



Integrate.



CleanSweep® OEM Interface Products



CleanSweep® CL44Idsp – This is big!

As automakers continue to abandon the stand-alone, standard-sized head-unit in favor of integrated designs, JL Audio's product development team felt that a need existed for a high-quality integration solution. This product would need to deliver world-class audio results while not interfering with vehicle functionality, safety or reliability. To this end, we embarked on a two-year project to develop the **CleanSweep® CL44Idsp** — a patent-pending, DSP-based solution that permits almost any factory-installed audio system to serve as the source for a high-performance aftermarket sound system.

The cure for factory sound no longer requires major surgery.

If you own a newer vehicle, chances are that the head unit is not easily replaced due to cosmetic or functional concerns. This doesn't mean you have to settle for whatever audio quality your vehicle manufacturer decided was "good enough".

By accepting, processing and controlling the audio from almost any factory-installed head unit or amplifier, the CleanSweep® CL44Idsp makes virtually any modern vehicle a candidate for high-end sound, without costly fabrication, integration or radical surgery to the dashboard (and without needing to purchase an aftermarket head unit).

But you don't have to take our word for it; here are a few comments from professional, independent reviewers...

“The best solution for high-end sound with a factory head unit.”

– Paul Sonoda, *CarSound & Performance* - August, 2005

“After calibration, the sound changed dramatically... The sound delivered was excellent and worth (its price tag).”

– Pichet Wongnak, *The Bangkok Post* (Thailand) - Sept. 9, 2005

“...the JL Audio CleanSweep must be considered as the current state-of-the-art, a simple yet elegant interface solution to those European car enthusiasts who won't settle for second best...”

– Richard Truesdell, *European Car* - February, 2006

“This is a terrific new product...”

– Ken C. Pohlmann, *Road & Track Road Gear* - December, 2005

- 1) About the size of a paperback book, the CL44Idsp accepts virtually any analog audio signal, from low-voltage line-level to high-power amplified speaker-level, via its four differential-balanced inputs. With fully automatic level compensation, it then converts the two or four connected analog signals to digital audio with 24 bit effective resolution.
- 2) The CleanSweep® CL44Idsp applies the power of its state-of-the-art, 32-bit SHARC® DSP processor to automatically equalize each of the four channels with 30 bands of equalization (that's 120 bands total), effectively correcting the response of almost any factory-equalized, full-range signal. These digital-domain corrections will range from subtle to dramatic, depending on the degree of equalization engineered into the factory audio system. To accomplish this complex feat, you simply load the supplied CleanSweep® calibration CD into the factory-installed CD player, set its volume control between 1/2 and 3/4 volume, play the designated calibration track and then press the "Calibrate" button on the top of the CL44Idsp processor. Approximately 20 seconds later, the processor has finished analyzing and equalizing the factory-installed source's response and stores the corrections in non-volatile flash memory.
- 3) The CL44Idsp then converts the digitally corrected signals back to analog audio and sends them out to your aftermarket amplifiers through two pairs of low-distortion, line-level outputs.
- 4) The CL44Idsp includes an intuitive rotary user interface (a knob with stops at both ends) to control the master system volume at the outputs of the processor unit for both the OEM (factory) and auxiliary sources. The master volume eliminates the effects of any equalization that is dependent on the OEM volume control position and allows a high signal-to-noise ratio to be maintained in the system. When pressed, the master volume knob also selects between the OEM and Auxiliary source. A dash-mountable status LED changes color to indicate OEM or AUX input modes. These small controls can be easily mounted within reach of the driver.
- 5) The CL44Idsp can be deployed in signal-sensing mode, powering up and providing a 12-volt turn-on signal for aftermarket equipment whenever signal is detected. It can also be activated by a conventional 12-volt trigger, if the OEM system provides one.

What does it all mean?

- 1) You retain your car's interior cosmetics and the normal operation of the factory-installed vehicle functions, including navigation, OnStar®, steering wheel controls, climate controls, etc. You can also use the CL44Idsp's master volume knob/source selector switch instead of the factory volume control.
- 2) You gain the freedom to add an aftermarket source of your choice (iPod®, satellite radio tuner, DVD player, etc.) via direct line input, as opposed to inferior sounding FM-modulator approaches. Since these signals are free of equalization, the CL44Idsp will pass them without applying any correction. The master volume control knob, when pressed, selects between the factory source and the additional source unit.
- 3) You also gain peace of mind, because you are not messing with your car's complex electronics. Since the CL44Idsp typically connects to the factory-installed system as if it were a speaker, the possibility of creating faults or diagnostic issues when the vehicle is serviced is virtually eliminated. A CleanSweep® installation is fully reversible because there is no permanent modification of the factory system, and because the CL44Idsp is not a vehicle specific interface, it can be easily integrated into your next vehicle.
- 4) Most importantly, you gain spectacular, aftermarket sound quality!

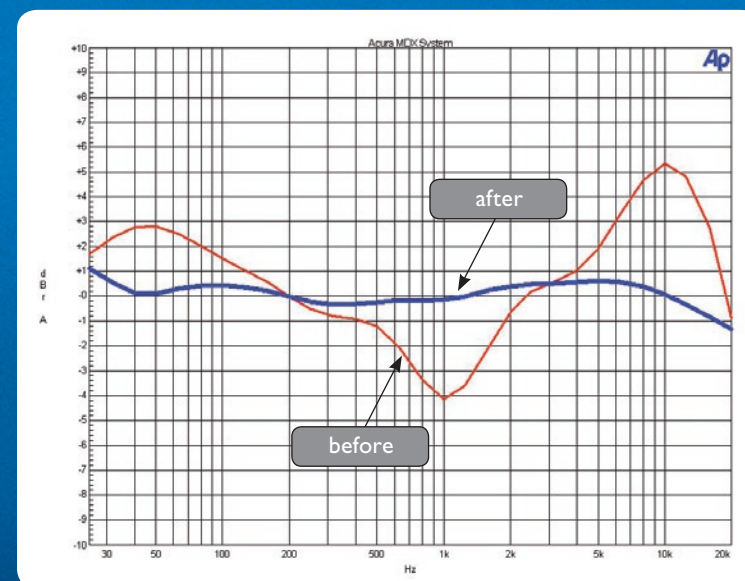


Response Correction is the Key:

A huge number of factory-installed sound systems incorporate non-defeatable (often radical) equalization curves aimed at correcting the response of factory speaker systems. Many also employ volume-dependent equalization effects; for example, reducing bass output at high volume and increasing it at low volume. While these characteristics might make sense within the limitations of the factory-installed speaker system, they wreak havoc on sound quality when a higher performance system is installed. Simple line level converters cannot correct for this equalization, but the *CleanSweep®* CL44Idsp can!

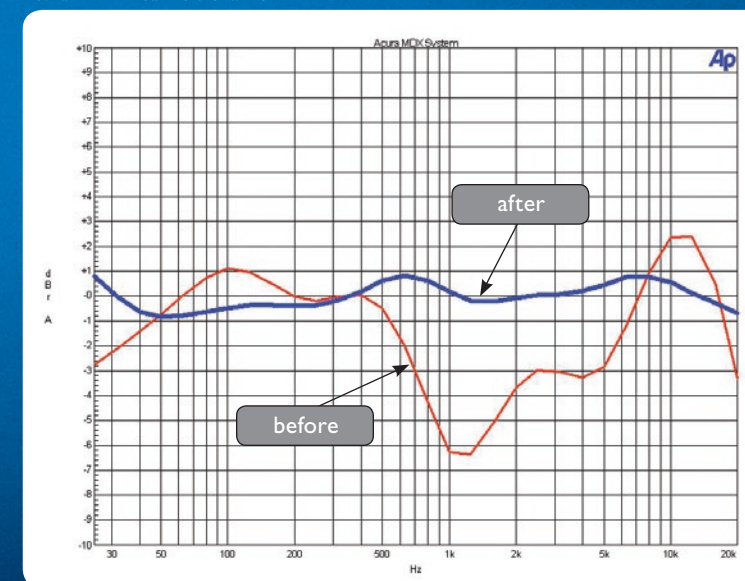
Here are some examples of factory system equalization, from a 2001 Acura® MDX with a factory-installed base system and from a 2002 Volkswagen Jetta® with a Monsoon® factory audio upgrade. In both cases, the CL44Idsp makes a huge difference in sound quality. **In each example, the red line shows the factory unit's frequency response (with all tone controls set flat) and the blue line shows the frequency response after CleanSweep® correction.** Note how front and rear channels are equalized differently in the Acura® system and how the CL44Idsp is able to correct the response of each channel independently.

Acura® MDX Front Left Channel:



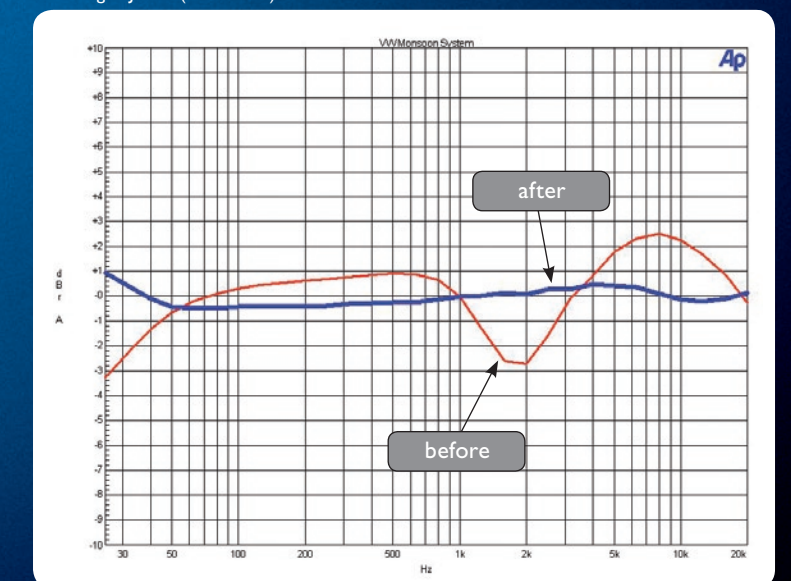
Result: CL44Idsp corrects the response to within +/- 1dB

Acura® MDX Rear Left Channel:



Result: CL44Idsp corrects the response to within +/- 1dB

Volkswagen Jetta® (Monsoon®) Front Left Channel:



Result: CL44Idsp corrects the response to within +/- 1dB

Integrate.

CLEANSWEEP® PRODUCT LINE OVERVIEW

CleanSweep® CL-SSI Signal Summing Interface

- Sums multiple, filtered OEM signals to full-range for use with the CL441dsp.
- 2-way mode: sums an OEM subwoofer signal to front and rear OEM high-pass signals, creating front and rear full-range stereo signals (illustrated below).
- 3-way mode: sums OEM low-pass, bandpass and high-pass signals, creating a stereo pair of full-range signals.
- Level-setting indicators allow the user to quickly balance signal levels without additional equipment.
- Differential-balanced inputs ensure noise immunity and compatibility with a wide range of OEM source units and amplifiers, including those with load-detecting startup logic.
- Includes a defeatable signal-sensing turn-on circuit.

Front & Rear Full-Range Outputs to CL441dsp



New for 2006!



OEM Front Signal OEM Rear Signal OEM Sub Signal
(2-Way, 4-channel mode shown)

The Original CleanSweep® CL441dsp OEM Audio Interface with Automatic Digital EQ

- Accepts virtually any analog OEM audio signal, from low-voltage line-level to high-power amplified speaker level, with fully automatic level setting.
- Automatically analyzes and corrects the OEM frequency response using 120 bands of digital equalization (30 bands per channel).



- Sends corrected signals to your aftermarket amplifiers via two pairs of preamp outputs (with 8 volts of unclipped output capability) and provides a master volume control.
- Manages system turn-on via intelligent signal-sensing circuitry.
- Allows the addition of an aftermarket stereo source to the system (MP3 player, DVD system, game console, satellite radio tuner, etc.).

Clean front and rear preamp-level outputs to your aftermarket amplifiers



Powerful DSP processor automatically corrects the factory source unit's frequency response to deliver exceptional aftermarket audio performance.

CleanSweep® CL-SES Source Expander Switch

- Expands any single Aux Audio Input to accept up to three stereo sources.
- Ideal for use with the CleanSweep® CL441dsp or any aftermarket source unit.
- Provides a level-trim control for each source to aid in achieving equal sound levels between sources.
- Advanced CMOS switching for pristine sound quality and reliability.
- Automatic Mode: uses signal-sensing to switch between source units.
- Manual Mode: uses the included remote push-button to switch between sources.
- Differential-balanced inputs provide superior noise immunity.

To Aux Input

Connect additional source unit here (or up to three with CL-SES).

Connect front & rear factory audio signals here (or outputs of CL-SSI).

New for 2006!





CleanSweep® CL-SSI – Summing Made Simple

Until now, summing filtered OEM audio signals has involved using products intended for other applications in creative ways (typically involving lots of cables, y-adaptors and other complicated means). Here is a better way...

The CleanSweep® CL-SSI is the industry's first dedicated signal summing interface and is easily configured to merge 2-way or 3-way OEM signals prior to sending them into a CL441dsp for response correction. This makes it the perfect choice for integrating with "premium" OEM sound systems that do not present full-range audio signals.

Mission:

To sum multiple, filtered OEM signals to full-range for use with the CL441dsp.

Features and Capabilities:

2-way or 3-way Summing Capability provides exceptional application flexibility without the need for y-adaptors, LOC's or any other external accessories.

In 2-way mode, the CL-SSI will sum the OEM subwoofer signal(s) to both front and rear OEM high-pass signals, creating front and rear, full-range stereo signals.

(See Example A)

In 3-way mode, the CL-SSI will sum the OEM low-pass, bandpass and high-pass signals, creating a stereo pair of full-range signals.

(See Example B)

Defeatable Signal-Sensing Turn-On Circuit allows the CL-SSI to turn on an entire aftermarket audio system when signal is sensed at its inputs.

Intuitive Level-Setting Indicators allow the user to quickly balance signal levels without additional equipment. Each input section features a green LED optimum level indicator flanked by LED's indicating "Too Low" or "Too High". This allows for quick and accurate level matching via the Level Trim controls in a matter of seconds.

Differential-Balanced Inputs ensure noise immunity and compatibility with a wide range of OEM source units and amplifiers, including those with load-detecting startup logic.



The CL-SSI has been engineered for fast, accurate and efficient setup through its on-board calibration features. No external test equipment is needed.

CleanSweep® CL-SSI

Input Range Switching

allows any combination of line-level or speaker-level signals to be used as inputs, permitting accurate level setting.



Speaker-level input position is compatible with OEM power chips that use load-detecting startup logic.

Signal-Sensing Turn-On Circuit

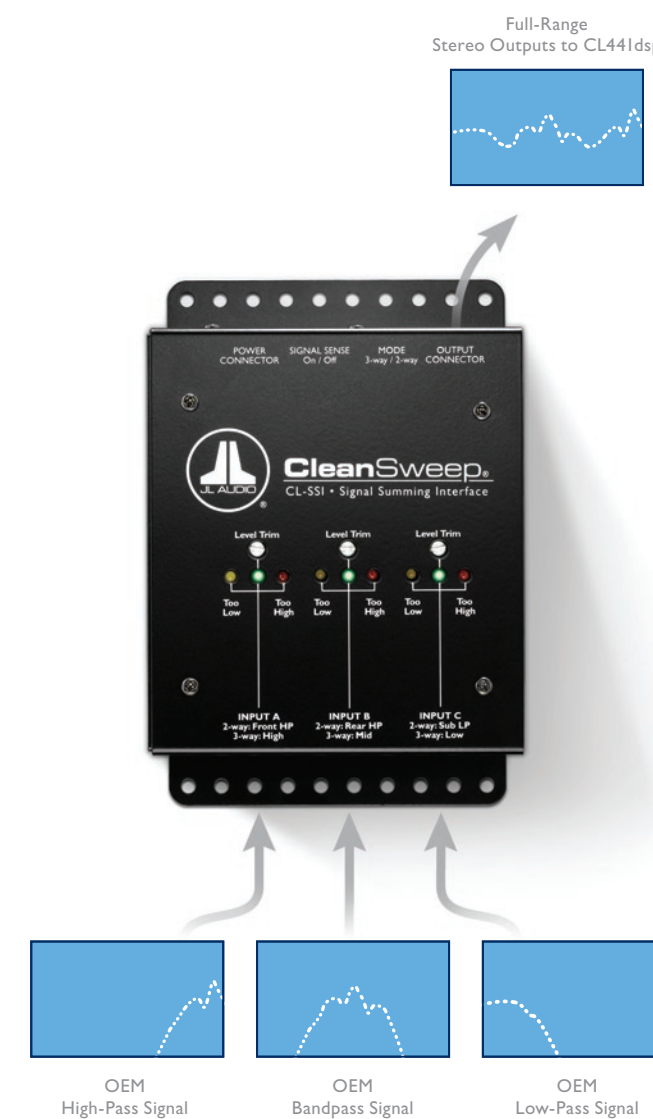
allows the CL-SSI to turn on an entire aftermarket audio system when signal is sensed at its inputs.



Includes output harness for direct connection to CL441dsp inputs.



Example A: 2-Way, 4-channel mode



Example B: 3-Way, 2-channel mode



CleanSweep®
CL-SES • Source Expander Switch



CleanSweep® CL-SES – Your car, your choices.

The CL-SES is a high-quality audio source switch that allows you to select from up to three input devices via automatic signal sensing or a manually operated switch. This gives you the freedom to install your choice of audio sources, without resorting to weak sounding FM modulators or cassette adaptors. The CL-SES can be used to expand the auxiliary input capabilities of the CleanSweep® CL44Idsp or any head unit that provides an auxiliary line-level input, including many OEM head units.

Mission:

To expand the input capabilities of any line-level auxiliary audio input circuit.

Features and Capabilities:

Expands any stereo Auxiliary Audio Input to accept up to three stereo sources.

Ideal for use with the CleanSweep® CL44Idsp or any aftermarket source unit with a line-level auxiliary input.

Differential-balanced inputs provide superior noise immunity.

Advanced CMOS switching ensures pristine sound quality and reliability.

Automatic Mode uses signal-sensing to switch between source units. You determine which source units have priority over others and select between them simply by turning them on or off.

Manual Mode uses the included remote push-button to switch between source units.

Level-trim controls for each source aid in achieving equal sound levels between sources.

Compatible with:

- MP3 players, including iPod®
- CD players
- DVD players
- Mini Disc players
- Cassette players
- Satellite Radio tuners
- Portable and Mobile TV systems
- Personal Computers and PDA's
- Game Consoles
- Navigation Systems
- Hands-free phone kits
- Camcorders
- Parking Assist Systems



JL AUDIO®

Ahead of the Curve™

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