S21 3-in-1 Automotive Sensor

The MAXMAC S21 3-in-1 automotive sensor is a multi-parameter air quality detection module developed for intelligent and healthy cabins. It integrates PM2.5 particle sensing, CO2 concentration detection, NTC temperature and humidity acquisition to provide reliable environmental data for HVAC, fresh-air intake, recirculation and purification systems.

The product combines laser scattering PM detection, NDIR infrared CO2 measurement and CMOSens temperature and humidity sensing. It supports a 9-16 V vehicle power supply and LIN communication, with wide-temperature operation from -40°C to 85°C for stable use in demanding vehicle environments.

By monitoring particles, CO2, temperature and humidity together, S21 helps build a more complete cabin air quality control loop, improving comfort and safety during congestion, tunnel driving, long trips, parking rest and other occupied cabin scenarios.

Product Advantages:

- PM2.5 + CO2 + NTC/humidity integration reduces system complexity
- Laser scattering and NDIR technologies support accurate monitoring
- LIN communication interface for HVAC and cabin controller integration
- Wide-temperature design for high and low temperature vehicle use
- Low-noise operation supports cabin comfort requirements
- Compact structure fits dashboard, duct and HVAC box installation areas
- Temperature and humidity data support defogging and ventilation control

Typical Applications:

- Intelligent healthy cabin air quality monitoring systems
- Automatic fresh-air intake and recirculation control for HVAC
- In-cabin PM2.5, CO2, temperature and humidity display
- Air purification, defogging, ionizer and fragrance system linkage
- Comfort and safety configuration for new energy vehicles
- Environment monitoring for long-distance driving and parked vehicles

Standard Specification

Item	Description
Product Name	S21 3-in-1 Automotive Sensor
System	**PM2.5 + CO2 + NTC / humidity**
Supply Voltage	9-16 VDC
Operating Current	Average 80 mA @ 13.5VDC; peak 350 mA @ 13.5VDC
Operating Env.	-40°C to 85°C, 5%-95%RH, non-condensing
Storage Env.	-40°C to 85°C, 5%-95%RH, non-condensing
Life / Noise	30000 h; ≤25 dB(A) @ 50 cm
Communication	LIN
Overall Dimensions	88.8 mm × 65 mm × 16 mm
Main Body Dimensions	65 mm × 54 mm × 28 mm
PM2.5	**Laser scattering technology**
PM2.5 Range	0-999 μg/m³
PM2.5 Resolution	1 μg/m³
PM2.5 Accuracy	≤100 μg/m³: ±15 μg/m³; ＞100 μg/m³: ±15%
CO2	**NDIR infrared technology**
CO2 Range	400-9999 ppm
CO2 Resolution	1 ppm
CO2 Accuracy	±(50 ppm + 5% of reading)
Temperature	**CMOSens principle**
Measuring Range	-20°C to 85°C
Resolution / Accuracy	0.1°C; ±2°C
Humidity	**CMOSens principle**
Measuring Range	1-99%RH
Resolution / Accuracy	0.1%RH; ±5%RH

Note:

Specifications can be confirmed by project. Mounting structure and communication details can be customized for the vehicle platform.

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