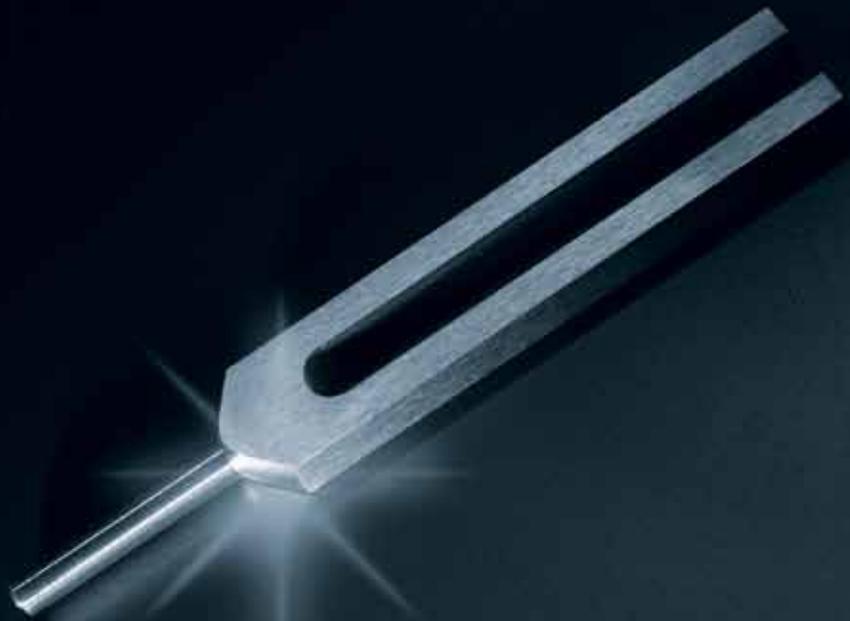


dbx-tv<sup>®</sup>



sound.  
intelligence.  
dbx-tv.

## Total immersion

# Great audio turns TV into an immersive experience

Today, television is the heart of home entertainment—with the potential for an enthralling, compelling experience that captivates everyone in the household. But, while today's TV pictures deliver on this potential, the sound is often sadly lacking. Without external amplifiers and speakers, the sound of today's TV sets falls far short of the picture.

dbx-tv®, with 25 years of audio experience and over half a billion installations around the world, now offers a family of software-only audio technologies that helps the sound live up to today's TV picture. dbx-tv's intelligent and affordable Digital-Signal-Processing (DSP) approach guarantees the best possible sound quality from any television set, large or small.

### Total Sonics™: Delivering enthralling audio to TV sets

dbx-tv's Total Sonics suite includes several intelligent, innovative DSP audio enhancement technologies that fit in most of today's TV SoC ICs. Combining level-sensitive equalization, dynamic range control, and 3D sound expansion, Total Sonics is an, efficient solution for TV makers to better match audio quality to today's brilliant pictures.

### Total Volume™: Controlling loudness in TV sets

Uncontrolled changes in volume levels are a top complaint of TV viewers everywhere. dbx-tv's Total Volume is the result of years of intensive R&D based on decades of audio compressor experience. It solves this annoying problem once and for all.

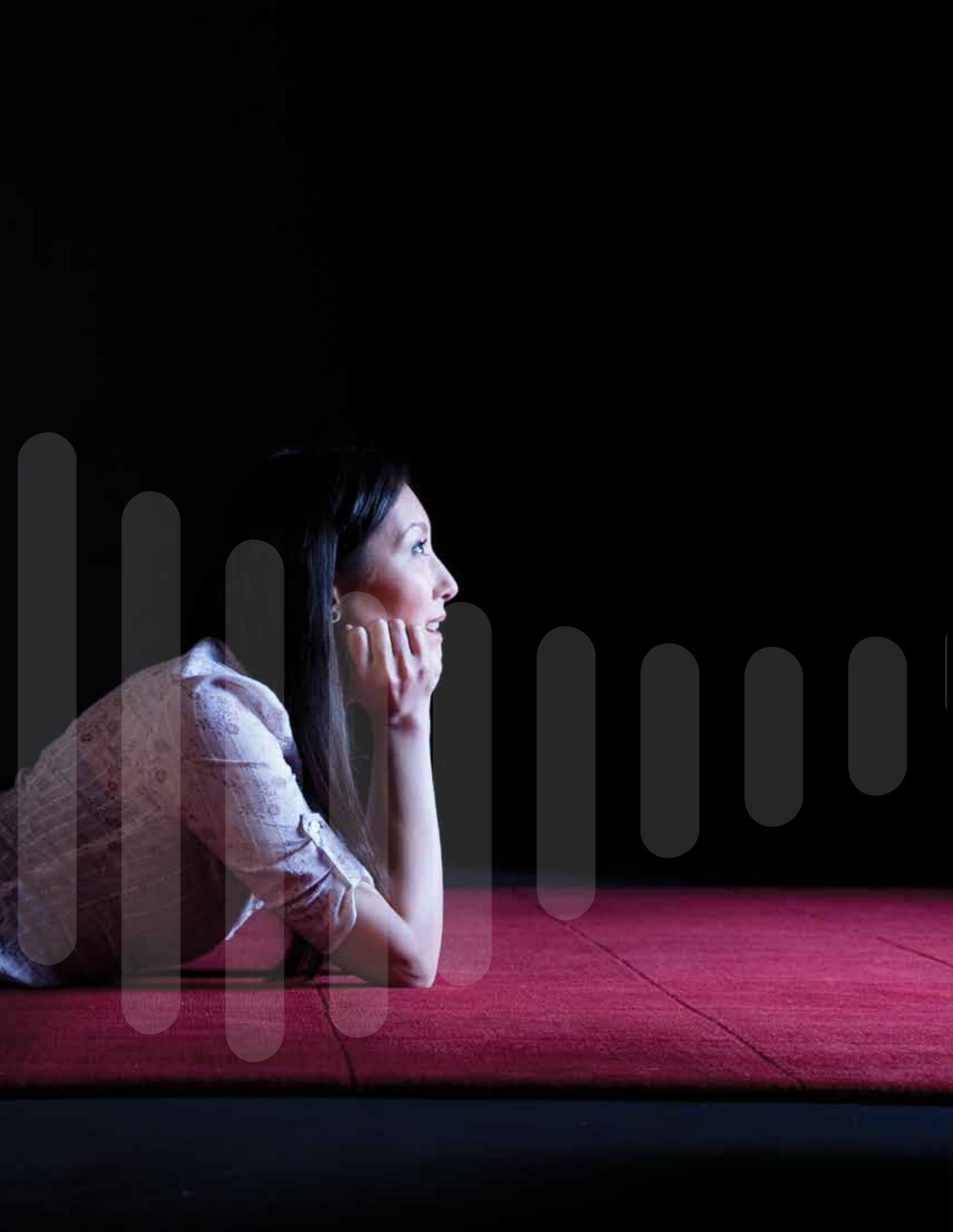
### Total Surround™: Expanding the sound stage

dbx-tv's Total Surround delivers surround sound effects from the two speakers already in a TV set. Sounds appear to come from above, to the side, and behind the listener without the need for additional speakers.

### Total Cal™: An indispensable set-up tool for manufacturers

Total Cal is an automated, PC-based tool for manufacturers to set up, customize, and control the over one-hundred parameters required by Total Sonics, Total Volume, and Total Surround. It makes getting the best possible sound from each TV model. It makes setting up TV sets fast, efficient, and easy.





# Total Sonics

dbx-tv Total Sonics



## **dbx-tv Total Sonics guarantees the best possible sound quality from any TV, large or small**

Total Sonics is software-only technology that runs in a relatively limited-capacity DSP, such as those available in many TV SoC ICs. Matched through Total Cal™ to an individual TV model, Total Sonics allows even tiny speakers to generate deeper bass than previously thought possible. Total Sonics corrects response and imaging anomalies caused by speaker size and placement and the cosmetic constraints of cabinet design. You and your customers will be amazed at the detailed, immersive sound that results.

## **Deep bass. Crisp highs. Natural sound.**

Total Sonics makes all this possible, on any TV, without any new hardware, using the audio DSP already in your sets. Get bigger, better sound out of your TVs at minimal cost with Total Sonics from dbx-tv.



# Total Sonics' intelligent core technologies

## **dbx-tv dynamic equalization**

- Customized frequency response correction with dynamic level-dependent bass boost
- Generates the maximum bass possible with any speaker without overload
- Addresses errors caused by speaker size, placement, cabinet design
- Delivers the sonic results you desire through tailored response targeting

## **dbx-tv 3D sound**

- Dynamic psycho-acoustic filters
- Broadens and deepens acoustic image from two-speaker systems
- Corrects for poor speaker placement
- Won't over-enhance already processed material

## **dbx-tv dynamic range control**

- Sophisticated dynamics processor tailored to match the audio system
- Optimizes sound within limited dynamic range systems
- Eliminates speaker overload and amplifier clipping
- Ensures dialog intelligibility on all program material



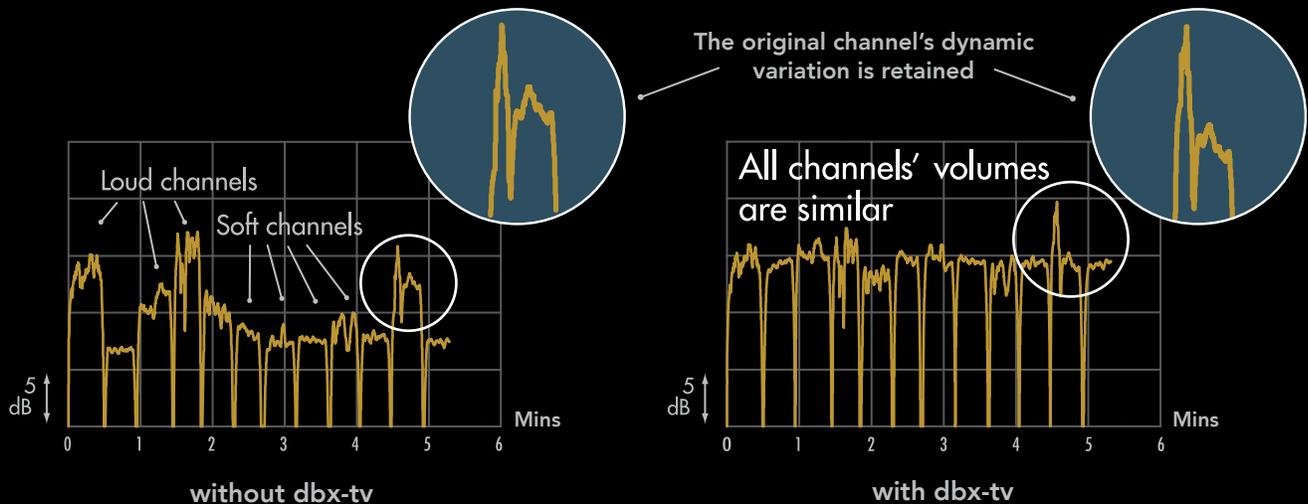
# Total Volume

## dbx-tv Total Volume solves all TV loudness problems

Total Volume eliminates the constant need to reach for the remote to adjust TV volume. By taming loudness spikes and clarifying inaudible dialog, Total Volume creates a more consistent and enjoyable listening experience from even the most difficult source material. Total Volume solves the problems caused by loud commercials, switching channels, varying input sources, and changes in surround processing or program dynamics.



### TV channel loudness levels



### **Total Volume is intelligent and simple, yet versatile and effective**

- Configurable to suit a wide variety of viewing conditions:
  - Normal mode** tames commercials and channel changes while largely preserving artistic dynamic intent
  - Night mode** allows quiet listening without losing dialog or disturbing sleeping children—even through explosive sound effects in action thrillers
  - Movie mode** provides maximum dynamic range and realism without overload
- Preserves dialog intelligibility even at low volume settings
- Controls loudness changes triggered by excessive surround sound processing

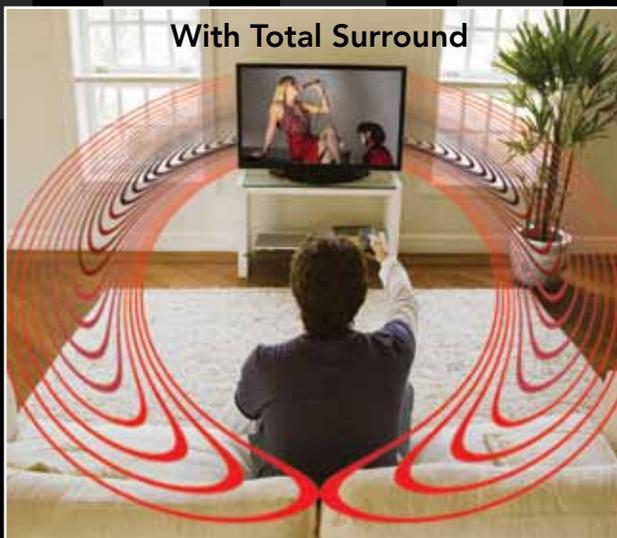
### **Total Volume's amazing performance is virtually free of artifacts**

- Maintains the tonal balance, spatial presentation, and subjective dynamics of the original sound
- Virtually no pumping and breathing
- No effect on lip-sync

### **Total Volume is incredibly efficient and flexible**

- Software only, requires no hardware changes
- Runs within DSP already available in most TV SoC ICs and many audio amplifiers
- Can be placed anywhere in the audio processing chain

# Total Surround



## dbx-tv Total Surround delivers immersive sound with just two speakers

While some TV viewers purchase additional speakers and distribute them around the room to enjoy theatre-like surround-sound, most viewers just watch TV. Using only the two speakers already in the TV, Total Surround's proprietary psychoacoustic algorithms amplify aural "cues" that make sounds appear beside, behind, and above the listener.

## Total Surround intelligently controls spatial enhancement

Total Surround's intelligent control software senses the spatial and surround cues already present in the source program and automatically adjusts its processing for the best result. This avoids over-processing material which has already been spatially enhanced. The result is a consistent and stable acoustic image, that maintains dialog intelligibility while immersing the viewer in the sound field.

# Total Surround broadens and deepens the acoustic image

Total Surround uses sophisticated Digital Signal Processing to form unique, proprietary psycho-acoustic filters that analyze two-channel program material. Total Surround identifies the essential portions such as dialog, direct sound, spatial cues, and surround. It then controls each of these elements individually, dynamically, and in real time to transform dull and lifeless TV sound into an enveloping sonic experience.

Optimized in its configuration by Total Cal, with the right program material, Total Surround moves the acoustic image beyond the speakers, filling the room with exciting sound that comes from all around you.

## Additional audio processing

In addition to dbx-tv's groundbreaking Total Sonics and Total Volume packages, we also offer traditional DSP (pure software) audio modules. We're your "one-stop shop" for all your TV sound processing needs.

### Virtual Surround

By exploiting our unique psycho-acoustic filters, dbx-tv Virtual Surround transforms dull and lifeless TV sound into an enveloping sonic experience using only two speakers. It automatically senses already processed material and adjusts its processing accordingly. And, dbx-tv Virtual Surround won't sacrifice dialog intelligibility as it delivers a wider, deeper, and more detailed sound field.

### Graphic EQ

Our 7-band Graphic EQ allows television viewers to easily adjust the sound to suit individual preferences for tonal balance. TV makers may choose fewer bands for low-DSP-power implementations.

### Pre-set EQ

We also offer fixed pre-set EQ tailored to different program material such as sports, news, video games, music, movies, etc.

### Bass/Treble Control

Familiar bass/treble tone controls provide simple means for viewers to make sonic adjustments.

### Stereo Synthesis

Our stereo synthesis processing creates a broad sound stage from mono program material.

### Volume Control

dbx-tv also offers an efficient and effective volume control. It can be customized to any desired volume taper.

# Total Cal

dbx-tv Total Cal



## dbx-tv Total Cal realizes the promise of Total Sonics, Total Surround, and Total Volume

Total Cal is a PC-based acoustic measurement and configuration tool. It simplifies and shortens calibrating a TV's audio system by automatically assessing the TV's audio hardware capabilities and adjusting its audio performance to suit the set maker's objectives.

Total Cal comes complete with calibrated measurement microphones, a powerful Windows computer, and dbx-tv's sophisticated software to enable TV makers to get the best possible sound from their TV set hardware configuration.

## Why Total Cal?

With over 100 individual parameter settings, Total Sonics, Total Surround, and Total Volume are extremely flexible and adaptive. But, optimizing each parameter would normally take an experienced audio engineer several hours. Thanks to the Total Cal system, you don't have to be an audio expert to achieve excellent results.

In mere minutes, Total Cal acquires data about the set and generates all the settings required to optimize Total Sonics, Surround, and Volume's many components. Set makers can even specify a desired "sonic signature", and Total Cal will achieve it across an entire product line.

Total Cal makes it easy for Total Sonics to deliver the best possible sound from all your TV models.

## How Total Cal works

Total Cal's operations are divided into four sections: Data Acquisition, User Preference, Solution Generation, and Audible Evaluation.

### Acquiring Data

Total Cal sends a carefully tailored series of signals to the TV under test. The system records the TV's acoustic output via three dbx-tv Measurement Microphones (custom designed for dbx-tv by Earthworks®). Measurements are made in a normal listening room. There's no need for an anechoic chamber. The process takes only a few minutes.

### Setting User Preferences

dbx-tv knows that "flat" response is not always the goal. To achieve satisfying sound, designers must balance many factors, including low-frequency extension, maximum playback level, and distortion at maximum levels. Different markets may require different sonic characteristics. Total Cal provides a way for manufacturers to set these sonic "goals" to achieve consistent performance across a product line, despite variations in individual TV models. Total Cal can also adapt the sonic configuration of one TV chassis for several different markets.

### Storing the Results

All these settings may be stored individually or together under the user's choice of names. This makes it easy to apply specific targets or groups of targets to a series of models to serve the needs of specific markets.

### Configuring the Solution

Finally, Total Cal runs through an adaptive, genetic algorithm to configure Total Sonics, Total Volume, and Total Surround for a specific stored system response. Within minutes, Total Cal generates all the parameter settings required for dbx-tv Total technology to achieve the desired results for each measured system response.

### Listening to the Result

Total Cal's Evaluation Control Panel allows users to easily turn on and off individual Total Sonics, Total Volume, and Total Surround components. It's easy to switch among solutions at the click of a mouse. This enables manufacturers to quickly evaluate the results Total Cal delivers and choose the best response to suit market requirements.

### The Bottom Line

Total Cal's control over Total Sonics, Total Volume, and Total Surround delivers the best possible sound from from each and every one of your TV models.



Total Cal operates in an ordinary room. No anechoic chamber is required

## Who is dbx-tv?

dbx-tv was first created in the early 1980s by the same cutting-edge audio engineers who developed the famous dbx audio compressors—which remain the gold standard in recording studios and live performances today. The Emmy®-award-winning dbx-tv audio broadcasting system was adopted as the standard for analog (BTSC) broadcasts in North and South America, and has been used in over half a billion TV receivers worldwide.

Today, dbx-tv now includes a broad range of digital-audio signal-processing technologies available exclusively under license from THAT Corporation. A growing number of TV IC makers support dbx-tv's worldwide decoder and audio enhancement technologies.

All dbx-tv audio processing technologies are based on our 25-plus years of audio expertise. We give you a path to consolidate all your audio enhancement needs with one trusted intellectual property provider.

To learn more, please contact us at

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Making Good TV Sound Better™



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