

From First Drive to Full Potential: Aixtreme Racing Advances the FS26 with ATI

Aixtreme Racing is the Formula Student team of the University of Applied Sciences Aachen (FH Aachen), founded in 2007. Just one year after its founding, the team completed their first race car. Today, the interdisciplinary team consists of nearly 40 students who handle every aspect of development, construction, and operation themselves, combining skills from mechanical, electrical and software engineering with business and marketing. The team competes in the Formula Student series, one of the most prestigious international engineering competitions, where university teams from around the world design and build Formula-style single-seater race cars and are evaluated on both technical performance and business strategy.

After years of competing with combustion-powered vehicles, finishing their run with a second place at the 2024 Formula Student Italy Combustion Event, Aixtreme Racing made a decisive step toward the future: alongside that final combustion season, the team simultaneously began the transition to a fully electric drivetrain. In 2025, this effort culminated in the debut of the FS25, their first electric race car, competing at official Formula Student events for the very first time.



ATI: Enabling a seamless Transition to Electric Power

This transition would not have been possible without the support of Accurate Technologies Inc. (ATI), a global leader in vehicle network solutions, data acquisition, and diagnostic tools. ATI has been a key partner throughout the development of the FS25, providing both hardware and software that proved essential for integrating and validating the car's complex electric powertrain.

As part of the sponsorship, Aixtreme Racing received ATI's CANary FD interfaces, CANverter interfaces, the DLX Data Logger, and CANLab Network Analysis software kindly supplied via ATI's German office near Munich. Together, these tools became a central part of the team's development.



The New Generation

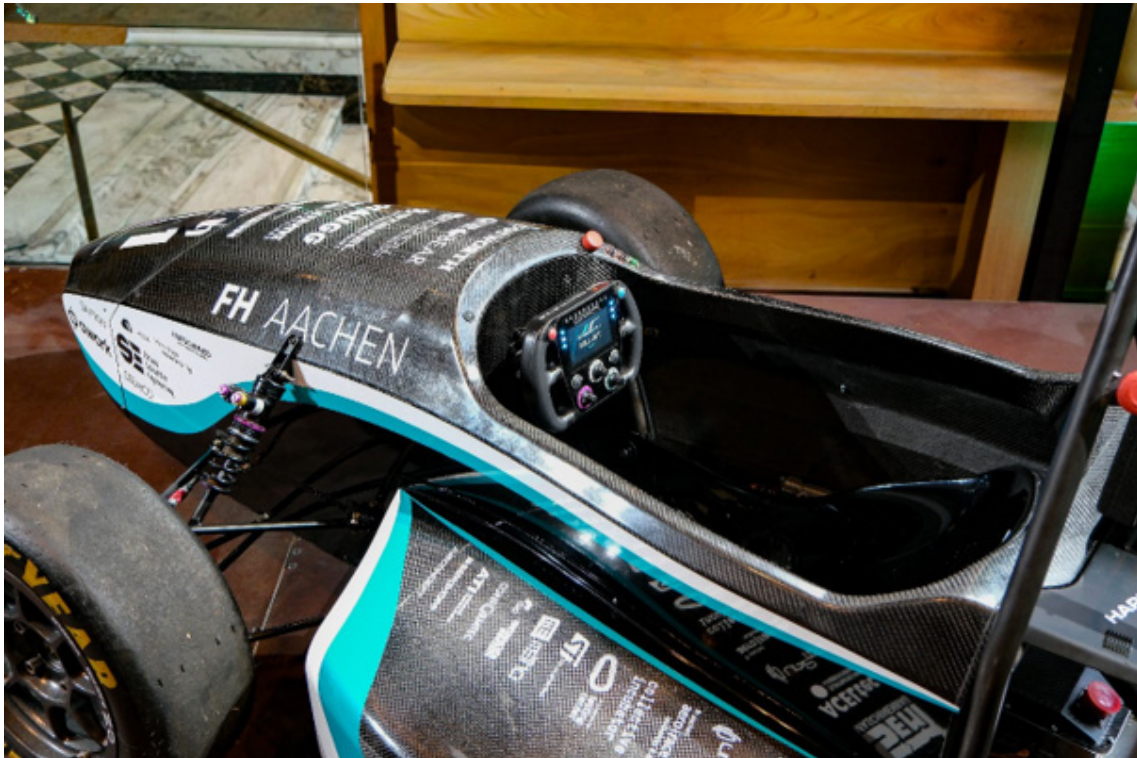
The FS25 was developed as a conversion design based on its predecessor, the FS23 EVO, with nearly all structural components being carried over and adapted to accommodate the new electric drivetrain. In practice, this required extensive reworking of numerous systems throughout the car.

At its heart, the FS25 is powered by an Emrax 228 axial flux motor delivering up to 124 kW of peak power and 220 Nm of torque. Energy is supplied by a custom-designed 600-volt battery in a 2p144s configuration, divided into twelve stack modules. Power is transferred via a purpose-built two-stage gearbox optimized for the electric motor's characteristics. Vehicle control is handled by a Cosworth Antares 8 VCU paired with the Cosworth CSG10. For the electronics infrastructure, a MIL-spec wiring harness with concentric twisting ensures enhanced reliability and EMC resilience. An in-house developed master Battery Management System (BMS) monitors and controls all battery functions.



The FS25 raced for the first time in the summer of 2025, with the team competing at several Formula Student events in Germany and Italy. There the car was tested thoroughly, both on track and off-track during scrutineering.

These lessons fed directly into the development of the FS26, next season's car, which is being completed in August of 2026. It features a newly developed accumulator with lighter stacks, newly implemented cell balancing and a reworked BMS, together with a revised powertrain package and a lighter monocoque and rear frame.



ATI Tools in Practice

With the introduction of a full CAN network connecting the VCU, BMS, inverter, and other subsystems, reliable tools for monitoring and debugging became indispensable. Both the CANary FD interface and CANLab software were central from the very beginning of the prototype development. Without them, the initial calibration and configuration of the motor and inverter would not have been feasible. Its four-channel CAN interface proved especially critical in developing and validating the team's in-house Battery Management System, enabling the team to monitor CAN communication between all critical components in real time.

Especially valuable were the CANary FD's trace functionality and message-sending capabilities. Using DBC file translation within CANLab, engineers were able to quickly identify and decode signals and create or send required CAN messages with minimal effort. The ability to simulate bus participants allowed individual devices to be tested in isolation, which greatly accelerated the debugging process and reduced integration risk.



Further flexibility in the testing and development process came from the CANverter interface. It enabled the team to connect and test new sensors that were not part of the original wiring harness, for example evaluating new RECU concepts on the existing vehicle without the need to reroute cables or open the full harness. This meant that new ideas could be prototyped and validated quickly, without disrupting other systems.

The CANLab software environment was praised by the students for its clear, intuitive interface. All key features, from trace and send to signal decoding and bus simulation, are logically structured and easy to navigate, significantly reducing the learning curve for new team members and streamlining day-to-day development tasks.



Looking Ahead

With the FS26 being nearly finished and entering its testing stage, ATI's tools will continue to play a central role. The team plans to use the DLX Data Logger extensively on track to monitor battery cell capacities and temperatures, log charging cycles, and detect trends or potential issues early. On race day, the same tools will allow rapid setup adjustments and deliver valuable post-run performance data.

The team is looking forward to putting its progress and skills to the test at this year's Formula Student France and Italy competitions.

Beyond these events, Aixtreme Racing looks forward to continuing its collaboration with ATI throughout the testing, development, and racing phases of the FS26. ATI's hardware and software have not only made the transition to electric power possible but have given the team the confidence and capability to compete at the highest level of Formula Student.

For further information on Team Solarium or ATI visit their respective websites:

<https://www.fh-aachen.de/studium/studieren/mitmachen-und-engagieren/studentische-projekte/laengerfristige-projekte/aixtreme-racing>

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