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Ramtron rolls microcontroller-independent FRAM

[R. Colin Johnson](#)

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PORTLAND, Ore. — Ramtron International Corp. has unveiled what it claims is the first in a new family of intelligent ferroelectric RAMs capable of recording data independent of a separate microcontroller previously needed to make the nonvolatile memory operate like solid-state storage devices.

[FRAM](#) marries high-speed nonvolatility with unlimited rewrites while operating at speeds comparable to SRAM. Until now, however, a [dedicated microcontroller](#) was needed, either on-chip or connected to an external FRAM chip.

Ramtron (Colorado Springs, Colo.) said it has developed an FRAM chip that can record data independent of a microcontroller, until polled. "We've designed a family of single-chip FRAM-based digital event recorders," said Craig Taylor, Ramtron's director of applications. The FM6124 monitors "changes in up to 12 digital inputs and automatically records and time-stamps activity on those inputs. It can be used for event recording, time-of-use recording, activity monitoring, for recording the intervals between events, or for other data recording applications like vehicle and pedestrian counting."

Ramtron's digital event recorders are meant to be used with a microcontroller, but only when turned on or when it polls the digital event recorder chip to check for newly recorded events. The approach is said to extend battery life for remote-sensing applications. Using FRAM instead of flash, it can record up to 10,000 events per second with unlimited rewrites. Flash memory is slower to program and burns out if rewritten too often.

Among the FRAM's programmable features are the ability to alert users when it records an event. "It can also be programmed for much more complicated event recording such as for instrumentation applications," Taylor said.

Ramtron said customers have requested a free-standing digital event recorder chip, especially for applications where there is no microcontroller. By placing the recorder inside equipment to monitor usage, for instance, a

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manufacturer could lower component costs by using an external microcontroller to poll the event recorder to verify warranty coverage.

"We have customers who have been asking of this chip, for instance, to determine whether an expensive industrial lamp is still under warranty," said Taylor. "If you embed this chip into the lamp so that it monitors usage, then when the lamp burns out the manufacturer can determine whether it is still under warranty by reading out the FRAM, which has recorded how many hours and over what time interval the lamp has been used."

The FM6124 stores only 32 kbytes, of which 8 kbytes are dedicated to recording events and 24 kbytes can be set up to store event or user data. Future generations will have larger memory arrays. Texas Instruments is manufacturing Ramtron's FRAM chip, producing both parallel- access 4-Mbit and serial-access 2-Mbit memories.

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