+357 96 030922
info@marketpublishers.com

Automotive ECU Market Assessment, By Type [Engine Control Module, Powertrain Control Module, Body Control Module, Others], By Capacity [16-bit, 32-bit, 64-bit], By Propulsion [Internal Combustion Engine, Battery Electric Vehicle, Others], By Vehicle Type [Passenger Vehicles, Commercial Vehicles, Others], By Region, Opportunities and Forecast, 2016-2030F

https://marketpublishers.com/r/AAC15BF3AABBEN.html
Date: March 2025
Pages: 225
Price: US$ 4,500.00 (Single User License)
ID: AAC15BF3AABBEN

Abstracts

Global automotive ECU market size was valued at USD 95.64 billion in 2022, expected to reach USD 158.52 billion in 2030, with a CAGR of 6.52% for the forecast period between 2023 and 2030. The rise of electric vehicles and integrated systems is expected to change the automotive market significantly. The shift has led to the development of advanced control units like battery management, ADAS, and ABS. The shift from mechanical to electronic control units has resulted in advanced automotive systems like cruise control, power steering, and infotainment HUD. The adoption of electronic control units (ECU) has been driven by improved fuel efficiency and emission compliance. The integration of ECU with LiDAR sensor technology has revolutionized autonomous driving.

In 2021, Denso developed an advanced driver assistance system (ADAS) for Lexus LS and Toyota Mirai. These innovations include LiDAR technology for the precise detection of surrounding vehicles and road shapes. Additionally, there is a Locator Telescopic Camera designed to identify and assess the vehicle's immediate environment. DENSO developed the Spatial Information Service Electronic Control Unit (SIS ECU) to further enhance performance, which accurately determines the vehicle's position.

Therefore, the market players are expanding their research and development spaces for

+357 96 030922
info@marketpublishers.com

technological adoption. The focus is to produce ECU technology that is flexible, AI integrated, IoT friendly, and adopts sensory technology. Increased economic activities around emerging economies are garnering vehicle sales, eventually increasing the demand for various ECU systems. The utilization of ECUs in advanced software-based commercial vehicles with infotainment systems are anticipated to flourish the market growth. Moreover, the improved engine performance along with the enhanced fuel efficiency in all types of vehicles are delivered through ECU systems. The constant monitoring and parameters adjustments of vehicles helps the system use limited amount of fuel and enable optimum performance.

Autonomous Driving and Higher Vehicle Connectivity to Flourish the Market Expansion

Automotive technologies are undergoing significant evolution due to user convenience, trends, and safety concerns. It has led to the rise of Vehicle Electronic Control Units (ECUs), which are accelerated by factors like vehicle electrification, advanced touch-screen infotainment systems, and sensor technology. ECUs are crucial in developing Advanced Driver Assistance Systems (ADAS) and autonomous control systems, expediting data processing. The increasing demand for vehicles with ADAS and driving automation demonstrates the growing importance of automotive ECUs. Furthermore, the rise of connected vehicles, incorporating wireless telematics and location technology, has increased the adoption of electronic control units (ECUs) in various automotive applications. ADAS, a key component, uses ECUs and sensors to enhance safety features like Adaptive Cruise Control, Lane Keeping Assistance, Blind-Spot Monitoring, and Automatic Emergency Braking. ECUs are crucial in modern vehicle safety enhancements like anti-lock braking systems, electronic stability control, and airbag deployment, contributing to improved safety and accident prevention. Developers are continuously improving the intelligence and driver-centric nature of these platforms.

In August 2023, Continental unveiled an extension to its portfolio of automotive software development tools with the introduction of the forthcoming vECU Creator application. Known as 'vECU Creator,' this software is set to provide developers at automotive manufacturers, suppliers, and third-party organizations with the capability to configure and deploy virtual cloud-based Electronic Control Units (ECUs) within their specialized development environments. This advancement is expected to enhance and streamline the development process for ECUs, offering flexibility and efficiency to those involved in the automotive industry.

Evolution from Mechanical to Electronic Control Units

+357 96 030922
info@marketpublishers.com

The transition from mechanical control units to electronic control has been a transformative force in the automotive industry. The shift has a significant impact on passenger vehicle consumers, introducing a new era of software-based features like in-car music players, touchscreen panels, and electronically controlled outside rear-view mirrors (ORVMs). These tech-driven enhancements have become integral to the modern vehicle, influencing consumer preferences during the car-buying process.

Electronic Control Units (ECUs) play a crucial role in optimizing engine performance by fine-tuning and enhancing power distribution throughout the vehicle. Additionally, automotive ECUs facilitate vehicle diagnostics, swiftly identifying and troubleshooting system issues. The integration of remote features, such as over-the-air (OTA) updates, in ECUs has streamlined remote monitoring, maintenance, and software upgrades, reducing operational time and costs. These units can also accumulate and store valuable data on system performance, usage patterns, and malfunctions, which can be analysed to enhance processes and develop predictive maintenance plans. This marks a pivotal step towards efficiency and proactive system management in the automotive world. Furthermore, the ECU vendors try to enhance the technological aspect and produce future-ready ECU systems.

In April 2023, TTTech Auto introduced the N4 model, a high-performance networking ECU designed to support modern automotive E/E architectures and facilitate the development of future software-defined vehicles.

Government to Support the Vehicles with Lower Emission Levels and Higher Fuel-Efficiency

One of the primary advantages of electronic control units (ECUs) lies in their intelligent management of ignition control and air-fuel mixture. ECUs continuously oversee and regulate the ratio of air and fuel supplied to the engine's cylinders. This precise control of the air-to-fuel ratio ensures that the engine operates at optimal efficiency, leading to reduced fuel consumption and diminished greenhouse gas emissions. Additionally, ECUs are responsible for managing the ignition timing of spark plugs, which directly affects the air-fuel mixture within the combustion chamber. By fine-tuning ignition timing, ECUs optimize engine performance, resulting in increased efficiency and reduced emissions.

Government backing for eco-friendly vehicles includes tax incentives and business prospects for manufacturers. Additionally, authorities enforce strict emission and fuel-efficiency standards for automobiles, compelling the adoption of advanced ECUs to

+357 96 030922
info@marketpublishers.com

improve engine performance and reduce emissions. Meeting these regulations indirectly spurs growth in the ECU market by fueling the need for cutting-edge ECU technology. Furthermore, ECUs have roles in Intelligent Transportation Systems and Vehicle-to-Everything communication systems. Government investments in transportation infrastructure can drive demand for ECUs utilized in these applications, further advancing the ECU market.

Passenger Cars Lead the Automotive Market with Advanced ECUs

The passenger car segment is poised to take the lead in the market, primarily due to its high production volume and the ongoing stream of technological innovations. This segment encompasses a wide range of vehicles, including sedans, hatchbacks, SUVs, and crossovers, outshining the commercial and heavy-duty vehicle categories. Electronic Control Units play a pivotal role in developing and integrating novel features within passenger vehicles. Manufacturers are continuously enhancing their vehicles through the incorporation of advanced infotainment systems, Advanced Driver Assistance Systems (ADAS), and Vehicle-to-Everything (V2X) communication. These advancements are positioning ECUs at the heart of features such as Adaptive Cruise Control (ACC), Lane-Keeping Assist (LKA), Blind-Spot Monitoring (BSM), Traffic Jam Assist (TJA), and Automated Parking (AP). V2X communication empowers vehicles to engage with other vehicles, infrastructure, and pedestrians, thus elevating road safety and optimizing traffic performance.

In February 2021, Magna announced its plans to introduce a novel product category for new vehicles. Their initiative involves bringing 3D surround view capabilities to automobiles using next-gen cameras and automotive electronic control units (ECUs). Magna's upcoming generation of cameras and domain controllers is set to democratize the advantages of 3D surround view, a driver-assistance technology historically prevalent in luxury vehicles. This technology will become accessible starting with the 2022 model years and will extend to a variety of customers and vehicle platforms.

Internal Combustion Engine Continue to Dominate

Based on propulsion type, the internal combustion engine is set to take the lead in the market. Globally, ICE vehicles, encompassing gasoline and diesel-powered vehicles, continue to reign supreme in the automotive landscape. Consequently, the demand for Electronic Control Units remains strong to enhance these vehicles' performance, fuel efficiency, and emissions management. Manufacturers persist in their investments in ICE technology, even as the automotive industry experiences a shift toward electric and

+357 96 030922
info@marketpublishers.com

hybrid vehicles. Recent ICE vehicles are equipped with cutting-edge ECUs that fine-tune engine performance, resulting in reduced emissions and improved fuel economy. Moreover, government authorities emphasize the integration of ECUs with ICEs, as they play a pivotal role in retrofitting older ICE vehicles with emissions control systems to meet global emissions standards. Additionally, consumer preferences favor ICE propulsion due to the established trust, familiar functionality, and user-friendliness, further bolstering the segment's position in the global market.

Asia-Pacific to Lead the Market

Asia-Pacific is expected to lead the global automotive ECU market due to expanded manufacturing capabilities, increased per capita income, and advanced automotive technologies. The region's manufacturing sites are home to major automotive manufacturers, leading to a high demand for electronic control units (ECUs). The development of advanced ECUs has been a major focus of the Asia-Pacific technology and electronics industry. Leading companies like Panasonic, Bosch, Denso, and Samsung are contributing to market growth, investing significant resources in research and development to create ECUs that meet international automotive standards. The region's automotive industry is transforming the automotive space, with ADAS, advanced telematics, and anti-theft tools transforming the automotive industry. Government ties up with important local players to enhance automotive manufacturing. The authorities try to identify different automotive components like ECU, ADAS, and lighting units to focus on their specific markets.

In March 2023, the Indian Automotive Sectorial System of Innovation (IASSI) released the UNIDO-DST survey report, which comprise measurements, analysis, and policy recommendations. This comprehensive report extensively presents the results of the national manufacturing innovation survey for the year 2021-22. Furthermore, it highlights eight pivotal technologies crucial to Industry 4.0, providing a strategic pathway for automotive component manufacturers to prepare for the future. One of the notable technologies, is proposed integration of big data with Electronic Control Units (ECUs), aiming to optimize automotive manufacturing processes. By incorporating big data within ECU systems, automotive manufacturers can leverage valuable insights for predicting malfunctions and enhancing the performance of their upcoming vehicle models.

Impact of COVID-19

The pandemic adversely impacted the automotive industry, including production

+357 96 030922
info@marketpublishers.com

shutdowns and supply chain disruptions, such as lockdowns and reduced workforce operations, which curtailed market growth. In emerging economies like India and China, the progress of automotive giants ground to a halt during the virus's spread. Furthermore, the post-COVID economic downturn compelled end-user customers to tighten their budgets, leading to a global reduction in vehicle demand. The pandemic triggered a shift in consumer behavior and preferences, favoring personal vehicles over shared transportation options like public transit and ridesharing. The change boosted the demand for Electronic Control Units (ECUs), particularly in personal vehicles equipped with advanced features.

Impact of Russia-Ukraine War

The Russia-Ukraine war introduced significant geopolitical uncertainties that have impact on the global automotive market. The ramifications of raw material shortages pose a threat to the progress of the automotive sector's electrification and the development of smart technology. It in turn, has a direct effect on the global automotive ECU market, given the declining demand for new vehicles. Supply chain disruptions and geopolitical tensions resulting from the conflict have led to increased component and material costs for ECU manufacturers. Consequently, these manufacturers were compelled to seek alternative supply sources or accept higher pricing, ultimately driving up production costs. As a result, end-user prices in the conflict-affected regions rose. Additionally, trade policies and tariffs were modified due to the Russia-Ukraine conflict, further affecting the pricing and availability of electronic control units (ECUs) and the overall performance of the automotive sector.

Key Player Landscape and Outlook

The market for automotive ECU is dominated by mid-large size companies. From new technological advancements to security telematics, the market players focus on innovation and technology, regulation compliance, and cost efficiency. Furthermore, the companies produce ECU solutions that are flexible with technological integration such as AI integration, IoT-integration. Research and development (R&D) programs are a priority for electronic control unit (ECU) vendors, with the aim of developing ECUs that are technologically advanced and innovative. It includes the development of ECUs with higher processing power, enhanced memory capacity, and improved connectivity features to meet the evolving automotive requirements.

In August 2023, Continental AG and Amazon Web Services accelerated automotive software development with virtual electronic control unit. The unit shortens the

+357 96 030922
info@marketpublishers.com

development time up to twelve months and helps automakers identify vehicle issues.

In February 2023, Elektrobit collaborated with Canonical to create a Linux-based development platform, specifically on the Ubuntu Linux distribution. The solution is available for OEM and Tier 1 suppliers and is likely to benefit an open-source operating system for ECU development.

In January 2023, Foxconn entered into a strategic agreement with NVIDIA to create a platform for the development of automated and autonomous vehicles. The agreement stipulates that Foxconn will become a Tier-1 manufacturer, manufacturing DRIVE orin ECUs for the automotive industry worldwide. The EVs manufactured by Foxconn is expected to incorporate DRIVE ORIN ECUs, as well as DRIVE HYPERION™ sensors for advanced automated driving capabilities.

+357 96 030922
info@marketpublishers.com

Contents

+357 96 030922
info@marketpublishers.com

8. GLOBAL AUTOMOTIVE ECU MARKET OUTLOOK, BY REGION, 2016-2030F

+357 96 030922
info@marketpublishers.com

+357 96 030922
info@marketpublishers.com

9. MARKET MAPPING, 2022

10. MACRO ENVIRONMENT AND INDUSTRY STRUCTURE

11. MARKET DYNAMICS

12. KEY PLAYERS LANDSCAPE

+357 96 030922
info@marketpublishers.com

+357 96 030922
info@marketpublishers.com

I would like to order

Product name: Automotive ECU Market Assessment, By Type [Engine Control Module, Powertrain Control Module, Body Control Module, Others], By Capacity [16-bit, 32-bit, 64-bit], By Propulsion [Internal Combustion Engine, Battery Electric Vehicle, Others], By Vehicle Type [Passenger Vehicles, Commercial Vehicles, Others], By Region, Opportunities and Forecast, 2016-2030F

Product link: https://marketpublishers.com/r/AAC15BF3AABBEN.html

Price: US$ 4,500.00 (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/AAC15BF3AABBEN.html