Solution Brief

Industrial and Robotics
Intel® Core™ Ultra Series 3 Processors

Functional Safety, Real-Time and AI: Innovation with Intel® Core™ Ultra Series 3 Processors

Intel® Core™ Ultra Series 3 processors offer enhanced Functional Safety features, while delivering the performance needed to handle heavy workloads in the latest demanding Industrial and Robotics use cases.

Revolutionizing Industrial Robotics at the Edge

At Embedded World 2026, Intel presents its vision for next-generation industrial automation by integrating functional safety, deterministic real-time processing, and AI-driven robotics into a single high-performance edge solution. This breakthrough enables demanding applications, opening new possibilities for more performance-intensive Industrial applications, including collaborative robots (Cobots), Autonomous Mobile Robots (AMRs), and emergent markets (e.g., humanoids) where Safety matters.

Uncompromised Performance

Through this innovative concept, Intel demonstrates that running Functional Safety (FuSa) AI workloads with its Real-Time requirements and processing demands is not only feasible at the edge but becomes transformative with Intel® Core™ Ultra Series 3 processors. Intel architecture enables the complete FuSa AI workload to be executed seamlessly within a dedicated Low-Power Cluster powered by highly efficient E-Cores, while simultaneously preserving unrestricted access to high-performance resources for demanding applications. The additional E-Cores and P-Cores in the High-Power Cluster, and the full availability of GPU and NPU, deliver uncompromised power for the most sophisticated industrial and robotics applications.

Key Architectural Benefits:

Advanced SoC Physical Separation – Safety applications executed on dedicated computational subsystems ensure better isolation and freedom from interference from the non-Safety critical applications.

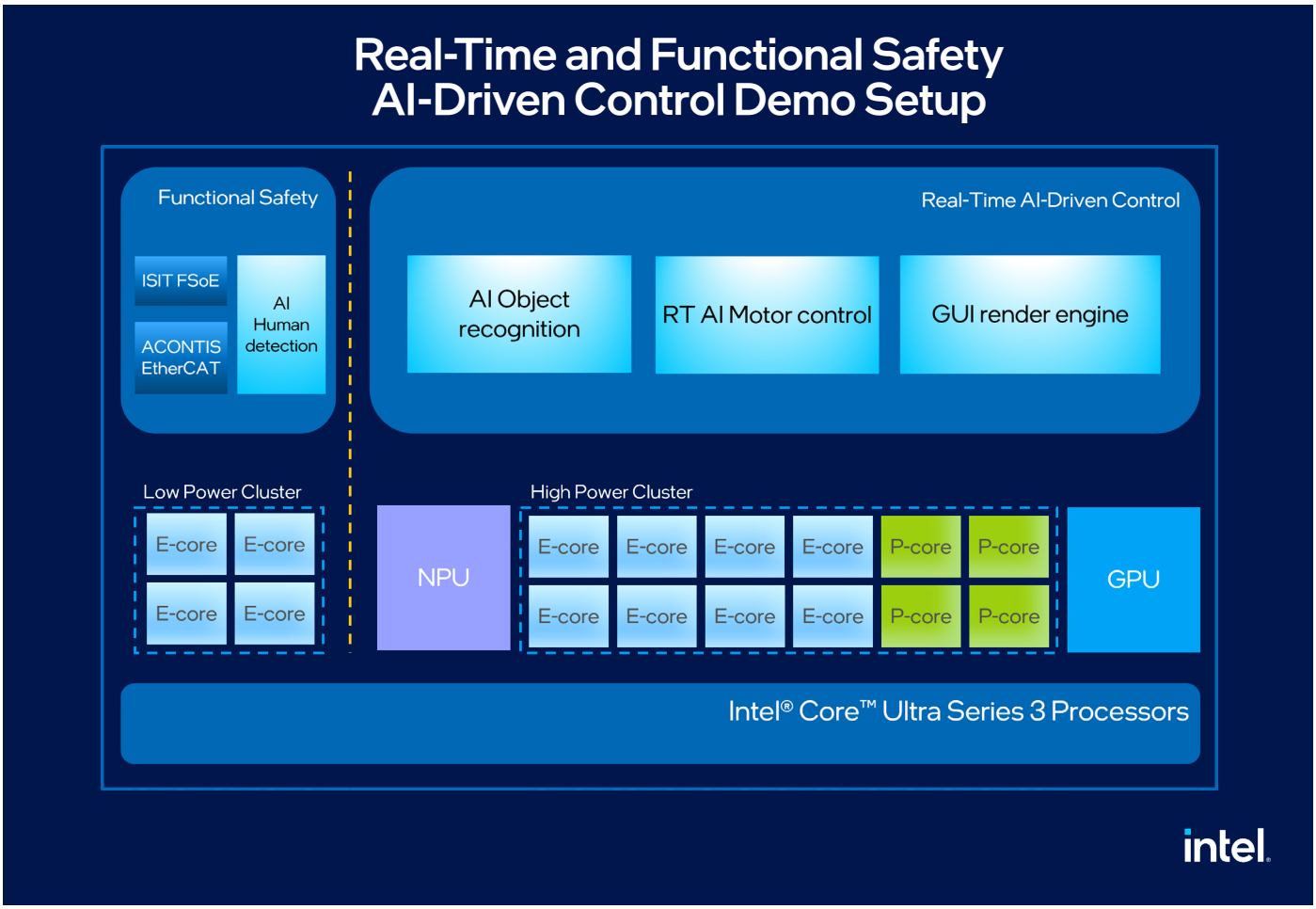
Unrestricted High-Performance Access – Full availability of the high-performance resources, including E-Cores, P-Cores, GPU, and NPU, for the most complex industrial robotics applications.

Enhanced Functional Safety

Intel® Core™ Ultra Series 3 processors include **Intel® Silicon Integrity Technology**[1], a set of SoC hardware/firmware-based integrity-related features that detect silicon faults and report error conditions. Specific FuSa technical collateral is available in documentation packages, such as the **Intel® Functional Safety Essential Design Package** (Intel® FSEDP), which provides SoC information relevant to IEC 61508 and ISO 13849. These capabilities are essential to the future of truly autonomous systems where safety-critical reliability and high-performance computing empower manufacturers to confidently address tomorrow's most challenging industrial automation requirements.

FuSa Ecosystem

As a further demonstration of Intel® Core™ Ultra Series 3 processors' Functional Safety capabilities, the demo showcases a production-ready safety communication solution based on EtherCAT and FSoE (Fail Safe over EtherCAT), made possible through Intel strategic collaboration with ACONTIS and ISIT partners.



Select next-generation edge computing for Functional Safety, Real-Time, AI-mixed criticality workloads for long-life availability, Industrial use conditions with Intel Core Ultra Series 3 processors.

Discover the future of industrial robotics. Visit Intel at Embedded World 2026, Booth 5-333.

Learn More

Intel technologies power the next generation of industrial solutions, working across the ecosystem to extend silicon innovation into mission-critical implementations.

- Intel® Core™ Ultra processors
- Intel® Solutions for Industry 4.0
- Intel® Silicon Integrity Technology Tech Brief

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[1] Available on select SKUs.

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