

32-BIT MCUS

Motor control with AI-based predictive maintenance

Renesas introduced four CAN-connectable RA6T1 MCUs (micro-control unit) targeted for motor control applications in smart homes, industrial automation, and building automation.



The MCUs are dedicated for use in AC drives, pumps, line conveyors, solar inverters, refrigerators, air conditioners, etc. (Source: Renesas)

Based on the Arm Cortex-M4 core, the micro-controllers operate at 120 MHz. Beside CAN, the units support UART, SPI, and I²C interfaces. The chips are available in scalable 64-pin to 100-pin LQFP packages. A 64-KiB RAM and a 256-/512-KiB Flash are integrated. When used with the motor control solution bundle, the sampling period is 250 μ s. Further, the units include a 12-bit ADC (analog/digital converter), an analog comparator, and a six-channel programmable gain amplifier. The IEC 60730 standard for functional safety in home appliances is supported. The implemented Google Tensorflow Lite Micro framework adds a failure detection capability to the MCUs. It detects potentially detrimental anomalies in the motor systems. This helps to improve predictive maintenance processes and to reduce maintenance costs.

“AI (artificial intelligence) and machine learning are taking predictive maintenance to the next level as the industry advances toward Maintenance 4.0. We are excited to join forces with Renesas and accelerate the adoption of smart home and Industrial IoT (Internet of Things) applications,” said Ian Nappier, Product Manager at Google. “Integrating our open-source TensorFlow AI framework with Renesas’ powerful RA6T1 MCUs brings breakthrough intelligence to motor control equipment.”

The company also introduced the Renesas Solution Starter Kit (RSSK) for developers working on a motor control solution using the RA6T1 MCUs. The kit offers motor control debugging and allows customers to begin evaluating their motor control design, executing real-time analysis and tuning. The solution includes an RA6T1 CPU card and a 48-V inverter board, along with a GUI (graphical user interface) tool for motor workbench. It also incorporates a sensor-less vector control sample program that corresponds with the company’s Flexible Software Package.

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