PSOC™ Edge E84 - Smart Wearable

Development Teams

Application : **CSS ICW MCU APP**
Middleware: **CSS ICW SW MCU PPCM**
Systems: **CSS ICW MCU PE SYSML**

PSOC™ Edge E84 – Smart Wearable demonstrates audio processing with DEEPCRAFT™ Audio Enhancement and audio inferencing with DEEPCRAFT™ Voice Assistant along with showcasing Graphics capabilities.

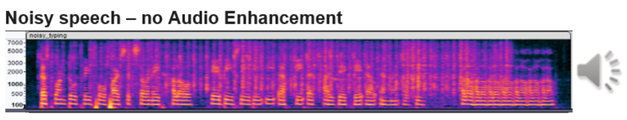
The entire demo runs on the Arm® Cortex®-M55 core of PSOC™ Edge E84. Inferencing and audio processing (Deep Subband Noise Suppression) are accelerated by Arm® Ethos-U55.

Note: The user should be at 1 feet from the mic (close talking).

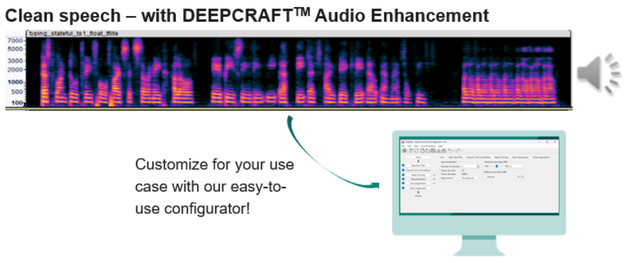
DEEPCRAFT™ Audio Enhancement – From Noisy to Clean Audio

DEEPCRAFT™ Audio Enhancement is a AI-based software solution that enables developers to build differentiated voice & audio products, going from noisy environment to clear speech rapidly.

Noisy speech – no Audio Enhancement



Clean speech – with DEEPCRAFT™ Audio Enhancement



Customize for your use case with our easy-to-use configurator!

Solution Overview

- **Noise Suppression & Acoustic Echo Cancellation** to remove environmental noises
- **Audio Scene Analysis & Beamformer** to improve the signal-to-noise ratio of desirable voice
- Accelerated using **Ethos U55 NPU's + M55 Helium DSP**
- **Easy-to-use Software tool** to calibrate echo tail, beamformer, noise suppression aggressiveness - outputting *.h and *.c file to easily integrate in your project
- **Rigorous** acoustic testing, **exceeding** industry-standard benchmarks, to ensure **rapid go-to-market**

KPIs

- Target Active Power (100x/sec): 22 mW (HPF + AEC + BF + NS)
- MCPS: 101
- Memory: 555 kB (RO), 345 kB (RW)

DEEPCRAFT™ Voice Assistant

DEEPCRAFT™ Voice Assistant is a AI-based software solution that enables developers to easily add high quality voice features (commands, keywords, wake word, ..) to devices.

Ok Infineon, what's my heart rate?



Customize for your use case with our easy-to-use cloud tool!



Solution Overview

- **Low Power** voice chain - **accelerated using Ethos U55 NPU's + M55 Helium DSP**
- **High Accuracy**, low false detects
- **Speech to intent** leveraging ML to create best-in-class performance (VAD, **Wake Word**, Commands)
- Versatile solution for **digits recognition**
- **Best solution for balanced native/non-native** talkers; **English language** (release 1); additional languages coming
- **Easy-to-use cloud tool** to create wake words & commands

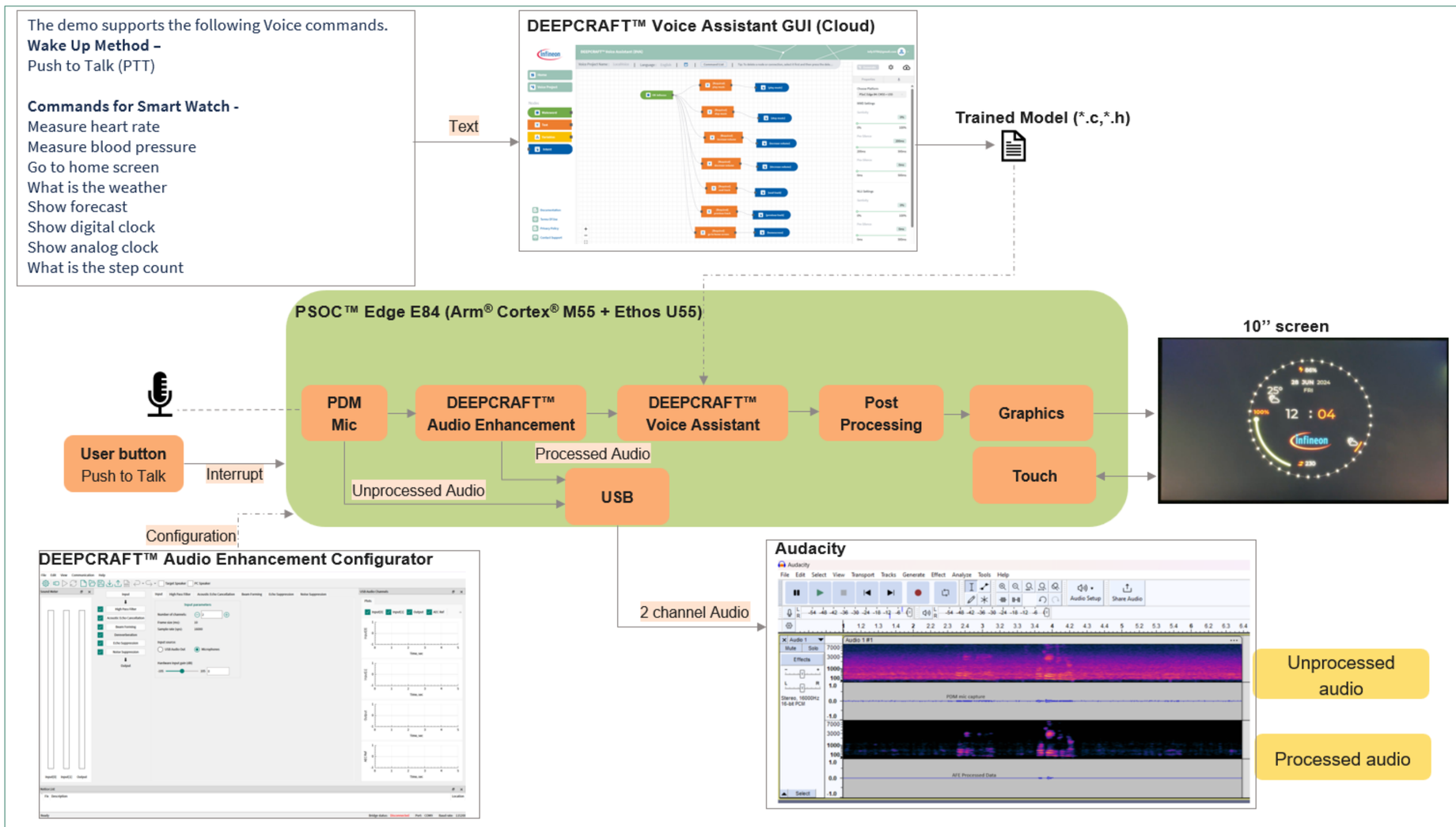
KPIs

- Target Active Power (100x/sec): 7 mW (WWD + 20 Commands)
- MCPS: 31
- Memory: 534 kB (RO), 1506 kB (RW)

System Overview

The demo supports the following Voice commands.
Wake Up Method –
Push to Talk (PTT)

Commands for Smart Watch -
Measure heart rate
Measure blood pressure
Go to home screen
What is the weather
Show forecast
Show digital clock
Show analog clock
What is the step count



Customer Benefits

- Edge Based Voice Inferencing with command/wake-word customization.
- Superior Audio Processing capabilities with tuning options.
- Infineon's in house Audio algorithms and Inferencing libraries.
- Infineon's ML infrastructure to train and deploy models.