

Control Loop Processor - Towards European programmable solution for dedicated hard real time applications

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Applications featuring hard real-time control loops (typically greater than 1 kHz) with complex algorithmic needs currently lack a European space-qualified microprocessor. Electrical motor drive is an example of impacted application. Indeed, the harsh constraints imposed to the associated software currently impeach having a viable solution with currently available space grade controllers and processors. In addition, having enhanced, superior and more intelligent actuators and/or mechanisms is today increasing in space equipment (e.g. fault tolerant motor...) thus justifying filling the gap.

In the continuity of an S.A.B.C.A. proprietary component, the development of a standard product – called Control Loop Processor (CLP) is foreseen. To address the targeted requirements, several key features will be integrated. Basically, a cache-free, non-interruptible and RISC architecture ensures a fully deterministic behaviour and a dual IEEE-754 floating-points unit provides the support for high-demanding computation needs. Various on-chip peripherals as well as an embedded robustness/anomaly management allow fulfilling the mission requirements with minimal board impact and intrinsically safe embedded software. A Simulink-based development environment allows automatic OS-free code generation. Launchers electrical actuation (VEGA, Ariane 5 mid-life evolution...) is the first targeted application as well as next-generation AOCS equipment.