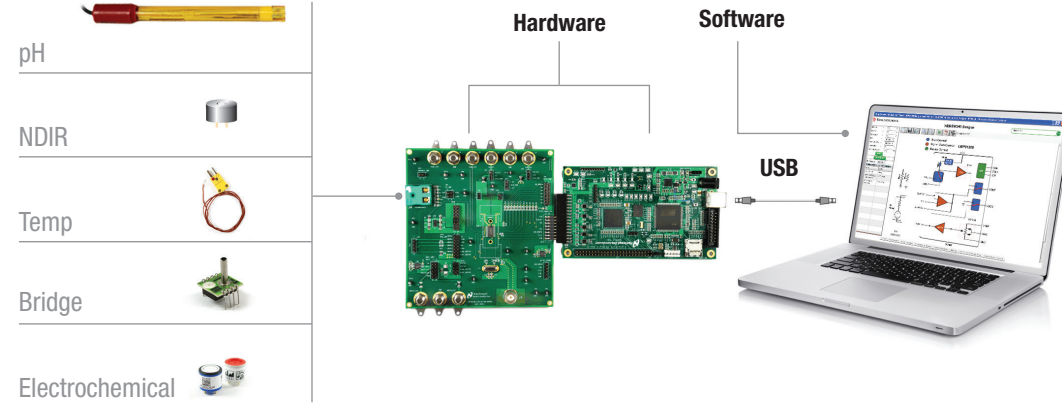
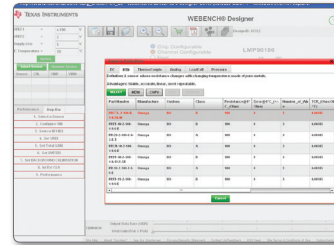


WEBENCH® Sensor AFE Designer

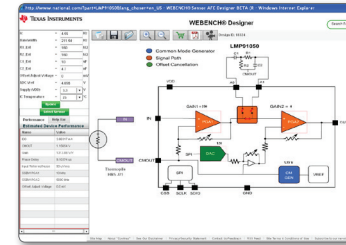
Sensors



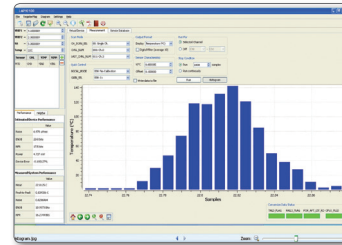
WEBENCH® Sensor AFE Designer software shows all configurable elements for easy online or on-bench design. Simply select a sensor, configure the signal path, optimize your design, and load to a Sensor AFE for immediate prototyping.



Step 1 Select sensor type, model, or enter required parameters



Step 2 Configure range, offset, gain, sample rate, and diagnostics for each signal path



Step 3 Review performance, store configuration data, and load to Sensor AFE

TI's WEBENCH Sensor AFE Designer offers unparalleled configuration and performance options for system designers.

Design Resources and References



TI E2E™
Community

E2E Precision Data Converter Forum

www.ti.com/e2epdc

Get more information on the Sensor AFE family of products at

www.ti.com/sensorafe

- Design with WEBENCH Sensor AFE Designer
- Watch videos
- Find companion products
- Download datasheets
- Order samples and EVMs

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Sensor Analog Front Ends

Improve Performance. Reduce System Size, Cost & Power



Texas Instruments' Sensor analog front end (AFE) products are the industry's only configurable ICs designed to interface with multiple sensor platforms and provide easy-to-use, modular solutions for bridging the gap between the microprocessor and sensor. The Sensor AFEs and WEBENCH® Sensor AFE Designer are part of an integrated hardware and software development system that allows customers to quickly design and configure a solution and move rapidly to prototyping.

Whether designing with the tool online or on the bench, simply select the sensor(s), configure the optimal signal path for your solution, then download the design to a Sensor AFE chip.

Sensor AFE

- Design and configure solutions online or on the bench
- Prototype quickly on the bench
- Easily calibrate and run diagnostic tests
- Simplify manufacturing
- Reduce time-to-market

TI's growing family of Sensor AFEs dramatically reduces development time by using a single chip across multiple sensor platforms instead of designing several complex discrete solutions.

Sensor AFE Portfolio

Device	Sensor Type	Applications
LMP9100x Family	Electrochemical Cells, Solid-State Materials, CO, O2, H2S Gases	Safety and Security, Building Automation and Monitoring, Air Quality, Petrochemical, Toxic Gas Monitors
LMP9105x Family	NDIR Sensor CO2, CH4, Alcohol Gas, Freons, Green House Gases	CO2 Monitors Demand Control Ventilation, Alcohol Breath Analyzers, Environmental Monitoring
LMP91200	pH	Steam and Water Quality Monitoring, TDS Meters, Chemical/Petrochemical Plants, Pharma, Food Industry
LMP90xx Family	Temperature, RTD, NTC, TC, Resistive Bridge	Industrial Automation, Temperature Transmitters, Weigh Scales, Force, Automotive

New products are listed in bold red.

Safety, Security and Environment Monitoring

LMP91000 / 2

The LMP91000/2 is a complete programmable potentiostat circuit that interfaces to most single channel Electrochemical cells.

Need

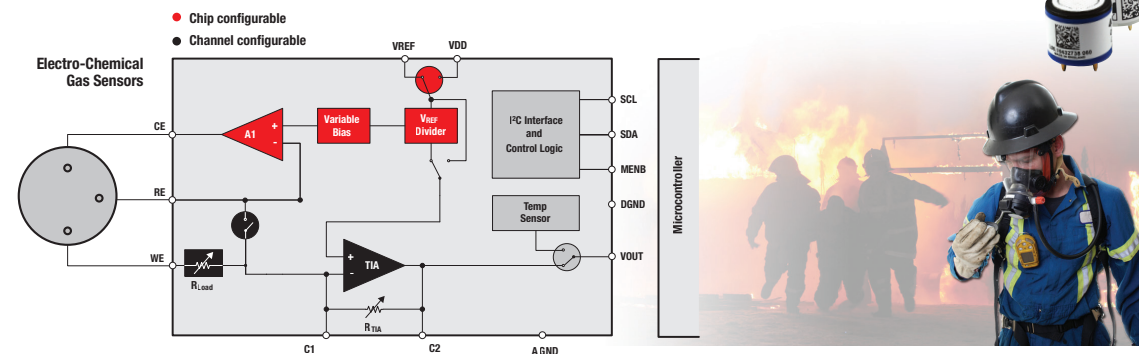
- Simplify the PCB build for multiple gases, different sensors and platforms
- Low power
- Sensor can never be shut down
- Temperature compensation
- Sensor Diagnostics

Traditional Solution

- No diagnostics
- Bias current specification over temperature is not guaranteed
- No protection for probe when power removed
- High power
- Large form factor

Best In Class: Worlds first integrated AFE for MULTIPLE toxic gas sensors

- Reconfigurable to support a wide array of sensor without redesign
- Ultra low power (<10 uA operating)
- Internal FET facilitates system power cycling without requiring sensor warm-up
- 4 mm x 4 mm enables integration into small sensor modules
- Integrated temp sensor and diagnostics improve accuracy and reliability



Smart Building Automation, Alcohol Breath Detection, Refrigerator Leakage

LMP91050 / 51

The LMP91050/1 enables lowest solution size & cost Non-Dispersive Infrared (NDIR) sensor systems.

Need

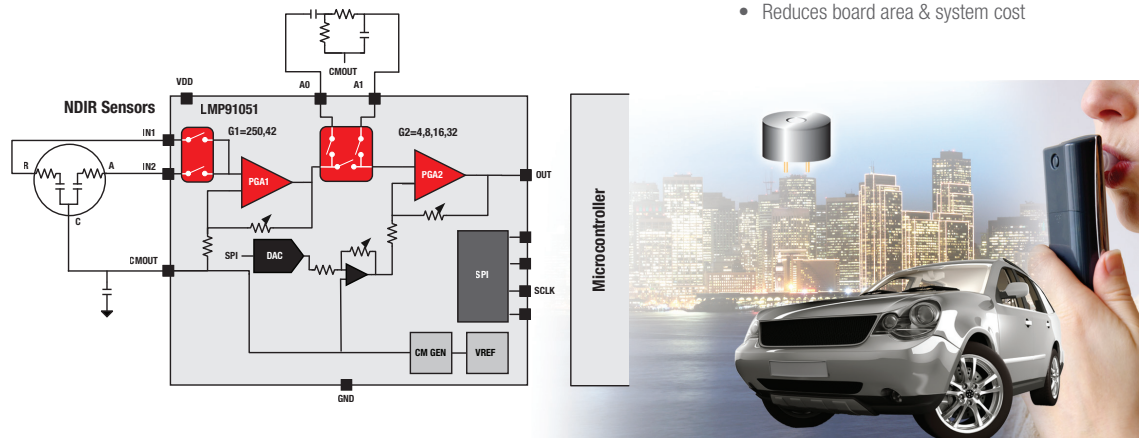
- Simplify the PCB build for multiple sensors and platforms
- "Dark Signal" offset cancellation
- Thermal stability of gain and phase delay
- Small form factor

Traditional Solution

- Requires multiple components
- Expensive cost of ownership
- Higher resolution ADC
- Needs 20s of settling time for signal path

Best In Class TI Solution: Optimized for highest gain platform with best noise performance

- Reconfigurable to support a wide array of thermopile sensors
- On board active "Dark Signal" offset cancellation eliminates need for high dynamic range ADC
- DC coupling enables fast settling leading to rapid power cycling
- Reduces board area & system cost



Water, Food, Environment Monitoring

LMP91200

The LMP91200 is a complete programmable, highly integrated, high impedance solution that interfaces with most pH sensors

Need

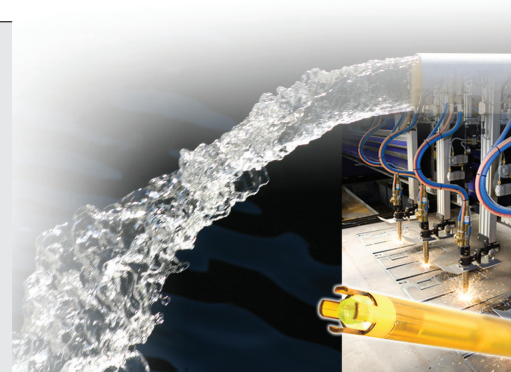
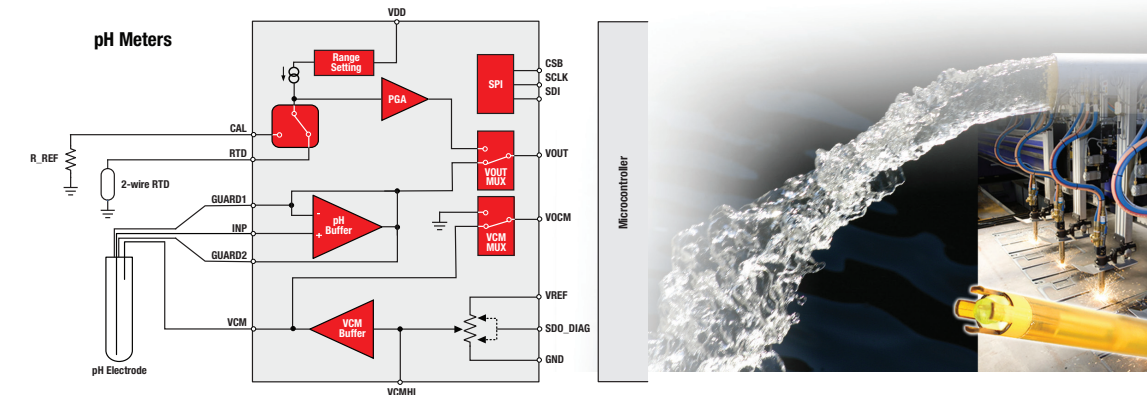
- Very high impedance and ultra low bias input buffer
- Temperature compensation
- Maintain high input impedance even when power is removed

Traditional Solution

- No diagnostics
- Bias current specification over temperature is not guaranteed
- No protection for probe when power removed
- High power
- Large form factor

Best In Class TI Solution: Worlds lowest bias current solution that extends the life of the pH sensors

- Lowest bias current solution <125fA max enables interface to high impedance sensors
- Guard ring in package minimizes leakage on board and package
- Maintain bias < 10pA with no power applied extends probe lifetime
- Small form factor solution
- Sensor diagnostics functions



Temperature sensing, Industrial and Process Automation

LMP90100 / 77-80 / 97-99

The LMP90100 family is a complete programmable multi-channel, low power 24-bit Sigma Delta ADC that interface with Temperature and Bridge Sensors

Need

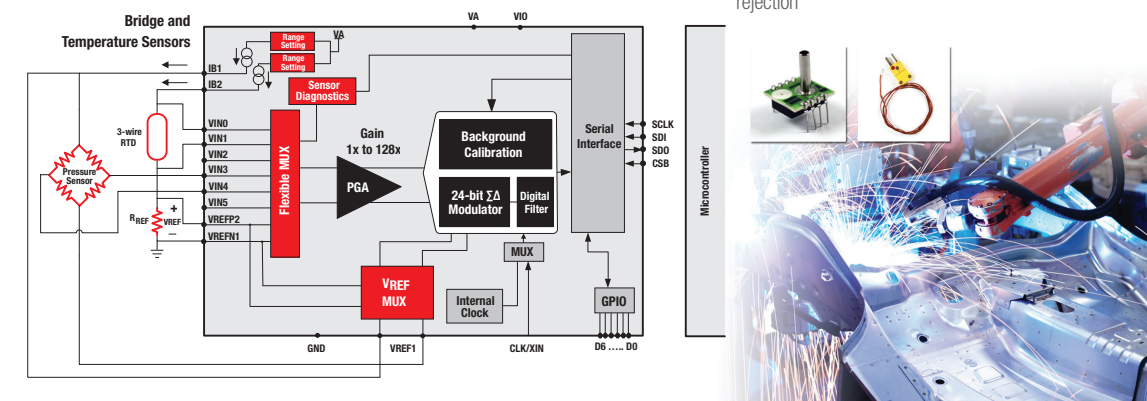
- Flexible implementation to support universal Input type transmitters
- Data Integrity check
- Low drift over time and temperature
- Diagnostics

Traditional Solution

- Extensive need for external mux, amplifiers, filters and complex programming.
- Inflexible multiple solutions needed to support all temperature transducers
- Higher cost of ownership

Best in class TI Solution: Easy to use and configurable solution with software support

- Supports all thermocouples, thermistors and RTDs
- High resolution 24 bit Delta Sigma ADC with 1x to 128x PGA.
- Enables high performance temperature sensing solutions -Example: Less than 0.01° C of intrinsic error for Type K thermocouple across entire temperature range
- Minimum component count implementation with diagnostics, sensor protection and EMI /power line noise rejection



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