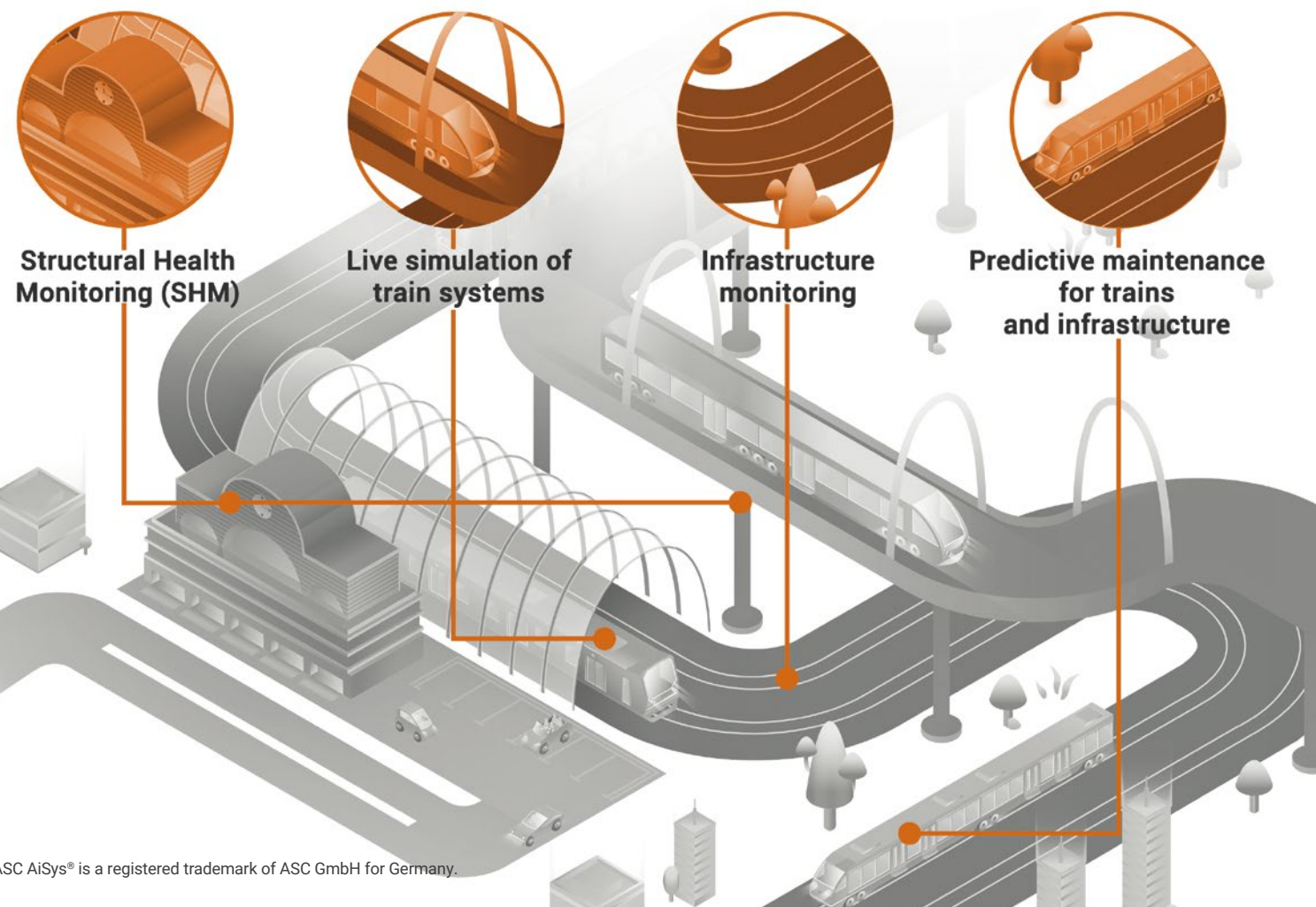


Digital Railways – ASC AiSys® smart sensor systems connect worlds

With ASC AiSys® smart sensor systems, ASC is taking the next step in digitalization: Inertial sensors not only take measurements and digitize them, they also process and analyze the measured data on site! In this sense, they are the link between the real and the virtual world. This is because they make integration into digital twins, for example, very simple, as only the necessary data need to be transferred either by cable or wirelessly.

ASC AiSys® smart sensor systems offer a great level of flexibility in terms of implementing predictive maintenance applications and monitoring solutions, due to a modular construction system. Any selection can be made from different technologies and measuring ranges, relying on ASC's widely trusted basic sensors. This means that the properties that are most important in the rail sector remain unchanged: a high level of reliability under challenging environmental conditions, as well as excellent long-term stability.



ASC AiSys® is a registered trademark of ASC GmbH for Germany.

ASC – smart in motion



ASC Inertial sensors
 analog – digital – smart



With ASC you can benefit from a wide range of services



Solution-oriented consulting



R&D customized sensor solutions



Expert advice for choosing suitable sensors



Calibration of accelerometers from all manufacturers in our DAkkS accredited calibration laboratory according to certificate D-K-18110-01-00



ISO 9001: 2015



"With us, customers don't just get a sensor, but an individual comprehensive solution for its use."



ASC GmbH
 Ledererstraße 10
 85276 Pfaffenhofen/Germany
 Phone +49 (0) 84 41 / 78 65 47-0
 office@asc-sensors.de

www.asc-sensors.de/en

Smart sensor solutions for digital railways

Made in Germany

ASC – smart in motion



Track position data acquisition (EN 13848)

ASC's piezoelectric accelerometers detect the vertical acceleration on trains. Uniaxial gyroscopes also measure the track geometry in the bends. This way, errors in the longitudinal height of the track superstructure can be detected quickly.

Bogie stability (EN 13749)

Train bogies are subject to heavy loads. ASC's OS series capacitive accelerometers are ideal for bogie stability testing because they can easily withstand heat, cold, humidity, and dust (IP68).

Navigation

Knowing the exact positioning of trains is critical for rail traffic safety. ASC's inertial measurement units (IMUs) and gyroscopes detect the positions of trains, even when other locating systems are disrupted or unavailable.

Predictive maintenance – trains and infrastructure

Our ASC AiSys® smart sensor systems monitor train bogies in real time. They even measure minor linear accelerations and low-frequency, dynamic, and static constant accelerations. This means damage can be detected at an early stage.

Capacitive accelerometers

ASC's capacitive accelerometers are based on high-quality sensor elements (MEMS), which have impressive long-term stability and reliability. This technology makes it possible to measure static (DC), constant and dynamic (AC) accelerations, with a 7 kHz range and amplitudes of up to ± 400 g. Furthermore, the dimensioning of the micro mechanics has an extremely short recovery time, with a shock resistance of up to 6,000 g.

IEPE accelerometers

ASC's piezoelectric accelerometers are based on both the shear and compression principles. The sensors have integrated electronics that convert charge shifts in the PZT ceramic into analog voltage signals (IEPE, Integrated Electronics Piezo Electric). This technology has a high pass characteristic, meaning no static DC components are detected. However, highly dynamic measurements with a very high bandwidth of up to 20 kHz and amplitudes up to $\pm 2,000$ g are possible.

Inertial sensors for strong rails

analog – digital – smart



ASC 271
ASC 281

Gyroscopes



ASC P Series

IEPE
Accelerometers



ASC OS Series

Capacitive
accelerometers



ASC IMU 8

Inertial
Measurement Units



ASC AiSys®
ACC 2211

ASC AiSys® smart
sensor system



ASC IMU 7

Inertial
Measurement Units



ASC MF Series

Capacitive
accelerometers



ASC LN Series

Capacitive
accelerometers



ASC CS Series
ASC EQ Series

Capacitive
accelerometers



ASC AiSys®
VibroTherm

ASC AiSys® smart
sensor system

Running dynamics tests (EN 14363)

ASC accelerometers and IMUs record train drive dynamics and thus make it possible to assess derailment safety and other parameters. Furthermore, our ASC AiSys® smart sensor systems can even detect material weaknesses at an early stage.

Ride comfort measurements (EN 12299)

Our accelerometers will win you over with their low frequency and measuring ranges. They are therefore ideal for ride comfort measurements, where the smallest of linear accelerations and low-frequency vibrations have to be recorded.

Infrastructure monitoring

ASC CS accelerometers have a current output signal and are therefore intended for loss-free signal transmission for the structural health monitoring of railway bridges. ASC EQ sensors reliably detect even the smallest vibration amplitudes with their high resolution of <1 μ g. They are perfect for track bed monitoring.

Predictive maintenance – wheelset bearings and gearing mechanism

ASC AiSys® VibroTherm smart sensor systems measure the vertical acceleration at the wheelset bearings, thus monitoring the longitudinal height of the track superstructure. They also even detect even the smallest vibrations and temperature changes in real time and can therefore prevent damage to the gearing mechanism.

ASC AiSys® VibroTherm smart sensor combination

ASC GmbH and Ephy-Mess GmbH worked together to develop the ASC AiSys® VibroTherm. This has given ASC the opportunity to demonstrate how flexibly ASC AiSys® modules can be integrated and easily combined. The temperature is also recorded, digitized, and transmitted, along with vibration measurements, via a common CAN bus. The sensor analyzes both the vibration measurements and temperature monitoring.



Find out more!
[www.asc-sensors.de/en/
applications/rail-transport](http://www.asc-sensors.de/en/applications/rail-transport)

Inertial Measurement Units (IMUs)

ASC's analog Inertial Measurement Units record raw data for all 6 degrees of freedom of moving objects. All IMUs are manufactured according to a proven modular principle and can therefore be optimally adapted to any application. The quality of the ITR-free ASC IMU 8 with tactical grade performance sets it apart on the market. It features accelerometers with measurement ranges from ± 2 to ± 30 g and an in-run bias stability of <45 μ g, as well as angular rate sensors with measurement ranges from ± 10 to ± 400 °/s and a bias stability of <0.1 °/h.

Gyroscopes

ASC gyroscopes are based on tried-and-tested MEMS vibrating rings. The design of micro mechanical silicon structures makes the gyroscopes extremely desensitized to external shocks and vibrations. In terms of maximum achievable accuracy, the uniaxial and triaxial gyroscopes are available for both industrial grade (bias stability <12 °/h, measurement range ± 75 to ± 900 °/s) and tactical grade (bias stability <0.1 °/h, measurement range ± 10 to ± 400 °/s) performance specifications.