Smoke detectors save lives, but only when they are used properly.

3 out of 5 deaths result from fires in properties without working smoke alarms

23% of deaths are caused by fires where smoke alarms were present, but were intentionally disabled due to false alarms

83% less time available to escape a fire than in the 1970s due to the more synthetic materials in buildings

New high performance sensing solutions from ADI are helping smoke and fire detector manufacturers to combat these challenges.
The Challenges for Manufacturers

- High Occurrence of Nuisance Alarms, Which Results in:
  - Turning off the detector
  - Not changing batteries
  - Covering the detector with plastic

- Large Size and High Power
  - Cannot be integrated into fixtures to meet architectural or aesthetic designs
  - High power consumption
  - Less suitable to meet demand for wireless detectors

- Regulatory Compliance
  - New products must pass UL 217/UL 268 and EN 54/EN 14604 tests to reduce false alarms and detect fires caused by synthetic materials

The Solution from ADI

- Space-saving integrated module—photodiode, AFE, and LEDs
- On-chip calibration reduces factory end-of-line calibration requirements
- Reduces power dissipation
- Particle size estimation using two LEDs reduces false alarms
- Enables UL and EN compliant detectors
ADPD188BI

An integrated smoke-to-bits sensor incorporating dual wavelength LEDs, a photodiode, and an AFE. The ADPD188BI has better smoke differentiation and fewer nuisance alarms due to its dual wavelength, wide dynamic range, and high SNR. It is engineered to meet the latest regulatory requirements such as UL 217/UL 268 and EN 54/EN 14604.

Learn more at analog.com/smokedetection.

Small Size, Easy to Mount, Designed for UL Listing

EVAL-CHAMBER/
EVAL-CHAMBER-10/28800X

The patented ADI Smoke Chamber is designed for a controlled optical environment with maximum airflow. The background response of the chamber uses a small percentage of available dynamic range and provides self-diagnostic capability. It is engineered to meet the latest regulatory requirements. There are two evaluation models available, the EVAL-CHAMBER (2 pieces) and EVAL-CHAMBER-10 (10 pieces). The production version is the Accumold 28800X and is available from Accumold and Arrow.

Learn more at analog.com/smokedetection.
UL Tested Smoke Detection Hardware and Software: Reduce Risk, Lower Development Cost, and Accelerate Time to Market

CN-0537 Smoke Detector Reference Design

This reference design plus related software is designed and tested to meet UL 217 8th edition, UL 268 7th edition, and similar smoke/fire detection standards. To address the needs of different customers, a number of solution offerings are available, which are summarized in the table below. The hardware is Arduino form factor compatible and is designed to accelerate prototyping and the evaluation of the embedded smoke detection algorithm. The hardware is comprised of the EVAL-CN0537-AR0Z reference design, which is described in the CN-0537 circuit note, and the supporting EVAL-ADICUP3029 microcontroller board. The data (EVAL-CN0537-DATA) package provides an extensive smoke dataset taken at UL certified facilities for those who wish to develop their own algorithm and the CN-0537 source code—excluding the detection algorithm. The algorithm (EVAL-CN0537-ALGO) package includes everything in the data package and a UL certified smoke detection algorithm with associated algorithm project files.

CN-0537 Reference Design Offerings

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<tr>
<th>Solution Options</th>
<th>Description</th>
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| Hardware EVAL-CN0537-AR0Z EVAL-ADICUP3029 | Smoke detector reference design hardware for prototyping and solution evaluation. A tested and verified UL 217/UL 268 smoke detection algorithm is embedded as part of the installer for evaluation. | Hardware
  ➤ Smoke detector (CN-0537) reference design
  ➤ Microcontroller development board (ADICUP3029)
  Software
    ➤ Embedded SW executable (.hex)
    ➤ ADPD188BI no-OS driver
  Documentation
    ➤ CN-0537 circuit note
    ➤ CN-0537 hardware user guide
    ➤ Tested and verified UL 217/UL 268 test result

| Data EVAL-CN0537-DATA | CN-0537 source code (excl. detection algorithm) plus over 1700 sample fire/smoke datasets taken at certified UL facilities for algorithm development. | Data
  ➤ UL test datasets files
  Software
    ➤ CN-0537 source code (excl. detection algorithm)
  Documentation
    ➤ UL test datasets user guide

| Algorithm EVAL-CN0537-ALGO | Full source code and UL 217 8th edition/UL 268 7th edition tested and verified algorithm, associated project files, CN-0537 source code and over 1700 sample fire/smoke datasets to accelerate system development. | Software
  ➤ CN-0537 source code including UL detection algorithm (.c)
  ➤ MATLAB® and Python UL algorithm projects
  Data
    ➤ UL test datasets files
  Documentation
    ➤ Algorithm documentation
    ➤ UL test datasets user guide
    ➤ MATLAB/Python user guide
  Support
    ➤ 10 hours of phone support

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