Sound terminal software expansion for STM32Cube

Application	X-CUBE-SOUNDTER1
Middleware	Sound Terminal Biquad Calculator
Hardware Abstraction	STM32Cube Hardware Abstraction Layer (HAL)
Hardware	STM32 Nucleo expansion boards X-NUCLEO-CCA01M1 (Translate)
	STM32 Nucleo development board

Features

- Complete driver and middleware to build applications using STA350BW Sound Terminal® device
- Control of STA350BW Sound Terminal to implement basic functions and advanced DSP management
- User-friendly BSP interface for an easy configuration of the device functions (initialization, audio playback, volume and mute control) and biquadratic filter management
- Dedicated middleware to facilitate biquadratic filter design based on standard filter typologies and parameters
- Easy portability across different MCU families thanks to STM32Cube
- Free, user-friendly license terms
- Sample implementation available on X-NUCLEO-CCA01M1 board when connected to a NUCLEO-F401RE, NUCLEO-F072RB, NUCLEO-L053R8, NUCLEO-L476RG or NUCLEO-F746ZG board.

Description

X-CUBE-SOUNDTER1 is an expansion software package for STM32Cube. The software runs on the STM32 and includes drivers for audio data playback using the STA350BW Sound Terminal® device.

It includes drivers and BSP layers designed to exploit all the device features such as tone management, biquadratic filter configuration and initialization, and volume and mute control, as well as the basic initialization routines and audio control functions.

The expansion is built on STM32Cube software technology to ease portability across different STM32 microcontrollers and comes with examples demonstrating the capabilities of the X-NUCLEO-CCA01M1 when connected to a NUCLEO-F401RE, NUCLEO-F072RB, NUCLEO-L053R8, NUCLEO-L476RG or NUCLEO-F746ZG board.

The software is available also on GitHub, where the users can signal bugs and propose new ideas through [**Issues**] and [**Pull Requests**] tabs.

Product summary	
Sound Terminal software expansion for STM32Cube	X-CUBE-SOUNDTER1
Sound Terminal 2.1-channel high-efficiency digital audio system	STA350BW
Sound Terminal expansion board based on STA350BW for STM32 Nucleo	X-NUCLEO-CCA01M1

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1   Detailed description

■ What is STM32Cube?

STM32Cube is a combination of a full set of PC software tools and embedded software blocks running on STM32 microcontrollers and microprocessors:

- STM32CubeMX configuration tool for any STM32 device; it generates initialization C code for Cortex-M cores and the Linux device tree source for Cortex-A cores
- STM32CubeIDE integrated development environment based on open-source solutions like Eclipse or the GNU C/C++ toolchain, including compilation reporting features and advanced debug features
- STM32CubeProgrammer programming tool that provides an easy-to-use and efficient environment for reading, writing and verifying devices and external memories via a wide variety of available communication media (JTAG, SWD, UART, USB DFU, I2C, SPI, CAN, etc.)
- STM32CubeMonitor family of tools (STM32CubeMonRF, STM32CubeMonUCPD, STM32CubeMonPwr) to help developers customize their applications in real-time
- STM32Cube MCU and MPU packages specific to each STM32 series with drivers (HAL, low-layer, etc.), middleware, and lots of example code used in a wide variety of real-world use cases
- STM32Cube expansion packages for application-oriented solutions.

How does this software complement STM32Cube?

This software is based on the STM32CubeHAL hardware abstraction layer for the STM32 microcontroller. The package extends STM32Cube by providing a component driver designed to exploit the STA350BW advanced features, a board support package (BSP) for the X-NUCLEO-CCA01M1 expansion board and dedicated middleware components to ease biquadratic filter design and management.

The drivers abstract the low-level details of the hardware to allow the middleware components and applications to access the device in a hardware-independent manner.

The package also includes a sample application that the developer can use to start experimenting with the code. The application is designed to enable audio sample playback using the on-board STA350BW device and to allow the full control of the device at runtime, implementing functions such as audio output, volume and mute control, equalization and filter setup.

The demo requires at least one passive, 8 Ω speaker, but, for stereo reproduction, you need two speakers, to be directly attached to the on-board connectors.

Revision history

Table 1. Document revision history

Date	Version	Changes
16-Nov-2015	1	Initial release.
15-Jul-2016	2	Updated cover page features and description.
17-Apr-2018	3	Updated cover image.
11-Nov-2022	4	Updated cover page description.

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