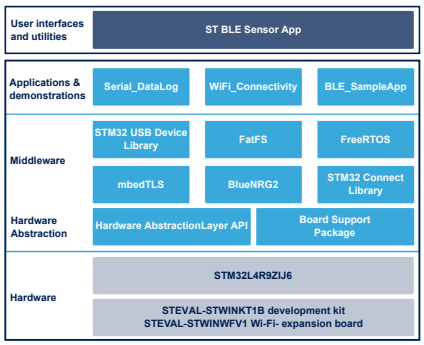
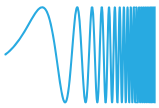
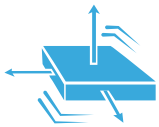
STSW-STWINKT01

Data brief

Firmware examples for STEVAL-STWINKT1B evaluation kit for Industry 4.0







Product summary	
STWIN SensorTile Wireless Industrial Node development kit and reference design for industrial IoT applications	STEVAL-STWINKT1B
Firmware for STEVAL-STWINKT1B evaluation kit	STSW-STWINKT01
Firmware runs on:	STM32L4R9ZIJ6 Ultra-low-power ARM Cortex-M4 MCU with DSP and FPU
FW development environments	- Keil - IAR Embedded Workbench - STM32CubeIDE
Other utilities	ST BLE Sensor mobile Android/iOS app for sensor data visualization
Applications	Condition Monitoring / Predictive Maintenance Sensing

Features

- Set of firmware examples that show how to implement basic functions on the STEVAL-STWINKT1B (and STEVAL-STWINKT1):
  - Sensor data streaming example via USB terminal (VCP)
  - Wi-Fi network functionality using the connectivity framework (with Wi-Fi expansion board)
  - Sensor data streaming via Bluetooth® low energy
  - Source code freely available from the ST website with developer-friendly license terms
- Embedded software, middleware and drivers:
  - FatFS third party FAT file system module for small embedded systems
  - FreeRTOS third party RTOS kernel for embedded devices
  - STWIN Low-Level BSP drivers
- Based on STM32Cube software development environment for STM32 microcontrollers

Description

The STSW-STWINKT01 firmware package for the SensorTile Wireless Industrial Node (STWIN) development kit provides sample projects that you can use to develop custom predictive maintenance, smart industry, IoT and remote monitoring applications. The package is based on STM32Cube software technology, and includes all the low level drivers to manage the on-board devices and system-level interfaces.

The package features one project that demonstrates data logging functionality. It involves streaming data via the USB Virtual COM Port class, which you can subsequently display directly on a PC terminal.

Other two projects demonstrate wireless connectivity using Bluetooth® low energy and Wi-Fi. The BLE_SampleApp project allows you to stream environmental sensor data via the Bluetooth® low energy protocol, and is compatible with our freely available ST BLE Sensor app on Android and iOS stores, so you can read and manipulate the data from your mobile device. The Wi-Fi project requires the STEVAL-STWINWFV1 Wi-Fi expansion board (not included in the kit) to implement basic network functionality including pinging a remote station, connecting to a TLS secure server, sending data to an echo server and verifying returned data, and running a server that a remote client can connect to.

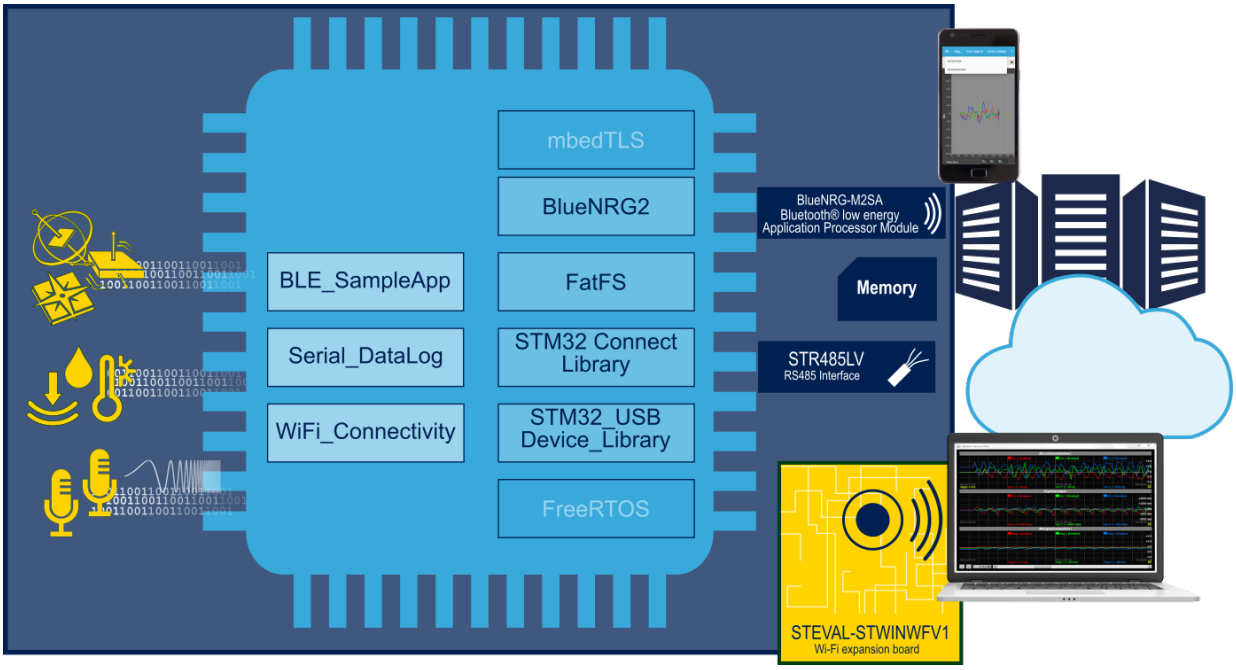
For HSDatalog example, refer to FP-SNS-DATALOG1 software package.

For audio streaming examples, refer to X-CUBE-MEMSMIC1 software package.

1 System overview

The STSW-STWINKT01 firmware is designed to drive the STEVAL-STWINKT1B (and STEVAL-STWINKT1) SensorTile Wireless Industrial Node Development Kit hardware with many of the features and functions underlying wireless predictive maintenance and condition monitoring technologies.

Figure 1. STSW-STWINKT01 block diagram



The kit features a battery-powered core system board with ultra-low power STM32L4R9ZIJ6 MCU that receives data reflecting the operating conditions of industrial machinery from a range of advanced ST environmental and motion sensors, including the state-of-the-art ISM330DHCX inertial measurement unit with machine learning capability.

The firmware contains an STM32Cube HAL for standard device interfacing and middleware libraries for security, wired and wireless communication, file system and operating system functionality. The software package comes complete with sample sensor data manipulation and streaming applications to help you understand the fundamental working mechanisms of the libraries so you can build on them with your own application functionality.

RELATED LINKS

Visit the ST Condition Monitoring / Predictive Maintenance application page for more information on relevant ST applications and solutions

Revision history

Table 1. **Document revision history**

Date	Version	Changes
18-Jul-2019	1	Initial release.
14-Nov-2019	2	Updated cover page product summary table, features and description.
10-Feb-2020	3	Added UltrasoundFFT application and STM32 Connect Library middleware references.
30-Mar-2020	4	Updated title.
11-May-2020	5	Updated cover page image, features and description. Updated Figure 1. STSW-STWINKT01 block diagram. Removed references to audio sample applications.
13-Nov-2020	6	Added references to FP-SNS-DATALOG1.
15-Dec-2020	7	Added STEVAL-STWINKT1B compatibility information.