Artemis Development Kit with Camera

KIT-17071
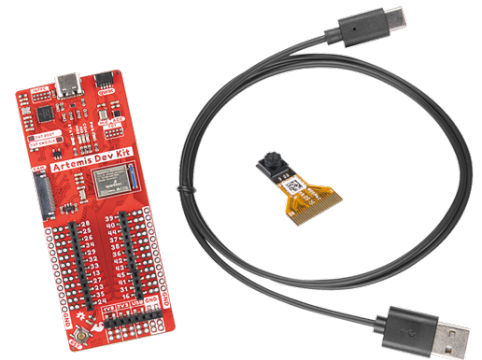
Product Overview

11-25-2021

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Description

SparkFun Artemis Development Kit with Camera allows access to more software development features than previous Artemis based boards. This kit can be programmed using softwares like the Arduino IDE, Arm® Mbed™ OS (Studio and CLI), and AmbiqSDK. An updated USB interface (MKL26Z128VFM4 Arm® Cortex®-M0+ MCU, from NXP) allows the Artemis Development Kit to act as Mass Storage Device (MSD), Human Interface Device (HID), and Communication Port (COM).

The Artemis Module provides a Cortex®-M4F with BLE 5.0 running at 48MHz with an available 96MHz turbo mode and power as low as 6uA per MHz (less than 5mW). This module is fully FCC/IC/CE certified with 1M flash and 384k RAM that gives plenty of room for the user's code. The flexibility of the Artemis module starts with an Arduino core. The Artemis module can be programmed and used just like an Uno or any other Arduino. Additional functionality stems from the ability of the Artemis Development Kit to run RTOS, such as the Arm Mbed OS or the AmbiqSDK.

A LIS2DH12TR MEMS accelerometer for gesture recognition is attached to the "Qwiic" I^2C bus and a digital MEMS microphone. It also includes an edge camera connector for the Himax CMOS imaging camera to experiment with always-on voice commands and image recognition with TensorFlow and machine learning. The Artemis Development Kit pins are broken out to 0.1" spaced female headers (i.e., connectors). There are also two rows of breakout pins with 0.1" pitch spacing for headers and a 0.08" pitch spacing to clip on IC-hooks, used by most logic analyzers. Additionally, the Silk on the back of the Artemis development kit acts as a chart to show pins by functionality (peripherals, ADC, PWM, UART0, and UART1) and act as an aid while developing software. The board is powered and programmed via USB-C, and includes a Qwiic connector to make I^2C easy and is fully compatible with SparkFun's Arduino core to be programmed under the Arduino IDE.

Features

- Compatible with Arduino, Mbed™ OS, and AmbiqSDK development programs
- **Power:**
  - 5V provided through the USB-C connector
  - 1.8V, 3.3V, and 5V available on power header
- Interface chip (MKL26Z128VFM4 Arm® Cortex®-M0+ MCU):
- Drag and drop programming
- SWD interface
- JTAG programming PTH
- **Artemis module:**
  - Apollo3 Arm®Cortex®-M4F MCU
  - BLE 5.0 with FCC certification
  - 24 breakout I/O pins:
    - Eight 14-bit ADC pins
    - Eighteen 16-bit PWM pins
    - Two independent UART ports
    - Three peripheral I^{2}C/SPI buses
  - JTAG programming PTH
- **Sensors:**
- 3-axis accelerometer (LIS2DH12)
- PDM microphone (SPH0641LM4H-1)
- Camera connector (for the Himax HM01B0 camera)
- **Qwiic connector:**
  - On primary I^{2}C bus
- Himax HM01B0 camera
- **Image sensor:**
  - Ultra-Low Power Image Sensor (ULPIS) designed for always on vision devices and applications
  - High sensitivity 3.6μ BrightSense™ pixel technology
  - 320x320 active pixel resolution with support for QVGA window, vertical flip, and horizontal mirror readout
  - Programmable black level calibration target, frame size, frame rate, exposure, analog gain (up to 8x), and digital gain (up to 4x)
  - Automatic exposure and gain control loop with support for 50Hz/60Hz flicker avoidance
  - Flexible 1bit, 4bit, and 8bit video data interface with video frame and line sync
  - Motion detection circuit with programmable ROI and detection threshold with digital output to serve as an interrupt
  - On-chip self-oscillator
  - I^{2}C 2-wire serial interface for register access
  - High CRA for low profile module design

Features

- **Sensor parameters:**
  - Active pixel array 320x320
  - Pixel size 3.6µm x 3.6µm
  - Full image area 1152µm x 1152µm
  - Diagonal (optical format) 1.63mm (1/11″)
  - Color filter array monochrome and Bayer
  - Progressive scan mode
  - Electronic Rolling Shutter Shutter Type
  - Frame Rate MAX 51fps @ 320x320, 60fps @ 320x240 (QVGA)
  - CRA (maximum) 30º
- **Sensor Specifications:**
  - Supply Voltage: Analog - 2.8V, Digital - 1.5V (Internal LDO: 1.5V – 2.8V), I/O - 1.5 – 2.8V
  - Input Reference Clock: 3MHz – 50MHz
  - Serial Interface (I^{2}C): 2-wire, 400KHz max.
  - Video Data Interface: 1b, 4b, 8b with frame / line SYNC
  - Output Clock Rate MAX: 50MHz for 1bit, 12.5MHz for 4bit, 6.25MHz for 8bit
  - Est. Power Consumption (include IO with 5pF load):
  - QVGA 60FPS (Typical) < 4mW
  - QVGA 30FPS (Typical) < 2mW

Mouser Part Number

View Part

To learn more, visit
https://www.mouser.com/new/sparkfun/sparkfun-kit-17071-artemis-development-kit/