

Press release

TTTech Aerospace's high-performance radiation-hardened TTEthernet® network controllers for space entering series production

- TTTech Aerospace's TTEthernet® Systems on Chip (SoCs) network controllers (TTESwitch Controller HiRel and TTEEnd System Controller HiRel) has successfully been qualified by STMicroelectronics to be used for space flights.
- These are the world's first radiation-hardened TTEthernet® SoCs space controllers to enter series production.
- The fully deterministic TTEthernet® network controllers uniquely support standard Ethernet, rate-constrained and time-triggered traffic.
- High Gigabit/second bandwidths allow for high data payload and control data transfers on a single network.
- Two launcher programs and one robotic program have already implemented avionics systems based on these TTEthernet® SoCs network controllers.

Vienna, Austria, August 19, 2021: TTTech Aerospace and its semiconductor partner STMicroelectronics have completed the development, industrialization, and qualification of highly integrated, radiation-hardened TTEthernet® Systems on Chip (SoCs) network controllers. They are used in deterministic, fault-tolerant, Ethernet-based networks for space applications. The successfully qualified TTESwitch Controller HiRel and TTEEnd System Controller HiRel are already being used in the avionics systems of two major launcher programs and on one robotic program.

Electronic components used in a spacecraft need to fulfil very high quality and production standards and work reliably in extremely harsh environments. With the qualification successfully completed, TTESwitch Controller HiRel and TTEEnd System Controller HiRel are now available as series products, ready for use in a broad variety of space flight applications, such as launch vehicles, satellites or robotic applications.

TTTech Aerospace's TTEthernet® network controllers (TTEEnd System Controller HiRel and TTESwitch Controller HiRel) uniquely act as Systems on Chip (SoCs). They support three traffic classes: standard Ethernet (IEEE802.3), rate constrained and time-triggered traffic (SAE AS6802) for a wide variety of networking applications. Thanks to their high Gigabit/second bandwidths, the network controllers are ideal for real-time transfer of high data payloads (e.g. high-resolution images and videos) and hard real-time transmission of safety-critical control data with short latency over one single network. A wide range of interfaces allows for high flexibility in connecting to electronics hardware for easy integration.

“Our TTEthernet® SoCs network controllers are the first of their kind worldwide to enter series production. They act as a ‘central nervous system’ connecting all systems in the spacecraft. Their modular and deterministic nature supports design optimization and a significant reduction in software complexity and equipment size. This reduces system integration as well as verification and validation effort, enabling faster development of more capable, lower cost, fault-tolerant computing platforms for avionics and control applications,” explains Christian Fidi, Senior Vice President Business Unit Aerospace, TTTech.

The TTEEnd System Controller HiRel and TTESwitch Controller HiRel are equipped with an integrated LEON2 CPU for system management and diagnostics that ensures automatic time synchronization of the application to the network. The chip is based on a radiation-hardened design process and packaged in a cost-efficient plastic package. This ensures reliability in harsh environments requiring high radiation tolerance for applications like launch vehicles and low earth orbit (LEO) satellites.

Images



Caption: TTTech Aerospace's SoC TTEthernet® network controllers ^{TT}EEnd System Controller HiRel and ^{TT}ESwitch Controller HiRel have been qualified for spaceflight by STMicroelectronics (Credit: TTTech Computertechnik AG)

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Caption: “Our TTEthernet® SoCs network controllers are the first of their kind worldwide to enter series production. They act as a ‘central nervous system’ connecting all systems in the spacecraft,” explains Christian Fidi, Senior Vice President Business Unit Aerospace, TTTech. (Copyright: TTTech Computertechnik AG, Photographer: Robert Fritz)

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About TTTech Aerospace

TTTech Aerospace provides deterministic embedded network and platform solutions for aerospace and space applications. Its products have already completed over 1 billion flight hours in Level A safety-critical applications like fly-by-wire, power systems, avionics, engine controls and environmental control systems. Proven, mature solutions help customers in the aerospace and space industries to develop integrated, modular and scalable deterministic network platforms that increase safety, fault-tolerance and availability. In addition, integrated solutions reduce size, weight, power and cost (SWaP-C), allowing for easier handling of equipment and lowering total lifecycle cost.

TTTech Aerospace is a business unit of TTTech Computertechnik AG, a leading provider of safe networked computing platforms. TTTech is the innovator of Deterministic Ethernet and a driving force behind the IEEE TSN and the SAE Time-Triggered Ethernet standards. TTTech Computertechnik AG operates under the umbrella of the TTTech Group, a globally oriented group of high-tech companies, founded and headquartered in Vienna, Austria.

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