

TTTech in AeroSpace

Business Unit Aerospace

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Electronic Robustness for a More Electric and Connected World

TTTech

Autonomous & Near Autonomous Operations

\$1.9 Trillion

Economic impact of near autonomous cars by 2025



Real-Time Internet of Things



25+ Billion

Embedded and intelligent systems by 2020



Every 2nd

Embedded device will be safety relevant by 2020



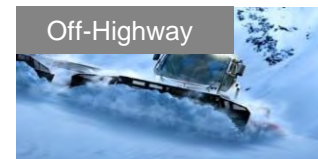
Safety & Reliability

TTTech Markets and Key Benefits



Markets

Focus on Safe and Robust Networking and Controls



Key Benefits with TTTech

- ✔ TTTech is the technology leader in robust networked safety controls
- ✔ TTTech is the innovator of Deterministic Ethernet and the driving force behind the IEEE TSN standard and SAE Time-Triggered Ethernet standard
- ✔ TTTech transfers proven aerospace network technology to mass markets like automotive and manufacturing

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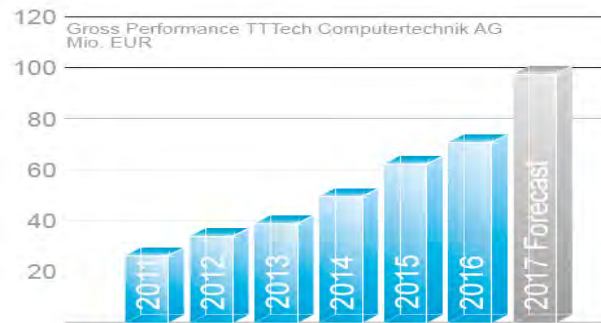
Company Key Facts

Facts

- ✓ Globally oriented high-tech company, headquartered in Vienna, Austria
- ✓ Innovation leadership - successful transfer of ground breaking research to high-volume production
- ✓ Privately held joint stock company with solid financial base and diversified shareholder basis
- ✓ More than 540 employees with offices in 9 countries (2017)
- ✓ Flexible supply network with leading industry partners and research institutions

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TTTech



Gross Performance in MEUR



Trends in Aerospace

2) Autonomous & Near Autonomous Operation

Autonomy to reduce operation costs and increase efficiency and UAVs



3) Real-Time Internet of Things on the Aircraft & Manufacturing

IoT + prognostic maintenance allows higher levels of efficiency & new business models



1) High Performance Modular/ Scalable Platforms

The aircraft as “iPhone / iPlane” as semi open integration platform to enable lower cost, new levels of differentiation & new business models



Safety & Reliability & Availability

Strategic Position



TTTech Aero provides:

- networking/computing **products and platform solutions & services**

Customer benefits:

- future-proof, cost-effective, deterministic, certifiable, robust, scalable, **flexible and modular airborne onboard systems**

Boeing 787



Bombardier CSERIES



Airbus A380



NASA Orion



Aerospace BU Offering



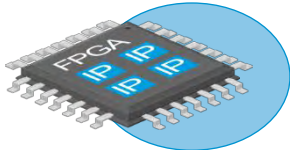
Offering



- Flight & Rugged Hardware, TTEthernet[®]/AFDX[®] Switches & End Systems



- Components for Flight & Rugged Hardware, e.g., TTP Controller



- Flight Communication Networks IP



- Development, Test & V&V

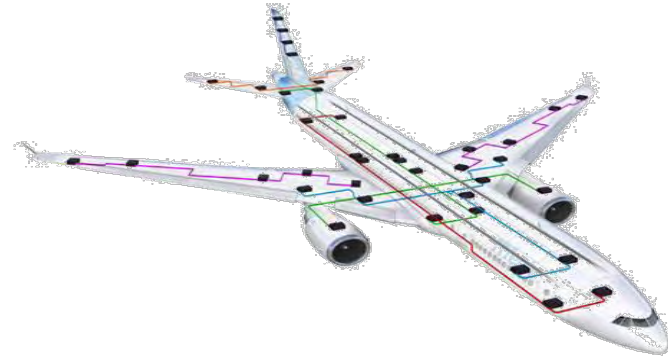
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Benefits

- ✓ Scalable and modular architectures
- ✓ Simplified integration and reconfiguration
- ✓ Reduced complexity and system life cycle cost
- ✓ Reduced SWaP
- ✓ Cross-industry standards in critical systems

Focus Application Areas TTE/AFDX/TTP

- ✓ Avionics / IMA / DIMA
- ✓ Flight controls / Fly-by-wire
- ✓ Distributed power generation platforms
- ✓ Engine control (EEC / FADEC)
- ✓ Landing gear systems
- ✓ Other utility systems, e.g. air management
- ✓ Space – launchers, satellites, human space, exploration and ground stations
- ✓ UAV's (Unmanned Aerial Vehicles)
- ✓ Aerospace Computing Platform (integration of networking and computing)



Boeing 787



Bombardier CSERIES



Airbus A380



NASA Orion



Focus Customers



Aero Dual-Use



Civil Aerospace



Space / New Space



TTTech's BU Aero Answer



Open Modular Platforms Solutions:
Future-readiness – modular upgradeability / technology insertion

Enabling
Future
Capabilities

Reduced cost – Development / Recurring / Time-2-Market

Increasing
Efficiency

Flexibility with new platforms and **business models**

Increasing
Performance

more for less

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