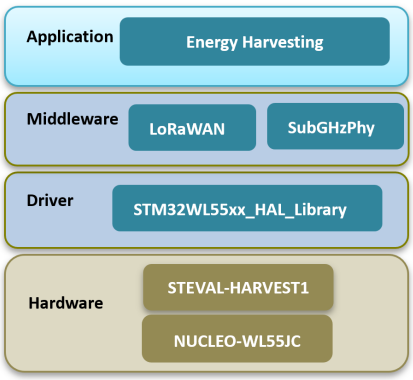
STSW-HARVEST1

Data brief

Energy Harvesting board based on LoRa software package



Features

- Complete firmware to build applications based on LoRaWAN (NUCLEO-WL55JC1) using Energy Harvesting board
- Sample application included in the package:
  - Energy Harvesting
- Sample implementation is available for the STEVAL-HARVEST1 expansion board, plugged onto a NUCLEO-WL55JC board using Morpho Connector
- Energy Harvesting application to perform temperature, humidity, acceleration, presence and motion detection data reading and sending the packet consisting of sensor data to LoRaWAN Gateway
- Battery Free solution
- Free, user-friendly license terms

Product summary	
LoRa based expansion board for STM32NUCLEO	STEVAL-HARVEST1
STM32 NUCLEO-64 development board with Arduino and ST morpho connectivity	NUCLEO-WL55JC
Applications	Energy Harvesting

Description

The STSW-HARVEST1 software package provides a complete firmware to build application using LoRa based IC STM32WL55(Mounted on NUCLEO-WL55JC1).

The software comes with sample implementations of the drivers running on the STEVAL-HARVEST1 expansion board on top of a NUCLEO-WL55JC1 board.

The sensors mounted on the STEVAL-HARVEST1:

- STTS22H sensor to measure temperature with accuracy ±0.5°C.
- LIS2DU12 sensor to measure acceleration with selectable full scales of ±2 g/±4 g/±8 g/±16 g.
- STHS34PF80 sensor to detect the presence and motion of an object.
- SHT40-AD1B sensor to measure relative humidity and temperature

1 Applications

Example included in the project is:

- Energy harvesting

This project works based on PVD (Power voltage detector) feature. The STM32WL55 wakes up using this feature. Once the voltage builds up across the storage capacitor using the solar panel and crosses the threshold voltage, the MCU wakes up. The MCU then initializes all the ICs (STTS22H, LIS2DU12, STHS34PF80, SHT40-AD1B) and takes readings. The LoRa packet sent consists of these sensors data. VDD drops here. Finally, MCU enters in stop mode and VDD again starts increasing. This step keeps on repeating. State machine handles all the possible states.

The Node consisting of STEVAL-HARVEST1 and NUCLEO-WL55JC1, runs totally on the solar panel. No external power is needed. It is maintenance free solution.

Revision history

Table 1. **Document revision history**

Date	Revision	Changes
16-Sep-2025	1	Initial release.

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