

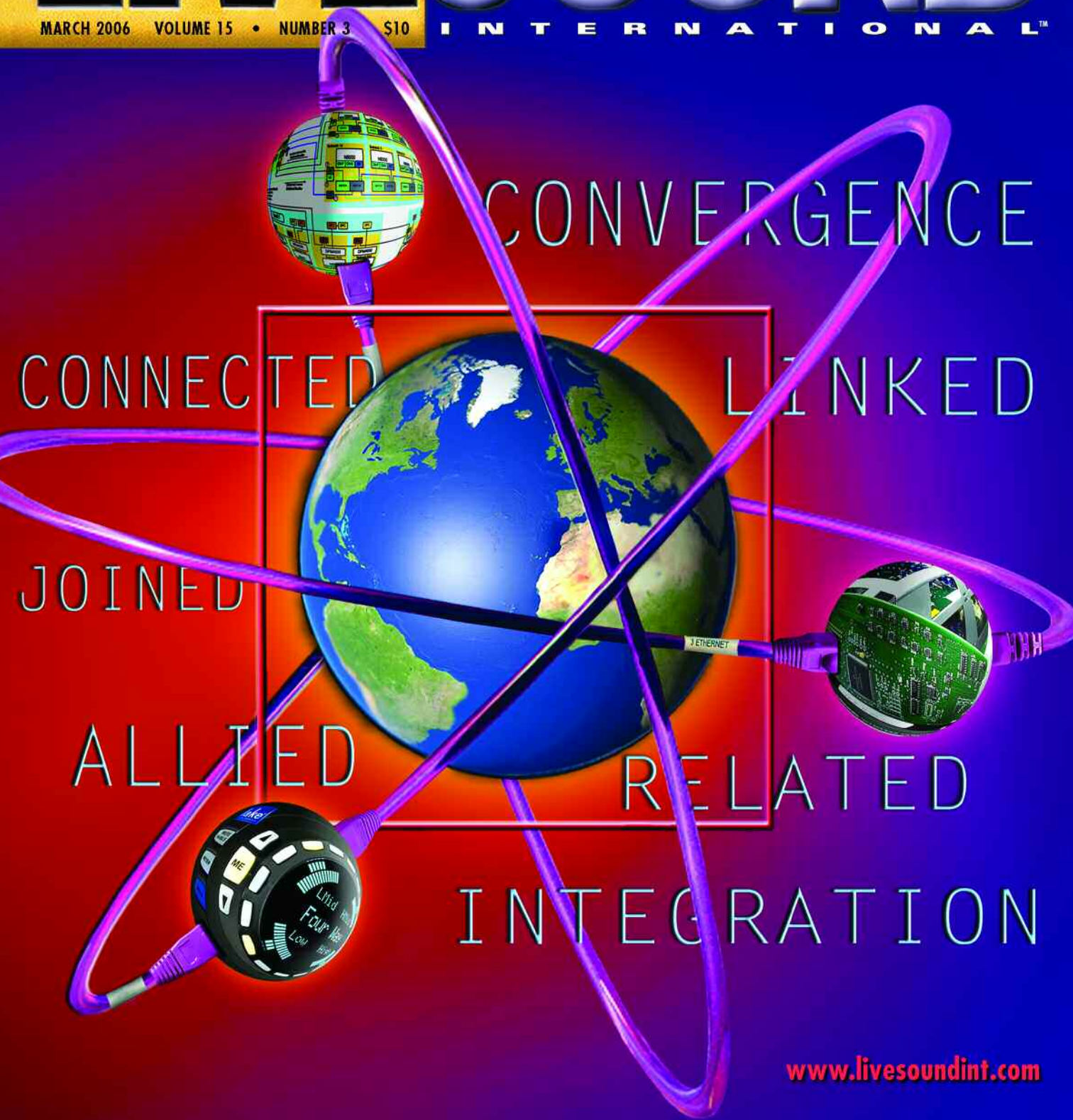
INSTALLATION ■ CONCERT ■ THEATER ■ CORPORATE AV ■ WORSHIP ■ CLUB ■ RECORDING

THE JOURNAL FOR LIVE EVENT TECHNOLOGY PROFESSIONALS

LIVE SOUND

MARCH 2006 VOLUME 15 • NUMBER 3 \$10

INTERNATIONAL™



www.livesoundint.com

Total Audio Solutions

Electro-Voice offers total solutions with NetMax and IRIS-Net

By Ethan Wetzell

This Factory Direct was submitted by Electro-Voice. Live Sound makes every effort to eliminate any use of marketing inspired hyperbole.

Audio professionals have the challenge of designing systems to satisfy the increasing requirement for feature-rich, higher quality audio systems that are more intuitive and ergonomically correct, yet simultaneously keep with the current technological state of the art. One area of increased development is that of integrated systems, with networkable and software controlled systems rapidly becoming a popular choice. But, at the end of the day, with all of the options that are available, what is the best choice?

Electro-Voice (EV) has made major investments in this trend with the development of the NetMax, a modu-

lar audio routing and control hardware and the IRIS-Net software platform. NetMax is a hardware system that provides analog and digital audio routing; mixing and matrixing; CobraNet audio networking; digital signal processing (DSP); and a variety of options for data connection and control, TCP/IP networking, remote control and supervision. In addition, the IRIS-Net software platform integrates the control and configuration of many products under the Telex Pro Audio umbrella into a single, open-source software application.

IRIS-NET

EV's IRIS-Net software is the latest version of the I.R.I.S. (Intelligent Remote-Integrated Supervision) audio control and supervision software platform. First developed in 2001, it was released in 2002 as the control, configuration and monitoring platform for the proprietary Precision Series DSP Remote Controlled Amplifiers. Since then, IRIS has been used in many high profile applications including 2005's Houston Rodeo, Live 8 and on Kenny Chesney's *Somewhere in the Sun* Tour.

IRIS-Net provides a complete set of tools for real-time control and monitoring of an audio system down to the transducer level. Details such as signal levels, component temperature, impedance, output current and volt-



The EV NetMax N8000 audio processing and matrix system.

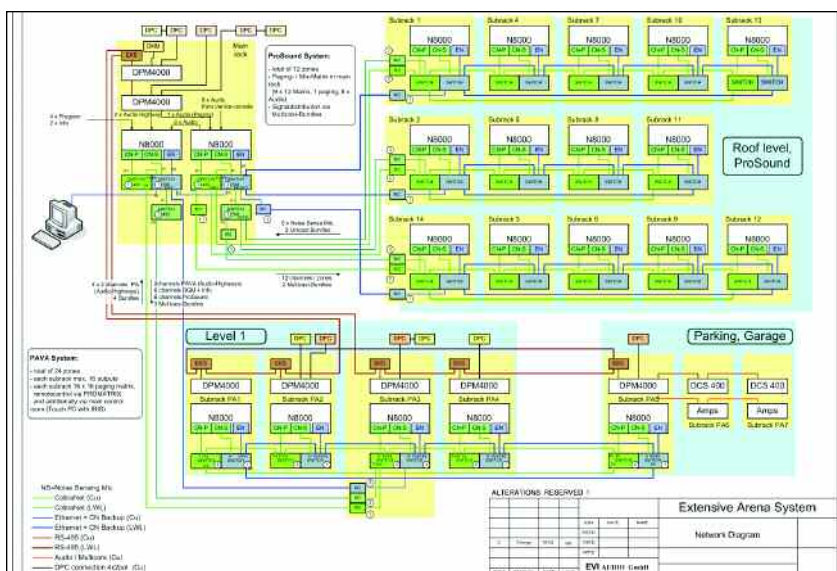
age, fault conditions and other parameters can be monitored in real-time.

A useful feature of IRIS-Net is the One Button System Check, that allows an operator to see a detailed overview of the operational status of the entire PA system in less than a minute. IRIS is able to run an impedance sweep of all components connected to an amplifier including connectors, cable, crossover networks and transducers, and then store a reference measurement of the system as it exists, in a given configuration, and in a given environment. This reference is subsequently stored in the system and can be exported to external files on a control PC for future reference. User definable tolerances can be applied to these references allowing an operator to customize the system supervision for their specific application. It then compares a real-time measurement against these references and is able to alert the operator at any time a tolerance is exceeded.

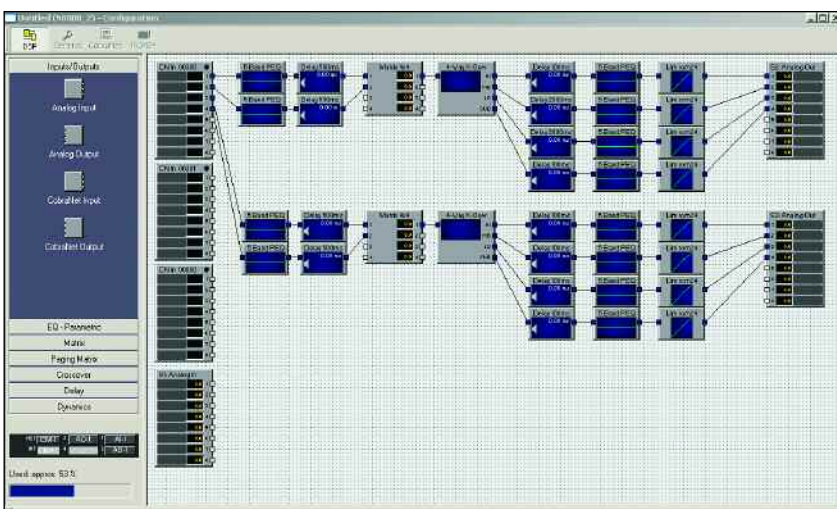
The core of IRIS is based on a drag-and-drop graphic user interface that is completely customizable by the programmer. A library of control and monitoring graphical user interface (GUI) elements is provided, and includes items such as faders, LEDs, meters, buttons and display elements. The function and behavior of these elements is completely customizable for control surface design.

Today, one of the most frustrating things for an operator, is to have access to the tools and features of a piece of technology, only to find that they are too complicated to be of any practical use. As such, IRIS allows the use of custom graphics and text boxes in addition to the on-board control elements. The combination of these GUI tools allows a programmer to develop a control surface that is effective, easy to operate and use for any customer, regardless of the user's technical knowledge.

Additional customization and system security is available through the use of GUI layers within an IRIS project. Up to 32 layers can be created within a project to allow a variety of different options in which the system can be monitored and controlled. Multiple users can be created within IRIS, each with a unique password



An extensive arena system design incorporation NetMax.



IRIS-Net DSP.

and access to specific layers of the GUI. This allows a programmer to create a control surface that is specific to the needs of any, and all, operators of the system. For example, the system administrator will have access to all aspects of the DSP and system configuration, while other layers can be created and password protected for less technical users, thus allowing them to access elements such as preset recall, muting and levels, but prevent them from changing critical details such as crossovers and limiters.

From its inception, IRIS was created as an open architecture platform that would be modular and expand-

able to accommodate current and future products and systems. Additional products are added to the IRIS shell through the creation of .DLL files, which are then integrated with the IRIS core. Over time, the products IRIS will be able to control will expand throughout the Telex Pro Audio family to include Electro-Voice, Dynacord, Klark Teknik and Midas. In addition, the IRIS-Net shell is designed to be used by a variety of third party hardware to control and monitor any type of product or subsystem needed in a typical audio system design. Software developer kits will also be soon available to allow

Factory Direct

the authoring of custom .DLLs for integration into the IRIS shell of these third party products.

NETMAX – A FLEXIBLE HARDWARE PLATFORM

The latest addition to the IRIS-Net platform is the NetMax N8000 audio processing and matrix system. The name NetMax is taken from “Networkable Matrix” and, as the name implies, provides a completely network enabled solution for audio distribution, control, processing and supervision.

The N8000 is a modular system that allows for a variety of different hardware configurations. The chassis has four card slots that can be populated with any combination of eight-channel input or output modules in analog or digital format. Cards can be added or removed without removing the cover of the unit, thus allowing the addition, or exchange of cards, without removing the chassis from a rack.

The AI-1 analog input card and AO-1 analog output card feature balanced Euroblock connections with a dynamic range of 117 dB and 118 dB respectively. The DI-1 digital input module features Euroblock and optical connectors, and supports both AES/EBU and S/PDIF formats at 32 kHz-192 kHz sampling rates. All

inputs are equipped with high quality sample rate converters and signals are processed internally with a 48-bit word length.

A separate slot is provided for the optional CM-1 CobraNet card. The CM-1 card supports up to 32 channels of simultaneous digital input and output and provides primary and secondary 100Base-TX network ports to support redundant network designs. The CM-1 interface allows the transmission and reception of multiple audio channels at 48/96 kHz sample rate with a 16, 20 or 24-bit word length, as well as clock and control data, on a single cable using standard Ethernet media and hardware.

When it comes to processing horsepower, the N8000 chassis is provided with 300 MIPS (million instructions processed per second) of on board processing power, with the option to add a DSP-1 DSP expansion card to add another 300 MIPS to the processing engine. Additionally, each input and output card comes equipped with 100 MIPS of on board processing, making for a total of 1,000 MIPS of processing power available in a fully expanded chassis.

Accompanying the processing engine is a library of DSP processing objects available to the designer. These include multiple EQs and filters,



incorporating notches, shelves, high-pass and low-pass, band-pass and all-pass. A variety of crossover blocks, delays up to 2 seconds and multiple compression and limiting algorithms are also provided.

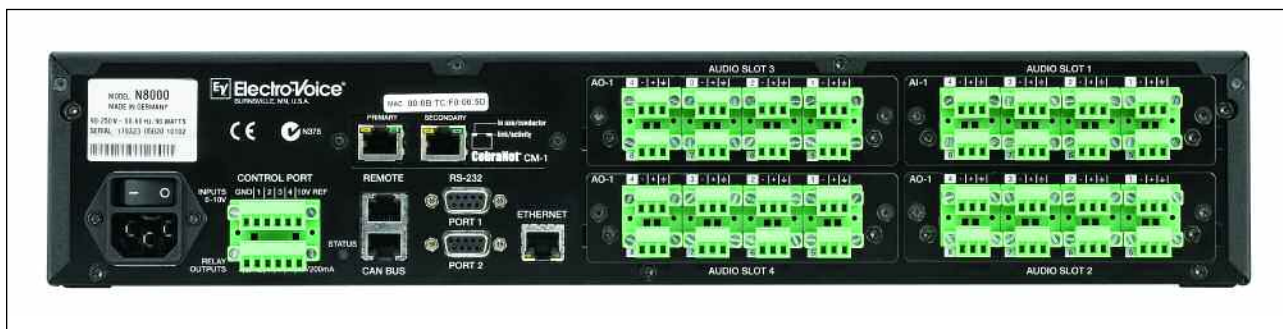
EV has also included a special loudspeaker DSP block that includes six bands of parametric EQ, crossover, time alignment, digital trim and mute, compression and limiting in a single DSP object. All of these elements are freely configurable, but this DSP block also allows the designer to import EV speaker presets from a library included with IRIS directly into a single block without needing to add and then program the DSP elements individually.

Of course, no digital matrix would be complete without matrix and routing options, and there is a wide variety to choose from, including standard crosspoint matrices, priority matrices, mixers and routers. The priority matrix provides the unique feature of being able to interface with a Dynacord ProAnnounce paging and background music system, to allow the control and activation of the matrix for routing of paging, alarms, chimes and prerecorded messages from a ProAnnounce paging console, or DTI2000 telephone paging interface.

The DSP configuration is performed using an intuitive drag-and-drop CAD-style interface within IRIS-Net. DSP objects can be added or removed, while a DSP resource meter keeps the designer alerted to the true amount of processing resources that are being used. In addition, IRIS and NetMax use an auto compiler for DSP configuration, so each time a new object is added, removed or modified, the project is compiled and the resource meter is updated. DSP configurations can be uploaded to the PC



NetMax Uncovered – The N8000 modular system loaded with I/O modules.



Rear panel view of the N8000 system.

or downloaded to the N8000 via IRIS over an Ethernet connection. Additionally, configuration files can be uploaded or downloaded through the front panel USB port on the unit, or over an Ethernet connection using any web browser. This allows the designer or technician to quickly back up or view a configuration file even if they do not have access to the original IRIS program.

Latency is always a concern with digital signal processing and within the N8000, the total latency of a signal from an analog input to an analog output is 2.2917 milliseconds (ms) including any signal processing. The unit also uses a fixed-latency design, so this latency is always the same, regardless of any signal processing that is done in the DSP configuration.

Being able to successfully integrate an audio system into a complete AV system is becoming increasingly important, and the EV engineers kept that in mind while developing NetMax. The N8000 therefore comes with a variety of options for integrations and connectivity. A 10-baseT/100-baseTX Ethernet port is provided for connection to a WAN/LAN infrastructure, allowing the use of existing, or off the shelf, Ethernet hardware for communication with IRIS-Net. Additionally, the unit has an integrated web server to allow communication, administration and diagnostics over a LAN/WAN using any web browser. This allows the user to perform advanced configuration of the unit, view error logs and verify the operational status of it and its connected components even without the IRIS-Net software.

Multiple, general purpose I/O ports are also provided to allow

external control via contact closures and simple use panels. This can be done with either analog or digital control data, allowing the use of switches, relays and potentiometers to perform a wide variety of freely configurable functions. Outputs allow the interconnection of external devices for event and fault monitoring, or to trigger external devices based on conditions or events within the NetMax system or manually initiated through IRIS-Net. Dual, freely configurable RS-232 serial ports are also provided.

In addition, a user can communicate with the N8000 using an intuitive ASCII parser that is freely published by EV. This allows advanced users another option to perform any task within the unit, or create complex communication protocols with third-party equipment, including connection to a multimedia control surface, such as a Crestron or AMX system. Again, the RS-232 can also be configured for communication with a Dynacord ProAnnounce system. This integration thus creates a unique flexibility for NetMax both pro audio and commercial applications.

Finally, a Controller Area Network (CAN) interface is provided for communication with EV's DSP Remote Control Precision Series Amplifiers. CAN is an automation and control networking protocol that is widely seen in industrial and automation applications, and has been extensively implemented in the automotive industry. In fact, if you buy an automobile built in the US after 2008, your car will have a CAN bus on-board for control and diagnostics, and it might even be in what you are driving right now. CAN

is a protocol that provides such features as confirmed packet delivery and collision avoidance, making it a highly effective protocol for networking. A highly efficient and stable protocol, CAN is able to support up to 100 devices, per network, with a network bus length of 1,000 meters. Best of all, configuration of a CAN bus is quick and easy, saving the designer or technician valuable time and money.

CONCLUSION

At the end of a day, after pouring over spec sheets and manuals, a system designer or technician is always faced with the same questions: What is the best solution for me? Will this technology still be viable in six months? A year? Or even more? And finally, is this going to make the lives of my customers and myself easier?

We believe that ElectroVoice has developed the IRIS-Net platform as an integrating foundation to bring all parts of the audio chain together. NetMax and IRIS-Net is designed to deliver a solution that is effective and relevant to today's needs and applications, while at the same time, offering a structure for future development and expansion. In order to be an effective and useful tool, a product must not only offer both unique and efficient solutions, but remain open enough to allow easy integration with the rest of the audio and visual worlds. ■

Ethan Wetzell is a senior technical applications specialist for Electro-Voice with more than 15 years experience in the industry. He has worked in numerous theaters and other live performance venues as an audio technician and sound designer, as well as recording studios and post production facilities. For more information on this product, go to www.telex.com.



Digital Goes Midas

prolight+sound Frankfurt Hall 4.1 Booth E70

www.midasconsoles.com

29.March.2006