

Case Study

# Freescale processors help turn a solo performance into a multi-track tour de force

**With VoiceLive 3, one performer can have it all— a sound engineer, backup singers and a band**



## One Performer. Endless Possibilities.

With VoiceLive 3, a live performer can create rich harmonies, guitar effects and layered tracks without needing a multi-voice choir, full guitar rig and professional sound engineer. VoiceLive 3 does it all, with a complete suite of effects and a looping function for creating tracks on the fly—all packed into a sleek, 13.8" x 8.5" aluminum chassis. The foot-controlled unit brings together vocal and guitar processor, and dedicated looper to deliver top-quality music production, including:

- *Comprehensive voice effects*, from doubling, echo, reverb and other classic effects, to harmony and vocoder modes for expanded voicing and musical possibilities.
- *No-compromise guitar effects and amp tones* along with a wide range of amp emulations to use when setting up a traditional amp isn't practical
- *Looping* feature for building an intricate, multi-layered performance by creating multiple tracks, with the ability to store and recall loops.

## Next-Generation Technology for Total Performance Control

The form factor may be modest, but the technology behind VoiceLive 3 is anything but. TC-Helicon's next-generation 3iC processing boasts three independent cores dedicated to vocals, guitar and looping plus increased memory and lightning-fast access to presets and sounds. Carefully considered I/O options add to VoiceLive 3's flexibility, portability and control. The system includes dedicated vocal PA and guitar outputs to allow a performer to send stereo guitar loops directly to an amp while stereo vocal loops go separately to the PA. There are also separate monitor and headphone mix outputs, RoomSense microphones for controlling harmony and adding ambience, and two control units for expression pedals.

The entire system is designed for easy access to presets, sounds and switching between them, while also providing complete customization of switch functions and deep edit control. Each mode provides instant access to layer-specific functions via footswitches, with the

## Challenge:

Enable solo performers and songwriters to build multi-layered performances without the need for additional voices, instruments or sound engineering expertise

## Solution:

VoiceLive 3 from TC-Helicon brings together three powerful capabilities—vocal effects, guitar effects and looping—in a single performance system.

## Benefit:

Solo performers can combine a variety of musical effects to create impressive multi-track performances, using one compact, easy-to-use, footswitch-controlled system.



LCD display instantly and clearly showing which footswitch controls are controlling which effect. Footswitch assignments can also be customized across layers to suit personal preferences.

## TC-Helicon Makes It Possible. Freescale Makes It Work.

VoiceLive 3 depends on powerful multimedia applications processing capabilities as well as high-performance digital signal processing, and Freescale provides both. A multimedia applications processor from the Freescale i.MX28 family powers the control, display and looping functions, while Freescale's 24-bit, dual-core Symphony audio DSP56720 handles all the audio processing.

TC-Helicon selected Freescale's ARM-based i.MX283 to be the core processor for VoiceLive 3 because it provided the right balance of performance, power and cost. The i.MX283 offers an extremely high level of integration to minimize the need for external components, enabling TC-Helicon to achieve more system functionality at a lower cost and a smaller footprint. The i.MX28 processor includes integrated:

- Power Management—meets all power requirements without requiring a separate switching regulator or other power circuitry
- LCD Controller—streamlines display design with a built-in controller to drive the system's LCD panel
- MicroSD card interface—enables storage of loops on built-in memory media
- USB with PHY—Used to receive audio or control data through a USB port and for updating the firmware using a USB flash drive
- Analog I/O—accommodates multiple audio inputs and outputs and eliminates the need for a separate analog-to-digital converter

Implementing the i.MX283 applications processor in VoiceLive 3 allowed TC-Helicon to create an upgrade from VoiceLive 2 by providing double the processing power, improving the user interface, adding more control capabilities and increasing the inputs/outputs available.

The DSP56720 provides the increased memory and performance needed to support the advanced audio requirements of VoiceLive 3. "The two things we had to have as far as processing were audio performance from the DSP and high integration in the applications processor, and we got both with Freescale," says David Hilderman, Chief Operating Officer, TC-Helicon. "No one else came close to providing the level of integration we got when we went with the i.MX283."

Freescale provided development support for VoiceLive 3 with the i.MX28 evaluation kit (EVK) and a Linux BSP to support the features of the i.MX28 processor. The EVK and complete software package enabled TC-Helicon to reduce their development cycle time and get to market quicker.

## Freescale: Innovation for Consumer Applications

Freescale delivers system solutions, including reference designs, to help develop cutting-edge consumer applications. Our technology includes a complete range of microcontrollers and application processors built on ARM® technology with broad operating system support. Among these are i.MX application processors for Android™ and Linux® operating systems and Kinetis microcontrollers, which support a range of Real Time Operating Systems (RTOS) such as Freescale MQX™. Add to that our Xtrinsic sensing solutions—designed with the right combination of high-performance sensing capability, processing capacity and customizable software. With a comprehensive ecosystem of tools, software, technology and services, Freescale helps facilitate innovation and shorten your design



### Freescale Technology for VoiceLive 3

- i.MX283 multimedia applications processor
- Symphony DSP56720

### Freescale Development Tools for VoiceLive 3

- i.MX28 evaluation kit (EVK)
- i.MX28 Linux BSP

cycle. Freescale also offers a formal product longevity program ensuring that a broad range of program devices will be available for a minimum of 10 years.\*

## TC-Helicon: Providing Creativity and Control to Singers

A member of the TC Group of leading sound and audio technology brands, TC-Helicon is a dedicated group of engineers, researchers and product specialists who interact with singers and those who have a passion for the singing voice. All this knowledge and experience is used to design products respecting and empowering the modern vocalist. TC-Helicon products focus on removing barriers and inspiring creativity in performance, ranging from near-field personal vocal monitors to floor-based vocal multi-effects pedals. From the incredibly user-friendly VoiceLive Play to the intricately conceived VoiceLive Touch, TC-Helicon products make effects work where it counts.

\*These products are/or may be supported by Freescale's Product Longevity Program. For Terms and Conditions and to obtain a list of available products please see: [freescale.com/productlongevity](http://freescale.com/productlongevity)

To learn more about how TC-Helicon VoiceLive 3 is powered by Freescale technology, visit [freescale.com/voicelive3](http://freescale.com/voicelive3)