Sensirion Automotive Solutions Increasing energy efficiency, safety, and comfort in vehicles

SENSIRION
automotive solutions

Automotive Solutions

for increased energy efficiency, safety and comfort

Sensirion Automotive Solutions specializes in designing, developing and manufacturing environmental sensors for automotive HVAC applications. With sales offices in China, Japan, South Korea, the US and Switzerland, we offer top-quality local support to OEMs and 1st tier suppliers around the world.

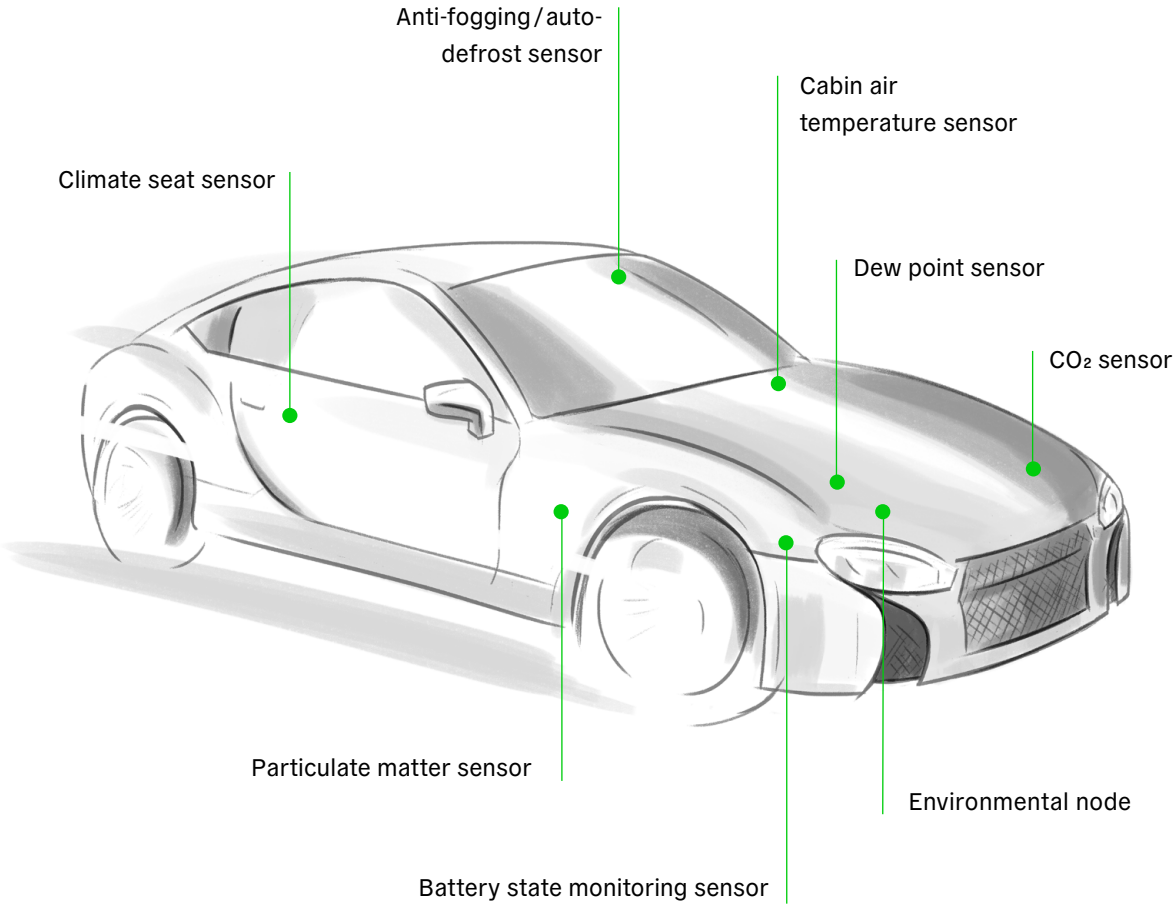
Our main focus is to improve energy efficiency as well as the safety and comfort of passengers. We continuously improve our manufacturing processes to meet the most stringent standards. Sensirion Automotive Solutions is organized as a legally independent entity within the Sensirion Holding and currently employs approx. 200 employees.

Our R&D centers are located in Switzerland, Germany and South Korea, with production sites based in Switzerland, South Korea, China and Hungary.

IATF16949 and ISO14001
certifications for all production plants

Our global manufacturing operates through a network of plants certified under both IATF16949 and ISO14001 standards.

Environmental sensors portfolio



Particulate matter sensor
SAPS series

Features

- PM1 and PM2.5 output
- Rapid response time
- Accurate measurement thanks to laser-based technology
- Resistant to dust and water
- Compliant with RoHS and REACH
- Fully customizable for dashboard or HVAC integration, reducing installation time and costs

Spending time in an enclosed vehicle with poor air quality can be detrimental to our health. One of the most dangerous indoor air pollutants is PM2.5, particulate matter with a diameter of less than 2.5 microns. These miniscule particles can travel deep into the human lung, leading to a range of health complications. By issuing alerts via the LIN when cabin air quality changes, our sensor informs the HVAC system that adjustments need to be made to improve ventilation and air exchange.

Specifications

SAPS series specifications	
Particle size	PM1 (0.3 - 2.5 µm) PM2.5 (0.3 - 2.5 µm)
Mass concentration range	0 - 1,000 µg/m³
Mass concentration resolution	1 µg/m³
Accuracy (to Standard reference and KCl)*	±15 µg/m³ (1 to 100 µg/m³) and ±15% (100 to 1,000 µg/m³)*
Operating temperature range	−40 to +80 °C
Guaranteed accuracy temperature range	−20 to +65 °C
Storage temperature range	−40 to +85 °C
Supply voltage	9 - 16 V
Electrical interface	LIN2.1
IP ranking	IP52 with air tight flow channel design*
Dimensions	73 mm × 30 mm × 40.4 mm**
Weight	< 100 g

* To avoid particulate settling or accumulation at the air outlet or air inlet, which may affect product sensitivity, response time and accuracy, ensure that the SAPS series are installed by Sensirion Automotive Solution instruction. Please contact info@sensirion-automotive.com for further details.
** Dimensions of SAPS series main body, not including mechanical parts for installation.

Climate seat sensor
SACS series

Features

- Rapid response time
- Rounded edges and soft material for undetectable integration in the seat
- Smart three-wire interface for easy integration into a seat cable harness
- 15-kV ESD protection for safe handling on the production line

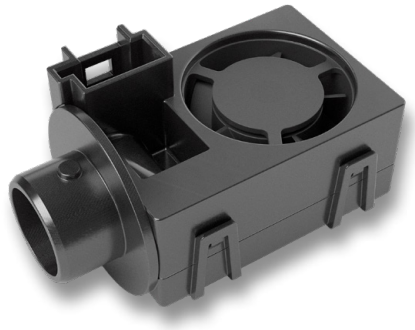
The smart reduction of energy usage starts with accurate monitoring technology – and climate-controlled seats are no exception. Our sensor is integrated into the seat structure, above the cushion and directly beneath the cover material, where it monitors humidity and temperature in the immedate vicinity of the passenger. It communicates this information to the HVAC controller, which uses the data to optimize seat ventilation, reducing cool air requirements. With its fast response time, it provides advanced information before the occupant begins to sweat.

Specifications

SACS series specifications	
Relative humidity	Range 0 - 100 % Accuracy ± 3 % (10 - 60 °C air temp. / 10 - 80 % RH) Response time < 10 sec
Temperature	Range −40 to +90 °C Accuracy ±0.4 °C (10 - 70 °C air temperature)
Dimensions	19.5 mm × 11.5 mm × 2.6 mm
Weight	< 6 g
IP rating	IP5K2
Supply voltage	4.5 - 5.5 V
Wire assignment	Ground, output (MSPPM* signal), power supply

* Multi-signal pulse-position modulation

Cabin air temperature sensor
SACT series



Features

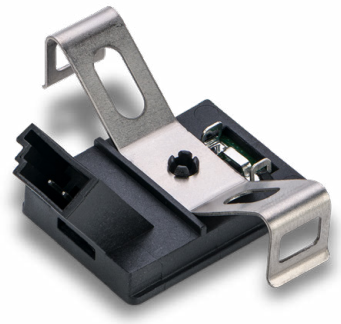
- Accurate temperature output
- Low noise with fan
- Analog interface
- RoHS and REACH compliant

To ensure passenger comfort, energy efficiency and the overall effectiveness of the climate control system, monitoring interior temperature is crucial. Our sensor communicates its readings directly to the HVAC system, allowing for optimized ventilation and heating. The sensor features a small form factor for easy installation and offers a variety of options for integration, mounting and electrical interface. To create an environmentally responsible system other relevant air quality sensors can be added.

Specifications

SACT series specifications	
Accuracy	0.5 °C at 25 °C
Operating temperature range	−30 to +70 °C
Storage temperature range	−40 to +85 °C
Supply voltage	9 - 16 V
Response time	< 10 seconds
Electrical interface	Analog
Dimensions	31 mm × 31 mm × 52 mm
Weight	< 25 g

Anti-fogging / auto-defrost sensor
SAAF series



Features

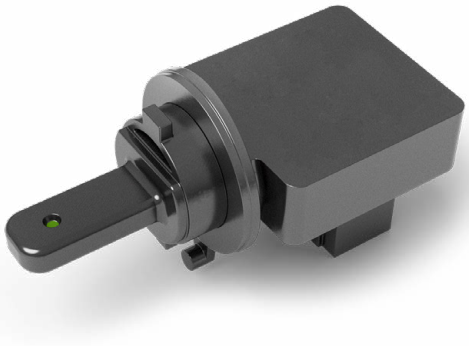
- Compact design to ease design-in in densely populated space
- Easy assembly thanks to angled connector
- Flexible installation with bracket or tape mounting
- Customer-specific solutions

To provide optimal visibility and enhance driver safety the windshield needs to be defogged automatically. Our sensor measures relative humidity and temperature on the inside of the windshield, enabling the HVAC system to actively prevent fogging. While providing state-of-the-art performance, it has been engineered to our customers' ease-of-use: its small footprint allows it to be placed at the best position for optimum system performance in the densely populated area at the rear-mirror socket. The angled connector allows for assembly on the manufacturing line.

Specifications

SAAF series specifications	
Relative humidity	Range 0-100 % Response time < 10 sec (0-60°C)
Temperature	Range −40 to +85 °C Accuracy ±0.8°C
Dew point temperature	Range −40 to +85 °C Accuracy ± 1°C at 0 to 15°C, 60-100 % RH ± 1.5°C at -20 to +25°C, 35-100 % RH
Electrical interface	LIN 2.2, 19.2 kBd
Supply current	< 2mA
Supply voltage	9-16 V
Dimensions	30 mm × 19 mm × 12.6 mm

Dew point sensor
SADP series



Features

- Rapid response time thanks to zero dead space design
- Watertight measurement tip (IP6K4K)
- USCAR-standard sealed connector and sealed housing
- Easy toolless mounting with bayonet
- LIN interface, always-on 12 V compliant

Accurate measurement of intake air humidity and temperature is essential to ensure energy efficiency and passenger comfort. Mounted inside the HVAC system, our sensor provides the HVAC controller with fast and accurate measurements to continuously determine the optimal evaporator setpoint. Cooling the air only as much as needed reduces energy-intensive reheating and avoids excessively dry air that can cause discomfort.

Specifications

SADP series specifications	
Relative humidity	Range 0 - 100 %
Temperature	Range −40 to +85 °C Accuracy ±0.5°C
Dew point temperature	Range −15 to +70°C dew point Accuracy ± 2°C dew point (20 - 50°C air temp. / 30 - 100 %RH)
Electrical interface	LIN 2.2, 19.2 kBd
Supply current	Typ. 2 mA
Supply voltage	9 - 16 V
Dimensions	62 mm × 26 mm × 33 mm
Weight	15 g

Environmental node
SAEN series

Features

- All-in-one environmental platform (PM1, PM2.5, RH, T, CO, CO_2, NOx, VOC)
- CO_2 concentration monitoring for indoor comfort
- Fully customizable for different application needs
- Dust-protection and long lifetime
- Simplifies integration, reduces costs and saves energy

All-in-one environmental platform to simplify indoor air quality monitoring in vehicles. The modular platform combines multiple sensors in a never-before-seen form factor and can measure up to eight environmental parameters (PM1, PM2.5, RH, T, CO, CO2, NOx, VOC). At its core is a miniaturized, MEMS-based PM sensing component. Together with the patented geometric arrangement, it allows the integration of the light source, detector, signal processing and algorithm into a cost and space efficient solution.

Specifications

SAEN series specifications*		
Operating temperature range	−40 °C to +80 °C**	
Storage temperature range	−40 °C to +85 °C	
Supply voltage	9 - 16 V	
Electrical interface	LIN 2.1 / 2.2	
Dimensions	45 mm × 57 mm × 31 mm	
Weight	55 g	
IP rating**	IP00, IP52 for indoor air	IP54 for outdoor air
Relative humidity / temperature**	−40°C to +80°C / response time <15 s	−40°C to +80°C / response time <25 s
Particulate matter precision (PM1, PM2.5)**	±10 µg/m³ (1 to 66 µg/m³) ±15 % (66 to 1,000 µg/m³)	
CO_2 accuracy (400 - 10,000 ppm)**	0 °C - 50 °C: ± 200 ppm or ± 10 % m.v. apply whatever is higher	
Gas sensor**	Indoor TVOC index	NOx / CO 10 AQS Lvs

* Product is under development – specifications are subject to change,
** For detailed specifications for each parameter please contact us.

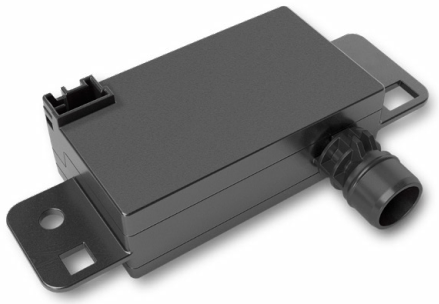
CO_2 sensor
SACD series

Features

- Robust photoacoustic measuring technology
- Configurable alarm levels
- Low-power surveillance mode
- Compact design for hidden in-cabin mounting
- LIN interface, always-on 12 V compliant with possibility of waking bus

To protect passengers from R744 leakage into the cabins and to optimize the recirculation rate, CO_2 levels must be monitored. High concentrations of CO_2 can accumulate due to continuous slow leakage of R744 into the cabin when the vehicle is parked or when recirculation is used. Our sensor is mounted inside the cabin to measure CO_2 levels accurately and continuously. The measured CO_2 levels in the cabin can also be used to make more efficient use of recirculation rather than general assumptions based on the number of passengers.

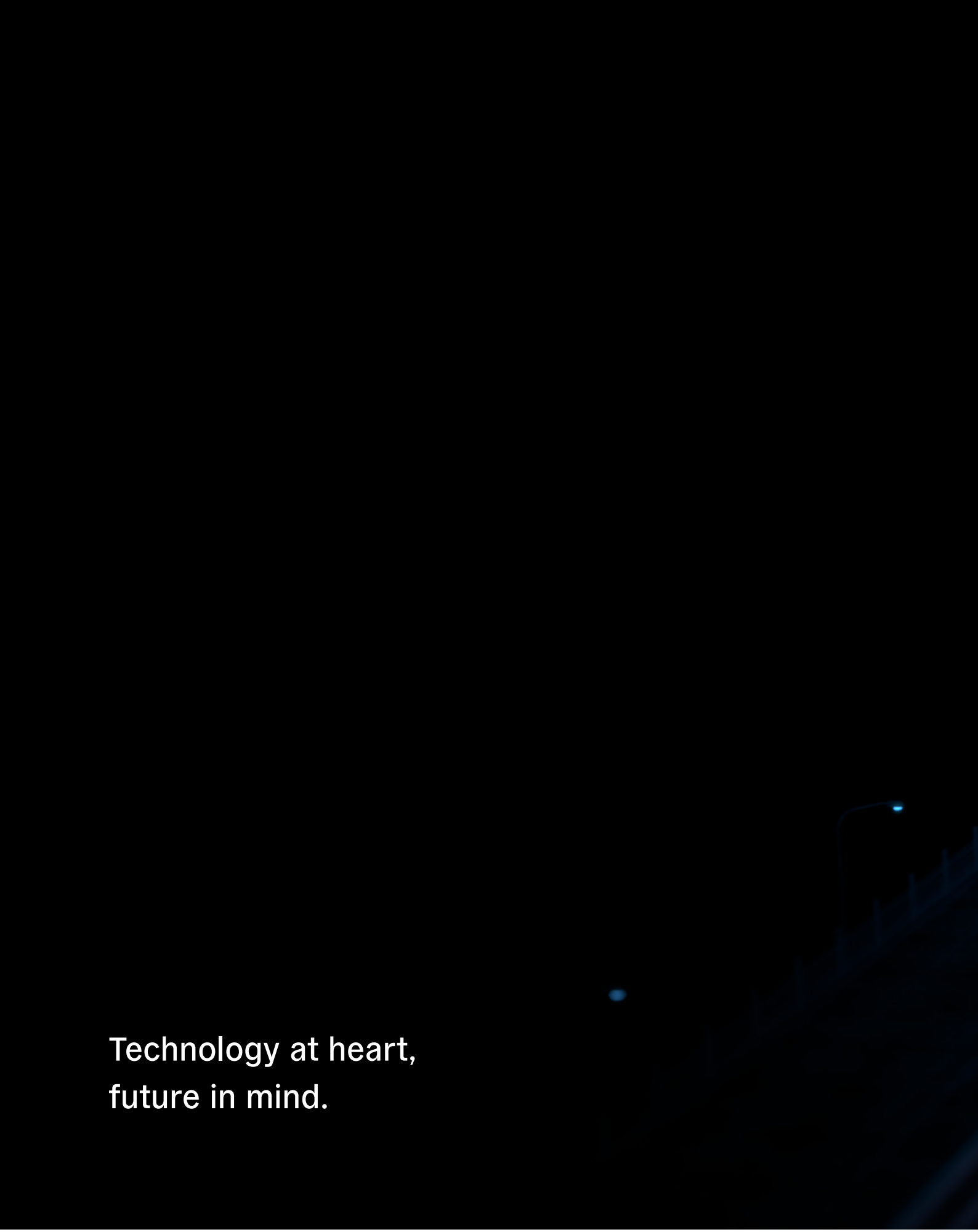
Battery state monitoring sensor
SABM series



Features

- Thermal runaway detection sensor with distinct sensor technology
- Operating time of 15 years possible
- Customer-specific solutions

In the event of a thermal runaway (e.g., caused by an impurity in the battery cell) people inside or around a vehicle need to be warned immediately. Our thermal runaway detection sensor offers the required accuracy and a fast response time to allow the vehicle to take immediate action in a short time.


Technology at heart,
future in mind.