TDK MPU-9250 :: 9-axis IMU

The TDK MPU-9250 is a 9-axis motion tracking device that combines a 3-axis gyroscope, a 3-axis accelerometer, a 3-axis magnetometer and a Digital Motion Processor (DMP) in a small 3x3x1mm housing and is available as a pin-compatible upgrade of the MPU-6515.

This sensor has its own I2C bus that provides a full 9-axis MotionFusion output. It offers programmable ranges for precise motion tracking: Gyroscope (±250, ±500, ±1000, ±2000°/sec), Accelerometer (±2g, ±4g, ±8g, ±16g) and Magnetometer (±4800µT).

The software is architected with long-term maintainability, portability across MCU platforms, and adherence to high software quality standards as core design principles.

✅ Layered architecture with clear HAL abstraction
✅ Conforms to ISO C99 standard
✅ Portable across multiple MCU platforms
✅ Supports both RTOS and bare-metal environments
✅ CMake build system for scalable integration
✅ Seamless integration with GCC toolchain
✅ Statically analyzed for MISRA, CERT, and CWE compliance

Initialization Interface

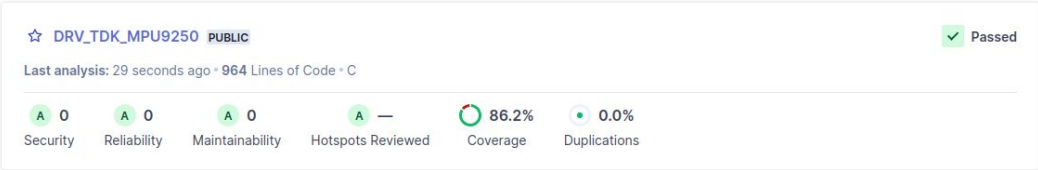
```
mpu9250_result_t mpu9250_init( mpu9250_handle_t*, ... )
```

Configuration Interface

```
mpu9250_result_t mpu9250_set_config( mpu9250_handle_t*, ... )
mpu9250_result_t mpu9250_calibrate( mpu9250_handle_t*, ... )
```

Data Retrieval Interface

```
mpu9250_result_t mpu9250_get_device_info( mpu9250_handle_t*, ... )
mpu9250_result_t mpu9250_get_config( mpu9250_handle_t*, ... )
mpu9250_result_t mpu9250_read_imu( mpu9250_handle_t*, ... )
mpu9250_result_t mpu9250_read_accel( mpu9250_handle_t*, ... )
mpu9250_result_t mpu9250_read_gyro( mpu9250_handle_t*, ... )
mpu9250_result_t mpu9250_read_temp( mpu9250_handle_t*, ... )
```



Communication Interface:
I²C