+44 20 8123 2220
info@marketpublishers.com

Military Robots Market – Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented By Platform Type (Airborne, Land, Naval), By Mode of Operation (Manual, Autonomous), By Application Type (Intelligence, Surveillance, and Reconnaissance, Search and Rescue, Combat Support, Transport, Others), By Region, Competition, 2019-2029

https://marketpublishers.com/r/M5DF26C930CDEN.html
Date: February 2024
Pages: 180
Price: US$ 4,900.00 (Single User License)
ID: M5DF26C930CDEN

Abstracts

Global Military Robots Market was valued at USD 13.76 billion in 2023 and is anticipated to project robust growth in the forecast period with a CAGR of 5.99% through 2029. The global military robots market is experiencing robust growth, propelled by advancements in technology and increasing defense expenditures worldwide. This market encompasses a diverse array of unmanned systems designed for various platforms, including airborne, land-based, and naval applications. These robots serve multiple functions across different modes of operation, ranging from manual control by human operators to fully autonomous operations driven by artificial intelligence (AI) algorithms.

In the airborne segment, unmanned aerial vehicles (UAVs) have emerged as a dominant force, offering unparalleled versatility and capability in reconnaissance, surveillance, and combat operations. Armed UAVs play a crucial role in providing real-time intelligence, target acquisition, and precision strikes, enhancing the situational awareness and combat effectiveness of military forces. Additionally, miniaturized UAVs enable low-altitude surveillance and reconnaissance in urban environments, augmenting ground-based operations with aerial support.

On the land-based front, unmanned ground vehicles (UGVs) are widely employed for

+44 20 8123 2220
info@marketpublishers.com

various applications, including intelligence, surveillance, reconnaissance (ISR), search and rescue (SAR), combat support, and logistics. These robots range from small reconnaissance drones to large, heavily armored vehicles capable of carrying out complex missions in hazardous environments. Autonomous UGVs equipped with advanced sensors and navigation systems offer enhanced mobility and situational awareness, reducing the risk to human personnel in dangerous situations.

In the naval domain, unmanned marine vehicles (UMVs) are playing an increasingly important role in maritime operations, including mine countermeasures, underwater reconnaissance, and coastal surveillance. Autonomous underwater vehicles (AUVs) and unmanned surface vehicles (USVs) provide navies with the ability to conduct persistent surveillance and reconnaissance in littoral zones and contested maritime environments. These unmanned systems leverage advanced sensor technologies to detect and neutralize underwater threats, safeguarding naval assets and maritime infrastructure.

The mode of operation is a critical determinant of military robot capabilities and functionality. While some robots are remotely controlled by human operators, others operate autonomously, relying on AI algorithms to execute predefined tasks and make real-time decisions. Manual operation offers greater flexibility and control, allowing operators to adapt to changing mission requirements and environmental conditions. In contrast, autonomous operation enhances efficiency and reduces human intervention, enabling robots to operate in challenging and unpredictable environments with minimal oversight.

The application of military robots spans a wide range of scenarios and missions, including intelligence, surveillance, and reconnaissance (ISR), search and rescue (SAR), combat support, transportation, and logistics. ISR drones provide persistent surveillance and gather valuable intelligence, enabling commanders to make informed decisions and monitor enemy activities. SAR robots are deployed in disaster zones and hazardous environments to locate and extract survivors, while combat support robots provide firepower and tactical support to ground forces during operations. Additionally, unmanned transport vehicles facilitate the movement of personnel and supplies in hostile environments, enhancing the mobility and sustainability of military operations.

Key Market Drivers

Modern Warfare and Asymmetric Threats

+44 20 8123 2220
info@marketpublishers.com

Modern warfare has evolved considerably in recent years, with a shift towards asymmetric threats, urban warfare, and counterinsurgency operations. These changing dynamics have driven the demand for military robots to augment human capabilities in combat environments. Military robots play a crucial role in asymmetric warfare, where conventional armed forces are pitted against non-state actors, insurgents, or guerrilla groups. These adversaries often use unconventional tactics, hide among civilians, and employ improvised explosive devices (IEDs). Robots can assist in IED detection and disposal, surveillance, and reconnaissance, reducing risks to human troops. Urban environments present complex challenges for military operations, with close-quarters combat, restricted mobility, and a higher risk of collateral damage. Military robots equipped with advanced sensors and mobility capabilities can navigate and gather critical intelligence in urban settings, providing a tactical advantage to military forces. Counterinsurgency operations involve identifying and targeting insurgents while minimizing harm to civilian populations. Military robots equipped with non-lethal capabilities, such as less-lethal weapons or crowd control devices, can help in these operations by providing a measured response and reducing the potential for civilian casualties. Military robots offer improved situational awareness by providing real-time data through sensors and cameras. This data is crucial for identifying threats, monitoring adversaries, and planning tactical responses, particularly in asymmetric warfare scenarios. Military robots serve as force multipliers, enhancing the capabilities of armed forces. They can perform tasks that are dangerous or tedious for humans, allowing human troops to focus on mission-critical activities. This aspect increases the overall effectiveness of military operations.

Technological Advancements in Robotics

Technological advancements in the field of robotics have played a pivotal role in driving the growth of the global military robot market. These innovations have enabled the development of more capable, versatile, and autonomous military robots. Military robots are becoming increasingly autonomous, with the integration of artificial intelligence (AI) and machine learning. These technologies enable robots to make informed decisions, adapt to changing environments, and perform tasks with minimal human intervention. Advancements in sensor technology, including LiDAR, radar, and infrared sensors, have improved the perception capabilities of military robots. These sensors enhance navigation, obstacle avoidance, and target identification, making robots more effective in various operational scenarios. Modern military robots are designed to be highly mobile and versatile. They can traverse challenging terrains, navigate obstacles, and access remote or hard-to-reach locations. This mobility is essential for performing reconnaissance, surveillance, and search-and-rescue missions. Human-machine

+44 20 8123 2220
info@marketpublishers.com

interaction has improved, allowing operators to control military robots with greater precision and ease. Intuitive interfaces, such as haptic feedback and immersive control systems, enhance the efficiency of robot operators. The miniaturization of components and materials, coupled with enhanced durability, has led to the development of compact and rugged military robots. These robots can withstand harsh environmental conditions and are suitable for deployment in a wide range of operational environments.

Counterterrorism and Homeland Security

The global focus on counterterrorism and homeland security has driven the demand for military robots. Law enforcement agencies, border security forces, and special operations units have adopted these robots to enhance their capabilities in counterterrorism and security missions. Military robots are employed in counter-terrorism operations to locate and neutralize threats, including explosives, chemical, biological, radiological, and nuclear (CBRN) hazards. They are essential for bomb disposal, perimeter security, and hostage rescue operations. In the aftermath of terrorist incidents, military robots play a vital role in search and rescue operations. They can access areas that are unsafe for human responders, such as collapsed buildings or hazardous environments, and locate survivors or victims. Border security forces use military robots to monitor and secure international borders. These robots can patrol remote areas, detect unauthorized border crossings, and relay real-time information to human operators. Military robots are employed for the protection of critical infrastructure, such as power plants, transportation hubs, and government facilities. They provide an additional layer of security by conducting routine inspections and responding to potential threats. During crises, such as natural disasters or large-scale emergencies, military robots assist in crisis response efforts. They can provide situational awareness, deliver essential supplies, and support first responders in managing complex situations.

Urbanization and Megacity Conflict

The increasing trend of urbanization and the potential for conflict in megacities have heightened the demand for military robots. As the world's population continues to concentrate in urban areas, the likelihood of conflicts or security challenges in densely populated cities has risen. Megacities are characterized by complex urban terrain, including tall buildings, narrow streets, and dense infrastructure. Military robots are equipped to navigate these challenging environments and provide valuable reconnaissance and surveillance capabilities in urban conflict scenarios. The presence of civilians in megacities poses a significant challenge during conflicts. Military robots

+44 20 8123 2220
info@marketpublishers.com

can help reduce civilian casualties by providing surveillance, identifying threats, and ensuring that operations are conducted with greater precision and minimal collateral damage. Urban warfare necessitates extensive reconnaissance and intelligence-gathering efforts. Military robots equipped with advanced sensors and cameras can enter buildings, access confined spaces, and transmit critical information to military forces. In the event of natural disasters or humanitarian crises in urban areas, military robots support crisis management efforts. They can conduct search-and-rescue missions, assess structural damage, and deliver supplies to affected populations. The mere presence of military robots in urban areas can serve as a deterrent to potential threats, dissuading hostile actors from engaging in violent actions. This contributes to the overall security of megacities.

Global Defense Budgets and Military Modernization

The allocation of substantial defense budgets by countries and ongoing military modernization programs are key drivers of the global military robot market. Governments and armed forces are investing in advanced technologies, including military robots, to enhance their defense capabilities. Many nations allocate significant portions of their budgets to defense and security. These budgets support the development, acquisition, and deployment of military robots to address various security challenges. As part of military modernization efforts, armed forces are acquiring cutting-edge technologies, including robotics and unmanned systems. These modernization programs aim to maintain military readiness and ensure that armed forces are equipped with the latest tools and capabilities. Military robots are included in the acquisition plans of many countries as they seek to enhance their defense capabilities.

Key Market Challenges

Safety and Ethics Concerns

As the use of military robots expands, ethical and safety concerns become increasingly relevant. These concerns arise from the potential for robots to make life-and-death decisions, the risk of unintended harm, and the ethical implications of autonomous systems in warfare. The concept of lethal autonomous weapons systems (LAWS), often referred to as "killer robots," raises profound ethical and legal questions. The deployment of robots capable of autonomously selecting and engaging targets without human intervention is a contentious issue. There is an ongoing debate about the moral and legal responsibility for the actions of such robots in the event of errors, accidents, or violations of the rules of engagement. The use of military robots must align with

+44 20 8123 2220
info@marketpublishers.com

international humanitarian laws and the principles of proportionality and discrimination. There is a concern that autonomous systems might not be able to make nuanced judgments in complex, dynamic situations, potentially leading to disproportionate use of force and violations of human rights. Determining responsibility and accountability for actions taken by military robots is challenging. If a robot makes a decision that results in harm or violates ethical guidelines, it may be difficult to attribute responsibility. This lack of accountability can lead to legal and moral dilemmas. The risk of civilian casualties and collateral damage is a major concern, particularly in urban warfare environments. Military robots must be able to distinguish between combatants and non-combatants, and any failure to do so could result in civilian harm and public backlash. The acceptance of military robots in society, both domestically and internationally, is influenced by ethical considerations. Public perception of the ethical use of robots in warfare can impact policy decisions and public support for defense programs.

Cybersecurity and Vulnerabilities

The increasing integration of advanced technologies and connectivity in military robots exposes them to cybersecurity threats and vulnerabilities. Ensuring the security of these systems is a pressing challenge for military organizations. Military robots are susceptible to cyber-attacks and hacking attempts. Adversaries may seek to disrupt communication, take control of robots, or manipulate data. Successful cyber-attacks on military robots can compromise missions and lead to unauthorized access. Military robots collect and transmit sensitive data for various purposes, including surveillance, reconnaissance, and targeting. Protecting this data from interception and ensuring privacy is essential, especially when operating in contested environments. Robots that can be remotely controlled present vulnerabilities. If an adversary gains control of a robot through hacking or jamming, it can be turned against friendly forces or civilians. The supply chain for military robot components and software must be secure to prevent the insertion of malicious code or compromised components. Ensuring the integrity of the supply chain is challenging, given the global nature of the defense industry. As military robots become more autonomous, the decision-making processes of these systems must be secured against tampering or manipulation. Protecting the integrity of decision-making algorithms is vital to ensuring the robots' reliability and effectiveness.

Regulatory and Legal Frameworks

The global military robot market operates in a complex landscape of national and international regulations and legal frameworks. The lack of standardized guidelines and evolving laws pose challenges to the development, export, and use of military robots.

+44 20 8123 2220
info@marketpublishers.com

The export of military robots and related technologies is subject to export controls and arms trade treaties. Compliance with these regulations can be complex, and the interpretation of what constitutes a military robot varies among nations. Some countries and international organizations are advocating for bans or restrictions on the use of fully autonomous weapons. While these discussions are ongoing, they create uncertainty about the future use of military robots. The lack of a standardized definition and classification of military robots hinders the establishment of consistent regulatory frameworks. This ambiguity can lead to difficulties in harmonizing laws across borders. The development and deployment of military robots challenge traditional rules of engagement (ROE) in armed conflict. Defining ROE for autonomous systems and ensuring compliance with these rules is a complex process that demands international cooperation. As robots increasingly work alongside human troops, guidelines for human-robot collaboration must be established. These guidelines should clarify the roles, responsibilities, and authority of human operators in relation to autonomous robots.

Technological and Budgetary Constraints

Despite the rapid advancement of technology, military robots face certain technological constraints that can limit their operational capabilities. Additionally, budgetary considerations can impact the development and acquisition of these systems. Military robots must operate in diverse and often harsh environments, including extreme temperatures, rough terrains, and contested spaces. Developing robots that can withstand such conditions, while also performing at a high level, is technologically challenging. Battery technology remains a limitation for many military robots. The need for extended endurance and operational range presents a challenge. Longer missions require more efficient power sources and energy management systems. The sensory capabilities of military robots, while advanced, are not without limitations. Sensors can be susceptible to interference from environmental factors, such as fog, rain, or dust, impacting situational awareness.

Key Market Trends

Autonomous Systems and Artificial Intelligence (AI)

The integration of autonomous systems and artificial intelligence is a dominant trend in the global military robot market. Advances in AI and robotics technology are enabling military robots to operate with a higher degree of autonomy and make decisions in complex and dynamic environments. This trend is reshaping the capabilities of military robots in various operational domains. Military robots are becoming more autonomous,

+44 20 8123 2220
info@marketpublishers.com

capable of executing tasks with minimal human intervention. They can navigate through complex terrains, adapt to changing situations, and make decisions based on real-time data. This increased autonomy is particularly valuable for tasks such as reconnaissance, surveillance, and explosive ordnance disposal (EOD). Machine learning algorithms are enhancing the learning and decision-making capabilities of military robots. These algorithms enable robots to recognize patterns, adapt to new situations, and continuously improve their performance. For example, autonomous drones can learn to identify potential targets or threats based on historical data and real-time input. Swarm robotics, where multiple robots work together in a coordinated manner, is gaining prominence. Swarms of robots can perform tasks such as surveillance, search and rescue, or environmental monitoring more effectively than single robots. They can share information, distribute tasks, and operate in a decentralized manner. AI-powered military robots can process vast amounts of sensor data in real-time. This capability allows them to analyze data from various sources, including cameras, sensors, and communication systems, and make rapid decisions based on the information received. Autonomous military robots are capable of planning and adapting missions on the fly. They can adjust their actions based on changing circumstances, such as unexpected obstacles, threats, or opportunities. This adaptability enhances the versatility of military robots across different operational scenarios.

Human-Machine Teaming and Collaboration

Human-machine teaming and collaboration represent a significant trend in the global military robot market. Rather than replacing human soldiers, military robots are increasingly designed to work in conjunction with human operators, providing support and enhancing the capabilities of military forces. Military robots are being developed with the goal of seamless integration into existing military systems. They can communicate with other military assets, such as ground troops, vehicles, and command centers, ensuring that information is shared effectively and in real-time. Human operators can remotely control military robots, enabling them to perform tasks at a distance. This capability is crucial for missions that involve hazardous environments, explosive devices, or chemical, biological, radiological, and nuclear (CBRN) threats. Operators can manipulate robotic arms, drive unmanned vehicles, or fly drones from a safe location. Military robots are designed to supplement and enhance human skills. For example, robots equipped with advanced sensors and cameras can provide soldiers with improved situational awareness, enabling better decision-making on the battlefield. They can also carry heavy loads or perform repetitive tasks, reducing the physical strain on human troops. The collaboration between humans and robots is becoming more

+44 20 8123 2220
info@marketpublishers.com

sophisticated. Robots can follow commands, interpret gestures, and even engage in collaborative tasks with human team members. This teamwork extends to areas such as reconnaissance, surveillance, and even medical support on the battlefield. Military units are increasingly using simulation and training environments to prepare soldiers for working with military robots. These simulations allow troops to practice coordinating with robots, understanding their capabilities, and making the best use of their support in real-world missions.

Multi-Domain Operations

Multi-domain operations, which involve integrating air, land, sea, cyber, and space capabilities, are a prominent trend in the global military robot market. Modern warfare often requires military robots to operate in multiple domains simultaneously, making them integral components of joint force operations. Military robots are being designed to operate across various domains, from aerial drones conducting reconnaissance to ground robots supporting infantry units. These robots can communicate and share information seamlessly, enabling a more comprehensive view of the battlefield. Multi-domain operations rely on interconnected sensor networks that collect data from different domains and provide a holistic view of the operational environment. Military robots play a critical role in these networks by contributing data from their sensors, enhancing situational awareness. Military robots are being developed with multi-domain capabilities. For example, unmanned aerial vehicles (UAVs) can transition to maritime operations, conducting surveillance over water, while ground robots can provide support during amphibious or littoral operations. In multi-domain operations, military robots can coordinate attacks and defense strategies across various domains. For instance, drones can work in conjunction with ground robots and cyber capabilities to conduct coordinated attacks on enemy positions while simultaneously defending against threats. The integration of cyber and physical operations is a key aspect of multi-domain operations. Military robots can assist in cyber warfare, providing support for cyber experts by collecting data, assessing vulnerabilities, and helping to secure critical infrastructure.

Miniaturization and Portability

The miniaturization of military robots and their increased portability are significant trends in the global market. These developments allow for greater flexibility in deployment and support various mission profiles. Miniature military robots are becoming increasingly prevalent. These compact robots are highly maneuverable and can access confined spaces, making them valuable for tasks such as search and rescue in collapsed

buildings or reconnaissance in complex urban environments. Military robots are being designed to be man-portable, allowing infantry units to carry them into the field. Man-portable robots can be rapidly deployed, supporting dismounted troops with tasks such as reconnaissance, surveillance, and EOD. Advances in materials and components have led to the creation of lightweight military robots. These robots are easy to transport and can be rapidly deployed to address emerging threats or opportunities on the battlefield. Military robots are often designed with a modular approach, allowing operators to attach or detach various components and payloads based on mission requirements. This modularity enhances the versatility of the robot, enabling it to perform a wide range of tasks. Miniature drones, known as micro air vehicles (MAVs), are gaining popularity for surveillance and reconnaissance missions. These small drones are easily transportable and can be launched quickly to provide real-time intelligence to ground troops.

Segmental Insights

Platform Type Analysis

The market is divided into airborne, Land, and naval segments based on the platform. Due to the increased use of land robots in many nations, growing investment, and R&D efforts to improve ground robots, and growing border security concerns in Asian nations, the land sector is anticipated to rise significantly over the projected period. The deployment of these robots is also anticipated to support the market's expansion because they are employed in numerous tactical military applications. The government's efforts to invest in the military and defense industries, the growing interest by manufacturers in modernizing its current robots, and the numerous military modernization plans are all likely to contribute to the expected significant growth of the airborne and naval segments.

Regional Insights

Due in large part to the existence of significant manufacturers in this sector, European Military Robots have the largest market share. Furthermore, a wide range of technological integration is well-managed in this region. Motion and task planning, navigation and collision avoidance, voice and haptics-based human-machine interface, and other technologies are included in this. Asia Pacific is predicted to have exponential growth in the upcoming years, in second place to Europe. China’s military plans for marine, land, and air defense have contributed significantly to this. The military will undergo a profound transformation, and China and India prioritize investing in cutting-

+44 20 8123 2220
info@marketpublishers.com

edge technologies like nanotechnology and artificial intelligence.

Key Market Players

Northrop Grumman Corporation

Thales Group

Clearpath Robotics Inc.

Cobham Limited

QinetiQ Group plc

AeroVironment, Inc

BAE Systems.

Elbit Systems Ltd.

Raytheon Technologies

Report Scope:

In this report, the Global Military Robots Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

Military Robots Market, By Platform Type:

Airborne

Land

Naval

Military Robots Market, By Mode of Operation:

Manual

+44 20 8123 2220
info@marketpublishers.com

Autonomous

Military Robots Market, By Application Type:

Intelligence, Surveillance, and Reconnaissance

Search and Rescue

Combat Support

Transport

Others

Military Robots Market, By Region:

Asia-Pacific

China

India

Japan

Indonesia

Thailand

South Korea

Australia

Europe & CIS

Germany

Spain

+44 20 8123 2220
info@marketpublishers.com

France

Russia

Italy

United Kingdom

Belgium

North America

United States

Canada

Mexico

South America

Brazil

Argentina

Colombia

Middle East & Africa

South Africa

Turkey

Saudi Arabia

UAE

Competitive Landscape

+44 20 8123 2220
info@marketpublishers.com

Company Profiles: Detailed analysis of the major companies present in the Global Military Robots Market.

Available Customizations:

Global Military Robots market report with the given market data, TechSci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

Detailed analysis and profiling of additional market players (up to five).

+44 20 8123 2220
info@marketpublishers.com

Contents

+44 20 8123 2220
info@marketpublishers.com

+44 20 8123 2220
info@marketpublishers.com

+44 20 8123 2220
info@marketpublishers.com

7. EUROPE & CIS MILITARY ROBOTS MARKET OUTLOOK

+44 20 8123 2220
info@marketpublishers.com

8. NORTH AMERICA MILITARY ROBOTS MARKET OUTLOOK

+44 20 8123 2220
info@marketpublishers.com

9. SOUTH AMERICA MILITARY ROBOTS MARKET OUTLOOK

+44 20 8123 2220
info@marketpublishers.com

10. MIDDLE EAST & AFRICA MILITARY ROBOTS MARKET OUTLOOK

+44 20 8123 2220
info@marketpublishers.com

+44 20 8123 2220
info@marketpublishers.com

+44 20 8123 2220
info@marketpublishers.com

+44 20 8123 2220
info@marketpublishers.com

I would like to order

Product name: Military Robots Market – Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented By Platform Type (Airborne, Land, Naval), By Mode of Operation (Manual, Autonomous), By Application Type (Intelligence, Surveillance, and Reconnaissance, Search and Rescue, Combat Support, Transport, Others), By Region, Competition, 2019-2029

Product link: https://marketpublishers.com/r/M5DF26C930CDEN.html

Price: US$ 4,900.00 (Single User License / Electronic Delivery)

If you want to order Corporate License or Hard Copy, please, contact our Customer Service:
info@marketpublishers.com

Payment

To pay by Credit Card (Visa, MasterCard, American Express, PayPal), please, click button on product page https://marketpublishers.com/r/M5DF26C930CDEN.html

To pay by Wire Transfer, please, fill in your contact details in the form below:

First name:
Last name:
Email:
Company:
Address:
City:
Zip code:
Country:
Tel:
Fax:
Your message:

**All fields are required

Custumer signature _____

Please, note that by ordering from marketpublishers.com you are agreeing to our Terms & Conditions at https://marketpublishers.com/docs/terms.html

+44 20 8123 2220
info@marketpublishers.com

To place an order via fax simply print this form, fill in the information below and fax the completed form to +44 20 7900 3970