



Go ballistic

Bloodhound SSC aims for 1,000mph on the ground

Rapid results

The latest technologies in the field of rapid prototyping

In their element

Keeping aluminum, iron, and steel at the cutting edge



24hrs

Interviewed

Tim Cindric
President, Penske Racing
Robert Davis
Senior VP, Mazda North America

➔ **How to win an around-the-clock race** featuring Peugeot, Manthey, Joest, Brumos, Risi, and Vitaphone Racing

COVER STORY 020

On through the night

By nature, 24-hour races are among the hardest events in motorsport and require a unique blend of skill and experience to win. PMW turned to six experts in the discipline to find out how it's done

COVER STORY 021

The panel

Cliff Mearns (USA)
Four-time Le Mans winner, Mearns is a legend in the world of endurance racing. He has won the 24-hour race at Le Mans four times and is a member of the 24-hour club.

Neville Headman (UK)
Headman has won the 24-hour race at Le Mans twice and is a member of the 24-hour club.

Alker Edwards (UK)
Edwards has won the 24-hour race at Le Mans once and is a member of the 24-hour club.

Steve Sims (USA)
Sims has won the 24-hour race at Le Mans once and is a member of the 24-hour club.

John Higginson (UK)
Higginson has won the 24-hour race at Le Mans once and is a member of the 24-hour club.

Ralf Jüttner (GER)
Jüttner has won the 24-hour race at Le Mans once and is a member of the 24-hour club.

022

Chocoholic

The Belgian road team, Belgian car dealer, and Korean OEM have teamed up to build a new silhouette racer for the Belgian Touring Car Series

026

Top cee'd

A British road team, Belgian car dealer, and Korean OEM have teamed up to build a new silhouette racer for the Belgian Touring Car Series

032

Chocoholic

The Belgian road team, Belgian car dealer, and Korean OEM have teamed up to build a new silhouette racer for the Belgian Touring Car Series

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Forge ahead

...a stinkload of sportscar horsepower

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Rocket science

...a stinkload of sportscar horsepower

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I REMEMBER...

...a stinkload of sportscar horsepower

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AXON SYSTEMS manufactures telemetry systems and telemetry-based torque and temperature transducers.

The technology relies on a strain gauge attached with glass fiber epoxy to the shaft in question. As the shaft flexes under load, this is converted into an electrical voltage, which is processed by a small telemetry unit on the shaft. A type of ring stator recovers the signal and relays it to a central data acquisition system. It all sounds very delicate, but in fact the robust nature of the component design and the materials used mean that all vehicles can have these monitors installed, even at rotational speeds of up to 15,000rpm.

Axon sprang from the wreckage of bankrupt telematics company Optim Electronics in 2005. Motorsport quickly became a key area of interest.

"We now split the bulk of our business markets between the series production work for car manufacturers, and motorsport, where we're working together with established partners and new customers," explains sales manager, Gerhard Spitz.

Axon has installed its technology on the rear driveshafts of a leading F1 team's car to measure the torque during testing.

"Our customers supply the shafts, then we attach the strain gauges and do the calibration and instrumentation so they can be returned in a matter of days," continues Spitz. "Customers are interested in the torque on the shafts under acceleration as well as under braking, and it enables them to check their designs in a unique way."

The collected data is also used by engineers to fine-tune their simulations.

"This is important because it speeds up how the designs can be refined, and saves the team a lot of time and money on track use," notes Spitz.

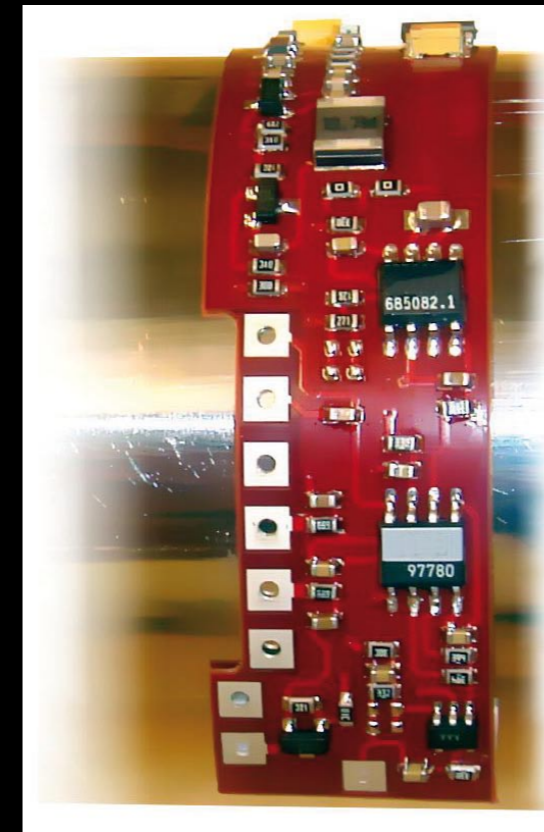
The next step for Axon will be to create a digital system with a full multichannel capability, enabling more variables to be measured. For example, force, torque, and temperature could all be easily measured in one spot. This will be completely researched and designed in house, as the company invests heavily in new technology.

"We have everything we need, all the manufacturing equipment, pick and place machines, an application and calibration laboratory, and almost every type of test bench imaginable," concludes Spitz. "This is why the turnaround times are so fast!" ❖

WORDS BY JONATHAN LAWSON

AXON

systems



AXON Systems is the supplier of high performance telemetry systems for measuring torque, force, temperature and other parameters from rotating parts such as prop – and drive shafts.

The systems are easy to use and designed for very harsh physical and electrical environments. A further service of AXON Systems is providing full application, calibration and documentation for torque measurement shafts.

As a turnkey solution, the AXON J1 can quickly and easily be installed, giving detailed measurements safely from free rotating shafts and engine components.

The innovative 1-channel-telemetry-system AXON J1 allows users to equip rotating shafts with strain gauges or thermocouples and wirelessly transmits a dynamic signal to a stationary unit, where the analog signal can be processed easily by any data acquisition system.

To protect the telemetry unit against mechanical shocks, water and oil, the system on the moving shaft can be covered with a high-strength fiber glass laminate. The power for the telemetry is supplied by an inductive power supply, meaning, no battery needs to be installed on the shaft, and added weight is limited to just a few grams.

The lightweight rotor telemetry unit processes the signal and transmits it to a stator unit which also supplies the inductive energy to the rotor. The inductive head of the AXON J1 is equipped with a stator-ring in the form of a flexible moldable loop that allows installation even in the tightest areas.

Axon's IPT – Intelligent Power Transmission provides a high level of power to the shaft, even for vehicles with large suspension travel such as rally and off road cars.

The high performance J1-telemetry system in conjunction with the experienced application and on-site service makes AXON Systems the real partner in powertrain testing.



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GERHARD SPITZ REVEALS HOW AXON'S STRAIN GAUGES ARE MEASURING THE DRIVESHAFT TORQUE ON F1 CARS