Universal Sensing Module with Wired Connectivity

NXP's universal sensing module is a universal, software-configurable analog input solution designed for high-precision sensing and edge intelligence. It supports versatile sensor inputs (voltage, current, temperature, resistance, pressure and weight) and ensures reliable wired connectivity via CAN FD, Ethernet and USB.

With an advanced NAFE13388 analog front end and an MCX N947 MCU, this module delivers high-accuracy, high-precision data, in addition to real-time diagnostics, anomaly detection, and predictive maintenance for industrial automation, lab instrumentation and smart manufacturing.

Its modular, expandable platform enables seamless integration with AI/ML applications, making it the ideal choice for future-proof industrial sensing.

Key benefits

- Fully tested, modular and expandable platform with ready-to-use libraries
- Versatile sensor integration and choice of connectivity options
- Easily expand your capabilities to design for new use cases like AI/ML
- Quick evaluation using a web server application (GUI)

Target applications

- Programmable logic controller: Slice I/O, analog I/O module
- Temperature measurement in process control
- Weigh scale
- Motor control: Torque and force measurement
- Automated test equipment: Wire bonding instrumentation
- Grain silo: Temperature, humidity, and weight
- Liftgates
- Mass spectrometer, LCR meter, water quality analyzer

Hardware

NAFE13388 analog front end

- Low-power 24-bit universal input AFE
- Voltage and current excitation sources
- Eight single-ended or four differential channels with ranges up to ±12.5 V (AFE capable of ± 25 V)
- Configurable for voltage, current, resistance, RTD, Thermocouples and other sensors
- Overvoltage protected up to ±36 V
- 7.5 kV HBM ESD and IEC 61000-4-5 2 kV Surge protected inputs

MCX N947 microcontroller

- Dual-core Arm® Cortex®-M33 @150 MHz
- Up to 2 MB dual-bank flash
- eIQ® Neural Processing Unit
- DSP Accelerator (PowerQUAD)
- Smart DMA Engine
- EdgeLock® Secure Enclave

Connectivity options

- CAN FD
- 10/100 Mbps Ethernet
- FS USB, HS USB

Software

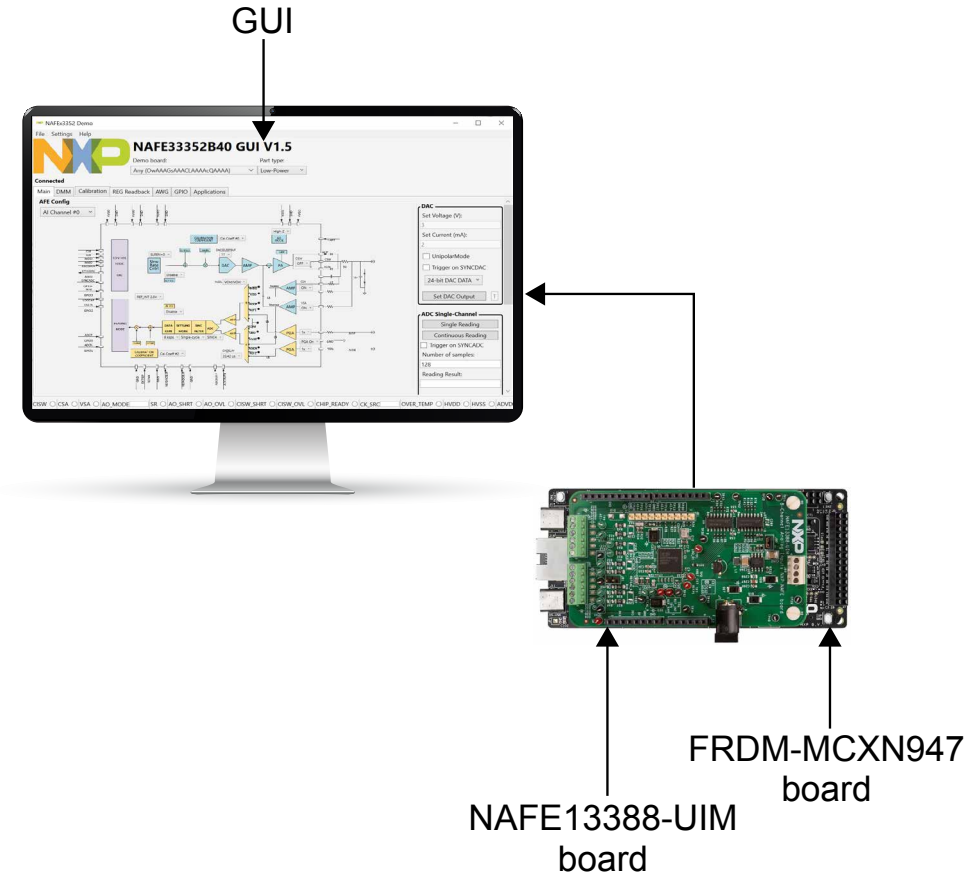
NAFE13388 universal analog sensing module with wired connectivity on Application Code Hub

The firmware repository for the FRDM-MCXN947 development board connected to a NAFE13388-UIM shield enables users to create an analog input module solution with wired connectivity when combined with a host (PC/Web) application.

- To compile and build the application source code, users must install MCUXpresso for Visual Studio Code or MCUXpresso IDE version 24.12 or later.
- Install Ruby to run a web-server application
- Install FreeMASTER Run-Time Debugging Tool to open and run the FreeMASTER PC GUI client.

Ordering information

Part Number	Description
NAFE13388-UIM	8-Channel universal input AFE Arduino® shield board
FRDM-MCXN947	FRDM development board for MCX N94/N54 MCUs



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