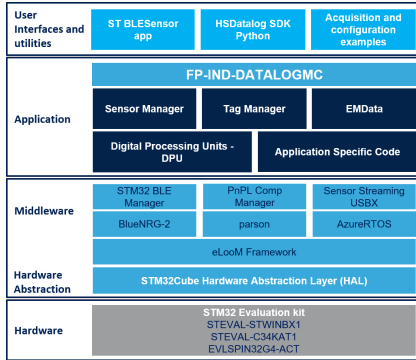


STM32Cube Function Pack for high-speed datalogging of sensors data and motor control telemetries



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

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. It 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.

[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. See UM for further details and installation guide. The list of supported motors is provided in the motor control SDK documentation ([X-CUBE-MCSDK-6](#)).

The function pack includes a Python GUI, `hsdatalogMC_GUI` that communicates with the [STEVAL-STWINBX1](#) via USB allowing the user to control the motor (start/stop commands, set velocity) and select a combination of motor control telemetries and sensor data to be logged. The [STEVAL-STWINBX1](#) communicates with the [STSPIN32G4](#) MCU via serial port (UART), using the motor control protocol (MCPv2). This protocol allows both system configuration and data logging.

[FP-IND-DATALOGMC](#) is based on application-level modules (SensorManager, TagManager, DPU digital processing units) that can be reused and extended to build its custom application. To enable this modularity, the function pack has been built on top of eLooM, an embedded light object-oriented framework for STM32 applications specifically designed for embedded low power applications powered by STM32.

The [DATALOGMC](#) application can save data to a microSD™ card (secure digital high capacity - SDHC) formatted with the FAT32 file system, or stream data to a PC via USB (WCID class). A Python SDK, provided within the function pack, makes it easy to read back and process sensor and motor data acquired using [FP-IND-DATALOGMC](#), a few ready-to-use scripts, and notebooks are provided.

| 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 |
| Applications | PMSM/BLDC Motor Control Industrial Sensors Condition Monitoring/Predictive Maintenance |

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. |

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