

XENSIV™ PAS CO2



Motivation for CO₂ sensing

- › Humans spend around **90% of their time** indoors, where air quality (IAQ) is **2 to 5 times worse** than outdoor air¹
- › **CO₂ level is a key indicator of IAQ** - Long term CO₂ levels of 1000 ppm already show negative health impacts²
- › Examples of **poor air quality health impacts**: headaches, fatigue, reduced concentration, decreased productivity and dizziness

XENSIV™ PAS CO2 - Value proposition

XENSIV™ PAS CO2 – Measure what matters!

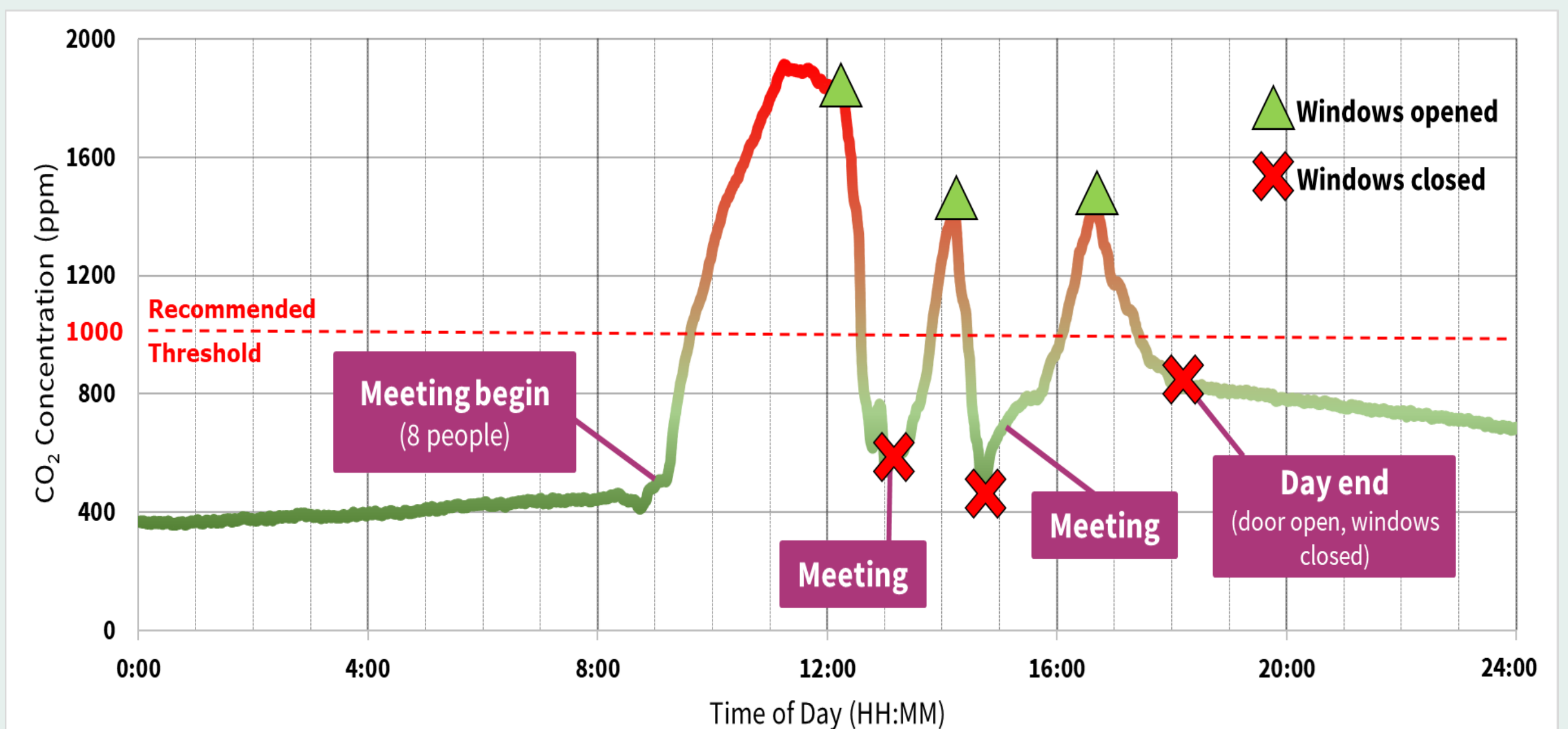
The XENSIV™ PAS CO2 leverages photoacoustic spectroscopy (PAS) to provide an exceptionally small, real CO₂ sensor that overcomes size, cost and performance challenges of existing CO₂ sensor solutions.

Applications of a real CO₂ sensor



XENSIV™ PAS CO2 - Use case

39 m² meeting room CO₂ concentration (over 24 hours)

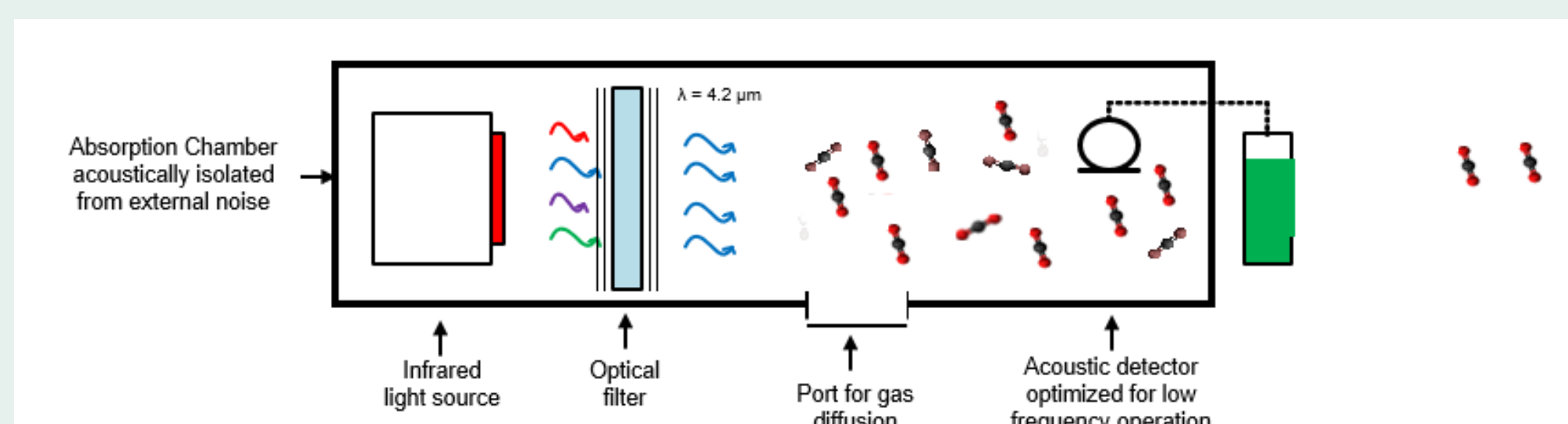


- › Quick rise in CO₂ concentration to high levels, but an open window quickly restored levels to a healthy zone

PAS operating principle

Photo Acoustic Spectroscopy (PAS)

- › Infrared emitter with blackbody radiation characteristic – periodically chopped
- › Optical filter tuned to CO₂ gas wavelength ($\lambda = 4.2 \mu\text{m}$)



- › Molecules absorb light → pressure increases ($\uparrow P$)
- › Pressure change detected by acoustic detector which is optimized for low frequency operation
- › Small signal for low CO₂ concentrations & vice versa

XENSIV™ PAS CO2 - Key specifications

Range	0 – 10,000 ppm
Accuracy	+/-30 ppm +/-3 % of reading (up to 5,000 ppm at ambient conditions)
Lifetime	10 years (in continuous mode: 1 readout / min)
Interface	UART, PWM, I ² C
Size & package	SMD; ~13.8 x 14 x 7.5 mm ³

- › **Real** CO₂ measurements enable accurate CO₂ readings, compared to indirect CO₂ sensing (eCO₂) – Direct ppm reading due to onboard microcontroller
- › Easy-to-integrate SMD module
- › Simple design ideal for high-volume and cost-sensitive applications