VOICE ENABLEMENT

Six Pack

JULY 2022

SECURE CONNECTIONS
FOR A SMARTER WORLD

PUBLIC

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GIVING VOICE TO A NEW GENERATION OF EDGE DEVICES

VOICE & AUDIO TEAM

VATEC -Team + RETUNE DSP

NXP Voice & Audio solutions creates **best-in-class**, **small footprint**, **low-power** software solutions on NXP platforms and select audio SoCs and DSPs

Combined Team Highlights

- Strong DSP Engineers, ML Engineers and Acoustics Engineers
- Engineers named on >50 worldwide patents in Acoustics, Signal Processing and Machine Learning
- 230+ person-years of collective experience in Audio, Acoustics and Voice Processing

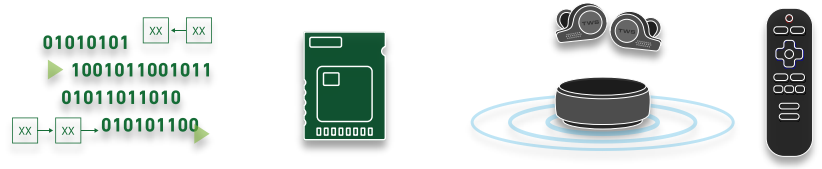
ONE-STOP FOR VOICE PROCESSING NEEDS AT THE EDGE

Value proposition

Battery operated, low-power devices + High efficiency, small footprint software = Maximum audio performance

Recognized and proven technology

NXP's embedded voice processing software in more than 45 shipping products and over 50 Million devices since 2015.



NXP Embedded Software | SoCs & DSP's | Consumer Products

VOICE AND AUDIO TECHNOLOGY SPECIALISTS

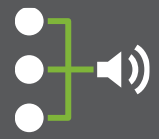
LEADERS IN

Two-Way Voice Communications

Voice UI Audio Front End Solutions

Wake Word Engine / Embedded Speech Recognition

SPECIALISTS IN



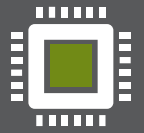
Microphone Arrays

Multi-channel Acoustic Echo Cancellation

Battery Operated, Low Power Devices

Always-On Voice

Acoustic Design & Testing



ML, Small kB, CPU footprint

FULL RANGE OF SOLUTIONS TO ENABLE CUSTOMERS' VOICE PROCESSING

FREE ENABLEMENT

Available to ALL CUSTOMERS via MCUXpresso SDK

VOICE INTELLIGENT TECHNOLOGY (VIT)

VOICE INTELLIGENT TECHNOLOGY

State-of-the-art deep learning speech recognition technology; provides 2 & 3-mic Beamforming / Wake Word & Voice Command Engine

- Online Model Creation Tool
- Wake Word
- Up to 12 Commands
- Supports English & Mandarin

Mass Market

PREMIUM OFFERINGS

NXP Royalty-Bearing Voice Software

CONVERSA

COMMUNICATION SUITE

Advanced full-duplex Voice Processing Software leveraging Traditional & Machine Learning Techniques

VOICESEEKER

AUDIO FRONT-END

Beamforming, Acoustic Echo Cancellation and Dereverberation Signal Processing Software

VOICESPOT

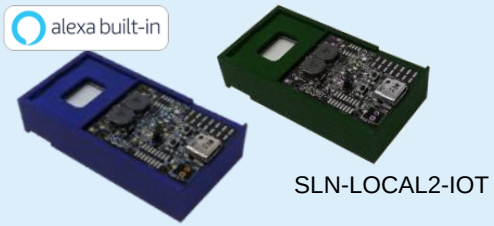
WAKE WORD ENGINE

Highest Performance, Smallest Footprint, Ultra-Low-power Capable Voice Trigger

Voice UI Software

Strategic / High Volume Customers

Turnkey Solutions



SLN-ALEXA-IOT

SLN-LOCAL2-IOT

RT1050, RT1060 & RT1170 EDGEREADY SOLUTIONS

Hardware & Software bundles targeted at Voice UI and Touch-less HMI Applications

Bundled Voice SW solutions available from NXP & third-party partners

Mass Market

COMMON APPLICATIONS

VOICE COMMUNICATION

CONVERSA

TWS

Headphones

Smart Doorbells

Smart Watch

Speakerphones

VOICE AS A USER INTERFACE (VOICE UI / CONTROL)

VOICESPOT

VOICE INTELLIGENT TECHNOLOGY (VIT)

VOICESEEKER

Sound Bar

Smart Speaker

TWS

Remote Controls

Home appliances

TV / Set-top Box

Smart Watch

Headphones

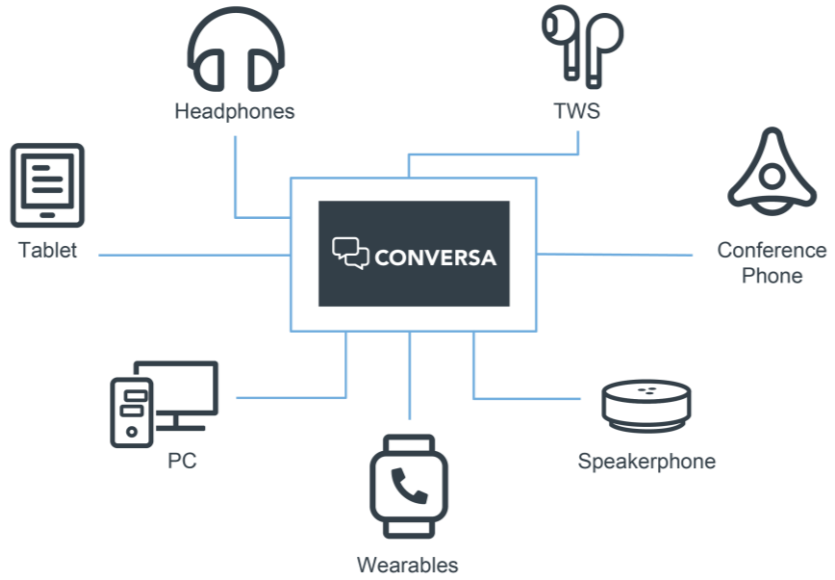
Wearables

CONVERSA OVERVIEW

WWW.NXP.COM/CONVERSA

Conversa is a comprehensive full-duplex hands-free telephony speech processing suite providing total control of uplink and downlink audio.

Conversa embedded multimicrophone, full-duplex voice processing delivers the ultimate in sound quality for speakerphone and headset applications.



Features

- Complete Uplink and Downlink Audio Processing
- Super-wideband Audio up to Fs=32kHz
- Acoustic Echo Cancellation
- 55dB total Acoustic Echo Cancellation (AEC) including Nonlinear Processing (NLP)
- Ambient Noise Reduction
- Adaptive Multi-mic Beamforming Leveraging Machine Learning
- Wind-noise cancellation
- Handling-noise cancellation
- Dynamic compression
- Limiter and squelch
- Sidetone
- Parametric EQs

Supported Devices

- i.MX RT500/600
- i.MX RT1060/1160/1170
- Compatible with Arm Cortex M7, M33, Cadence Hifi 4, Hifi 5, Fusion F1
- Additional ports available upon request

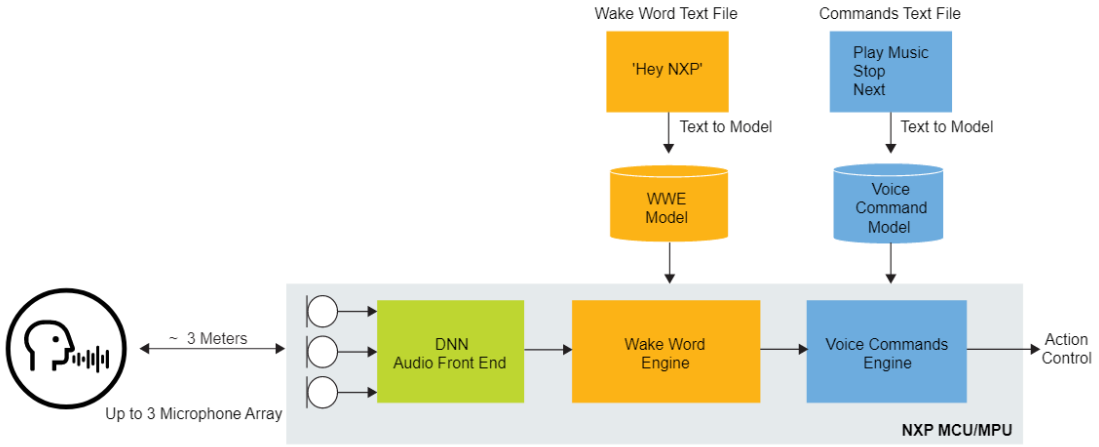
VIT OVERVIEW

WWW.NXP.COM/VIT

VOICE INTELLIGENT TECHNOLOGY (VIT)

Voice Intelligent Technology (VIT) provides voice UI enablement with always-on wake word detection and local commands.

It is based on state-of-the-art deep learning and speech recognition technologies and provides a complete audio front end / wake word / voice commands solution.



Features

- Always-on technology
- Wake word model creation with Text to Model (no audio database required)
- Custom commands using Text to Model
- Large vocabulary available for Text to Model
- Far-field audio front end supporting different microphones topologies (no tuning required) - up to 3 microphones supported
- Voice Activity Detection (VAD) helping minimize processing load during silent, non-speech period
- English and Chinese language support
- German, Spanish, Turkish, Japanese, Korean, French, Italian available on request
- Up to 3 Wake Words supported in parallel
- Online VIT model generation tool

Supported Devices

- i.MX RT500/600
- i.MX RT1040/1050/1060/1160/1170
- i.MX8 Mini, i.MX8 Plus, i.MX8 Nano

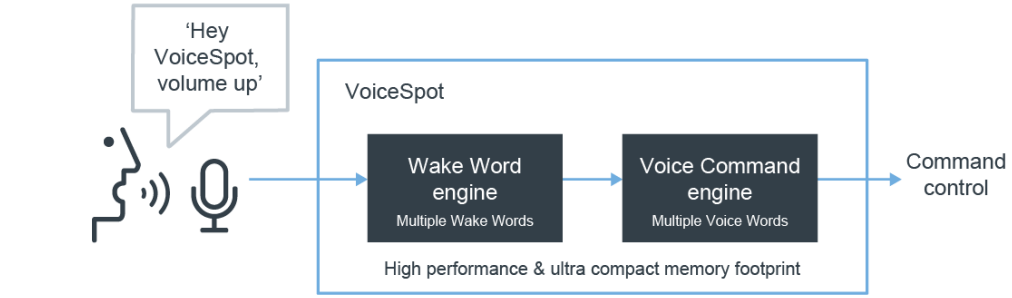
VOICESPOT OVERVIEW

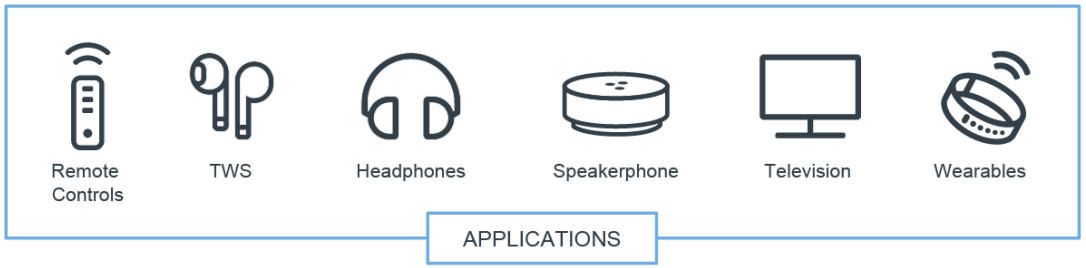
WWW.NXP.COM/VOICESPOT

VOICESPOT

VoiceSpot is a highly accurate, small memory and MIPS profile wake word engine supporting custom voice trigger words and phrases.

As a premium alternative to VIT, this wake word engine leverages custom trained models and advanced machine learning.





Features

- Small memory footprint
- Low computational complexity allows ALWAYS ON functionality
- Low latency, up to 100mS faster response time than competing solutions
- Custom Voice Triggers for target words / phrases and/or demographics are supported
- Multiple Trigger instances are supported
- Performs well in noise and reverberation, even with a single microphone
- Low False Reject Rate (FRR)
- Low False Accept Rate (FAR)
- Compatible with MCUXpresso SDK

Supported Devices

- i.MX RT500/600
- i.MX RT1060/1160/1170
- i.MX8 Mini, i.MX8 Plus, i.MX8 Nano
- LPC55xx
- Compatible with Cortex M4F, M7, M33

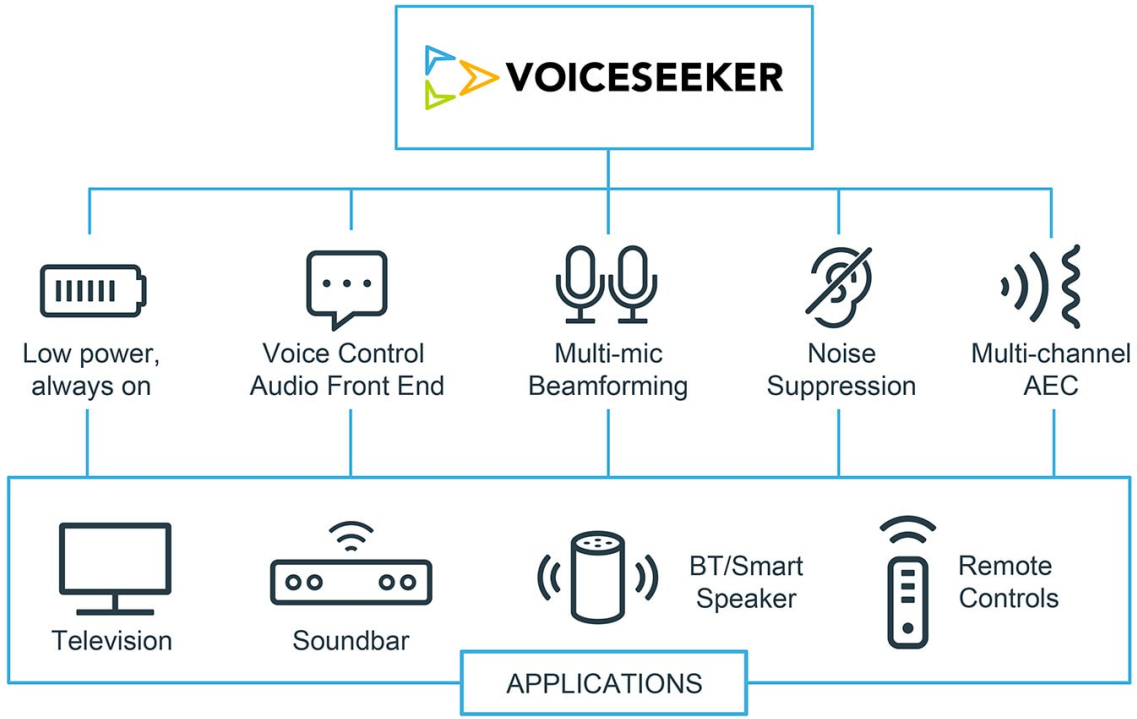
VOICESEEKER OVERVIEW

WWW.NXP.COM/VOICESEEKER

VOICESEEKER

VoiceSeeker is a multi-microphone voice control audio front-end signal processing solution.

VoiceSeeker provides high performance beamforming and multi-channel acoustic echo cancellation (AEC) to enable reliable trigger word detection and payload accuracy.



Features

- High Performance Beamformer - enables robust noise and reverberation immunity
- Flexible microphone placement
- Multichannel AEC - compatible with 5.1, 7.1, 5.1.2, 7.2.4 playback formats
- Direction of Arrival indication

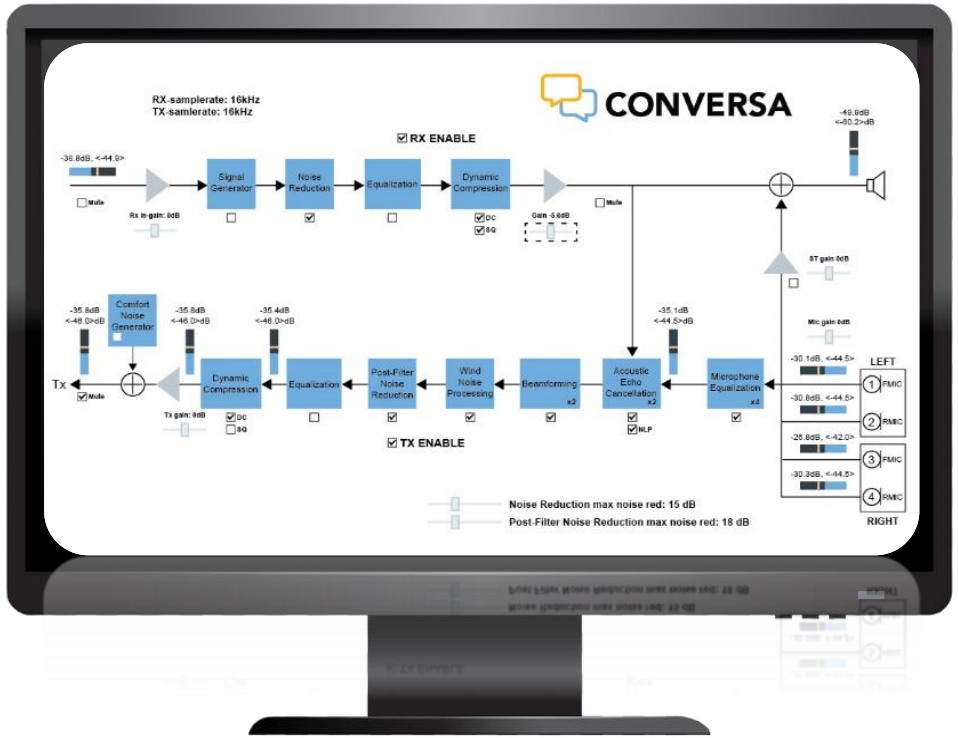
Supported Devices

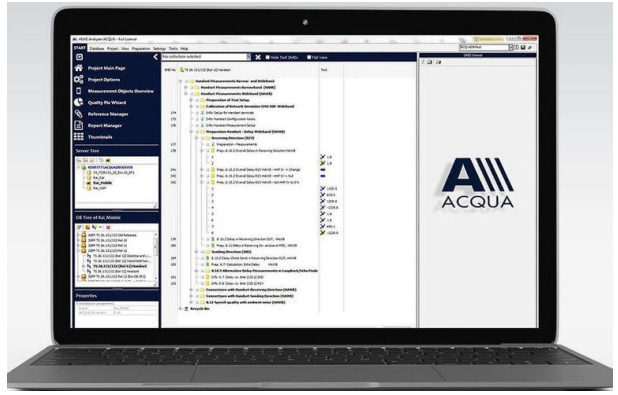
- i.MX8 Mini, i.MX8 Plus, i.MX8 Nano
- i.MX RT500/600
- i.MX RT1060/1160/1170

NXP SUPPORT / ENGINEERING SERVICES

NXP can help you implement our Voice Technology. We offer the following services throughout your product development cycle:

- Industrial Design Input for Acoustic System
- Microphone & Loudspeaker Placement Guidance
- Audio Architecture Review, Advice and Guidance
- Troubleshooting and Audio Path Debug
- Evaluate Prototypes & EV samples
- Preliminary Tunings & Test Reports
- Final Tuning & Test Reports
- Benchmarking against Competitors





Contact Voice@NXP.com

VOICE ENABLEMENT SUPPORT | MORE INFORMATION

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www.nxp.com/voice

www.nxp.com/conversa

www.nxp.com/voiceseeker

www.nxp.com/voicespot

www.nxp.com/vit

Community

Voice Software Forum

Support

Voice@NXP.com

Supported Platforms & Cores

i.MX RT

i.MX 8M

Arm Cortex M-Series

Arm Cortex A-Series

Cadence Hifi

Ecosystem Support

MCUXpresso SDK

Yocto BSP (Coming Soon)

VIT Modeling Tool

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