

**NASA's Orion Crew Exploration Vehicle
Systems Integration with TTEthernet**

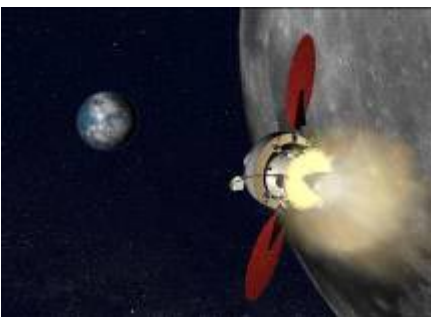
TTEch

"We look forward to realizing the potential of TTEthernet technology development, which provides a high bandwidth avionics databus capability supporting future technology insertion over Constellation's multi-decade mission."

Thomas W. Rathjen, Program Executive,
Constellation Systems Division at NASA



America will send a new generation of explorers to the moon aboard NASA's Orion crew exploration vehicle. Scheduled to make its first flights early in the middle of the next decade, Orion is part of the Constellation Program to send human explorers back to the moon, and then onward to Mars and other destinations in the solar system. Development of the Orion crew vehicle is already under way even as NASA continues its scientific exploration through the International Space Station and Space Shuttle programs.



Orion, launched atop an Ares I rocket, will be capable of carrying crew and cargo to the space station. The spacecraft will be able to rendezvous with a lunar landing module and an Earth departure stage in low-Earth orbit to carry crews to the moon and, one day, to Mars-bound vehicles assembled in low-Earth orbit. Orion will be the Earth entry vehicle for lunar and Mars returns. The Orion spacecraft takes advantage of 21st century technology in computers, electronics, life support, propulsion and heat protection systems.



TTEthernet is one of the advanced technologies to be deployed in Orion. This scalable real-time Ethernet platform is compatible with the Ethernet standard and its off-the-shelf components comply with IEEE 802.3. TTEthernet facilitates the design of complex integrated control systems for a variety of distributed applications. Key TTEthernet operation principles ensure its future use with other Ethernet-based networks in heterogeneous or legacy systems.

"TTEthernet is a flexible and open real-time Ethernet technology platform that facilitates the design of complex integrated systems."

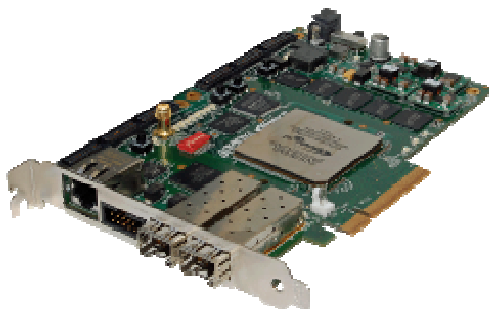
Markus Plankensteiner, Marketing Director at TTTech Computertechnik AG



TTEthernet is suited for safe and highly available real-time applications. This flexible and open technology platform offers deterministic real-time communication and TCP/IP Ethernet traffic in parallel on the same network. It enables the integration of standard Ethernet controllers and allows implementing hardware or software. Its innovative technology consolidates experiences and proven mechanisms from aerospace system design, automotive electronics and industrial automation.



Designed for growth, TTEthernet scales from purely software-based real-time Ethernet control solutions to demanding redundant networked applications. Integrating Ethernet with certified and production-proven time-triggered services provides a low-cost system integration platform solution. As TTEthernet combines safe and deterministic solutions with the open Ethernet infrastructure, it supports the fast integration of various network technologies at substantially lower total life cycle cost.



TTEthernet has been developed by TTTech and Honeywell. It is the culmination of nearly a decade of collaborative research and development that started with the successful deployment of TTTech's TTP protocol in the Honeywell Modular Aerospace Control (MAC) architecture for Full Authority Digital Engine Control (FADEC) systems. TTEthernet will be applied by Honeywell for production programs in the aerospace and automation industry including NASA's Orion crew exploration vehicle.

About TTech Computertechnik AG

TTTech Computertechnik AG is the leading supplier of solutions in the field of time-triggered data communication. The company's products improve the safety and dependability of networked computer systems in transportation and automation industries. The solutions are based on TTP and TTEthernet. FlexRay offerings are provided by TTTech's subsidiary, TTTech Automotive.

Further information is available at
www.tttech.com

For more information on NASA's Orion crew exploration vehicle visit **www.nasa.gov**

The logo for TTTech, featuring the word "TTTech" in a bold, blue, sans-serif font. The "T"s are stylized with a slight gap between them.

Artist's Concept, Stephan C. Hartman,
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