

redefining extreme low power

## nPZero SENTINEL Total

air quality, temperature, humidity, barometric pressure, light, and 9 axes accelerometer

Datasheet Rev. 2



Product name: nPZero SENTINEL Total

### Introduction

The **nPZero SENTINEL Total** is a small and capable air quality sensor for environment monitoring of smart buildings, work environment, and sensitive goods condition monitoring. It has Bluetooth Low Energy connectivity and sensors for temperature, 9 axes acceleration, barometric pressure with extreme sensitivity, relative humidity, light, as well as a gas sensing capabilities. The gas sensor output is analyzed in our back end to produce estimates for Index of Air Quality (IAQ), volatile organic compounds (VOC), and CO<sub>2</sub>.

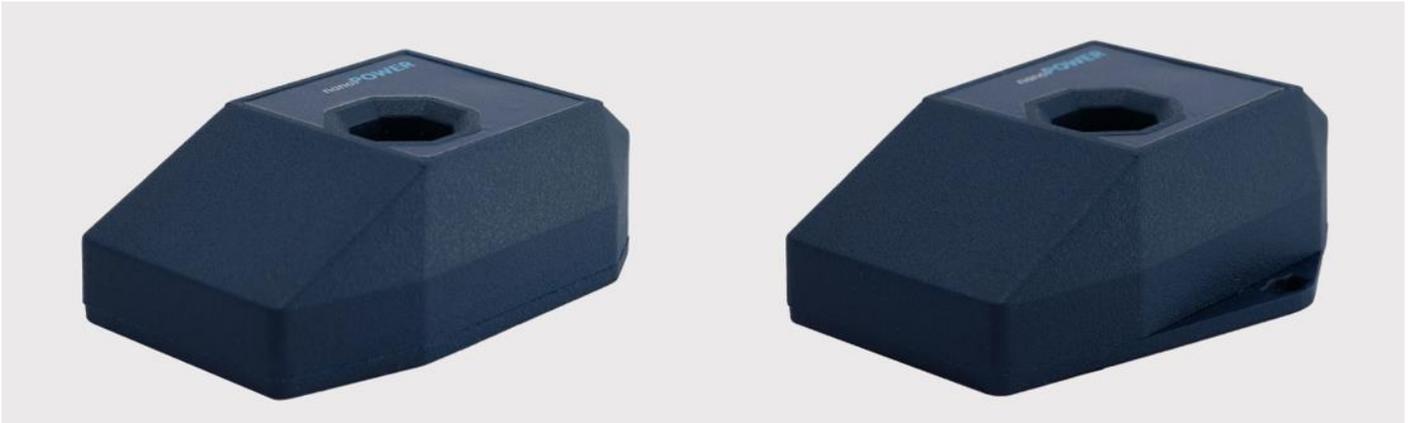
With next-to-zero power use with our nPZero-technology, it is both small and long-lasting. Nanopower's patent pending nPZero solution provides extreme low power capabilities that enables battery powered sensors in use cases where battery longevity is essential and changing a battery is not an option.

For use cases with settings for indoor environment monitoring, a typical battery life will be 5 years with possibilities for even longer life through modified settings.

While normal sensors have a low sensor polling frequency to preserve power, the **nPZero SENTINEL Total** combines long battery life with temperature monitoring every 4 seconds and impact every 0.6 seconds. This ensures that any deviation from specifications is detected and reported, never missing a beat.

The passive NFC enables the **nPZero SENTINEL Total** to be activated by handheld devices and efficiently integrated into processes, both for installation and operation.

The **nPZero SENTINEL Total** can be integrated into other BLE solutions, or used straight out of the box with the Nanopower mobile app for iOS and Android.



## Physical dimensions

Dimensions: (L x W x H) 56 x 37 x 19 mm  
Total width with flanges 47 mm  
Mounting holes ØM3, Zip tie 5mm width  
Center-to-center distance 42 mm

## Communication

BLE SoC: Nordic Semiconductor nRF52811 Bluetooth Low Energy with Bluetooth 5.2. Optionally Bluetooth Long Range.

BLE SDK: The system comes with default settings utilizing NUS (Nordic UART Service), e.g., to communicate with the Nanopower app for iOS and Android.  
The system can be delivered with a tailored setup, e.g., for connectivity over, e.g., gateways.

OTA: Firmware over the air update.

NFC: Passive NFC tag that enables, wake up of system from deep sleep/storage mode using, e.g., a mobile phone.

## Memory

64 KB (128 KB coming), equal to 45 alarms and 4,000 logs containing temperature, humidity, barometric pressure, light, and gas scan results

## Battery

14250 lithium thionyl chloride primary cell (lithium metal).  
Lithium content 0.30-0.35 g

## Enclosure

Thermoplastic: ABS, flame retardant grade.

Indoor installation at any angle, avoid direct sunlight into sensor area.

Outdoor installation on a vertical and weather protected area to ensure sufficient drainage of water. Avoid direct sunlight into sensor area. Direct sunlight and water on sensors will cause erroneous sensor readings and damage due to, e.g., frost.

## Sensors

Temperature:  $\pm 0.2$  °C (-10°C to 65°C)  
 $\pm 0.3$  °C (from -40°C to -10°C and from 65°C to 85°C)  
 $\pm 0.5$  °C (for remaining temperature span)  
Can wake system from sleep on thresholds, min/max

Accelerometer: 3-axis,  $\pm 2g/\pm 4g/\pm 8g/\pm 16g$  with output data rates from 1.6 Hz to 1600 Hz  
Can wake system from sleep on threshold

Gyroscope: 3-Axis,  $\pm 250 / \pm 500 / \pm 1000 / \pm 2000$  dps

Magnetometer: 3-Axis,  $\pm 4900$   $\mu$ T

Relative humidity:  $\pm 3\%$  (20-80% RH at 25°C incl. hysteresis)

Light sensor located at the bottom of the well

MEMS microphone (specifications tba)

Barometric pressure:  
Relative accuracy of  
 $\pm 1$  Pa for 10 hPa change over 950 - 1050 hPa at 25°C  
Absolute accuracy of  
 $\pm 1$  hPa over 950 hPa - 1050 hPa, 0°C to 65°C

Gas sensor with estimations in back-end of:  
IAQ: Index for Air Quality  $\pm 15\%$  (0-500)  
b-VOC equivalents: Breath-Volatile Organic Compounds  $\pm 5\%$   
CO<sub>2</sub> (ppm)  
Dew point

## Operating conditions

Temperature: -20 - +85°C  
>+5°C for gas sensor  
Air pressure: 300 - 1100 hPa

## Certifications

RED - Radio Equipment Directive, CE

Assembled in Portugal

## Mobile app - Nanopower

The nPZero SENTINEL series can be connected to the Nanopower mobile app which will be available for download from Apple App Store and Google Play.

Using the mobile app, you can:

- Read both real-time and historical sensor data from your nPZero SENTINEL devices.
- Choose between predefined modes to fit your requirements.
- Wake the device from deep sleep and activate the Bluetooth communication using the NFC function.

Visit [www.nanopower.store](http://www.nanopower.store) for more information

