

eXtremeDB™ Fusion for Industrial Control

“Integrating a proven database system has helped us meet customers’ needs faster by reducing the development cycle.”

-- Hydril Company

An Embedded Database for Industrial Control

Industrial control systems are naturally data-hungry. Real-world input forms the basis for their decisions, and this data must be acquired, sorted, analyzed and transmitted at a speed that bars using most traditional database systems.

McObject’s eXtremeDB Fusion is the exception: an embedded database used widely for real-time control in manufacturing, energy extraction, transportation, telecommunications and other fields. Its unique architecture meets these systems’ performance and reliability demands, and its use in development lends a time-to-market advantage.

Performance for Event-Driven Operations

Industrial control is event-driven, with actions driven by interrupts coming from sensors. A key requirement is guaranteed maximum response time under peak load, at least for high-priority functions.

eXtremeDB Fusion offers transaction prioritization, to give precedence to selected operations. It supports both in-memory and on-disk data management; for maximum speed and predictability, specify all-in-memory, which eliminates disk I/O and other overhead. eXtremeDB Fusion can even be deployed in the operating system kernel, for the ultimate in zero-latency operation.

High Availability Database System

For always-on reliability, eXtremeDB’s proven High Availability (HA) sub-system enables deployment of two or more synchronized embedded databases within separate hardware instances, with automatic failover.

Development Ease & Faster Time-to-Market

eXtremeDB Fusion’s native C/C++ API is intuitive to use, and leads to easily maintainable code (a SQL interface is also available). The database provides sophisticated debugging, and supports virtually all data types and querying methods. Deploying the proven eXtremeDB Fusion in place of a ‘homegrown’ database dramatically reduces development, testing and QA.



eXtremeDB Fusion Features and Benefits

Tiny footprint – With a code footprint as small as 50K and minimal CPU demands, eXtremeDB deploys easily on resource-constrained controllers and field devices.

Real-time performance – With optional all-in-memory storage and retrieval, eXtremeDB delivers the needed responsiveness, whether measured microseconds to register electrical current changes, milliseconds for opening and closing valves, or seconds for materials movement.

Hybrid data management – eXtremeDB Fusion combines in-memory and on-disk data storage in one

embedded database system, to optimize applications for persistence, speed, cost and form factor.

High Availability – Fault tolerant embedded database, proven in numerous commercial applications, offers the highest degree of reliability and data durability.

Kernel mode database – Integrating the database in software deployed as kernel modules delivers the ultimate in high-priority, zero-latency execution.

Industry-tested solution – McObject's database system is proven in industrial control systems ranging from shipbuilding to oil and gas exploration, electrical grid stabilization, thermal control, and telecom equipment SCADA.

Application areas:

Supervisory control and data acquisition (SCADA), pressure control (oil and gas drilling), thermal control, computer numerical control (CNC), facilities management, simulation, production monitoring, safety management, robotics and autonomous systems, distributed control systems, inventory management, defect and resolution monitoring, scheduling and planning systems, motion control.

Technical Specs

- Code size from 50K to 250K, depending on the platform and features.
- Source code and object code licenses are available.
- Transaction performance measured in microseconds.
- In-memory and on-disk data storage co-exist within *eXtremeDB* Fusion database instances, via simple database schema declarations.
- 64-bit edition offers real-time processing of very large databases (VLDBs); in tests managing databases larger than one terabyte, *eXtremeDB-64* processed 87.78 million query transactions per second (benchmark report is available).
- Supports virtually all data types, including structures, arrays, vectors, BLOBs and Unicode.
- Querying methods include B-tree, R-tree, T-tree, Patricia tries, hash table and custom indexes.
- Native C/C++ and SQL interfaces; supports varied data types and sophisticated debugging features.

Architectures supported:

32-bit, 64-bit, ARM, DSP, Embedded Intel® (Pentium, Embedded Intel® Architecture etc.), Freescale (Coldfire, MCORE, HC08 etc), MIPS, Power Architecture™ (including PowerPC), x86, XScale.

Operating systems supported:

VxWorks, QNX Neutrino, Linux and embedded Linux distributions (Wind River, MontaVista, LynuxWorks etc.), Windows Embedded, Mentor Graphics/Nucleus, INTEGRITY, eCos, LynxOS, RTXC Quadros, uCLinux, µC/OS-II, HP-UX, Sun Solaris, Bare bones boards (no operating system required).