

# AnalogMAX Series: Flexible Development Platforms

Include High-Performance Sensing and Signal-Chain Components from Analog Devices and the Intel® MAX® 10 FPGA

Arrow and Analog Devices in partnership with Trenz Electronic are introducing the AnalogMAX portfolio of boards to simplify the evaluation and design process for products needing robust sensing and analog signal conditioning. All AnalogMAX boards have high performing sensor, analog signal chain and power technologies from Analog Devices and are based on the Intel® MAX® 10 FPGA to provide flexibility in data processing and formatting. The combination of technologies and demo examples provide an effective starting point for designs in a variety of end markets including industrial, medical, instrumentation, and IoT.

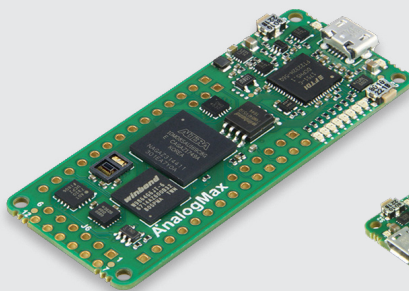
## Benefits of the AnalogMAX Series of Boards

- > **Flexible platform:** Featuring programmable analog components and the Intel® MAX® 10 FPGA to easily adjust to a wide range of use cases and production needs
- > **Rapid prototyping and product development:** An out-of-the-box experience that includes Jupyter notebook demos and software tools
- > **Small form-factor:** Formatted for Arduino expansion
- > **Quick customization services:** The AnalogMAX boards can be customized for specific application requirements - add new features, optimize BOM cost or make them production-ready

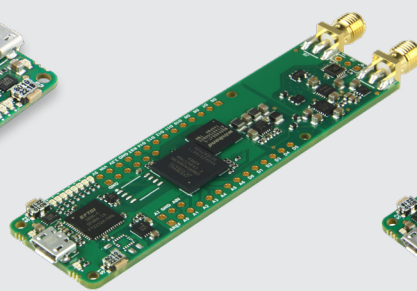
The AnalogMAX portfolio includes:

- > **AnalogMAX-01:** Programmable Sensor fusion board including optical smoke and aerosol detection with ADPD188BI and a 3-axis MEMS accelerometer based on ADXL362
- > **AnalogMAX-DAQ1:** Data acquisition system based on an 18-bit, 2 MSPS, Easy Drive, Differential SAR ADC for a wide range of precision measurement applications
- > **AnalogMAX-DAQ2:** Data acquisition system featuring the ADAQ7980 16-bit, 1MSPS  $\mu$ Module®, ideal for a wide range of precision measurement applications
- > **AnalogMAX-DAQ3:** Data acquisition solution featuring the ADAQ4003, 18-bit, 2MSPS  $\mu$ Module®, ideal for a wide range of precision measurement applications

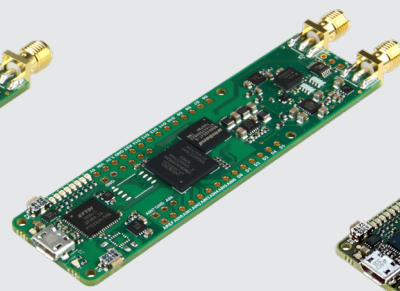
## AnalogMAX Series Boards



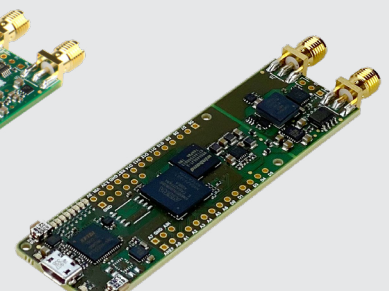
AnalogMAX-01  
(2.5 × 6.15 cm)



AnalogMAX-DAQ1  
(2.5 × 8.65 cm)



AnalogMAX-DAQ2  
(2.5 × 8.65 cm)

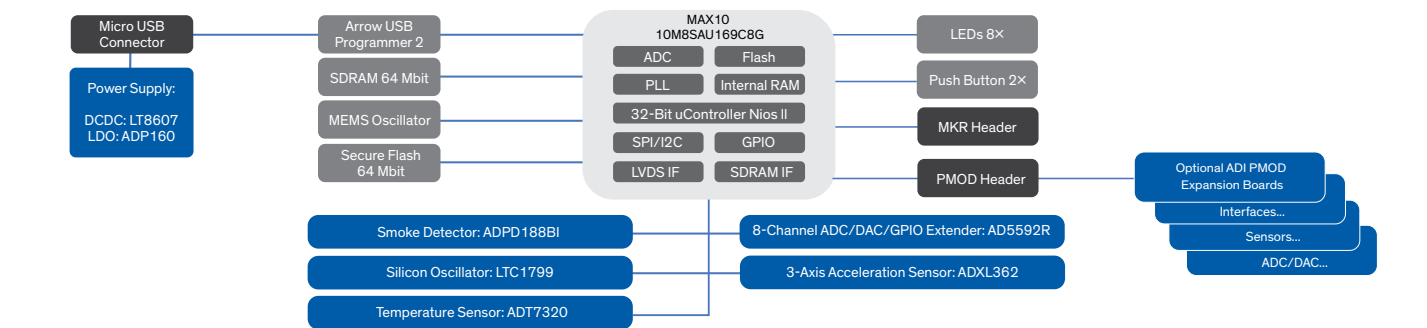


AnalogMAX-DAQ3  
(2.5 × 8.65 cm)

AnalogMAX-01: Full-featured Programmable Sensor Fusion Development Platform

Featuring Analog Devices' Dual-Wavelength Optical Module, 3-Axis Accelerometer, Temperature Sensor, and an 8-Channel Configurable ADC/DAC

Part of the AnalogMAX series of boards, the AnalogMAX-01 platform is a full-featured sensor fusion FPGA board featuring Analog Devices' ADPD188BI integrated optical module for smoke and aerosol detection , a 3-axis micropower ADXL362 MEMS accelerometer, a  $\pm 0.25\text{ }^{\circ}\text{C}$  accurate, 16-bit digital SPI temperature sensor (ADT7320) and the Intel® MAX® 10 FPGA. The ADPD188BI is a complete photometric system for smoke detection using optical dual-wavelength technology. The module integrates a highly efficient photometric front end, two Light Emitting Diodes (LEDs), and two PhotoDiodes (PDs). AnalogMAX-01 also features a fully calibrated, single-chip temperature sensor (0.25  $^{\circ}\text{C}$ , 16-bit), MEMS accelerometer (3-axis), and an 8-channel, 12-bit, configurable ADC/DAC/GPIO with on-chip reference.



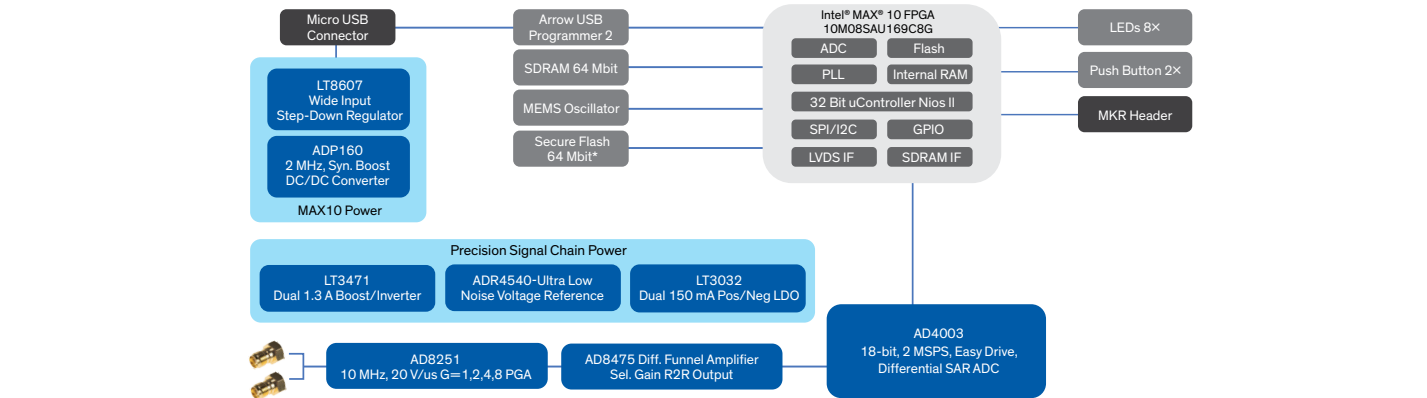
AnalogMAX-01 Block Diagram Features the ADPD188BI Integrated Optical Module for Smoke and Aerosol Detection and the ADXL362 3-Axis Accelerometer

AnalogMAX-DAQ1: A High-Accuracy Programmable Data Acquisition Development Platform

Featuring Analog Devices' AD4003 18-Bit, 2 MSPS, Easy Drive, Differential SAR ADC

AnalogMAX-DAQ1 is a high-performance, high-accuracy data acquisition platform that meets power, footprint, and reliability requirements of measurement instruments in industrial, medical, and scientific applications. The platform is a reference design for using the Analog Devices' AD4003 Easy Drive, Differential SAR ADC with a high-impedance, programmable ADC driver.

The high throughput allows accurate capture of both high-frequency signals and decimation to achieve higher SNR (Signal-to-Noise-Ratio), while also reducing anti-aliasing filter challenges. The reduced non-linear input current in high input-impedance mode coupled with a long signal acquisition phase broadens the range of low power precision amplifiers that can drive the AD4003 directly, reducing the signal-chain power demands.



\*: Optional, not mounted on the PCB

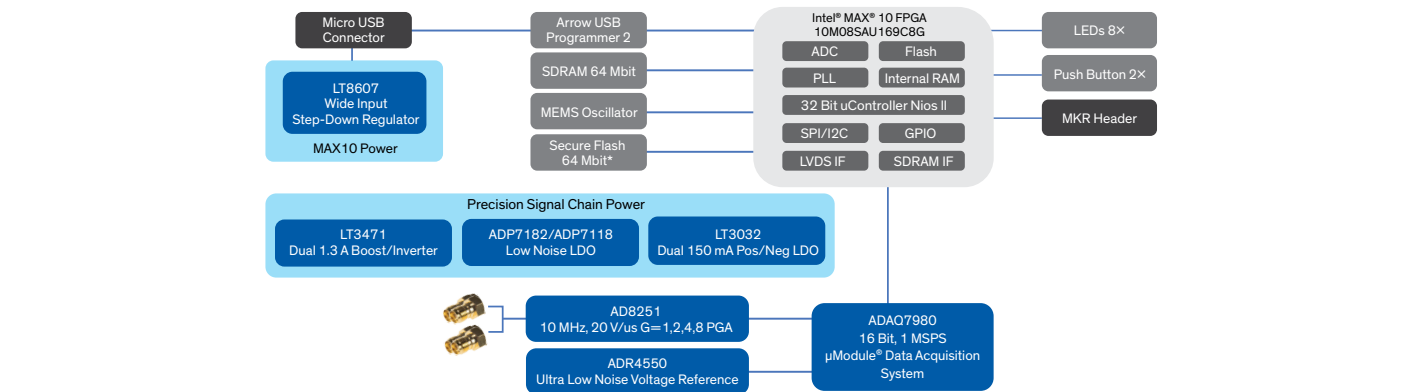
AnalogMAX-DAQ1 Block Diagram Features the AD4003: A 18-Bit, 2 MSPS, Easy Drive, Differential SAR ADC

AnalogMAX-DAQ2: A Programmable 16-Bit  $\mu$ Module®-Based Data Acquisition Development Platform

Featuring Analog Devices' ADAQ7980 16-Bit, 1 MSPS,  $\mu$ Module® Data Acquisition System

AnalogMAX-DAQ2 is a high-accuracy data acquisition platform that meets the footprint, power, and reliability requirements of measurement instruments in industrial, medical, and scientific applications. The data acquisition platform is a reference design for using the high-impedance, programmable ADC driver stage with AD8251 driving the ADAQ7980, a 16-bit  $\mu$ Module® that integrates several signal chain components into a tiny LGA 4 mm x 5 mm package.

The ADAQ7980  $\mu$ Module® solution contains a high accuracy, low power 16-bit SAR ADC; a low power, high bandwidth, high input impedance ADC driver; a low power, stable reference buffer, and an efficient power management block. This platform is ideal for small form factor systems that require accurate and reliable operation over long periods of time.



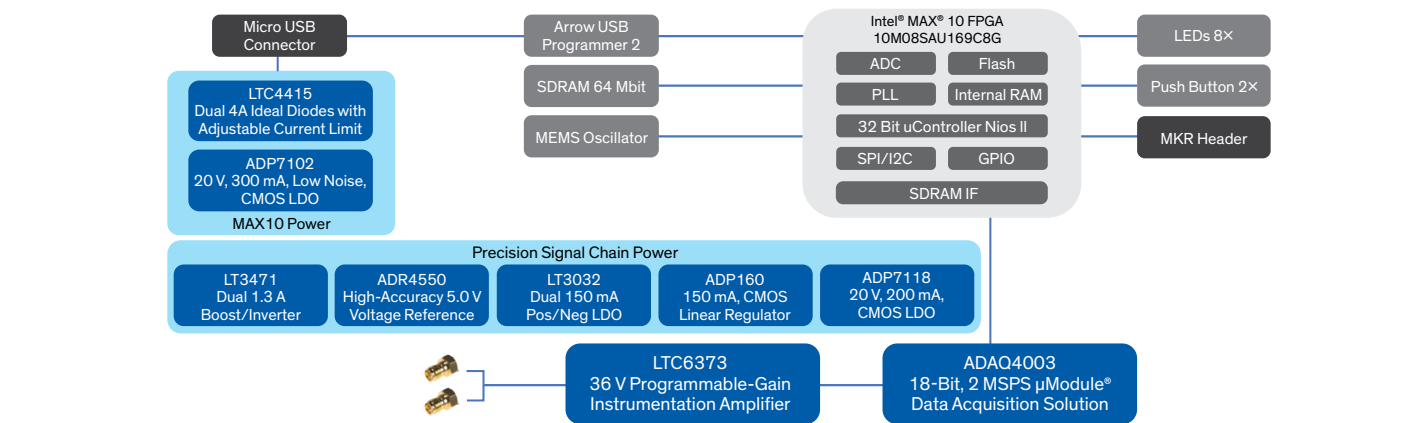
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AnalogMAX-DAQ2 Block Diagram Features the ADAQ7980: A 16-Bit 1 MSPS,  $\mu$ Module® Data Acquisition System

AnalogMAX-DAQ3: A Programmable 18-Bit  $\mu$ Module®-Based Data Acquisition Development Platform

Featuring Analog Devices' ADAQ4003 18-Bit, 2 MSPS,  $\mu$ Module® Data Acquisition Solution

AnalogMAX-DAQ3 is a low-cost, programmable, high-accuracy 18-bit, 2MSPS data acquisition rapid prototyping platform that meets power, footprint, and reliability requirements of measurement instruments in ATE, medical equipment, precision DAQ systems, and battery-powered equipment applications. The ADAQ4003  $\mu$ Module® DAQ solution contains a fully differential ADC driver (FDA), a low noise reference buffer, and an 18-bit SAR ADC, along with the critical precision passive components. The iPassives thin film resistors around FDA with  $\pm 0.005\%$  matching are factory calibrated to achieve a high degree of specified accuracy and minimize temperature dependent error sources.



AnalogMAX-DAQ3 Block Diagram Features the ADAQ4003: A 18-bit, 2 MSPS,  $\mu$ Module® Data Acquisition Solution

## AnalogMAX Series User Experience

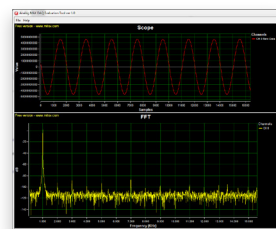
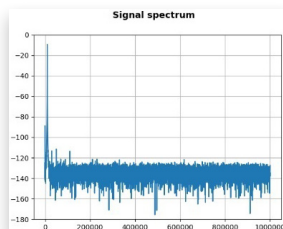
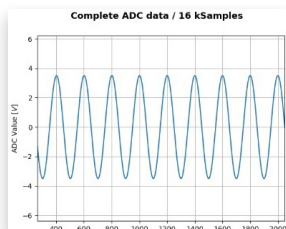
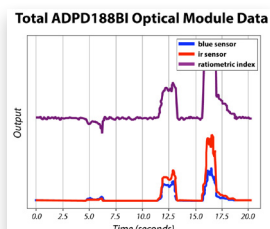
### Getting Started is Easy!

- > Works out-of-the-box with the latest code and documentation all available on [wiki](#) and [GitHub](#)
- > User experience includes intuitive demos featuring the Jupyter Notebook software tools or with the standalone Windows application DAQCapture. Jupyter notebook is flexible and extensible. DAQCapture is simple and easy to use. Both can be operated in a loopback mode, and do not require a source waveform.

### Jupyter Notebook Demo

The Jupyter Notebook demo software supports both types of products: AnalogMAX-01 and AnalogMAX-DAQ 1/2/3. It is flexible and extensible and acts as a starting point for users who desire a starting point that they plan to extend. The Jupyter Notebook software environment consists of:

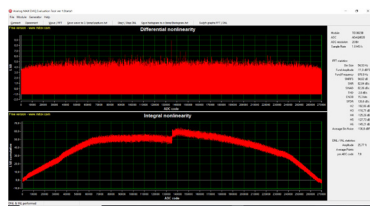
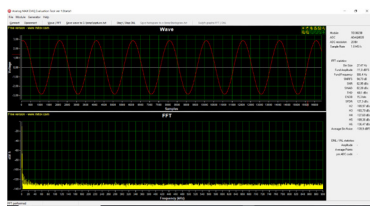
1. Jupyter Notebook environment
2. Anaconda distribution of Python
3. Pyserial (Python serial port support library)
4. Demo application software written in Python
5. A supported web browser



Jupyter Notebook Demo

### DAQCapture Windows Application

DAQCapture is a standalone application distributed as a single windows executable and is simple to run. The application supports AnalogMAX-DAQ 1/2/3 but not AnalogMAX-01.



DAQCapture Demo



**Watch Video:**  
[Introducing AnalogMAX-DAQ1 & AnalogMAX-DAQ2 from Analog Devices](#)

Online

[www.arrow.com/analogMAX](http://www.arrow.com/analogMAX)

### Ordering Information

Part #: [AnalogMAX-01](#)

Part #: [AnalogMAX-DAQ1](#)

Part #: [AnalogMAX-DAQ2](#)

Part #: [AnalogMAX-DAQ3](#)

### Documentation and Instructions

[github.com/ArrowElectronics/AnalogMAX/wiki](https://github.com/ArrowElectronics/AnalogMAX/wiki)

