Formula 1 Race Cars Using Magneti Marelli and Wind River Tech

Wind River announced that Magneti Marelli Motorsport has selected VxWorks for its telemetry devices for Formula One race cars.

Telemetry is a key factor in a winning race strategy, allowing race engineers to interpret the vast amount of data collected during a race to reach optimum performance. Magneti Marelli Motorsport needed to release a high-performance, reliable product in a very short time frame.

“Wind River provided us with VxWorks, as well as effective and efficient support during the whole project. They also ported the software to our hardware platform, keeping up with our challenging deadlines,” said Riccardo De Filippi, head of development at Magneti Marelli Motorsport. “We were really impressed by Wind River’s technology and support. Wind River allowed us to get the project completed in record time.”

“VxWorks is at the heart of the world’s most powerful and deterministic devices,” said Alexander Kocher, vice president and general manager for automotive solutions at Wind River. “When fractions of a second count, industry leaders can trust Wind River to help them achieve maximum levels of performance.”

Magneti Marelli’s telemetry units can handle thousands of channels of data, up from a few hundred in previous versions, from sensors all over the car. Cutting-edge technology in these telemetry devices such as the Kinetic Energy Recovery System (KERS) includes a high-speed moto-generator unit to help power the car and highly dynamic sensors that must be closely monitored.

Sensor data can be sent over a variety of networks in the vehicle, including Flexray, Ethernet, CAN and ARCNET. Flexray is a time-triggered protocol geared to the specific needs of vehicle data up to 10Mbit/s, particularly the engine control unit.

Ethernet provides data up to 1Gbit/s over copper wiring but with limited real-time performance at maximum speed. CAN and ARCNET are lower-rate data buses (1Mbit/s and 10Mbit/s respectively) representing a good combination of determinism, reliability and flexibility.

VxWorks allows the telemetry units to manage tasks for data acquisition, encryption and communication, and ensure that race engineers will receive the huge amount of vehicle performance data in real time to allow optimum vehicle performance on the track. Power-up time for the unit was also a substantial challenge for Magneti Marelli's team. Data collection and communication must start immediately when the telemetry device is activated to avoid missing crucial performance metrics. With Wind River's VxWorks and award-winning support, power-up time for the unit was reduced from several seconds to tenths of a millisecond.

To learn more, visit Wind River at www.windriver.com [1].

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