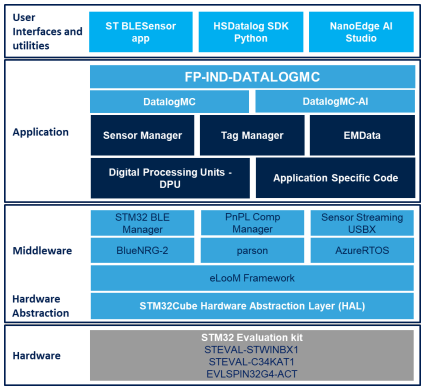
FP-IND-DATALOGMC

Data brief

STM32Cube Function Pack for high-speed datalogging of sensors data and motor control telemetries



STM32 Open Development Environment

Features

- High data rate (up to 6 Mbit/s) data capture software suite:
  - Simultaneously log motor control telemetries and sensor data.
  - Python real-time control and data analysis
  - Dedicated Python SDK, ready-to-use for integration into any data science design flow
  - Compatible with STBLESensor app for system setup and real-time control
  - Synchronized timestamping and labeling mechanisms common to all sensors and motor data
- Motor Control Protocol master implementation to interact with EVLSPIN32G4-ACT evaluation board, programmed as slave through MCSDK (X-CUBE-MCSDK)
- AzureRTOS: ThreadX, FileX, USBX
- Firmware modular examples based on eLooM (embedded Light object-oriented fraMework for STM32) to enable code reusability at application level
- Free, user-friendly license terms

Product summary	
STM32Cube Function Pack for Motor Control High Speed Datalogging	FP-IND-DATALOGMC
STWIN.box - SensorTile Wireless Industrial Node Development Kit	STEVAL-STWINBX1
STSPIN32G4 reference design for next generation smart actuators	EVLSPIN32G4-ACT
STM32 Motor Control Software Development Kit (MCSDK)	X-CUBE-MCSDK-6
Automated Machine Learning (ML) tool for STM32 developers	NanoEdge AI Studio
Applications	PMSM/BLDC Motor Control Industrial Sensors Condition Monitoring/ Predictive Maintenance

Description

The FP-IND-DATALOGMC function pack for STEVAL-STWINBX1 and EVLSPIN32G4-ACT is a powerful integrated toolkit for the next generation of smart actuators.

This toolkit is derived from a FP-SNS-DATALOG2 function pack and it allows the collection of heterogeneous data, combining STWIN.box sensor information with STSPIN32G4 motor control data and it provides a comprehensive view of the system's operational conditions. This enables both real-time monitoring and accurate performance assessment.

The v1.1.0 introduces a further firmware example called DATALOGMC_AI that implements a motor fault classification based on a machine learning solution developed through NanoEdgeAIStudio. The machine learning model allows an accurate classification of motor behavior into two states: good and faulty.

Users can also customize the model by adding their own classes, which can be achieved by incorporating additional data and modifying the training process.

The package also includes a portable mechanical setup that can be replicated with a 3D printer.

EVLSPIN32G4-ACT is designed to drive a variety of three-phase brushless DC motors (not included in the kit) and ready for FOC control algorithms. The list of supported motors is provided in the motor control SDK documentation (X-CUBE-MCSDK-6) and installation details are available in the Quick Start guide.

The FP-IND-DATALOGMC, thanks to its data-centric design and user-friendly Python SDK, may run with hardware boards that supply real-time data streams and motor telemetries, empowering users with full control of the data acquisition process.

The included firmware is compatible with the STBLESensor app, which lets you manage: the board, motor, and sensor configurations; start/stop data acquisition on SD card, and control data labeling. Sensor data and motor telemetries can also be stored onto a microSD™ card.

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

Revision history

Table 1. **Document revision history**

Date	Revision	Changes
16-Nov-2023	1	Initial release.
17-Jul-2024	2	Updated Cover image, Product summary and Description.