

GLADIUS 2.0: networked solution for the digitized battlefield

Facing the military challenges of today's global conflicts, joint task forces are highly reliant on information speed to ensure dominance on the battlefield. Besides firepower, mobility and protection, exchange of information, free from disruption and entire, between dismounted soldiers, their fighting vehicles and their military command is the key to fully accomplish their mission. The Soldier System GLADIUS 2.0 combines all these four features for mechanized and dismounted troops by integrating high-end technology components into one system, which overcomes those enormous challenges.

With over 40 years' experience in network solutions, mission systems and simulation solutions to military, governmental and commercial customers worldwide, Rheinmetall offers high knowledge and state-of-the-art solutions as a system-of-systems provider.

Rheinmetall has been digitalizing the "last mile" since 2006, developing and improving the GLADIUS Soldier System and delivering the latest version "System



GLADIUS Soldier with Vehicle and Autonomous System in the battlefield

Panzergranadier" (system for armoured infantry) for Germany's contribution to NATO's spearhead Very High Readiness Joint Task Force VJTF 2023, known as "IdZ-VJTF". IdZ-VJTF integrates more than 130 sub-systems from over 30 sub-suppliers, with all integration responsibilities managed by Rheinmetall Electronics.



GLADIUS Soldier in action



Our experience and expertise in the design, development, and production of soldier systems helps to ensure a decisive advantage in combat.

Stable connectivity, real-time situational awareness, platform to soldier systems integration, proven sensor-to-effector networks and autonomous systems all contributes to increasing the combat performance of each element of the integrated system on the digitized battlefield.

The Soldier System GLADIUS 2.0

GLADIUS 2.0 combines highest standards of protection, communication and up to date situational awareness for each individual soldier. It is modular, flexible and able to integrate a large number of subsystems as a result of its open generic system architecture design.

GLADIUS 2.0 follows a holistic approach enabling us to meet customer requirements around a C4I core system, clothing, protection, load carriage, weapons, reconnaissance and sighting sub-systems.

GLADIUS 2.0's design and universal interfaces help it to provide:

- Flexible and extendable interfaces such as NATO Generic Vehicle Architecture (NGVA) for future proofing
- Modular configuration and scalability to deliver the best function to weight ratio
- A comprehensive communications platform, including embedded IT Security
- Multi role configuration and role specific views to reduce cognitive and physical burdens
- Optimized sensor-to-decision and sensor-to-shooter networks
- Digital Core with High Definition Audio

The optimization of data, communication and information flow ensures information is delivered on time and supports NATO interoperability.

Advanced and efficient power management keeps the system running as long as possible by analyzing consumption and continuously adapting supply to meet system demands.

Rheinmetall works closely with its customers through workshops, studies, trials and test to ensure requirements are satisfied and user benefits of the system are maximized.

The Tactical Management System TacNet

TacNet provides functions far beyond those of conventional command and control systems. It controls the functions of a sensor-effector network via standard interfaces such as the Generic Inter-Vehicle Gateway (GIVG) or NGVA.



TacNet & Network

TacNet constitutes the control centre for a combination of platforms, sensors and effectors and give users situational awareness across the battlefield.

The incorporation of Artificial Intelligence (AI) helps the user stay focused on the mission target by providing information available that is relevant and appropriate to the profile of the soldier.

Embedded IT-Security fulfills the highest requirements, with information up to NATO SECRET always encrypted. Full digital audio configurations can take the advantage of the embedded IT-Security.

In summary, TacNet underlines the holistic C4ISTAR system approach.

Vehicle Integration

To deliver full combat power, the Infantry Fighting Vehicles (IFVs), their crews and dismounts should be fully integrated and operate cooperatively.

IFVs offer protection, mobility and equipment support. Furthermore, they can boost mission efficiency of the dismounts by allowing access to the IFV's sensors, effectors and communication systems.

For VJTF 2023, Rheinmetall has integrated GLADIUS 2.0 into the PUMA IFV to deliver "System Panzergrenadier". This provides interoperability of all respective elements up to company level. The integration of other vehicles into GLADIUS 2.0 is possible as the concept is platform agnostic.

In complex future operating environments, it will be essential for the IFVs and soldiers to operate together in a coherent network to gain mission success and maximize combat power.

The Networked Soldier

The Networked Soldier principle is a centralized data exchange of information. Each soldier, each vehicle, each sensor and each weapon station is an element of the data network and linked to each other. Each participant gets the relevant and latest data for their mission, to increase situational awareness and for concentration of effort as one coordinated unit.

Rheinmetall has digitized the sensor-to-shooter capability within the system for fast and precise target engagement.

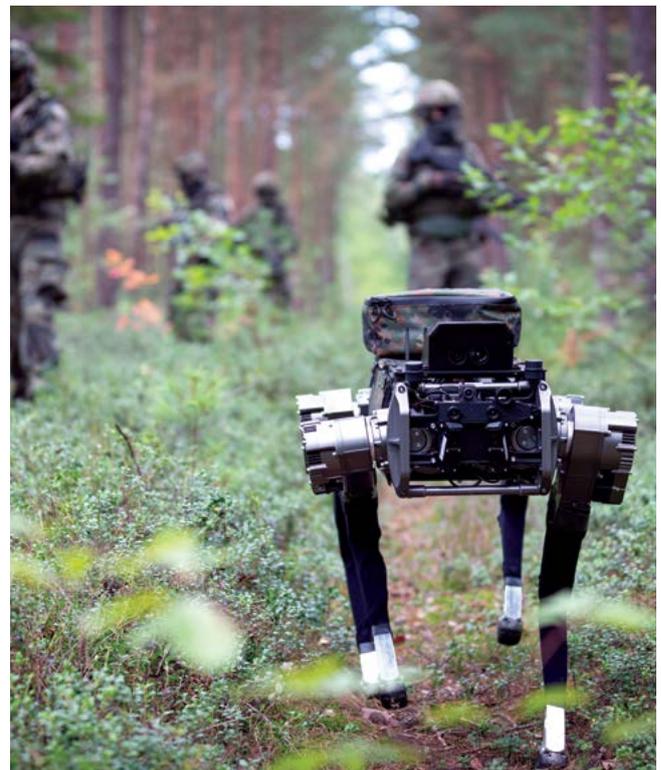
Decision support cycles are enhanced through the incorporation of AI to reduce cognitive load.

Integration of Autonomous Systems including Manned-Unmanned Teaming (MUM-T) into the Networked Soldier will provide logistic support, reconnaissance or direct weapon effects.

The Networked Soldier allows for flexible and modular integration of surveillance equipment, augmented reality and night vision capabilities to help deliver a decisive advantage and contribute to mission success.

Outlook – what comes next

Rheinmetall continues to work on the next generation of Soldier Systems to optimize and increase performance. Areas of current focus include: new power supply capabilities with lower weight; implementation of smart textiles; improved sight systems; integration of AI swarm technologies; bio-sensors and digitization of the health monitoring; and rescue procedures. ■



Soldier & Autonomous Systems & Network