Bosch BMP581 :: Barometric Pressure Sensor

th muda engineering

The Bosch BMP581 is an absolute barometric pressure sensor. Its small dimensions, low power consumption and high performance allow it to be used in a wide range of applications. It can measure barometric pressure from 30 to 125 kPa with an accuracy of ±0.3 Pa (equivalent to ±2.5 cm difference in altitude) and temperature from -40 to 85°C with an accuracy of ±0.5°C.

Typical applications for this sensor are the improvement of GPS navigation (e.g. improvement of time-to-first-fix, dead-reckoning, tilt detection), indoor and outdoor navigation, weather forecasting, vertical velocity and altitude control for drones.

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

```
bmp581_result_t bmp581_init( bmp581_handle_t*, bmp581_attr_t )
```

Configuration Interface

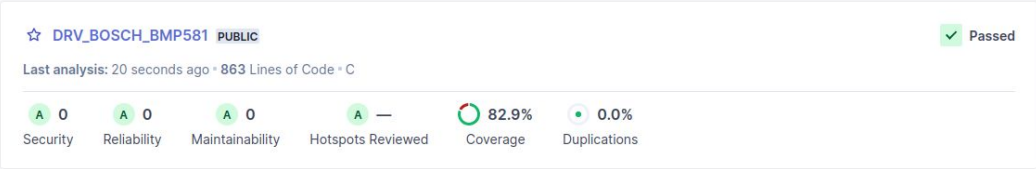
```
bmp581_result_t bmp581_set_config( bmp581_handle_t*, ... )
bmp581_result_t bmp581_set_power_mode( bmp581_handle_t*, ... )
```

Data Retrieval Interface

```
bmp581_result_t bmp581_get_device_info( bmp581_handle_t*, ... )
bmp581_result_t bmp581_get_config( bmp581_handle_t*, ... )
bmp581_result_t bmp581_read( bmp581_handle_t*, ... )
bmp581_result_t bmp581_read_temp_celsius( bmp581_handle_t*, ... )
bmp581_result_t bmp581_read_pressure_pa( bmp581_handle_t*, ... )
```

Non-Volatile Memory (NVM) Interface

```
bmp581_result_t bmp581_write_nvm( bmp581_handle_t*, ... )
bmp581_result_t bmp581_read_nvm( bmp581_handle_t*, ... )
```



Communication Interface:
I²C