![TrulySecure™ Speaker Verification]

Easy, Embedded,
Secure Authentication for Devices & Applications

Sensory's TrulySecure Speaker Verification (TSSV) technology is a language independent, highly secure yet convenient, on device verification of a person's voice or passphrase. The underlying technology leverages Sensory's deep strengths in speech processing, noise mitigation, speech feature extraction and machine learning. TSSV offers ease-of-mind specifications: no special hardware is required. TSSV uses standard microphones on phones, tablets and PCs. Additionally, all processing is done on-device so personal data remains secure.

TrulySecure Speaker Verification features a fast and simple to use enrollment in which users repeat a passphrase (either pre-determined or user-defined) three or more times. TSSV provides maximum security against unauthorized attempts to break in, while ensuring the highest verification rates for the user. It is robust to environmental challenges such as noise and therefore it works in real-life situations.

The TrulySecure Speaker Verification also features Sound ID, a recognizer capable of identifying a variety of environmental sounds, including glass breaking, babies crying, dogs barking, home security alarms, smoke/CO alarms and low battery warnings, doorbells, knocking, snoring and coughing. TSSV supports all major operating systems, offering nearly limitless implementation flexibility. Additionally, Sensory can customize TSSV to match the exact needs of its customers, enabling only the sound profiles required for specific use cases.

Contact Sales at www.sensory.com to develop your use case with Sensory's TrulySecure Speaker Verification!

Fixed-Phrase Authentication
Adds the ability to brand an application and layer-on voice-id capability.

User-Defined Passphrase Authentication
Customers can choose their own unique password to help enhance biometric security. This feature is language independent, so it works in any language or market!

Text-Independent Authentication
Design interactive applications that can recognize a user's voice no matter what phrase they speak. Offers the greatest flexibility in application design.

Configurable Security Levels
Provides two key security modes targeting high-security and low-security biometrics. Developers are additionally provided 5 sensitivity levels to fit application security needs.

Accuracy
Equal Error Rates as low as .2% in quiet conditions, and 1% in moderate noise!

Wake Word Detection
Provides speaker-independent recognition of a key-phrase. Applications can easily access audio and provide follow-on voice identification. Our wake-word technology adjusts to the environment and adapts to the user's voice.

Seamless Enrollment
Provides automatic learning of voices over time allowing applications to become personalized.

Sound Identification
Design applications that make sense of the world by listening for distinct sound events (e.g., baby cries, dog barks, doorbells).

Incremental Enrollment
Allows user enrollments to be adapted over time to enhance accuracy and security.

Tried & Tested
TrulySecure Speaker Verification has been deployed in over **20 million** devices to date.

| Mobile | Automotive | IoT | Medical Equipment | Biometric Security |

Authentication Modes & Specifications

When operated in **fixed-phrase or text-dependent modes**, TSSV supports both speaker-verification (it verifies who spoke) as well as phrase-verification (it verifies what was spoken). Together, the combined analysis allows the SDK to analyze both the voice characteristics and temporal structure of the audio under test. Thresholds for speaker-verification and phrase-verification can be controlled independently in order to provide a rich set of trade-offs to balance false-reject and imposter-accepts. The **text-independent** capability of TSSV allows learning of generic voice characteristics of an individual irrespective of the phrase they are speaking. Typical model size and processor speed benchmarks are provided below for text-dependent and text-independent authentication models. Additional specifications for fixed phrase and Sound ID models are available upon request. Speeds are typical for Raspberry Pi 3 model B.

	Authentication Text- Dependent	Authentication Text-Independent
Enrollment Requirement	3+ phrase repetitions	12+ seconds
Background model size	160 kB	156 kB
Enrollment model size	50 kB per enrollee	56 kB
Enrollment Memory	3.2 MB	5.2 MB
Enrollment MIPS	386	126
Enrollment Speed	2.0x real-time	2.0x real-time
Authentication Memory	1.8 MB	1.9 MB
Authentication Always-On MIPS	28	28
Authentication Peak MIPS	55	33
Authentication Spin-Up Time	8 msec	8 msec
Authentication Speed	23x real-time	21x real-time

TrulySecure Speaker Verification (TSSV) SDK specifications:

Languages	Fully language-independent
Authentication Types	Fixed-phrase, text-dependent, text-independent
Additional processing modes	Fixed-Trigger (wake-word), alarm detection, voice-type ID, sound identification
Advanced APIs	Seamless user enrollment, Voice-query extraction
OS Platforms	Windows (64-bit), Linux (x86_64, 32 & 64-bit ARM), MacOS, Android, iOS, Tizen
API Languages	C++, Java, Python, Objective-C, Swift, C#
Processing Location	On-device
Audio Formats	16 kHz, 16-bit, mono

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