## GENERAL DESCRIPTION

TDK Robokit1 combines sensors, processors, and actuators on a single board, making it an ideal robotics platform for quick prototyping and development. RoboKit1 integrates key product offerings such as 6-axis IMU, industrial IMU modules, capacitive barometric pressure sensor, digital I²S microphone, temp sensor, ultrasonic Time of Flight (ToF) sensors, magnetometer, and motor controller on a single PCB.

The open-source board comes with ROS drivers and algorithms, making it an ideal platform for ROS hobbyists, educational institutions, and a multitude of Robotics developers.

The Robokit1 platform also provides out of the box integrated software solutions such as obstacle detection, floor type detection, cliff detection (not suitable for RVC application), and dynamic heading detection. To go a step further, we have also enabled machine learning keyword spotting for applications wanting to integrate voice commands *(currently requires Raspberry Pi add-on)*.

There will be two SKU's released:

- **TDK_RoboKit1-DK**: Included is the TDK RoboKit1 Development Board (as seen below) as well as the Ultrasonic ToF modules and all the available ROS drivers and algorithms.
- **TDK_RoboKit1:** Complete TDK_RoboKit1-DK SKU as well as a 3D printed shell with sockets created for the ToF Sensors, the IIM-46230 Industrial IMU Module, a chassis with metal plates, standoffs, wheels and motors, an on/off switch, and an ESP32 BLD module for Bluetooth connectivity.
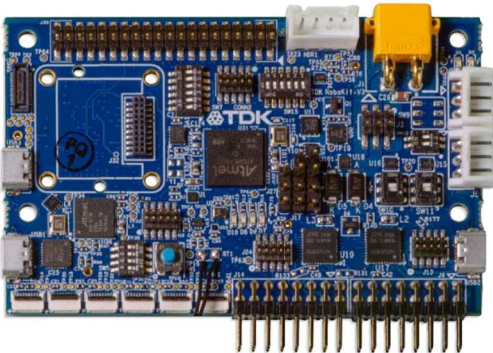

FEATURES

Hardware Features:
- ICM-42688-P 6-Axis IMU
- ICS-43434 Digital I²S Microphone (x4)
- ICP-10111 Barometric Pressure Sensor
- CH-101/201 ToF Modules (x9)
  - (Connected via flex cable)
- IIM-46230 Industrial IMU Module
  - (Connected via flex cable)
- HVC4223F Embedded Motor Controller
- AK09918C AKM Magnetometer
- Temperature Sensor

Software Features:
- Obstacle detection for any color objects in all lighting conditions
- Floor type and cliff detection using ultrasonic sensors
- RoboVac algorithm using IMU data for heading computation
- Robot Motor Control APIs
- "Hi TDK" key word spotting with noise filter and noise cancellation
- ROS1 and ROS2 drivers for all on-board sensors
- BLE enabled Windows and Android Apps for sensors and algorithms evaluation and data collection
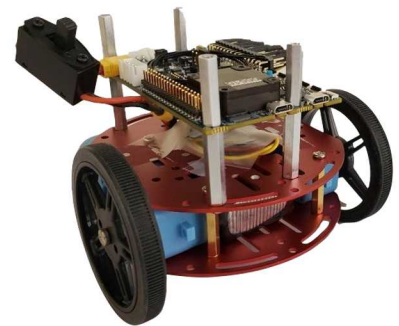
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