IOTEAM

Dust ADI Sensors

Arrow Part Number:
ITM-DASN-A-01
Dust ADI Sensors

Dusty PCB Ant/U.FL Ant Conn with Digital I²C Temperature Sensor ADT7420, MEMS Accelerometer ADXL362, Dual Axis MEMS

The Dust ADI Sensors module is a PCBA product incorporating Linear Technology®'s LTC®5800-IPM SoC running SmartMesh IP embedded networking software. The new Dust ADI Sensors is complete with on-board PCB antenna or U.FL connector, crystals, modular RF certifications and embeds the ADT7420, the ADXL362 and the ADXRS290 by Analog Devices.

The ADT7420, a ±0.25°C accurate, 16-Bit Digital I²C Temperature Sensor, offers breakthrough performance over a wide industrial range. It contains an internal band gap reference, a temperature sensor, and a 16-bit ADC to monitor and digitize the temperature to 0.0078°C resolution.

The Micro power, 3-Axis, ±2 g /±4 g /±8 g Digital Output MEMS Accelerometer ADXL362 is ultra low power and consumes less than 2µA at a 100 Hz output data rate and 270 nA when in motion triggered Wake-up mode. It provides both 12-bit and 8-bit output resolution; Measurement ranges of ±2g, ±4g, and ±8g are available, with a resolution of 1 mg/LSB on the ±2g range.

The Dual Axis MEMS Gyroscope ADXRS290 is a high performance MEMS pitch and roll (dual-axis in-plane) angular rate sensor gyroscope) designed for use in stabilization applications. It provides an output full scale range of ±100°/s with a sensitivity of 200 LSB/°/s.
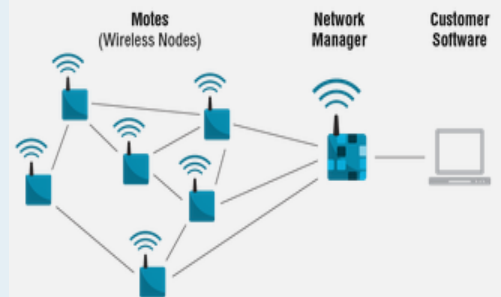
SmartMesh IP Functional Overview

A SmartMesh IP network consists of a highly scalable. self-forming multi-hop mesh of wireless nodes, known as motes, which collect and relay data, and a network manager that monitors and manages

The Dust ADI Sensors is a printed circuit board assembly (PCBA) product with on-board PCB antenna or U.FL Antenna connector with the ADT7420, the ADXL362 and the ADXRS290 by Analog Devices, and incorporating an LTC5800-IPM, a highly integrated, low power radio design with an ARM Cortex-M3 32-bit microprocessor running SmartMesh IP embedded networking software.

With SmartMesh IP time-synchronized networks, all motes in the network may route, source or terminate data, while providing many years of battery powered operation.

SmartMesh IP is a highly flexible network with proven reliability and low power performance in an easy-to-integrate platform. Dusty's behaviour in a SmartMesh IP network is determined by the choice of SmartMesh IP network software loaded: Wireless Mote, Manager, Access Point Mote™ in a SmartMesh IP network. The SmartMesh IP software provided is fully tested and validated, and is readily configured via a software Application Programming Interface.

Dust ADI Sensors Board
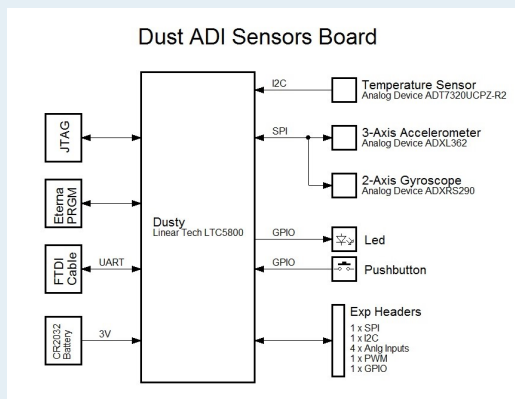
FEATURES

- PCBA module with PCB antenna or U.FL
- Integrates 2.4 GHz, IEEE 802.15.4e System-on-Chip, Complete with Embedded SmartMesh Networking Software
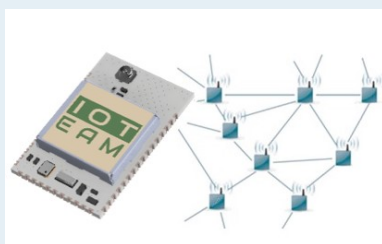
- >99.999% Network Reliability in the Most Challenging RF Environments
- Sub 50µA Routing Nodes
- Serves as either Wireless Mote, or EManager, or Access Point Mote in a SmartMesh IP network
- SmartMesh IP™ Embedded Wireless Mesh Networking
- Delivers your real-time critical information
- No wires, place sensors anywhere
- Encryption & authentication
- Secured network
- Complete Mesh Networking Software

- No network software development needed for the meshed network created by Dust
- High performance temperature Sensor
  - Temperature accuracy
    * ±0.20°C from −10°C to +85°C at 3.0 V
    * ±0.25°C from −20°C to +105°C from 2.7 V to 3.3 V
  - 16-bit resolution: 0.0078°C
  - Ultralow temperature drift: 0.0073°C
  - NIST traceable or equivalent
  - Fast first temperature conversion on power-up of 6ms
- Ultra low power Digital Output MEMS Accelerometer
  - Power can be derived from coin cell battery
  - 1.8 µA at 100 Hz ODR, 2.0 V supply
  - 3.0 µA at 400 Hz ODR, 2.0 V supply
  - 270 nA motion activated wake-up mode
  - 10 nA standby current
- MEMS pitch and roll rate gyroscope
- Easy implementation
  - No temperature calibration/correction required by user
  - No linearity correction required
- Low power
  - Power-saving 1 sample per second (SPS) mode
  - 700 µW typical at 3.3 V in normal mode
  - 7 µW typical at 3.3 V in shutdown mode
- Wide operating ranges
  - Temperature range: −40°C to +150°C
  - Voltage range: 2.7 V to 5.5 V
- Programmable interrupts
  - Critical overtemperature interrupt
  - Overtemperature/undertemperature interrupt I²C-compatible interface
- 16-lead, 4 mm × 4 mm LFCSP RoHS-compliant package

APPLICATIONS

- RTD and thermistor replacement
- Thermocouple cold junction compensation
- Medical equipment
- Industrial control and test
- Food transportation and storage
- Environmental monitoring and HVAC
- Laser diode temperature control
- Optical
  - image stabilization
  - Platform stabilization
  - Wearable products
- Hearing aids
- Home healthcare devices
- Motion enabled power save switches
- Wireless sensors and
- Motion enabled metering devices