position, you have complete control over the compression settings. In this mode, the threshold is fixed to -10dB. Therefore, you should follow the same setup procedure as in the preset operating modes. Remember that if the Ratio control is set to 1:1 (fully counter-clockwise), the compressor is basically off. A good place to start is with a 2:1 compression setting and Attack and Release in

BASIC SETUP & OPERATION

the 12o'clock positions. You may also want to start with one of the preset settings as described above.

4 TECHNICAL

4.1 SPECIFICATIONS

Number of Channels	2
Dynamic Range	>115dB
Signal to Noise Ratio	>95dB
Headroom	+24dBu
Frequency Response	10Hz to 50kHz
Crosstalk	>82db @ 10kHz
Compression Ratio.....	1:1 to 20:1
Compressor Attack Time	0.01mS to 100mS
Compressor Release Time	10mS to 500mS
Input Impedance, Left/Mono	100kOhms
Input Impedance, Right	10kOhms
Output Impedance.....	51Ohms
THD + Noise	<0.03%
Input Gain.....	-20dB to +40dB
Output Gain	-20dB to +20dB
Compressor Metering	Input/Output Level, Gain Reduction
Sidechain Output Impedance	51Ohms
Sidechain Input Impedance	10kOhms
Internal Operating Level.....	+4dBu = 0dB
Input Range	+4dBu or -10dBV, Switchable
Input Connectors	1/4", Tip Sleeve
Output Connectors.....	1/4", Tip Sleeve
Sidechain Connector.....	1/4", Tip Ring Sleeve
Power Supply.....	Internal, Linear Supply
Power Requirements.....	120VAC or 240VAC, 10W
Weight	8lbs.
Size	8"X1.72"X5"

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