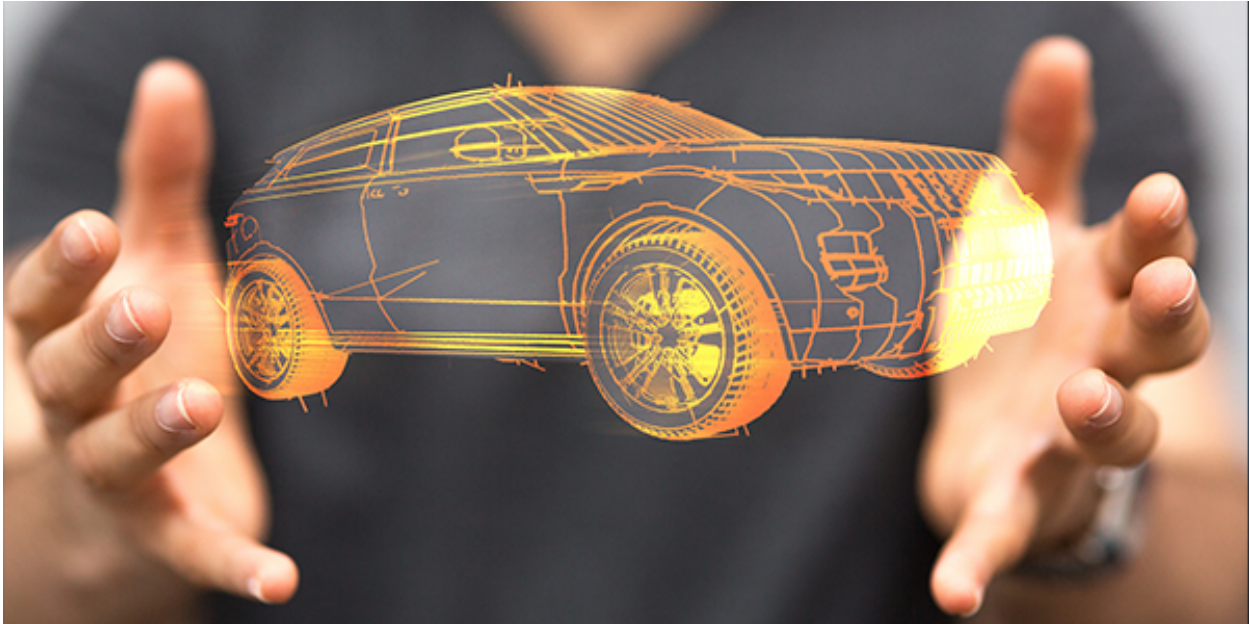# The Tesla Magic
2016 Top Transportation Game Changer

Tesla Motors is looking to revolutionize the transportation industry within the next two years with its upcoming Tesla Model 3 - a compact electric sedan that promises to combine the latest in car technology, all with a reasonable price tag that is achievable by the general public. Unlike Tesla's prior Model S that cost a minimum of $70,000 for its base model, the new Model 3 series is looking to thrill drivers with revolutionary features such as self-drive, self-park and accident avoidance with a starting price of about $35,000. Tesla promises to deliver much greater value to their customers with innovative features that will make driving not only fun again, but also safer than ever before.

The Tesla Model 3 is an electric car that accelerates silently from 0 to 60 mph in less than six seconds. With its advanced battery, the Model 3 offers a driving range of 215-miles before it needs recharging. The use of high performance embedded computer systems or integrated motherboards are needed to control these complex car functions, from battery management to autopilot. A human machine interface (HMI) can be used to manage and control settings such as sunroof control, temperature preferences, GPS map routes, connected Bluetooth devices and more. These systems, boards and HMI computers work in conjunction with a series of sensors, radar systems, cameras, GPS system and high resolution digital maps to deliver one of the most advanced mass market vehicles.

These high quality embedded systems and motherboards are required to offer desirable features such as highly scalable CPU options for various computing performance needs. These features can include anti-vibration, wide operating temperature ranges and reliable high performance CPUs to withstand the challenges of vehicle usage. Car manufacturers are not the only ones taking advantage of these advancements in computer technology, mass transit buses and trains can now offer these futuristic features as well. Trucks now can also have more efficient fleet management and communication systems. With technology being more advanced with exponential growth, the 'future' is arriving at our doorstep much faster than we think. Computer hardware manufacturers are able to capitalize on the trend and provide cost reduction through economy of scale. Vehicle manufacturers can now bring space-age features that were once limited to the consumers in higher income brackets into the mass market.

Technology plays a key role in this game-changing phenomenon and will continue to make a huge impact in all arenas of the world. Today, we are amazed by vehicles that can self-drive and brake on their own to prevent collisions. Tomorrow, these might be among the most basic of features for automobiles in the marketplace. The bar is now raised. It is an exciting time to witness the tremendous impact of technology and to be a part of this increasingly "magical" world we live in. Who knows, flying cars may not be too far off.

Axiomtek's Advanced Vehicle and Fleet Management Product Lines

Axiomtek's advanced embedded computer systems, embedded motherboards, and all-in-one touch panel PCs can be integrated by car manufacturers looking to adopt these futuristic features into various transportation applications. These in-vehicle PCs are feature-rich and offer a wide variety of options for scalability and customization.

Embedded Systems Product Lines:

Axiomtek's **tBOX** and **eBOX** product lines can be integrated into a variety of mass transit applications with features including high performance/low power consumption CPUs, anti-vibration features, safety and rolling stock certifications and more. The rugged tBOX products are designed for a variety of onboard transportation applications, while the versatile eBOX products can be integrated into applications such as fleet management, ticketing, signaling and more.

Some examples of Axiomtek's embedded computer systems suited for transportation applications are as follows:

tBOX810-838-FL

• Compact in size, with low power consumption quad-core Intel® Atom™ E3845 (1.91 GHz) or E3827 (1.75 GHz)

• eMark, ISO7637, EN50155, EN50121 and IEC60945 certifications for transportation industry applications

• Anti-vibration design with lockable I/O interfaces and M12 type LAN and power inputs

• Intelligent power management solution for ACC on/off delay, shutdown delay and over/under voltage protection

eBOX671-885-FL

• High performance 4th Generation Intel® Core™ i7/i5/i3 or Celeron® processors

• Cost effective power source options with less cabling through 4 channel Power over Ethernet (PoE) for surveillance cameras

• Fanless operation design with extended operating temperature range of -20°C to +50°C for operational stability in a variety of challenging environments

• Two internal PCI Express Mini Card slots for 3G/LTE/Wi-Fi add-on cards for wireless communication

Embedded Motherboard Product Lines:

Axiomtek's **embedded motherboards** can be utilized by integrators looking for a high performance, reliable board that can be customized to fit their specific needs. These embedded motherboards are highly scalable and customizable, with options for a variety of CPUs, rich I/Os and many useful features. The product line offers a variety of form factors and wide range of flexible options to satisfy the most discriminating project needs. Axiomtek's design assistance team can help ease the pain of project's development and deployment processes.

One example of Axiomtek's embedded boards suited for integration into many transportation applications is as follows:
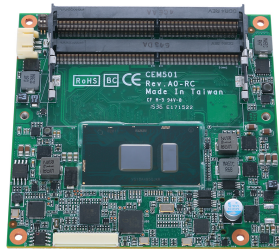
CEM501

• High performance 6th Generation Intel® Core™ i7/i5/i3 processors

• Compact COM-Express Type 6 module, with extensive customization capabilities

• Supports wide operating temperature range of -20°C to +70°C for operational stability in rugged environments

• Expandable two DDR4-2133 SO-DIMM with maximum of up to 32 GB of memory

• Intel® Gen 9 HD Graphics integrated in the CPU provides LVDS, VGA (optional) and two DDI ports to support HDMI/DVI/DisplayPort, enabling it to drive multiple HD 4K displays without the need for a discrete graphics card

All-in-one Touch Panel PC Product Lines:

Axiomtek's **touch panel PC** product lines offer features for HMI use including in-vehicle or onboard applications as well as fleet management. The product line is designed to offer high levels of versatility. It features categories such as transportation, light, heavy-duty and stainless steel to suit a variety of industrial uses; anti-vibration features; options for resistive or projected capacitive touchscreens screen sizes; wireless communication options; and many more.

Below is an example of one of Axiomtek's most advanced transportation touch panel PCs available right now:

GOT712-837

• Sunlight readable 12.1-inch XGA TFT LCD screen with auto-adjusting high brightness of 800nits

• EN50155, EN50121-3-2 EMC, EN61373 and EN45545 certifications with M12 lockable connectors for high vibration environments

• IP65 (NEMA4) rated front bezel for protection against dust and liquid spillage

• Fanless design with extended operating temperature range of -25°C to +70°C