**TTTech**

# RUAG Space and TTTech partner to provide electronics for fast, reliable data transfer based on TTEthernet for NASA Lunar Gateway

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***Space supplier RUAG Space and high-tech company TTTech are offering high-performance data exchange electronics for Lunar Gateway modules – in time for the ARTEMIS Mission challenge in 2024.***

RUAG Space, a leading space supplier, and TTTech, a leader in high-tech network technology, are teaming up to provide space electronics for the NASA space station "Lunar Gateway". In 2011, via a Space Act Agreement, TTTech and NASA standardized TTEthernet technology as an open industry standard i.e. SAE AS6802 together with several industry partners. This open standard has recently been ratified by NASA, ESA, CSA and JAXA as the "International Avionics System Interoperability Standards" (or IASIS) for deep space applications. TTEthernet technology allows fast and reliable data transfer on the "Lunar Gateway" space station, which will orbit around the Moon and serve as the portal to the surfaces of Moon and Mars. RUAG Space will provide space qualified hardware that enables the use of this highly reliable technology in space applications. Both companies will offer these electronic products to all interested customers. TTEthernet is also used very successfully by the NASA Orion spacecraft and by the new European launcher Ariane 6 as the on-board avionics backbone network.

### "Reliable products that are ready-to-use"

"This is a perfect partnership. An electronic product that brings together the strong experience from RUAG in space hardware engineering and manufacturing with the expertise in software and ASICs from TTTech", says Peter Guggenbach, CEO RUAG Space. "We have invested a lot of resources into engineering and customers can trust us to bring a reliable product that is ready-to-use. With our legacy of success, we will help customers save time and meet their ambitious mission schedules," says Peter Guggenbach. The first crewed mission i.e. ARTEMIS to the "Lunar Gateway" station and the moon is planned for 2024.

### "Unique safety-critical technology unmatched in the industry"

Christian Fidi, VP Products, Sales and Marketing of TTTech's Aerospace business unit, highlights the safety and reliability of the technological solutions: "We have delivered a safety-critical standard that is proven and as yet unmatched in the industry. Customers benefit from off-the-shelf hardware solutions that perfectly serve a highly competitive and dynamic space market. Time-Triggered Ethernet is faster and more reliable than any other technology in the market."

### Time-Triggered Technology

Time-Triggered Technology was invented by TTTech. The essence of this technology is to create networks that are fully deterministic, meaning each sender and receiver in a network knows when to send or expect a message. This brings several advantages: Not only are all failures that result in some latency in the network eliminated, it also allows to use the entire bandwidth of the links within the networks. These advantages make the technology superior in terms of safety and reliability. Moreover, the implementation of the TTEthernet protocol is compatible with ordinary Ethernet traffic. Based on IASIS, Deterministic Ethernet is becoming the de facto standard for avionics in the space industry. This makes the testing of space electronics much easier. Once in orbit, Time-Triggered Ethernet ensures the reliable data transfer among the computers used on board spacecraft or station – all with unparalleled speed and safety.

**Direct technical support for U.S. customers**

RUAG Space continues to expand its footprint in the U.S. as the office in Denver, Colorado, will increase its electronic competence and will serve as local interface and technical support to U.S. customers. "Our entire electronics portfolio – from onboard-computers, navigation receivers to antennas and more – can be ordered from Denver. With this expansion, we will continue to improve our service to our customers," explains Peter Guggenbach.

**RUAG Space: a leading supplier to the space industry**

RUAG Space is the leading supplier to the space industry in Europe, and has a growing presence in the United States. In total, RUAG Space has about 1,300 employees across six countries. RUAG Space develops and manufactures products for satellites and launch vehicles—playing a key role both in the institutional and commercial space market. RUAG Space is a division of the international technology group RUAG. RUAG develops and markets internationally sought-after technology applications in the fields of aerospace and defense for use on land, in the air and in space. RUAG generates sales of approximately CHF 2 billion and has over 9,100 employees – 400 of whom are trainees.

**About TTTech**

The TTTech Group consists of globally oriented high-tech companies, founded and headquartered in Vienna, Austria. 1,800 employees in 13 countries ensure close proximity to its international customer base and valued partners around the globe. The TTTech Group builds on 20 years of technology leadership with extensive experience in collaborating with market leaders. It has been engaged in the space market with its business unit Aerospace since 2000 as a provider of chip IP, development equipment and PC based tooling (network configuration). With TTEthernet, TTTech Aerospace offers a standardized (SAE AS6802) networking technology with outstanding characteristics. The platform solution's values have been acknowledged by several space agencies and leading industrial partners.

- More about the "Lunar Gateway": https://www.nasa.gov/topics/moon-to-mars/lunar-gateway
- Lunar Gateway Configuration Concept: https://www.nasa.gov/sites/default/files/thumbnails/image/gateway-configuration-20180907.jpg
- ARTEMIS Mission: https://www.nasa.gov/artemis
- More about "TTEthernet": https://www.tttech.com/technologies/time-triggered-ethernet/
- More about space electronics from RUAG Space: https://www.ruag.com/en/products-services/space/electronics
- Video about product portfolio from RUAG Space: https://youtu.be/qNbSjUdlXxQ
- Video about how RUAG Space products help society: https://youtu.be/gWRzl2ByvRA

**Photo captions and credits**

Picture 1:
Artist concept of the logistics module docked to Gateway in lunar orbit. Credits: NASA. Download: https://www.nasa.gov/feature/nasa-to-partner-with-american-industry-to-supply-artemis-moon-missions/

Picture 2:
Orion-Raumschiff nähert sich dem „Lunar Gateway" (Grafische Darstellung). Credits: NASA.
Download:
https://www.nasa.gov/sites/default/files/thumbnails/image/gateway_orion_approaching.jpg

Picture 3:
Christian Fidi, VP Products, Sales and Marketing of TTTech's Aerospace business unit, highlights the safety and reliability of the technological solutions: "We have delivered a safety-critical standard that is proven and as yet unmatched in the industry." Copyright: TTTech. Download: https://www.ruag.com/sites/default/files/media_document/2019-10/Picture%203%20Christian%20Fidi_.jpg

Picture 4:
"With our legacy of success, we will help customers save time and meet their ambitious mission schedules," says Peter Guggenbach, CEO RUAG Space. Copyright: RUAG Space. Download: https://www.ruag.com/sites/default/files/media_document/2019-09/DSC_7687_1.jpg

Picture 5: Time-Triggered Ethernet is faster and more reliable than any other technology in the market. Pictured: TTEthernet platform for outer space. Copyright: TTTech. Download: https://www.ruag.com/sites/default/files/media_document/2019-10/Picture%205%20TTE%20Switch%20Space%20cPCI.jpg


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