

IC²

IC Squared

IC2-FR & IC212S-FR



DIGITALLY STEERABLE LOUDSPEAKER SYSTEMS



IC² New Directions In Loudspeaker Design

(IC Squared) digitally steerable loudspeaker arrays provide an elegant solution to long standing acoustical problems. Combining the advantages of point source design with the control and flexibility of digitally steered array technology, IC² brings beam steering to high power applications.

The result is unsurpassed vertical pattern control - essential for delivering intelligible speech in reverberant spaces. IC² beams can be steered up or down while the stack or array remains hanging straight.

Four 8-inch, audiophile quality, low frequency transducers coupled with four 1-inch exit Titanium Nitride coated high frequency drivers produce surprisingly high sound levels. Each transducer has it's own powerful amplifier channel and DSP. When combined with the RHAON control software the user can create multiple tight beams of sound, steering them only onto the audience and away from reflective surfaces. Array modules can be used as stand alone high performance loudspeakers, in small arrays when additional control and output are needed, or flown in large multi-cabinet arrays when even more output and control are required.

Digitally Steerable Array Technology

Steerable by $\pm 30^\circ$ in the vertical plane - "dead" hang the array and adjust the aiming with the RHAON control software.

Variable Beamwidth Control

Vertical opening angles are adjustable from 10 to 80 degrees per beam, even from a single cabinet. With multiple cabinets beams as tight as 5 degrees can be deployed.

Variable Acoustic Centers

Use a single acoustic center, or employ multiple beams with multiple acoustic centers positioned virtually anywhere within the array.

Self-Powered

Integral DSP controlled 8-channel Class D digital amplifiers provide 60 Hz to 20 kHz high level performance.

Powerful - High Output

A single cabinet can deliver up to 131 dB peak SPL at 1 meter, over 100 dB at 30 meters - and even higher levels from multi-cabinet arrays.



One-Touch Presets - Intuitive Software

RHAON empowered IC² arrays provide a full set of remote control and supervisory functions, along with the ability to store up to 10 preset setup configurations in memory.

Multiple Inputs - Greater Versatility

IC² cabinets offer a wide range of inputs; standard analog, AES/EBU serial digital and multi-channel CobraNet digital audio.

Advanced Transducers

Audiophile quality transducers with highly efficient voicecoil and magnet designs ensure that IC² offers unsurpassed audio quality while offering all the benefits of a high-output steerable array.

Point Source Clarity • Line Array Power

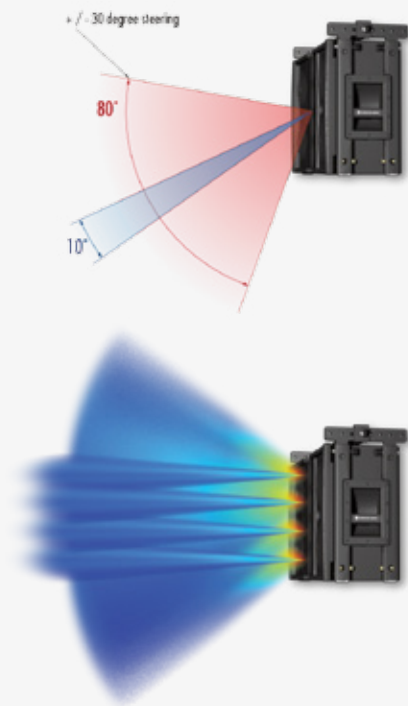
IC² loudspeaker systems are both powerful and versatile. As a stand alone loudspeaker, the IC² will deliver over 100 dB SPL of audiophile quality audio at 100 feet.

Digitally controlled, the output of an IC² can be delivered as a single, well controlled, vertical beam as tight as 10 degrees or as wide as 80 degrees. The beam center can be aimed over a 60 degree vertical range, up or down by 30 degrees. Horizontal dispersion is a consistent 120 degrees.

The IC² output can also be designed into 2, 3 or even 4 sonic beams, each having its own acoustic center and each individually shaped and aimed - all adjustable from a remote computer over a simple Ethernet connection.

When combined with other IC² loudspeakers in a vertical stack, IC² becomes a powerful digitally steerable line array system whose output can be precisely shaped and aimed digitally without altering the straight line configuration of the array. Conventional line arrays are aimed by changing the array's shape into a curve or "J" configuration - shapes that are more difficult to fly and aim, occupy more space and often interfere with sightlines.

IC² arrays always stand or hang straight and tall, while providing precise control over the array's output. Up to 20 IC² array modules and IC212S subwoofers can be flown in a single powerful array.

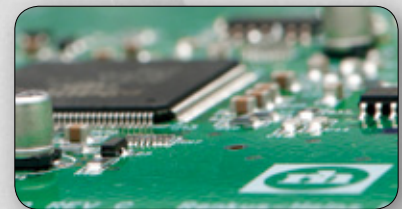


Integrated Audiophile Electronics

Each IC² loudspeaker cabinet is equipped with a high power 8-channel Class D digital amplifier module delivering 2000 Watts RMS of audiophile quality audio.

Each amplifier is integrated with RHAON electronics offering flexible input configurations and powerful DSP signal processing. IC² speakers come as standard with Analog, AES/EBU and CobraNet inputs allowing the most advanced connectivity available in the market.

Only the highest quality components are used to further assure years of trouble free performance.



Safe & Simple Hardware

IC² Fixed Installation cabinets fly safely and easily with integral metal strips and tough interconnect bars ensuring continuous metal-to-metal integrity throughout the array.

A simple R-HANG pickup bar allows an IC² array to fly from a single point with the whole IC2-FR array requiring less than 12" of depth.





IC2-FR Array Module

The IC2-FR array module is the core of the Renkus-Heinz IC² design concept. By itself it is a high-powered, high-performance point-source loudspeaker whose sonic output is digitally steerable. When stacked with other IC2-FR array modules, it becomes an even higher power digitally steerable line array with even tighter pattern control.

IC² arrays are unique as the array of loudspeakers doesn't have to be physically shaped into a curve or "J" shape to provide the coverage pattern needed to deliver the sound to the entire audience - IC² hangs straight while the coverage pattern is digitally controlled from a remote computer. A single IC2-FR array module can be divided into up to four separate beams and the acoustic center adjusted up or down.

IC² arrays with two modules can have as many as 8 separate beams, arrays with three modules can produce up to 12 beams, etc. and the acoustic center of each beam can be moved anywhere along the length of the array.

Separate configuration setups for different size audiences or seating arrangements can be stored as presets and recalled at any time.



IC212S-FR Dual 12" Subwoofer

The IC212S-FR is an ideal companion to IC² array modules in any installation that needs outstanding low frequency performance. Their dual high-power 12" woofers deliver outstanding low frequency impact in a design that maximizes the efficiency of their cutting edge woofer technology and Class D digital amplifiers.

Their low frequency output extends down below 42 Hz and delivers a peak SPL output of 136 dB providing a solid foundation for any musical performance.

IC212S-FR subwoofers can be ground stacked and used as a sturdy base for one or more IC² array modules, flown as separate low frequency arrays, or flown at the top of full range IC² arrays keeping the entire system off the floor.

Together, IC2-FR array modules and IC212S-FR subwoofers provide a high power full-range system capable of handling the most demanding musical performances especially in difficult acoustical environments.

High Power • Digitally Steerable Line Arrays

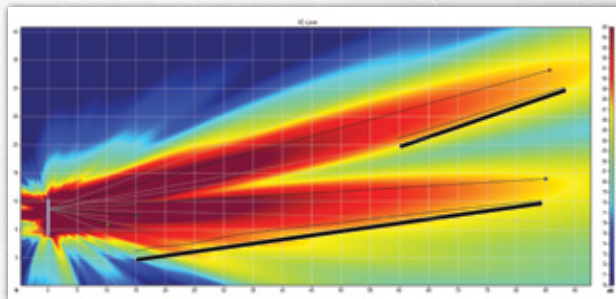
IC² arrays are unique, unlike other line arrays that need to be articulated and contoured to fit the audience, IC² hangs in a straight line, their output being digitally steered and shaped to precisely fit the audience areas. This straight line configuration allows it to easily blend into the background where they won't block sightlines or compromise aesthetics.

Digital steering of the array's output provides an unprecedented amount of control. Each module's output can be turned into as many as 4 separate sonic beams with each beam having the same or separate acoustic centers. Individual beams can be as wide as 80 degrees or as narrow as 10 degrees and can be aimed up or down by 30 degrees. Each module's output can be combined with that of adjacent modules into a single coherent point source, or treated and aimed individually.

Setups for different size audiences, different events and different seating arrangements can be stored as presets and recalled at any time making IC² extremely fast to setup and tune.

IC² arrays are extremely powerful. A single module can produce over 100 dB at 100 feet and as many as 20 modules can be stacked together when higher sound pressure levels are needed to cut through crowd noise or to cover larger areas.

IC² arrays deliver highly articulate, musical sound throughout the entire listening area whether in a small ballroom or a huge outdoor stadium.



RHAON simulation of IC² with multiple beams



Scalable & Versatile

Integral flying hardware supports up to 20 array modules and subwoofers.

Flexible Inputs

Choose from two analog inputs, AES / EBU inputs and multi-channel CobraNet digital audio. Remotely control with a PC or with third party controllers, such as those supplied by Crestron.

Audiophile Quality Transducers

High efficiency woofers coupled with advanced Neodymium high frequency compression drivers ensure superior audiophile performance.

Integral Class D Digital Amplifiers

Integral DSP controlled 8-channel Class D digital amplifiers provide 60 Hz to 20 kHz high level performance.

RHAON Control & Supervision

DSP processing of all elements, and supervision of critical functions, puts unparalleled control at your fingertips via an intuitive PC interface.

Applications

- Sports Arenas
- Outdoor Stadiums & Ball Parks
- Band Shells
- Ballrooms
- Theatres & Auditoriums
- Houses of Worship
- Performing Arts Centers

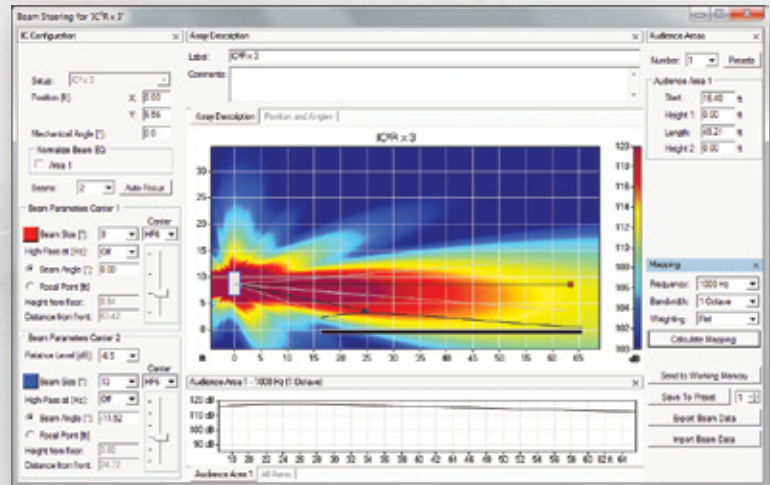
Powerful Algorithms • Intuitive Interface

The software algorithms that shape and aim the output of an IC² array are complex, but the user interface is intuitively simple. Our beam steering software, an integral part of RHAON, lets you model the audience area, then drag and drop beams until coverage is optimized. RHAON then calculates a set of FIR (Finite Impulse Response) filters that control the array's beams. At installation time, simply download the full set of FIR filters from your computer to the IC² modules over the Ethernet network.

The beams can be easily adjusted from your computer after the IC² array is installed with no need to re-hang or re-aim the speakers themselves.

With optimized coverage, everyone from the front rows to the rear of the audience enjoys consistently articulate and musical sound at comfortable listening levels.

RHAON also allows you to adjust the output level, EQ, high and low frequency shelving, muting and delay of IC² arrays from your computer.



RHAON

RENKUS-HEINZ AUDIO OPERATIONS NETWORK

RHAON gives you maximum control of:

- Real time digital audio distribution over standard Ethernet using proven CobraNet technology to deliver multiple channels of high quality digital audio over a single CAT 5 cable.
- A powerful DSP inside each IC² array on the network. Adjust eight bands of parametric EQ, high and low frequency shelving filters, input level control, muting and delay in real time; store up to 10 preset configurations.
- Our beam steering software with its ability to individually shape, steer and control multiple sonic beams to cover almost any audience area.
- Monitoring and supervisory functions. RHAON tracks critical operating parameters such as signal clipping, amplifier output voltage and current and temperature with automatic alert functions.



Connect



Control



Supervise



IC2-FR



IC212S-FR

Sensitivity: 1.0 V (for rated power output)

Freq. Range: 60 Hz to 20 kHz

Max SPL: 131 dB peak @ 1 m, +100 dB peak @ 30 m

Horiz. Dispersion: 120°

Vert. Opening Angle: 10° to 80° (computer adjustable)

Aiming Angle: Adjustable from -30° to +30°

Beam Control: Effective down to 800 Hz; lower when stacked

№. Transducers: Four 8" audiophile quality cone transducers
Four 1" HF titanium nitride HF drivers

№. Amp. Channels: 8

Dimensions: 18.5" H x 28.5" W x 11.25" D
(47 cm x 72.4 cm x 28.6 cm)

Weight: 126 Lbs (58 Kg)

Power Required: Universal 90/260 VAC, 50/60Hz. 29 VA Idle;
2000 VA @ rated power output

Hanging Method: R-Hang Flying hardware
Metric #10 attachment points

Inputs: Analog Audio & AES Inputs: Looping XLR
(female in, male out) and Phoenix 6-pin
(looping 3-in, 3-out)

Controls: Mute button
Up & Down Output Level push buttons
10 dB Input pad (on Analog 1 input)
Push-To-Reset circuit breaker, Preset Selector

Computer Controls: Gain, Mute, On/Standby, Input Selection
Compression, 9-Band Parametric EQ,
Shelving & Roll-off Filters, Delay

Status Indicators: Power, Signal, Overdrive, Thermal, Mute,
Input Pad, Failure, Digital Readout

Power Connector: Powercon locking connector

Finish: Black or white paint; custom color available

Enclosure: Finnish birch, perforated steel grill

Network Digital Format: 16, 20 or 24 bit PCM; 48 or 96 kHz sample rate;
selectable network latency

DSP/AMPLIFIER

Type: 8-channel, Class D amplifier/DSP processor

Power Rating: 250 Watts RMS per channel

Freq. Range: + 3, - 3 dB, 60 Hz to 20 kHz

THD Distortion: < 0.05% typical

Hum & Noise: <100 dB (A weighted)

Sensitivity: 1.4 V (for rated power output)

Freq. Range: 42 Hz to 120 Hz

Max SPL: 136 dB peak

№. Transducers: Two model SSL12-17, 12" woofers, 700 W pgm
@ 8 Ohms (each)

Dimensions: 18.5" H x 28.5" W x 23" D
(47 cm x 72.4 cm x 59 cm)

Weight: 160 Lbs (73 Kg)

Power Required: 90/136 V or 180/260 V AC, 50/60Hz
13 A @ 120 V, 6.5 A at 240 V

Hardware: 16 Metric M10 attachment points, interlocking
IC² flying hardware

Enclosure: Finnish birch, perforated steel grill

Finish: Black or custom color paint
Weather resistant (black TuffTex)

Power Connector: Powercon locking connector

Inputs: Analog audio & AES: looping XLR (female in,
male out) Phoenix 6-pin (looping 3-in, 3-out),
CobraNet: dual RJ45 connectors (for CAT 5
cable)

On-Board Controls: Mute button, Up & Down Output Level,
10 dB Input Pad (on Analog 1 input)
Push-To-Reset circuit breaker

Computer Controls: Gain, Mute, On/Standby, Input Selection
Compression, 9-Band Parametric EQ,
Shelving & Roll-off Filters, Delay

Status Indicators: Power, Signal, Overdrive, Thermal, Mute,
Input Pad, Failure

Digital Format: 16, 20 or 24 bit PCM; 48 or 96 kHz
sample rate; selectable network latency

PM-2LR AMPLIFIER

Type: Class D amplifier/DSP processor

Power Rating: 2 x 850 W RMS

THD Distortion: < 0.05% typical

Hum & Noise: <100 dB (A weighted)



Renkus-Heinz, Inc. Headquarters, Foothill Ranch, California, USA

Working together, there's no problem we can't solve, no schedule we can't meet, no project we can't take to a higher level of excellence, from the White House to the Olympic SuperDome, from corner churches to major metropolitan concert halls. Much as we love technology, our greatest satisfaction comes through helping people communicate through music, dance, theater, or the power of a new idea brilliantly expressed. When we make those kinds of connections, there's nothing more exciting – or more powerful.

